

THE IMPACT OF INTELLECTUAL PROPERTY RIGHTS ON THE ECONOMIC GROWTH OF THE REPUBLIC OF NORTH MACEDONIA

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Abstract: For a long time, scholars and governments had been dealing with the question of whether there is a nexus between intellectual property rights (IPRs) and economic development, and if so, how strong is the link. From the studies done until now, we have clearly indicated that the impact of IPRs is a complex issue and significantly varies across industries and across development stages. The conclusions of the economic literature are ambiguous: some studies conclude that this connection is apparently strong, while others conclude the connection of IPRs and economic development to be fairly weak. Nevertheless, the income of the country is an important determinant while analyzing the impact of IPRs on economic growth of a country. The effect of IPRs protection on growth depends upon the level of development. It is positively and significantly related to growth for low-and high-income countries, but not for middle-income countries. This suggests that, although IPRs connection is quite significant for high-income and low-income countries, middle-income countries are not a typical case of it.

The study looks at the impact of intellectual property rights on the economic growth for the case of the Republic of North Macedonia. To address some of the issues concerning IPRs, this study defines what Intellectual Property Rights are, their definition, history, protection, regime, their instruments, international and national laws etc. It also attempts to evaluate the relationship between the protection of intellectual property and economic activity in the Republic of North Macedonia.

Despite many inquiries into this particular field, it is important to accentuate that there is less research made on intellectual property rights and economic growth that is focused on data in a transitional context. Therefore, there is a significant gap in this area, which is evident from the dispersed regulation of the intellectual property rights in the Republic of North Macedonia. Put differently, there is no State Office for Intellectual Property, but State Office for Industrial Property. This makes research in this field even more complicated.

In the case of the Republic of North Macedonia this is a highly new prosperous field where less research is done. Therefore, the research results will highly contribute regarding this field to the country and its government regarding the economic development of the country as well as the establishment of the new sphere such as intellectual property.

Results of econometric modeling and the analysis of gathered data will provide the empirical evidence for the nexus between intellectual property rights and economic growth of the Republic of North Macedonia. Moreover, the research will discuss the reform of IPR's regime and will offer recommendations for their enforcement and administration.

Keywords: Intellectual property rights, economic growth, development, OLS

1. INTRODUCTION

One of the main goals of a particular country is to achieve sustainable economic growth. Therefore, the country employs lots of different instruments that will result with an acceleration of the economic growth and development and reduction of the poverty. Intellectual property, as one of the prerequisites for economic growth, refers to the protection of products of the human intellect that have a commercial value and that receive legal protection. In general, the objective of intellectual property law is to grant the creator of a work exclusive right over the exploitation of that work. The enormous importance of IPR phenomenon that have undertaken every country, shows the seriousness that country should take when dealing with the situation of IPR legislation, protection and regime. The national legislation for intellectual property protection appears to have some *differentia specifica*, although there are a number of international instruments, acts, conventions, treaties.

In the Republic of North Macedonia, the intellectual property protection is playing a significant role in economic and policy changes. Until now, Republic of North Macedonia has joined almost all important IPR international treaties. It is either a party to the WIPO Convention, Berne Convention for Protection of Literary and Artistic

Works, Paris Convention for the Protection of Industrial Property, TRIPS Agreement, WCT- WIPO Copyright Treaty and WIPO Performances and Phonograms Treaty, etc.

By being a member in these international treaties and agreements, the Republic of North Macedonia has formed its own IPR system by incorporating international IP rules. Although in Republic of Macedonia, there is a lack of comprehensive Intellectual Property Code, the Intellectual Property Rights are codified by related laws and regulations and administrative procedures of an authorized competent bodies that promulgate them. Presently, the Republic of North Macedonia is formulating its national IPR strategy in order to reap the main benefits from the IPR protection as well as to confront the pressures from its trade partners.

The intellectual property is an important instrument and nowadays the Republic of North Macedonia treats it like an important factor from which it can benefit a lot. The country has given importance to IPR strengthening and protection which *de facto* may impact the economic activity of the country. The general objective of this study is to evaluate the general impact of intellectual property rights on the economic activity in the Republic of North Macedonia as a transition country, by evaluating the overall patent activity in Republic of North Macedonia during the period 2013-2020 as well as the economic activity through some relevant indicators such as GDP growth for the analyzed period.

The primary purpose of this study is to provide in-depth analysis of Intellectual Property activity and regime in Republic of North Macedonia and its economic environment, whereas the secondary purpose is to generate discussion and encourage action with respect to promotion of Intellectual Property Rights in the Republic of North Macedonia.

The results from the econometric modeling and the analysis of collected data are then used to provide empirical evidence for the nexus between intellectual property rights and the economic development of the Republic of North Macedonia. Moreover, the research will examine the reform of the IPR regime and will offer recommendations for their enforcement and administration.

In this study there are several limitations that were faced. The first and very important one is the time period, which was specified from 2013 to 2020, due to the lack of the data.

Another limitation - this time from a legal perspective - is the absence of an Intellectual Property Code. Put differently, the intellectual property rights are codified by other related laws and administrative organs, in this case the State Office for Industrial Property.

2. THEORETICAL FRAMEWORK OF INTELLECTUAL PROPERTY

In general, the intellectual property implies the legal rights which result from intellectual activity in the industrial, scientific, literary and artistic fields. Moreover, intellectual property refers to a term of multiple distinct types of creations of the mind for which a set of exclusive rights are recognized in the corresponding law fields. Thus, intellectual property refers to products of the human intellect that have commercial value and that receive legal protection.

The overall objective of the intellectual property law is to grant the creator of work exclusive rights over the exploitation of that work, as the unfettered ability of others to copy the work or invention may deprive the creator of reward and incentive. The World Intellectual Property Organization (hereinafter: WIPO) is responsible for the promotion of the protection of intellectual property throughout the world. It declares intellectual property law as aiming at safeguarding creators and other producers of intellectual goods and services by granting them certain time-limited rights to control the use made of those productions. (WIPO, 1998). For some intellectual property rights, the grant of protection is also in return for the creator making the work accessible to the general public. At the same time, an importance is given to the notion of exclusive rights given as general subject to a number of limitations and exceptions, aimed at fine-tuning the balance that has to be found between the right holders and of users.

A good example of a scholar IPR theory writing is provided by Fisher (2001), who illustrates that the theory in essence is a struggle among and within four approaches. The first and most popular of the four employs the familiar utilitarian guideline that lawmakers' goal when shaping property rights should be the maximization of net social welfare. Pursuit of that end in the context of intellectual property, it is generally thought, requires lawmakers to strike an optimal balance between, on one hand, the power of exclusive rights to stimulate the creation of inventions and works of art and, on the other, the partially offsetting tendency of such rights to curtail widespread public enjoyment of those creations. (Fisher, 2001).

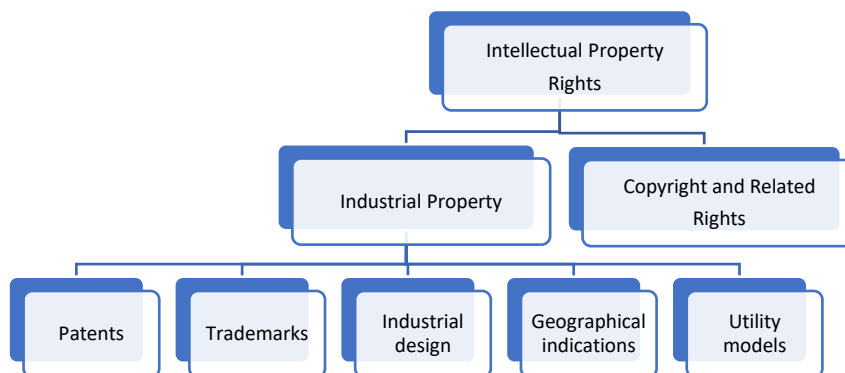
Although many of the legal principles governing intellectual property have evolved over centuries, it was not until the 19th century that the term *intellectual property* began to be used, and not until the late 20th century when it became commonplace in the majority of the world. (Lemley, 2005). Respectively, the British Statute of Anne 1710 and the Statute of Monopolies 1623 are presents as origins of copyright and patent law are First recognition of the

importance of protection of intellectual property is shown in the Paris Convention for the Protection of Industrial Property in 1883 and the Berne Convention for the Protection of Literary and Artistic Works in 1886.

- **Instruments of Intellectual Property Protection**

According to Polenak-Akimovska et al. (2004), the intellectual property is divided into two main branches: Industrial property and copyrights and related (neighboring) rights. Lately, the right of unfair competition is also added to these branches.

Figure1. Intellectual Property Rights Division



The above chart illustrates the proper division of Intellectual property rights and as it can be seen, Industrial property and Copyright together with related rights are the two main branches from whose is consisted intellectual property.

- **IPRs and economic development**

The complexity itself of the relationship between economic development and intellectual Property rights can be pointed out by the difficulty met on the interpretation of its own evidence. Nevertheless, evidence is emerging that stronger and more certain IPRs could well increase economic growth and foster beneficial technical change, thereby improving development prospects, if they are structured in a manner that promotes effective competition. (Evenson, 1995).

Thus, seen properly, IPRs do not necessarily generate monopoly market positions that result in high prices, limited access, and exclusive use of technologies. They are more similar to standard property rights, in that they define the conditions within which a right owner competes with rivals (UNCTAD, 1996).

Except for particular sectors, cases are infrequent in which a patent holder or copyright owner becomes a strong monopolist. Rather, there are likely to be competing products and technologies, including new ones that do not infringe the property right. Much depends on the scope of the product and process claims protected and on the technical characteristics of the invention. For example, narrow patent claims are relatively easy to invent around in generating follow-on innovation. Thus, IPRs may encourage competition, even if they may sometimes diminish competition among existing products.

Regarding the issue that strong IPR can enhance competition, Mansfield in his survey has indicated that for diffusion of technical information to competitors for a short time period as an important mechanism are shown the patent disclosure requirements. Later on, this information is used to develop a new product that will be compatible to the original one, by what it can compete with the original one. To almost every technical progress this characteristic of nature is in fact the key for its progress. Thus, different types of IPR such as patents, copyrights, trademarks and other forms of it, in fact raise the imitation cost but they do not slow down the competition of the products. Also it is important to mention that IPR gives more certainty to companies, since the cost of technology that is transferred is lower as well as it helps during monitoring of different operations of the licensee.

In this view, stronger IPRs in developing economies promise long-term growth and efficiency benefits as they attract additional FDI and licensing and spur further follow-on innovation and technology spillovers. This outcome is far more likely, however, if the implementation of stronger IPRs is accompanied by complementary policies that promote dynamic competition.

Most empirical studies are focused on the direction of causation, from economic development to strengthening of standards for intellectual property protection (Maskus, 1997). However, with a continuing development of the

economy, the demand for qualitative products and inventive capacity shifts up together with the demand of the firms for effective protection leading to high levels of income. Moreover, the economic development level causes differences in the strength of IPR regime.

The issue itself maintains complex nature, based on multiple variables. The considerable dependence of IPR effectiveness on certain circumstances of each country attracts the economists' attention. In order to see the influence of IPR in the economic activity thus the economic growth and development of the country, we shall first consider the aimed roles in the economy. Whether in statistic or dynamics terms, the analysis of IPRs in economic activity is utilitarian; regarding whether the benefits of this system will outweigh its cost. However, it is important to mention that this issue significantly depends from the characteristics of markets, institutions and products, which de facto, it is against the harmonization of one-size-fits-all approach regarding the IPR in international aspect. Yet, nowadays, the discussion of the effects of IPR in economic activity of a country, challenged economists to deal with the following issues and their explanation such as: stimulation of invention and innovation as well as the domestic and international diffusion of knowledge.

The invention is the creation of a new idea or a method, while innovation refers to the use of the new idea and method. An important point of view is that inadequate set of IPRs can stifle both these processes even at low levels of economic development. In most cases, the invention is a process involving minor adaptations of existing technologies, with cumulatively powerful effects on growth.

Nowadays, companies give more importance to the adoption of new organizational and management systems and mechanisms, as well as the technology diffusion whether it is foreign or domestic, which de facto is a kind of investment of the companies that gives the needed economic and social return for their growth in international aspect. Example, in technology-follower countries, utility models are very critical regarding the stimulation of this process, while trademarks stimulate development of new quality products even and in developing and non-developed countries. The protection of the trademarks play important role during and after the process of growth, since they can be easily recognized.

However, the process of stimulation of innovation and invention, de facto has two main effects in economic development. The first and most important is that in fact they stimulate more the entry of new small and medium enterprises in the markets. And the last but not the least is that they also stimulate the growth of existed enterprises and encourage them to exploit the advantages of the scale economies. By growing these companies develop different departments such as research and development, marketing, management and different strategies which will be part of invaluable help in their technical change.

Sectors that are dependent on copyrights, such as publishing, entertainment, and software, will not find much entry by local firms in the absence of copyrights, even if there is considerable activity in copying markets. Creation of new films, music, and software is expensive and little worth the investment by local entrepreneurs if their products will be copied. Accordingly, lower-quality copies may be widely and cheaply available, but society's long-run cultural and economic development is stunted.

Although we mention that IP can effect positively in economic development of a country, we should also mention the existence of the limitation she can have on the economic activity which de facto may cause economic damages, especially in a short time period, immediately after the IP regime has been strengthened.

Group of authors have explained that this aspect of costs and benefits conveys a prejudgment against the reforms in poor countries, since it is difficult to find who will benefit in the future during the present political force.

Authors often discuss their main fear about IPR, which in fact involves the issue of monopoly, thus they indicate that IPR create a monopoly market and they are concerned that companies will use this position to raise their prices. This issue will mainly concern the developing countries, since the number of applications of foreign firms is higher compared to domestic ones, there for the profits will be also transferred abroad, which will cause the growth rate to slow down.

The administration of IPR systems and their enforcement request high cost from the countries, since their process include various offices and human resources such as training examiners, lawyers, judges and officers. It is supposed that these costs mainly to be covered by the fees that are charged for the application and registrations that are filled in the appropriate offices, whether for patents, trademarks, industrial designs, etc. The need to maintain high rates of human capital represents in fact the opportunity cost of the personnel of the IPR administration.

The most present and frequent infringement of IPR are the unauthorized copies from materials that contain copyright protection, such as recording of software and the abuse of trademarks, especially in developing countries, where these infringements are more frequent meet.

This research study implies that by strengthening IPR, will either raise the economic growth or on other hand may decrease the economic growth. The above discussion depends on some important circumstances, which de facto make this issue to become an empirical issue. Today there are present two different studies related this issue that

have explained it in econometric terms. Both of these studies have one thing in common: they both indicate that IPR raises economic growth, although they use different ways and channel to prove it.

The first study in fact it is a very important study, which is consisted from the index of patent, economic growth and other variables, which is done across many different countries. According to their authors, firstly they did not found any strong direct impact of patent in economic growth, but what they did found was that there when the index is interacted with the measure of openness to trade, there is a significant positive effect. Moreover, it was predicted that strong IPR regime will stimulate an average raise in economic growth by 0,6 % in open economies.

Although similar to the first study, the second one was conducted by two known authors related this issue, Ginarte and Park, whose intention was to perform a similar analysis but this time to take into account also the capital investment and R&D investment, apart from economic growth and IPR. Moreover, as in the first study also and in this one, the authors didn't found any direct correlation between growth and patents but they indicated that: patents have a powerful and positive effect on physical investment and R&D spending, which in turn increase economic growth (Park & Ginarte, 1997).

3. RESEARCH METHODOLOGY

For an accomplishment of this analysis and in order to predict accurate results for the given analysis, The OLS model is used to determine the relationship between Intellectual property rights and economic growth for the case of the Republic of North Macedonia.

As a model analysis of Impact on Economic effects is given the following model:

$$\ln(\text{GDP}) = \beta_0 + (\beta_1 \times \ln \text{R\&D}) + (\beta_2 \times \ln \text{Patent}) + \varepsilon \quad (1)$$

The main data need for the accomplishment of this dissertation are Gross Domestic Product, Gross R&D expenditure as well as number of Domestic Patent Applications and Grants in Republic of North Macedonia, that cover the period from 2013-2020. Data for Domestic Patent Applications and Patent Grants or Registrations are taken from the State Office for Industrial Property (SOIP). The data for Gross R&D expenditure and Gross Domestic Product of the country are taken from the Statistical Office. For better illustration of all data that will be used in this analysis are listed in the table below:

Table 1: Data for economic model analysis

Year	GDP (in 000)	Gross R&D Expenditure (%)	IP Index	Domestic Applications	Foreign applications	Total	Registrations
2013	258369	0,2		48	363	411	105
2014	272462	0,18		44	399	443	102
2015	295052	0,17		53	368	421	173
2016	320059	0,17		55	403	458	463
2017	364989	0,16		150	365	515	524
2018	411728	0,14	2.8	34	401	435	328
2019	410734	0,11	2.9	39	372	411	334
2020	423862	0,11	3.1	27	336	363	406

Source: SOIP of the Republic of North Macedonia

- Patent application and Grants trend in Republic of Macedonia

Patents, as an important form of intellectual property, are not very present in Republic of North Macedonia, a fact that can be very easily understood from the data taken from State Office of Industrial Property. By legislation, in Republic of North Macedonia patent is understood as the right granted to an inventor by the state office for industrial property, which allows the inventor to exclude anyone else from commercially exploiting his invention for a limited period thus 20 years.

The table 1 below shows very clearly the exact number of the patent applications on each year, starting from 2003 until 2010, where these applications are separated into national and foreign applications, as well as the total number of applications and granted patents during these years.

Table2. Patent applications and grants in Republic of North Macedonia during the period 2013-2020.

Year	National applications	Foreign applications, national phase			TOTAL applications	Issued decisions patents granted
		PCT	EPZ	SOIP		
2013	48	23	363	386	434	105
2014	44	9	399	408	452	102
2015	53	15	368	383	436	373
2016	55	4	403	407	462	463
2017	150	13	365	378	528	524
2018	34	5	401	406	440	328
2019	39	11	372	383	422	334
2020	27	1	336	337	364	406

Source: State Office of Industrial Property, Annual report 2020.

- Trademarks applications and Grants trend in Republic of Macedonia

Trademarks are very significant instrument of Intellectual property rights in Republic of North Macedonia. By the Macedonian legislation trademarks are shown as distinctive sign or indicator used by an individual, business organization, or other legal entity to identify that the products or services to consumers with which the trademark appears originate from a unique source, and to distinguish its products or services from those of other entities.

Moreover below is presented the table with the correct information about the trademarks applications and grants during the period 2013-2020 in Republic of North Macedonia.

In the period 2013-2020 the State Office of Industrial Property received a total of 40892 trademark applications, of which 74,6% were under the Madrid Agreement and 25,4% were filed before the State Office for Industrial Property.

From the total number of applications, 86,3% were foreign and only 13,7% were from national applicants, so by this we can understand that there is a big difference between foreign and national applications in Republic of North Macedonia.

Table3: Trademark applications and grants, total and per year.

Year	Foreign applications									
	Domestic	The Madrid agreement					Total by Madrid agreement	Total foreign	Total applications	Trademarks registered
		Before SOIP	New	Ext.ter.	Ext. eff.					
1	2	3	4	5	6=3+4+5	7=6+2	8=7+1	9		
2013	478	515	2490	590	-	3080	3595	4073	535	
2014	458	598	2678	487		3165	3763	4221	294	
2015	433	617	3659	620		4279	4896	5329	626	
2016	494	749	3311	495		3806	4555	5049	1290	
2017	618	637	3854	707		4561	5198	5816	979	
2018	1276	690	4057	651		4708	5398	6674	1822	
2019	898	398	3130	601		3731	4129	5027	1433	
2020	944	537	2623	599		3222	3759	4703	783	
Sum	5599	4741	25802	4750	0	30552	35293	40892	7762	

Source: State Office of Industrial Property of the Republic of North Macedonia

- Industrial design trend in the Republic of North Macedonia

Industrial design is another important instrument of Intellectual property rights in Republic of North Macedonia and by its legislation is defined as compositions of lines or colors or any three-dimensional forms that give a special appearance to a product where its term of protection is 15 years.

The table listed below shows detailed information about national applications, foreign applications, total number of applications as well as the total number of registered industrial designs in Republic of North Macedonia during the period 2013-2020.

Table4: Industrial design applications for the period of 2013-2020 in Republic of North Macedonia.

Year	National	Foreign applications			Total applicat.	Industrial designs registered
		Before SOIP	Under Hague Agreement	Total foreign		
	1	2	3	4=2+3	5=4+1	6
2003	45	26	582	608	653	621
2004	31	16	566	582	613	577
2005	47	13	737	750	797	798
2006	32	3	773	776	808	815
2007	39	13	979	992	1031	1016
2008	21	11	1022	1033	1054	1064
2009	28	17	729	746	774	759
2010	35	10	715	735	760	746
Sum	278	109	6103	6242	6490	6396

Source: State Office of Industrial property of the RNM.

4. EMPIRICAL FINDINGS

The results from the conducted analysis show that IPRs have a significant impact in the economic growth of the Republic of North Macedonia. Since in the equation these variables are included: Gross Domestic Product (GDP), Gross Domestic Expenditure on Research and development (RD) and registered patents (Reg), from the results obtained we can suggest that there is a strong positive correlation between GDP and patent registrations. As mention above, IPRs can have positive or negative impact in the economic activity of a country, depending on the given circumstances.

Table5. Descriptive Statistics

	Mean	Std. Deviation	N
lnGDP	12.733396	.1978767	8
lnRD	-1.885174	.2228098	8
lnReg	5.555244	.6549669	8

Source: authors calculations.

Yet only the correlation with R&D showed a negative value, thus the impact of IPRs has a negative correlation with the GDP of the country, due to the fact that Republic of Macedonia dedicates a very small amount of R&D expenses regarding innovations and IPRs. What is important is that the value of R&D expense every year is declining, which in fact contributed in gaining such results.

Table6. Correlation

		LnGDP	LnRD	LnReg
Pearson Correlation	lnGDP	1.000	-.907	.792
	lnRD	-.907	1.000	-.584
	lnReg	.792	-.584	1.000

Source: authors calculations.

The results gained from the regression analysis indicate an impact of IPRs in economic activity, thus GDP in the case of Republic of North Macedonia, although it recommends higher R&D expenses regarding this field as well as

effective enforcement and administration.

The below summary table provides the values of R and R² for the given derived model, where from the data, R has a value of .963, which represents a correlation between GDP and R&D and registered patents. The value of R² is .899, which tells us that R&D and registered patents can account for 89.9% of the variation in GDP, which means that only 10.1% of the variation in the GDP cannot be explained by R&D and registered patents.

Table7. Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.963 ^a	.928	.899	.0630147

a. Predictors: (Constant), lnReg, lnRD

b. Dependent Variable: lnGDP

The next table provides details of model parameters (the beta values) as well as the significance of these values. From the equation we saw that β_0 is 10.935, where the values of β_1 and β_2 are -.599 and .120 respectively, where these values represent the slope of the regression line. In fact, the regression coefficient B represents the change in the outcome resulting from a unit change in the predictors. If the predictors have a significant impact while predicting the outcome, then B should be different from 0. The t-test shows whether the B is different from 0, meaning it shows the probability that observed values of t would happen if the B values were 0. Namely, if the significance is less than .05, these results reflect a genuine effect.

**Table8. Regression results
Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients		95% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	10.935	.228		48.000	.000	10.350	11.521
	lnRD	-.599	.132	-.675	-4.551	.006	-.938	-.261
	lnReg	.120	.045	.398	2.686	.043	.005	.235

a. Dependent Variable: LnGDP

Source: authors calculations.

According to the empirical results it is shown that the significance of R&D is .006 and for registered patents is .043. Both of the values are less than .05, which means that they are significant, thus they have a significant impact on the dependent variable in this regression model.

5. CONCLUSIONS AND RECOMMENDATIONS

Since IPR are a living matter, their development is conditioned by the development of human thought, the development of new technologies and new achievements of science and technology.

In this study, it has been endeavored to understand how strengthening of IPR protection is related with national economic activity. In Republic of North Macedonia, IP protection is playing a significant role in its economic reforms and policy. Intellectual property law in Republic of North Macedonia has met some reforms, although the biggest changes are supposed to come now with the ratification of specific law for intellectual property, since until now in Republic of North Macedonia is present only the office for industrial property.

Although the results of the analysis in the concrete case of the Republic of North Macedonia shows IP to have impact in the economic activity, it gives recommendations for their enforcement and administration, as well as recommendations regarding the R&D expenses for this field. These recommendations are done due to the fact that norms, laws and determinations of intellectual property rights would remain "useless" if not followed by efficient and effective system regarding their enforcement and protection, which implies that the enforcement of IP is an important condition for their efficient and effective protection.

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