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Commercialisation of Intellectual Property: A Comparative Analysis of Georgia and Estonia

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Abstract: Commercialisation of intellectual property (IP) constitutes a vital part of a state's economy and significantly contributes to the development and success of any innovative project. At the same time, commercialisation of IP is directly linked to the adopted legislation on patent rights as it regulates the protection and exploitation of IP. This article seeks to compare the IP commercialisation frameworks in Georgia and Estonia and identify the challenges encountered in patent protection mechanisms in Georgia. Estonia and Georgia are both located in the Eastern European region and share similar legal systems and constitutions. By aligning its legislative framework with European Union standards and supporting universities and fostering a culture of innovation, Estonia sets a notable example in IP commercialisation. However, Georgia's legislative framework still lacks certain elements that are crucial for developing IP commercialisation. The low number of registered patent applications in Georgia indicates the challenges and obstacles in this field. The comparison of legal frameworks and practices in these countries can provide important insights

into the challenges and solutions in IP commercialisation. The article examines how inefficient legislative framework leads to inconsistent patent protection mechanisms in Georgia, creating barriers in IP commercialisation, while underlining Estonia's success in innovation and the establishment of a progressive IP commercialisation landscape.

The article also presents a set of recommendations for Georgia to align its framework with EU standards, initiating joining the European Patent Convention, strengthening IP enforcement, and promoting open IP policies in universities, following Estonia's model.

Keywords: *Georgia's and Estonia's legislative frameworks in IP commercialisation, intellectual property, IP commercialisation*

1. Introduction

The main goal of any innovative project is its commercialisation. However, to enable the commercialisation of intellectual property (IP), it is important to implement a legislative framework and improve patent protection mechanisms. The lack of such a legislative framework in a country can result in inconsistent patent protection mechanisms and create challenges in IP commercialisation. While Georgia's IP legislation is lacking certain elements that are crucial for developing IP commercialisation, Estonia demonstrates significant progress in transforming innovation into intellectual property assets and their commercialisation. A comparative analysis of these two legislative frameworks, and the dynamic interplay between intellectual property, innovative ecosystems, and economic growth, presents a novel and progressive study. Despite the narrowing gap in patent ownership, a significant disparity in patent commercialisation persists. Enabling IP commercialisation is directly linked to the adopted legislation on patent rights. Despite its importance, however, academic literature on this topic has not been subject to a systematic review.

The research problem centres on Georgia's legislative framework leading to the inconsistency of patent protection mechanisms and IP commercialisation. Estonia and Georgia are post-Soviet countries located in the Eastern European region, sharing similar legal systems and constitutions. By aligning the legislative framework with EU standards and supporting

universities and encouraging the culture of innovation, Estonia sets a notable example in IP commercialisation. However, Georgia's legislative framework still lacks certain elements that are crucial for developing IP commercialisation. This research aims to provide a comprehensive analysis of the IP commercialisation frameworks in Georgia and Estonia, identifying key differences and proposing potential solutions for improvement.

Addressing the following research questions, the study makes use of mixed research methods, including a qualitative analysis of IP legislation, peer-reviewed academic literature, publications and policies of universities, and a quantitative analysis of patent registration data: (1) How does the absence of a legislative framework contribute to inconsistencies in patent protection mechanisms in Georgia? (2) What is the role of IP commercialisation in economic growth? (3) How do Estonian and Georgian frameworks in terms of IP commercialisation differ?

2. IP commercialisation

2.1 The importance of IP commercialisation

In the modern global economy, commercialisation of intellectual property has become increasingly important. Commercialisation is the process of turning products and services into a commercially viable value—in other words, bringing IP to the market with the prospect of future profits and business growth. "Empirical evidence demonstrates the value of intellectual property (IP) in creating economic growth. Especially in knowledge-based economies, IP plays a fundamental role in the decisions to invest in innovation" (Atun, Harvey & Wild, 2007, p. 279). Commercialisation is what gives the IP value; without commercialising it, intellectual property is just an invention or creation kept on the shelf. "The patent owner will not benefit from the patent unless he successfully commercializes a resulting product himself or makes it available to others for commercialization through a sale or licensing agreement" (UN, 2011).

Intellectual property commercialisation also significantly contributes to companies' financial prospects (Greenhalgh & Rogers, 2010). The EPO (European Patent Office) and the EUIPO (European Union Intellectual Property Office) have published a study confirming that ownership of intellectual property rights (IPRs) is strongly associated with improved economic performance at individual firm level (EPO & EUIPO, 2021). The

study showed that companies that own IPRs outperform those that do not. The companies' financial success was measured by employee's revenues and wages. "Overall, revenue per employee is approximately 55% higher for IPR owners than for firms that do not own IPRs. This relationship is particularly pronounced for SMEs. SMEs that own IPRs have 68% higher revenue per employee than SMEs that do not own any IPRs at all" (EPO& EUIPO, 2021). The dependency of many tech companies on commercialisation and licensing out their IPs further proves this point (Lichtenthaler, 2010). Correspondingly, countries that provide accessible tools and relevant legislative framework to own IPRs and commercialise them, gain more value in economy and development. This also creates a virtuous cycle—if a country creates a supportive environment for students and employers and encourages them to succeed in innovations and commercialise intellectual property, it boomerangs into enriching the country's economy. One of the great examples of that is Estonia—a country with a very supportive and developing startup environment, and home to many globally known companies that have created their value through IP and its proper management. To cite an Estonian lawyer: "Looking at some of the most successful companies in Estonia, such as the world-renowned Taxify and Skype, it is clear that they are not traditional companies with a large fleet of vehicles, but they create value through IP and their strategy for using it" (Jürgen, 2018).

This chapter summarised the importance of IP commercialisation. The main goal of any innovative project is its commercialisation, but for that to take place, it is important to actually enact the legislation adopted in the country to improve patent protection mechanisms and make commercialisation of IP accessible. "Safeguarding intellectual property, promoting licensing and encouraging entrepreneurship go hand in hand" (Othman, 2011). A well-designed framework is also a precondition for successful market strategies that are proven to be one of the key factors for IP commercialisation (Harrer & Lackner, 2014). While applying intellectual property theories in practice may present some challenges, it is very important to establish and maintain a well-structured framework to regulate it and make commercialisation accessible (Wilkof, 2014).

2.2 IP commercialisation in Georgia

In recent years, Georgia has been actively pursuing economic development and technological innovation. Along with this, IP commercialisation has emerged as a key driver of innovation, attracting investment and economic growth. This chapter explores the current landscape of IP commercialisation in Georgia, shedding light on its challenges and opportunities.

Despite legal and constitutional similarities to Estonia, there are major differences in IP-related legislations and Georgia's legislation is currently facing several challenges that create barriers to IP commercialisation:

Limited regional coverage: Georgia has limited regional coverage in regard to IP protection, as it is not a member of the EU or EPO. This restricts the ability of Georgian inventors and businesses to obtain international patent protection. As a result, Georgian innovators may come across some challenges while trying to license and market their IP assets globally.

Cross-border enforcement: Patents are territorial rights and have territorial scope. Unless a state is a member of a regional agreement, a patent is only valid in the country where it was registered. In this case, Georgia is a member of the Patent Cooperation Treaty (PCT, 1970), which allows Georgian applicants who are seeking patent protection internationally to file the application under the PCT, also called an international application. However, the PCT is not a regional patent but a mere mechanism that allows filing applications in several jurisdictions and acquiring several national patents simultaneously. Therefore, filing an application under the PCT requires additional resources, as it is a complex, time-consuming, and expensive process. This presents an obstacle for inventors and businesses seeking patent protection outside of the country.

Start-up ecosystem development: IP commercialisation and start-up environment are inter-connected with each other. A well-developed start-up ecosystem promotes the growth of technology-driven businesses and IP commercialisation of their assets (Galiakhmetov, Giuri & Munari, 2018). While Georgia is attempting to develop a start-up environment, it does not provide the same level of support, network, and programs as Estonia.

Patent granting procedures: Patent granting procedures and ensuring their efficiency are essential for developing effective IP commercialisation in the country. The national patent office of Georgia, Sakpatenti, requires improvements in its procedures and collaboration with international and European patent offices to align its procedures with best practices.

Before making a decision on granting a patent, Sakpatenti conducts a patent examination of an application, which comprises confirming the application's filing date, conducting an examination as to form, and carrying out substantial examination (Patent Law of Georgia, Art. 32, 5(12)). The application's filing date is confirmed in two weeks, provided the application lacks no required materials (Patent Law of Georgia, Art. 33). The next stage is examination as to form, in the course of which Sakpatenti takes a decision on the completion of the examination as to form within two weeks (Patent Law of Georgia, Art. 34). After the completion of the examination as to form, Sakpatenti conducts a substantive examination and decides on the refusal or granting of a patent (Patent Law of Georgia, Arts. 35–36). Only after this decision, Sakpatenti records the patent data in the register and publishes in the bulletin (Patent Law of Georgia, Art. 40).

As to international application, Georgia can serve as receiving office or designated or elected office of international applications, which means that international applications are accepted by Sakpatenti, which can act as an "elected office" or "designated office" for international applications, indicating Georgia as the place for obtaining a national patent. However, this process requires additional resources, time, and fees.

The procedure for appealing decisions: The appealing procedure is also very extensive and complex in Georgia, consisting of several steps and involving the administrative court. An applicant can appeal the decisions of Sakpatenti upon the completion of the examination as to form or termination of proceedings, as well as the decision of substantive examination on refusal of granting a patent to the Chamber of Appeals: "An appeal can be filed to the Chamber of Appeals within 3 months from the date of publication/ receipt of the respective decision. The Chamber of Appeals shall hear the appeal and take a decision within 3 months from its filing date." (Patent Law of Georgia, Art. 40(3(4)) and (5), LHG 5(12)) Appealing a decision of the Chamber of Appeals can be done in court as an administrative-legal act. As to patent disputes, such as those regarding infringement or issues with commercialisation, appeals are submitted to the court as a civil case. Therefore, appealing decisions is tied to court practice and involves extended timeframes.

Access to EU resources: Funding and grant programs, along with research networks and technology transfer initiatives are very important in IP commercialisation. Georgia has limited access to the EU funding programs as it is not a Member State, resulting in ineffective IP commercialisation and restricted financial and collaborative support.

There are also other challenges in Georgia's IP legislation, such as education awareness or foreign investment challenges. Unlike Estonia, Georgia is not a member of the European Patent Office (EPO), which delivers high-quality patents and efficient services that foster innovation, competitiveness, and economic growth among its member states. The EPO operates under the framework and rules established by the European Patent Convention (EPC), which grants European patents (EPC, Art. 2(1)). Patents granted under the EPC have the effect of and are subject to the same conditions in each of the contracting states for which it is granted as a national patent by that state, unless the EPC provides otherwise.

Challenges in Georgian IP commercialisation are also reflected in statistics regarding the number of submitted and registered patents in Georgia. Statistics from Sakpatenti are shown in Table 1.

Table 1. The number of inventions in Georgia.

Year	The number of inventions					
	National procedure				Foreign procedure	
	Submitted applications		Registered patents		Submitted applications	Registered patents
	Local	Foreign	Local	Foreign		
2021	90	5	42	4	159	82
2020	81	-	45	4	134	103
2019	87	1	31	4	110	80
2018	100	6	36	-	151	97
2017	75	10	37	6	147	163

Source: Sakpatenti, the national intellectual property centre of Georgia.

According to the provided data, the number of submitted and registered patents is very low, pointing to challenges within the IP landscape in Georgia and indicating difficulties in IP commercialisation and patent application procedures. The low number of patent applications is not merely a statistical concern but also reflects the ineffectiveness of the procedures, which is a more profound issue. These procedural challenges significantly reduce inventors' motivation to apply for patents, as the obstacles in the process block the potential for effective commercialisation. Consequently, economic incentives and benefits of IP reside only in its commercialisation. As a result, inventors tend to lose interest in registering intellectual property assets as they do not see the opportunity for commercialising them and gaining benefits.

2.3 IP commercialisation in Estonia

Estonia started developing its intellectual property field in the same period as Georgia (Pitta, 1992), making significant progress in this area and implementing a legal framework that supports the protection and commercialisation of IP. This chapter provides Estonia's approach to IP commercialisation, shedding light on the mechanisms and strategic legal initiatives that have lead to a successful creation, protection, and commercialisation of IP.

Estonia has established a comprehensive legal framework that supports the development of intellectual property industry. Membership of the European Union has encouraged and facilitated the harmonisation of its IP laws with EU law. This alignment of the laws is efficient not only domestically but also extends IP protection across the EU market, facilitating the legal aspects of cross-border IP commercialisation for Estonian inventors and businesses. In addition, Estonia is a member state of the European Patent Organisation, which entails membership in the European Patent Convention. Estonian patent owners can extend the protection of their assets across the member states, and likewise, foreigner inventors can be granted European patents and register their patents in Estonia. "The European patent shall, in each of the Contracting States for which it is granted, have the effect of and be subject to the same conditions as a national patent granted by that State, unless this Convention provides otherwise." (EPC, Article 2(2)) This provision streamlines patent granting procedures and ensures prompt and quality protection, encouraging innovation and IP commercialisation.

The patent application procedure consists of the following stages: filing of the application form, preliminary examination, publication, substantive examination, and registration in the case the patent is granted. If the patent application is rejected, the decision of the Patent Office may be appealed to the Board of Appeal. Upon disagreement with a decision of the Board of Appeal, an applicant may contest the decision by filing an appeal with a county court within the term specified in subsection 1 of Article 63 of the Principles of Legal Regulation of Industrial Property Act. Cases regarding disputes related to patents are heard by the Board of Appeal or in court. However,

> appeals and actions related to the legal protection of inventions, validity of patents and unlawful use of inventions protected by patent, petitions for the securing of an action and petitions for provisional legal protection,

> as well as other appeals, petitions and actions specified in this Act shall be heard by Harju County Court. (Estonian Patent Act, 25 406)

Estonia also has a vibrant start-up environment that plays a crucial role in developing innovation field. The Financial Supervision Authority of Estonia, Finantsinspektsioon, has initiated an Innovation Hub, which serves as a platform for communication between the authority and innovative financial sector companies. The Innovation Hub provides guidance, information, and support to financial technology (fintech) companies, companies that create innovative supervisory solutions and provide support solutions for financial sectors. The hub simplifies market entry for innovative businesses, particularly start-ups.

Estonia has also established several programs and start-up accelerators that provide support not only in funding projects, but also in offering guidance with intellectual property and helping commercialise their assets. These projects, among them Prototron, Ajujaht, Tallinn Creative Incubator, Tehnopol Startup Incubator, etc., contribute to IP education and awareness initiatives. It is very important to encourage start-ups to take their IP to the commercialisation stage, which is the idea and the final goal of intellectual property. This, in turn, contributes to a boost in economy, as these companies grow into so-called "unicorns" and larger companies by creating value through IP and commercialising their assets.

Estonian IP commercialisation landscape is supported by efficient and well-developed patent application and granting procedures, including European patent registration. The outcome is reflected in the number of registered patents in Estonia, which is very high compared to the Georgian example (Table 1). The data from the Estonian Patent Office is presented in Tables 2 and 3.

Table 2. Registered patents in Estonia.

Year	Register of European patents valid in Estonia	Incl. patents belonging to Estonian residents
2022	1,236	4
2021	1,595	3
2020	1,663	5
2019	1,977	9
2018	1,820	6

Source: Estonian Patent Office.

Table 2 shows the number of registered European patents valid in Estonia through the years 2018–2022, including also patents that belong to Estonian residents. This table demonstrates the efficiency of the European patent registration system, which encourages inventors to register European patents, as these have a better scope of patent protection.

Table 3. The number of filed applications.

Year	Filed national applications	Filed applications under PCT	Granted patents
2022	11	4	9
2021	25	1	8
2020	23	0	12
2019	32	0	5
2018	26	4	14

Source: Estonian Patent Office.

Table 3 corresponds to the number of filed applications, which are divided into national applications and applications filed under PCT. Compared to the European patent registration figures, the number of national applications and PCT applications is relatively low. This is also an indication of the efficiency of European patent, as inventors tend to apply for European patents directly, which is beneficial in many ways.

While Estonia has shown a notably high success rate, compared to Georgia, it is important to acknowledge that there is room for further growth and improvement for Estonia as well. Compared to other EU Member States, Estonia's results might not score as the highest and patenting activity in Estonia is considered to be low in comparison (Kelli *et al*., 2016). In some instances, other Member States, such as Finland, have demonstrated even stronger performance in intellectual property and innovation. The comparison between Estonia and Finland is analysed in the article on a case study, suggesting that

> one can easily see the vast disparity between Estonia and Finland when it comes to the number of triadic patents, the population level, the education level mainly as tertiary education (as indicator for education policy and highest level of education completed by each person), the gross domestic expenditure on R&D as a percentage of GDP and the expenditure for total R&D personnel and for personnel researchers (Dutt *et al.*, 2018, p. 140).

The research also provided statistical data, according to which Finland significantly outperforms Estonia in terms of strength of intellectual property. The authors set out the suggestions for Estonia and conclude that "to make the Estonian economy knowledge-driven and technologically intensive, the state must focus on cultural, economic, social and strategic factors. Education, collaboration, coordination and grants are the way forward." (Dutt *et al.*, 2018, p. 143)

There are certain support measures needed by Estonian SMEs from the public support system to acquire and commercialise their IPR. Such measures could be "improved IPR education, government support in the form of tax credits, special IPR grants, loan guarantees and refund of official filing fees for IPR applications." (Dutt & Nyman-Metcalf, 2021, pp. 119–120)

Estonia could model their process on the example of other Member States, one of them being Germany.

> Estonia lags behind Germany in respect of several global rankings related to technology and innovativeness. To make Estonian economy knowledge-driven and technologically intensive, the state must focus on cultural, economic, social and strategic factors. Estonia should adopt RDI policies similarly to Germany and also use the new UP regime to help its SMEs to acquire foreign patents. (Dutt, Wahl & Kerikmäe, 2019, p. 190)

3. IP commercialisation in universities

Universities serve as the main source of research, innovation, and creation of intellectual property, playing a crucial role in IP commercialisation. Beyond their traditional mission of passing knowledge, these academic institutions have become contributors to technological progress and economic growth by transforming academia and research into tangible assets (Ricketson, 1996). "During the last 20 years, universities have acquired a definitive role as agents of economic development" (Hearn, Cunningham & Ordonez, 2004). IP management and commercialisation are one of the main topics in the activities of European universities, as they can be regarded as effective tool to improve the competitiveness of the interested students and innovators (Peredy & Laki, 2020, p. 72).

Estonia, recognised for its success in technological advancements, owes much of this success to universities. A notable example of a successful university-

led commercialisation in Estonia was the development of Skype. In addition to Skype, the Tallinn University of Technology (TalTech) campus is also home to the Estonian Information Technology College and 150 high-tech companies. These companies have had a significant impact on the Estonian innovation ecosystem and provide a strong example of commercialising intellectual property.

For universities to ensure proper realisation of IP commercialisation, it is important that these institutions establish accurate mechanisms for IP disposal and distribution of revenue. TalTech, for example, has established a regulation regarding the Bases for Disposal of Intellectual Property, Principles for Acquisition, Encumbrance with Limited Real Right and Transfer of Assets.[1] The regulation establishes the bases for the transfer and granting of the use of intellectual property owned by Tallinn University of Technology. The university may own the results of an author's creative work based on IP legislation, a contractual agreement between the author and the university, or any other means. According to the regulation,

> [r]evenue shall be distributed based on the following principles: 1) in case of the disposal of copyright and rights related to copyright, the holder of the rights shall receive the revenue unless otherwise agreed; 2) in the case of the disposal of industrial property, the revenue shall be distributed as follows: 40% of the revenue shall be allocated to the authors, 20% to the university and 40% to the distributor.[2]

Georgian universities, on the other hand, face several challenges in IP commercialisation, including related regulatory barriers, limited funding, and lack of technology transfer infrastructure. Estonia has a research and development, innovation, and entrepreneurship strategy that sets forth the following:

> Creating opportunities for research institutions and higher education institutions to expand their knowledge transfer activities, to develop knowledge transfer services, and to upgrade the knowledge and skills of staff on knowledge transfer, including the development of a model for spin-off entrepreneurship and sustainable market-based commercialisation

[1] Established by Regulation No 4 of 30 October 2015 of the Board of Governors of Tallinn University of Technology, Amended by Regulation No 2 of 8 November 2019 of the Council of Tallinn University of Technology (entry into force 25.11.2019).

[2] Article 4 of Bases for Disposal of Intellectual Property, Established by Regulation No 4 of 30 October 2015 of the Board of Governors of Tallinn University of Technology, Amended by Regulation No 2 of 8 November 2019 of the Council of Tallinn University of Technology (entry into force 25.11.2019).

> of knowledge, and to improve the possibilities and capacities for the protection of intellectual property, including by streamlining the legal framework, supporting start-up innovation and the creation and exploitation of intellectual property in all sectors. (Estonian Ministry of Education and Research, 2021)

It is important for universities to keep track of the analysis and contribute to strategy plans—an example of this could be TalTech's explanatory note, which includes data on commercialised IP and licensing agreements (Tallinn University of Technology, 2021). Georgian universities need to address the challenges in research and development and devise strategies aimed at developing knowledge transfer and creating more opportunities for innovators. These challenges act as obstacles preventing the full realisation of the potential of academic research. While students are actively involved in IP creation, managing and protecting IP assets remain a barrier that would impact their ability to commercialise IP. In contrast to TalTech, Georgian Technical University (STU) does not have an operational Technology Transfer Office (TTO) or a unified intellectual property policy document. The absence of an intellectual property policy and a technology transfer office leads to complex problems:

a) Researchers undertake projects without calculating the estimated costs and benefits to the university. The future fate of the research results is also not analysed. Hence, the majority of research is conducted without its results having any practical application, often resulting in an invention that is neither commercialised nor used within the university;
b) In most cases, patents are cancelled due to a lack of interest in the second to third year after their creation;
c) Researchers carry out high-budget research, but the IP object turns out not patentable, leading to waste of resources due to a lack of prior patent research.

Establishing a technology transfer office in the university could solve the above problems. Compared to Estonian universities, Georgian universities lack support from incubators, funding programs, and projects that facilitate IP commercialisation. The organisation that aims to encourage private businesses to commercialise innovations is Georgia's Innovation and Technology Agency—GITA. However, it does not provide adequate support for students who seek protection of IP.

While Estonian universities are actively engaged in research and development, working closely with the industry to transfer technology and knowledge, Georgian universities struggle with regulatory challenges and shortage of resources. Estonia is a great example for developing the strategy for IP commercialisation and supporting universities in innovation and technology transfer. The country is still progressing in this field—along with other Baltic countries, Estonian universities have signed the Technology Transfer Cooperation Agreement to promote knowledge and technology transfer between research and development institutions, companies, and the public sector (WIPO, 2022). Through technology transfer offices, universities have the opportunity to facilitate the transformation of research findings into market-ready innovations.

4. Comparative analysis of IP commercialisation legislation in Georgia and Estonia

The intellectual property landscape has a vital impact on economic growth and innovation on a global scale. This chapter presents a comparative analysis of the legislation and frameworks of IP commercialisation in Georgia and Estonia, aiming to understand the challenges and opportunities that inventors, businesses, and academia might face while getting to the stage of IP commercialisation. Analysing the differences between the two frameworks could also contribute to the improvement of the overall picture, by following the example of better legislation, policies and mechanisms that are used in IP commercialisation.

Georgia and Estonia have both implemented legal frameworks for protection and commercialisation of IP. However, these frameworks and their effectiveness vary significantly. Estonia's legal framework for the protection and commercialisation of IP is stronger and appears more successful than Georgia's. Georgia's IP legislation establishes the foundation for IP protection and commercialisation; however, it faces several challenges in terms of enforcement, legal infrastructure, and limited resources, all of which impact IP commercialisation. Carefully structured government support significantly stimulates patent commercialisation (Ghafele & Gibert, 2014, p. 1). The close alignment of Estonia's framework with EU standards contributes to patent granting procedures in Estonia being much more efficient, providing better support for inventors and businesses. Developing a well-structured

patent granting procedure is important for establishing a successful IP commercialisation landscape. The contrast between the efficiency of Georgian and Estonian frameworks is reflected in the number of applications filed and patents granted in the two countries. The data given in previous chapters (see Tables 1, 2 & 3) show the importance of the granting procedures for the general outcome of the intellectual property framework in the countries. To demonstrate the contrast more clearly, Table 4 below presents the number of registered patents in both countries through the years 2018–2021.

Table 4. The number of registered patents in Georgia and Estonia.

Year	Registered patents in Georgia (incl. local and foreign procedures)	Registered patents in Estonia (incl. European patents valid in Estonia)
2021	128	1,603
2020	152	1,675
2019	115	1,982
2018	133	1,834

Source: Authors' calculations based on data from Tables 1, 2 and 3.

The data in Table 4 reveals the significant difference in the number of registered patents in Georgia and Estonia, with registered patents in Estonia exceeding Georgia's figures more than ten times. It must also be noted that Georgia has a larger population than Estonia.

Several factors contribute to the outcome of these statistics, with interlinking results. In addition to the EPO membership, which is a major contributor in Estonian statistics on registered patents, Georgia faces several additional challenges in its IP commercialisation framework. As there is insufficient support and funding from the government that would encourage students and start-ups to commercialise their IP assets, there is no motivation to create IP. The main source of innovative projects and research are the universities. Without the support, universities are not able to provide infrastructure for IP protection and commercialisation. One of the key differences in Georgian and Estonian IP commercialisation frameworks is the countries' approaches to universities in terms of intellectual property development. Estonia's success in the IP commercialisation landscape is partly due to universities, which play an important role in the development and exploitation of innovation and technology. Universities are partnered with several programs and incubators, which offer support, funding, and

assistance with IP management and commercialisation. Estonia is also a member of the Technology Transfer Cooperation Agreement, which provides TTOs in universities to facilitate IP commercialisation. As mentioned in the previous chapter, in contrast to Estonian universities, Georgian universities do not have TTOs and they lack support from funding projects, which creates obstacles for students seeking patent protection and commercialisation.

There are several factors contributing to the differences in the overall picture of IP commercialisation in Estonia and Georgia. "IPRs are beneficial to all sectors of the economy, and therefore the protection of such rights, once the intellectual property is created in any one country or region, is often made global through a crucial patchwork of bilateral and multilateral agreements" (Nyman-Metcalf, Dutt & Chochia, 2014). Apart from such agreements, one of the key factors is the harmonisation of the national laws; "the codification of Estonia's intellectual property law has been supported by the European Union and European Social Fund" (Kelli, 2015), therefore, Estonian legal mechanisms are well aligned with EU standards. While international agreements play a key role in the protection of intellectual property, it is extremely important that major aspects of the protection of intellectual property rights are harmonised globally (Taliashvili, 1998). Estonia, as a member of the European Union, has its national laws harmonised with the EU, including the intellectual property law and related mechanisms, which have helped the country to create a well-functioning framework (Ćemalović, 2021). Georgia, however, has not yet reached this point.

Having signed the Association Agreement, Georgia has undertaken an obligation to incorporate European legislation into Georgian law and to harmonise the legal mechanisms. Upon signing the Association Agreement, Georgia has taken the responsibility to implement European standards and directives in its national legislation, mostly set out in the Resolution adopted by the Parliament of Georgia on Harmonisation of Georgian Legislation with the EU Law (Resolution of the Parliament of Georgia, no. 828–IS) which provides that all laws and normative acts passed by the Georgian parliament should be harmonised with the standards and norms established by the European Union. The Association Agreement changes the political path of Georgia, redirecting it towards Europe. This should be the main goal of Georgia's policies, as "national legal mechanisms developed even at its maximum capacity are simply not effective enough […] since immaterial goods enjoy the legal characteristics that cannot be found in relation to 'material objects' (tangible goods)" (Taliashvili & Shamatava, 2020, p. 44). Especially when it comes to the intellectual property, which is characterised

by the "territoriality principle," it is important for the state to participate in international agreements and provide global access to the innovators.

The comparison of Georgian and Estonian IP commercialisation legislations reveals significant differences. Close alignment with EU standards provides a strong legal foundation for IP protection and commercialisation. In the absence of this alignment, Georgia faces enforcement-related challenges and limited resources, which impact the shaping of the innovation ecosystem and the country's economy.

5. Comparison of the EU and the US IP protection mechanisms and policies

"Intellectual property is a vital and growing part of the global economy, accounting for about half of the gross domestic product in countries such as the United States" (Kieff & Paredes, 2015). IP protection has become the most important method of securing intellectual assets under the legal system. As a result of globalisation and with the rise of technology transactions, measures of international IP protection have become one of the challenging issues at the international level.

The United States has been one of the frontrunners when it comes to IP infrastructure and its protection. This chapter provides a comparative analysis of intellectual property protection mechanisms and policies in the EU and the United States (USA). This analysis will underline insights into which framework would be more beneficial for Georgia in terms of IP protection and commercialisation. The EU's strategy follows a harmonised approach of IP protection. In order to harmonise the IP protection across the Member States, the EU has established several tools, such as the European Patent Office (EPO), Unitary Patent, and the EU patent system, covering multiple directives. The EU's IP protection framework indeed facilitates securing IP rights across the EU. However, it also faces some challenges related to navigating through the set of different jurisdictions and multiple languages, which can result in administrative obstacles.

As for the US framework, it provides a strong IP protection model, led by the US Patent and Trademark Office (USPTO), and has established a well-structured patent litigation procedure. As a country of a common law system, the USA's IP legislation emphasises the importance of case-law in developing

IP protection. "The "culture of patenting" is more dominant in the US than in other countries (Sweet & Eterovic, 2015). One of the strengths of the US's IP protection framework is its streamlined and speedy patent granting procedure and the role of patents in the field of innovations. Conditions for patentability and novelty also differ in the EPC and USPTO laws, for example, regarding publicly available inventions. EPO rejects inventions which are made available to the public before the filing date, and making publicly available include by means of a written or oral description, by use, or in any other way, as in Article 54:

> (1) An invention shall be considered to be new if it does not form part of the state of the art.
>
> (2) The state of the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application. (EPC, Art. 54)

However, the USPTO seems somewhat more liberal regarding publicly available inventions. According to Article 102 of 35 U.S.C., a disclosure made a year or less before the effective filing date does not count against patentability and novelty:

> (1) Disclosures made 1 year or less before the effective filing date of the claimed invention.—A disclosure made 1 year or less before the effective filing date of a claimed invention shall not be prior art to the claimed invention under subsection (a)(1) if (A) the disclosure was made by the inventor or joint inventor or by another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor; or (B) the subject matter disclosed had, before such disclosure, been publicly disclosed by the inventor or a joint inventor or another who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor. (Patent Act, 35 U.S.C., Art. 102)

However, in the USA, patent litigation process could be challenging as it could lead to increased costs and uncertainty for IP holders. The territorial scope of IP protection mechanisms is also different in the EU and the US. As for the commercialisation aspect, both the EU and the USA promote IP commercialisation through different approaches. The EU is establishing funding mechanisms, facilitating technology transfer, and supporting universities and research centres for innovation development. The USA has a strong innovation ecosystem, which is supported by entrepreneurs, inventors, and the US' patent system itself.

The comparative analysis highlighted several differences in the IP protection and commercialisation mechanisms. Georgia could definitely benefit from some aspects of the US' IP framework in terms of commercialisation, especially in encouraging entrepreneurs and businesses to support inventors and create more patents. However, because of Georgia's path towards accession to the EU, adopting EU's IP framework and implementing the European patent system would bring the country closer to the EU. In addition, Georgia can benefit from facilitating trade and collaboration in the EU market by aligning its legislation to EU's framework. Also, access to the EU market has more advantages for Georgia, as

> even though the US is the world's largest technology market, [i]t can sometimes be a better choice for firms to file at the EPO for various reasons; possibly because the firm's products or technologies are expected to be marketed in Europe rather than in the USA; the size of markets adopting those technologies (along with their supply chains) is larger in Europe than in the USA; or products in technological fields close to those of the patents are mostly manufactured in Europe. (Kim & Lee, 2015)

In terms of IP commercialisation, Georgia's best strategy would be to connect to global markets and harmonise with international standards as much as possible, as it would provide local inventors with broader opportunities to create and commercialise IP globally.

6. Recommendations for Georgian IP legislation

As innovation and intellectual property play a crucial role in driving economic growth and enhancing competitiveness, it is important for Georgia to strengthen its IP legislative framework. This chapter outlines a set of actionable recommendations aimed at improving Georgia's IP legislation, ensuring close alignment with the EU's framework, taking initiative to join the European Patent Convention, and following the example of Estonia by supporting university research and IP commercialisation.

6.1 Joining the European Patent Convention: The next step in the Validation Agreement

Georgia is not a contracting state of the EPC; however, the convention foresees European patent validation procedures. The agreement between the Government of Georgia and the European Patent Organisation on validation of European patents (Validation Agreement) was signed in 2019 and takes into account that

> the Georgian Law on Patents provides for a level of protection substantially similar to that existing in the member states of the Organisation and that Georgia will provide for a system enabling the effects of European patent applications and patents to be validated on request in its territory by introducing into its national law provisions in the spirit of those attached to the Agreement ("validation system"). (Validation Agreement, CA/23/19)

According to the agreement, with a validated European patent, from the date of publication of the information about its issuance by the EPO, the applicant shall be granted the same rights as he would be granted based on the national patent in accordance with the Patent Law of Georgia. Any legal action in relation to a validated European patent, except for those procedures which are related to a third-party complaint filed with the EPO, the central annulment and the limitation are regulated by the legislation of Georgia, in particular, presented on amendments to the Patent Law of Georgia in accordance with the draft law.

In May 2023, Georgia took a big step forward and completed the requirements for the Validation Agreement to enter into force (Sakpatenti, 2023). Correspondingly, the Parliament of Georgia has adopted relevant amendments to the patent law of Georgia. The agreement also provides that establishment of a validation system between the EPO and Georgia will strengthen the protection of industrial property in Georgia, and the validation system will contribute to the achievement of the goals set by the Association Agreement between the European Union and Georgia and support the EU's plans to gradually integrate Georgian economy into the EU internal market (Validation Agreement, CA/23/19).

After the entry into force, a European patent application and European patent validated in Georgia are given the same legal force and will be subject to the same conditions that apply to national patent applications and on the national patent according to the Patent Law of Georgia. On the

request of the applicant, the European patent application and European patents issued on its basis can be validated on the territory of Georgia, which simplifies patent granting procedures for foreigner applicants. In addition, as Georgia has ratified the Validation Agreement, the number of patents registered in Georgia will increase significantly and accordingly, revenues related to validation and maintenance fees will be higher as well. In particular, according to clause 2 of Article 6 of the Validation Agreement, 75% of the fee shall be credited to the national office—Sakpatenti (Validation Agreement, Art. 6(2)). The adoption of presented legislative changes and the entry into force of the Validation Agreement with the EPO is an important tool for the further development of the patent system in Georgia, which will strengthen the protection of industrial property in Georgia and also contribute to achieving the objectives of the Association Agreement between the European Union and Georgia. Implementation of the abovementioned legislative changes and the entry into force of the Validation Agreement will also facilitate Georgia's accession negotiations and joining the European Patent Organisation, which will benefit the country greatly in the long term. Furthermore, on the basis of draft amendments, a number of provisions in Georgian patent law will be brought in line with the European Patent Convention (EPC), the Patent Law Treaty (PLT), and the legislation of EU countries.

With completing the provisions and ratifying the Validation Agreement, Georgia has taken a significant step towards aligning its IP framework with European standards. The next strategic move that Georgia should consider is joining the European Patent Convention, which would be beneficial for Georgian innovators and businesses as it would provide access to a larger market for patented inventions. Consequently, this promises increased competitiveness and attracting foreign investments, leading to economic growth in the country. Joining the EPC would also contribute to solving the challenges that universities face in Georgia, as it would provide innovation support and facilitate technology transfer. Georgia could strengthen its IP framework through compatibility with international standards and establish a favourable environment for foreign businesses, thus increasing the potential of developing the IP commercialisation landscape in Georgia.

6.2 Unitary patent

In addition to the European patent, the unitary patent system is a very progressive and effective tool, which aims to provide a simplified and cost-effective way to obtain patent protection across multiple EU Member States. The unitary patent system was established to streamline the process of patenting inventions across the EU and reduce administrative burden and costs for patent holders. The unitary patent is an additional option enhancing the European patent system, it simplifies and centralises post-grant procedures, offering uniform protection across participating Member States while significantly reducing costs. Innovators who are seeking protection in many countries of the European Patent Convention will find the unitary patent system most beneficial (Veugelers & Harhoff, 2023). It also introduces a Unified Patent Court (UPC) to streamline litigation, provides attractive renewal fees, and benefits SMEs and other small entities with reduced translation costs (Plomer, 2020). Most importantly, as regards the management of a unitary patent, transfers, licences and other rights are no longer needed to be registered country by country in national patent offices. Instead, a single registration for unitary patent protection, centrally administered by the EPO, is sufficient (EPO, 2022). In fact, the unitary patent system simplifies legal mechanisms for acquiring a European patent, ultimately resulting in simplified and advanced legal protection mechanisms. Although the unitary patent system offers major advantages, such as simplifying the process and reducing administrative costs for inventors and businesses, it is important to acknowledge some concerns associated with this system. One of the potential issues pertains to language discrimination within the UPC, which could create financial burden on defendants in patent litigation (Xenos, 2020). In addition, there is some criticism regarding the scope of the UP system, as it does not include all the EU Member States, and moreover, the UPC tries to diminish the influence of the Court of Justice. However, the high costs of obtaining and maintaining patent protection are regarded among the major problems in EU patent law, preventing innovators from being able to fully capitalise on the value of their inventions. Unitary Patent Package (UPP), however, addresses these concerns regarding patent protection in the EU.

> The most obvious benefits of the new regime of unitary patent protection lie with the significant cost reductions of both obtaining and maintaining such protection. The new regime no longer requires validating patents in designated Member States. Thus, the patentees will no longer be

> required to incur significant validation costs, which have included costs of translations, publications and maintaining professional representatives in the designated countries. The renewal fees have also been set at an attractive, patentee-friendly level. Additionally, the new regime envisages lower fees for SMEs, natural persons, non-profit organizations, universities, and public research institutions. Special beneficial cost arrangements are also provided for those who offer to grant licenses of right. (Desaunettes, de Visscher & Strowel, 2023, p. 221)

Despite its complexities, the unitary patent system is still a promising system and could be a valuable tool for innovators, including those from Georgia who seek patent protection in multiple countries. Joining the unitary patent system could open up new pathways for Georgia and lead to greater access. Georgian and foreign inventors currently struggle with inefficient patent granting procedures in Georgia, as they are time-consuming and require additional resources. As a result, the number of registered patents in Georgia is very low. Joining the unitary patent system would provide Georgia a simplified and cost-effective way to obtain patent protection across multiple EU Member States and alleviate administrative burden and costs for patent holders. As the UP system is currently only available for the EU Member States, an important precondition for Georgia is to join the EU and become its member to fully benefit from the system. Alternatively, Georgia should already consider aligning its patent system so that it can join the UP in the future, if the system becomes available for non-EU member states as well.

6.3 Following Estonia's example

The well-structured IP legislative framework of Estonia, which closely follows EU standards, serves as a valuable example. Lawmakers in Georgia should look into the key factors that contribute to Estonia's success in IP commercialisation as it would be advantageous for Georgia to adopt the relevant mechanisms used by Estonia, including establishing technology transfer offices, fostering academic-industry partnerships, and providing funding to universities. Estonia's example demonstrates the significance of universities' engagement in IP commercialisation. "Estonian research, development, innovation and entrepreneurship work together to increase the well-being of Estonian society and the productivity of the Estonian economy, by providing competitive and sustainable solutions for the development needs of Estonia and the world" (Estonian Ministry of Education and Research,

2021). To increase the RDI intensity and knowledge transfer capacity of enterprises, Estonia has implemented a strategy to

> develop services to foster innovation (including product, market, process, organisational, personnel innovation) and design the necessary support system for enterprises (including quality infrastructure, advice on contracting and handling intellectual property as well as support to obtain the necessary certifications for products). (Estonian Ministry of Education and Research, 2021)

Increasing financial support to universities is essential when it comes to research, innovation, and technology transfer. Adequate funding encourages academic institutions and research centres to actively engage in the creation of IP and commercialisation. One of the main challenges in some developing countries is a lack of awareness in IP (Hasanov, 2022), which could also be solved by supporting universities and other educational institutions. According to Estonia's example, this approach would nurture a culture of innovation, which could further improve academia-industry partnerships.

Estonia's research and development, innovation, and entrepreneurship strategy also involves

> creating opportunities for research institutions and higher education institutions to expand their knowledge transfer activities, to develop knowledge transfer services, and to upgrade the knowledge and skills of staff on knowledge transfer, including the development of a model for spin-off entrepreneurship and sustainable market-based commercialisation of knowledge, and to improve the possibilities and capacities for the protection of intellectual property, including by streamlining the legal framework, supporting start-up innovation and the creation and exploitation of intellectual property in all sectors. (Hasanov, 2022)

Peer review of the Estonian R&I system suggests that in terms of knowledge transfer and intellectual property rights, there is potential for improvement. The report suggests that Estonian universities have a high success rate in commercialising intellectual property, but the TTOs are small and lack in providing guidance to students and universities in general (European Commission, 2019). "Innovation is widely recognised as being the key driver of economic growth alongside research and development" (Dragos & Racolța, 2017). This suggestion is applicable not only to Estonia, but also to Georgia. There are currently no TTOs in Georgian universities; however, there are great examples demonstrating the importance of

TTOs and how they can assist universities in IP commercialisation and technology transfer.

Furthermore, open intellectual property policies should be promoted and adopted in Georgian universities. Open IP policies are among the most important ways to provide guidance on IP creation and protection. In addition, these policies typically provide information regarding the IP disposal and distribution of commercialisation profit. For example, the TalTech policy outlines the conditions and bases for IP disposal, and also mentions a revenue distribution clause (Principles for the Acquisition…, 2015). Estonia's experience shows that the adoption of IP policies in universities facilitates the process of IP commercialisation, as these policies allow students and universities to benefit from research findings while creating and protecting IP. This would significantly contribute to IP creation in Georgian universities.

7. Conclusion

This article aimed to provide a comprehensive analysis of the IP commercialisation frameworks in Georgia and Estonia and identify the key differences and potential solutions for improvement. The findings underline Estonia's progress in forging a strong IP commercialisation environment through legislative alignment and the adoption of innovative practices, while Georgia faces challenges in enforcement, funding, and a lack of support in innovation fields.

The first research question, addressing how the lack of legislative framework leads to inconsistency of patent protection in Georgia, is answered by current data and statistics, which indicate a very low number of registered patents in the country. The statistics clearly reflect the impact of the absence of a legislative framework, demonstrating the inconsistency of patent protection mechanisms. The low number of registered patents applications in Georgia indicates the existing challenges and obstacles in this field. While Georgian legislative framework has made a slow progress toward improvement, it remains deficient in certain elements that are crucial for developing an IP commercialisation environment. Estonia, on the other hand, has set a notable example in IP commercialisation by aligning its legislative framework with EU standards and cultivating an innovation-friendly culture. The comparative analysis of IP commercialisation in Georgia and

Estonia accentuates the significant role of legal frameworks in shaping innovation and economic growth.

The second research question discusses the role of IP commercialisation in economic growth, demonstrating how it transforms intellectual property into value-generating assets. As the case of Estonia demonstrates, IP assets significantly contribute to companies' financial prospects, which, in turn, benefit the country's economy.

Commercialisation of IP has become increasingly important in the modern economy, and it is bringing IP to the market in view of future profits and economy growth (Benassi & Martin-Sanchez, 2022). Intellectual property cannot achieve its ultimate potential without commercialisation, as it gives value to IP. Hence, the main goal of any innovative project is its commercialisation. However, the adoption of proper legislation and developing a well-structured framework are necessary to improve IP protection in a country to unlock the commercialisation of IP.

The article proposed a set of recommendations for Georgia to align its framework with EU standards, following the steps after the Validation Agreement, such as joining the EPC, supporting universities, and strengthening IP enforcement, and promoting open IP policies according to the Estonian model. While Estonia has created an attractive hub for IP commercialisation by aligning its framework with EU standards, Georgia faces the challenge of enforcing legal reforms to fully tap into its IP commercialisation potential. The implementation an effective European patent validation system will give Georgia an opportunity to refine its patent legislation, drawing from the EPC and the principles of national patent offices of EU Member States. The entry into force of the Validation Agreement leads to the next step of signing the European Patent Convention, in which Georgia should take the initiative. This step would edge Georgia closer to EU standards and provide more opportunities for improving the IP commercialisation landscape in the country.

In response to the third research question, regarding the disparities in the IP commercialisation frameworks in Estonia and Georgia, the research analysis has revealed notable divergences between these two frameworks. Estonia has established a strong IP commercialisation environment through legislative alignment and innovative practices, while Georgia faces challenges in enforcement, funding, and a lack of support in innovation fields.

Understanding these differences, recognising the gaps in Georgia's IP legislation, and implementing the recommended improvements could cultivate an environment where innovation and IP thrive and commercialising it benefits the economy. Georgia can position itself as a hub for innovation and intellectual property by aligning its legal framework with EU standards, taking initiative in joining the European Patent Convention, drawing inspiration from Estonia, and supporting universities in research and IP commercialisation. Georgia could also benefit from the USA's approach to IP commercialisation, which is supported by entrepreneurs and investors. Motivating businesses to support inventors in creating and commercialising IP assets would also boost the number of registered patents in Georgia. These improvements would not only spur the country's economic growth, but also encourage Georgia to actively engage in the global innovative ecosystem.

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References

Atun, R.; Harvey, I. & Wild, J. (2007), 'Innovation, Patents and Economic Growth,' *International Journal of Innovation Management*, vol. 11, no. 2, pp. 279–297. https://doi.org/10.1142/S1363919607001758

Benassi, M. & Martin-Sanchez, M. (2022), 'Patent Intermediaries, "New" Actors in the Intellectual Property Market,' Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-10310-0

Ćemalović, U. (2021), 'Intellectual Property Rights and Digital Transformation in Estonia: Aspects Related to Copyright and Patent Protection,' *Strani Pravni Zivot*, no. 4, pp. 701–713. https://doi.org/10.5937/spz65-34681

Desaunettes-Barbero, L.; de Visscher, F.; Strowel, A. & Cassiers, V. (2023), *The Unitary Patent Package & Unified Patent Court: Problems, Possible Improvements and Alternatives*, Milano: Ledizioni.

Dragos, D. C. & Racolța, B. (2017), 'Comparing Legal Instruments for R&D&I: State Aid and Public Procurement,' *European Procurement & Public Private Partnership Law Review*, vol. 12, no. 4, pp. 408–421. https://doi.org/10.21552/epppl/2017/4/7

Dutt, P.; Ferraro, S.; Chochia, A. & Muljar, R. (2018), 'Using Patent Development, Education Policy and Research and Development Expenditure Policy to Understand Differences between Countries: The Case of Estonia and Finland,' *TalTech Journal of European Studies*, vol. 8, no. 1, pp. 123–153. https://doi.org/10.1515/bjes-2018-0008

Dutt, P. & Nyman-Metcalf, K. (2021), 'The Legal Implications of Public Support Policies Targeting Research, Development and Innovation in the European Union,' *TalTech Journal of European Studies*, vol. 11, no. 2, pp. 102–129. https://doi.org/10.2478/bjes-2021-0017

Dutt, P. K.; Wahl, M. & Kerikmäe, T. (2019), 'Using Patent Development, Education Policy and Research and Development Expenditure Policy to Understand Differences Between Countries—The Case of Estonia and Germany,' *International and Comparative Law Review*, vol. 19, no. 1, pp. 190–233. https://doi.org/10.2478/iclr-2019-0007

EPO (2016), *Measuring the Economic Impact of IP: Annual Report 2016*, European Patent Office.

EPO (2022), *Unitary Patent Guide: Obtaining, Maintaining and Managing Unitary Patents*, 2nd ed., European Patent Office.

EPO & EUIPO (2021), *Intellectual Property Rights and Firm Performance in the European Union: Firm-Level Analysis Report (February 2021)*, European Patent Office & European Union Intellectual Property Office.

Estonian Ministry of Education and Research (2021), *Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021–2035*, 15.7.2021.

Estonian Patents Act, RT I 1994, 25, 406, 16.3.1994.

European Commission (2019), *Peer Review of the Estonian R&I System*, Final Report, Horizon 2020 Policy Support Facility, Brussels. https://doi.org/10.2777/030204

European Patent Convention, Convention on the Grant of European Patents, Munich, 5.10.1973.

Galiakhmetov, R.; Giuri, P. & Munari, F. (2018), 'How to Enhance Patent Commercialisation? An Analysis of Patent Aggregators in Europe,' *International Journal of Innovation Management*, vol. 22, no. 4, art. 1850040. https://doi.org/10.1142/S1363919618500408

Ghafele, R. & Gibert, B. (2014), 'IP Commercialization Tactics in Developing Country Contexts,' *Journal of Management and Strategy*, vol. 5, no. 2, pp. 1–15. https://doi.org/10.5430/jms.v5n2p1

Greenhalgh, C. & Rogers, M. (2010), *Innovation, Intellectual Property, and Economic Growth*, Princeton, NJ: Princeton University Press. https://doi.org/10.1515/9781400832231

Harrer, R. & Lackner, M. (2014), 'Integrated Marketing Communications in the Commercialisation of Intellectual Property,' *International Journal of Intellectual Property Management*, vol. 7, nos. 1/2, pp. 47–56. https://doi.org/10.1504/IJIPM.2014.062793

Hasanov, O. (2022), 'Role of Intellectual Property Rights in Economic Growth: Theory and Evidence,' *Economics & Law*, vol. 4, no. 2, pp. 37–55. https://doi.org/10.37708/el.swu.v4i2.4

Hearn, G.; Cunningham, S. & Ordonez, D. (2004), 'Commercialisation of Knowledge in Universities: The Case of Creative Industries,' *Prometheus*, vol. 22, no. 2, pp. 189–200. https://doi.org/10.1080/0810902042000218364

Jürgen, L. (2018) 'Intellectual Property in Business: How to Increase Company Value Through Careful Strategic Planning?' Njord Law Firm, 30 August. Retrieved from https://www.njordlaw.com/njord-estonia-intellectual-property-business-how-increase-company-value-through-careful-strategic [accessed 20 Aug 2023]

Kelli, A. (2015), 'The Conceptual Bases for Codifying Estonia's IP Law and the Main Legislative Changes: From the Comparative Approach to Embedding Drafted Law into the Socio-Economic Context,' *International Comparative Jurisprudence*, vol. 1, no. 1, pp. 44–54. https://doi.org/10.1016/j.icj.2015.10.004

Kelli, A.; Värv, A.; Mets, T.; Mantrov, V.; Birštonas, R. & Ginter, C. (2016), 'Different Regulatory Models of Transfer of Industrial Property Rights in the Baltic States: A Plea for Harmonized Approach,' *International Comparative Jurisprudence*, vol. 2, no. 1, pp. 8–17. https://doi.org/10.1016/j.icj.2016.05.001

Kieff, F. S. & Paredes, T. (2015), *Perspectives on Commercializing Innovation*, Cambridge: Cambridge University Press.

Kim, J. & Lee, S. (2015), 'Patent Databases for Innovation Studies: A Comparative Analysis of USPTO, EPO, JPO, and KIPO,' *Technological Forecasting and Social Change*, vol. 92, pp. 332–345. https://doi.org/10.1016/j.techfore.2015.01.009

Lichtenthaler, U. (2010), 'Intellectual Property and Open Innovation: An Empirical Analysis,' *International Journal of Technology Management*, vol. 52, nos. 3/4, pp. 372–391. https://doi.org/10.1504/IJTM.2010.035981

Nyman-Metcalf, K.; Dutt, P. K. & Chochia, A. (2014), 'The Freedom to Conduct Business and the Right to Property: The EU Technology Transfer Block Exemption Regulation and the Relationship Between Intellectual Property and Competition Law,' in T. Kerikmäe (ed.) *Protecting Human Rights in the EU: Controversies and Challenges of the Charter of Fundamental Rights*, Heidelberg: Springer Verlag. https://doi.org/10.1007/978-3-642-38902-3_4

Othman, A. (2011), *Intellectual Property Commercialization in the EU: Policy Options and Practical Instruments*. Retrieved from https://www.academia.edu/37177994/Intellectual_Property_Commercialization_in_the_EU_Policy_Options_and_Practical_Instruments [accessed Feb 2024]

Patent Cooperation Treaty, PCT, 19.6.1970.

Patent Law of Georgia LHG, 5(12), 24. 2.1999.

Peredy, Z. & Laki, B. (2020), 'Possible Ways of IP Commercialisation in the European Higher Education Ecosystem,' *International Journal of Engineering and Management Sciences*, vol. 5, no. 3, pp. 56–74. https://doi.org/10.21791/IJEMS.2020.3.7

Pitta, L. A. (1992), 'Intellectual Property Laws in the Former Soviet Republics: A Time of Transition,' *Santa Clara High Tech. L.J.*, vol. 8, p. 499.

Plomer, A. (2020), 'The Unified Patent Court and the Transformation of the European Patent System,' *IIC—International Review of Intellectual Property and Competition Law*, vol. 51, pp. 791–792. https://doi.org/10.1007/s40319-020-00963-6

Principles for the Acquisition, Encumbrance with Limited Real Right and Transfer of Assets Regulation No 4 of 30 October 2015 of the Board of Governors of Tallinn University of Technology Amended by Regulation No 2 of 8 November 2019 of the Council of Tallinn University of Technology (entry into force 25.11.2019).

Resolution of the Parliament of Georgia concerning the Harmonization of Georgian Legislation to the EU Legislation, 828–IS, 2.9.1997.

Ricketson, S. (1996), 'Universities and Their Exploitation of Intellectual Property,' *Bond Law Review*, vol. 8, no. 1, art. 2. https://doi.org/10.53300/001c.5278

Sakpatenti (2023), 'European Patents will be Recognized in Georgia,' 17 May. Retrieved from https://www.sakpatenti.gov.ge/en/news_and_events/519/ [accessed 15 Jul 2023]

Sweet, C. & Eterovic, D. (2015), 'Do Stronger Intellectual Property Rights Increase Innovation?' *World Development*, vol. 66, pp. 665–677. https://doi.org/10.1016/j.worlddev.2014.08.025

Taliashvili, T. (1998), 'Some Aspects of Patent Law,' *Journal of Law*, vols. 5–6, pp. 37–43.

Taliashvili, T. & Shamatava, I. (2020), 'Recent Evolution of Intellectual Property Enforcement in Georgia,' *TalTech Journal of European Studies*, vol. 10, no. 2, pp. 42–56. https://doi.org/10.1515/bjes-2020-0014

Tallinn University of Technology (2021), Explanatory Note to the Key Indicators of the Strategic Plan 2021–2025 of Tallinn University of Technology. Retrieved from https://oigusaktid.taltech.ee/wp-content/uploads/2021/09/EN_Seletuskiri-u%CC%88likooli-arengukava-2021_2025-vo%CC%83tmena%CC%88itajatest.docx.pdf [accessed Feb 2024]

UN (2011), *Intellectual Property Commercialization: Policy Options and Practical Instruments*, New York and Geneva: United Nations Publications.

United States Code, Title 35 – Patents. (35 U.S.C., amended up to Public Law No. 117-328), United States of America.

Validation Agreement between Georgia and the European Patent Organisation, CA/23/19.

Veugelers, R. & Harhoff, D. (2023), 'New Options for Patenting in Europe,' *Science* vol. 381, no. 6654, p. 111. https://doi.org/10.1126/science.adj6400

Wilkof, N. (2014), 'Theories of Intellectual Property: Is it Worth the Effort?' *Journal of Intellectual Property Law & Practice*, vol. 9, no. 4, p. 257. https://doi.org/10.1093/jiplp/jpu018

WIPO (2022), 'Establishment of the Baltic Technology Transfer Offices Network,' 29 March. Retrieved from https://www.wipo.int/technology-transfer/en/news/2022/news_0005.html [accessed 25 Aug 2023]

Xenos, D. (2020), 'The Impact of the European Patent System on SMEs and National States,' *Prometheus*, vol. 36, no. 1, pp. 51–68. https://doi.org/10.13169/prometheus.36.1.0051