Intellectual property rights as the resource for innovative economy development

S M Nikitenko and M A Mesyats
Plekhanov Russian University of Economics, 39 Kuznetsky pr., Kemerovo, 650992, Russia
E-mail: nsm.nis@mail.ru

Abstract. This article is devoted to research of the legal and economic features associated with pledge of intellectual property (IP) in global and Russian practice. The study showed that the practice of banking crediting secured by pledge of rights to intellectual property is common for the United States, Europe, and Asia. At the same time, common and special legislation is used. The small experience of collateral transactions with intellectual property rights in banking crediting in Russia allowed the authors to analyze the signed pledge contracts and rank the pledgees banks. It was revealed that in Russia not only Russian but also foreign banks take part as pledgees in granting loans secured by the pledge of intellectual property rights. The existence of a relationship between the number of signed contracts of pledge of IP rights and the investment attractiveness of banks was established. Taking into account the global and Russian practice, the authors estimate intellectual property as a promising resource for the development of an innovative economy.

1. Introduction
We live in the material world, and we rarely think about the parallel non-material world, in which, as a rule, future tangible values are created. Just like the Moon, any material thing we use has a reverse, invisible side: non-material, intellectual. All the products that we consider and refer to as “innovative” have more than a market embodiment in a tangible form. The innovative product has a period of “non-material life”, as the fetus in the mother’s womb until birth – this is an “intellectual period”, ending with tangible results, and with the rights to them in the form of intellectual property (IP), which, according to Russian law, can take the form of patentable inventions, utility models, industrial designs, achievements of selection, computer programs, databases, mask works (layout-designs), and means of individualization (Civil Code of the Russian Federation, Part 4, Article 1225), which has some differences from the provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights [1].

In the material world, capital is usually understood as money and other valuables, and property is seen as the right to a plot of land, an apartment, a cottage, or a car. In the non-material world, we use the concept of “intellectual capital”, of which the rights to IP objects are an integral part [2].

In the non-material sphere, the holders of IP rights (physical persons or legal entities) have the opportunity to dispose of their IP rights in almost the same way as in transactions with tangible property, including:
- “selling” – transferring the rights under the license agreement [3];
- investing as a share in the authorized (share) capital of a business company (enterprise) [4];
directly “materializing” the patented knowledge in the form of innovative (high-tech) goods (services), which is supposed to be done if we aim to ensure the sustainable development of the knowledge-based national (regional, municipal) economy, in which information and intellectual resources become the main production resource;

- transferring in the form of collateral when making a cash loan (usually for legal entities) [5].

In this article, the authors focus on the last of the four options – collateral transactions with the IP rights. To date, the topic of intellectual property and pledge of IP rights has been reviewed from the standpoint of economic, organizational, legal and other aspects. Collateral transactions are of interest from the point of view of theory and practice, identifying the advantages and challenges in signing and implementing contracts of pledge of IP rights. The topic of pledge of IP rights is reflected in the works of Russian and foreign researchers. It should be noted that the terms for collateral transactions with IP rights differ in different sources (patent pledge, secured transactions, guarantee, collateral, mortgage transactions, warranted transactions, and ensured transactions). The experience of developed countries studied by the authors testifies to the significant contribution of the intellectual component into their economic development.

2. Practice of collateral transactions in the global market of intellectual property

The authors of this article noted that researchers from different countries reveal the legal aspects of disposing of IP rights differently, and have different views on patent pledge or collateral transactions. For example, Matthew J. Pinkerton presents the experience of foreign countries (Denmark, Japan and Australia) in terms of ensuring the protection and commercial use of IP rights in relation to startups [6]. Jorge L. Contreras refers to the phenomenon of “patent pledges” as “[public] commitments voluntarily made by patent holders to limit the enforcement or other exploitation of their patents”, proposing a “market reliance” theory and a practical resource (the pledge registry) to strengthen the legal framework; he also presents the range of patent pledges [7]. Other researchers have highlighted the legal aspects of secured transactions through the lens of licensing relations with respect to the transfer of IP rights. In particular, Andrea Tosato in his work “Secured Transactions and IP Licenses: Comparative Observations and Reform Suggestions” (2018), stresses that “there is a sharp legal and economic distinction between a licensee granting a security interest in an IP license and a licensor using revenue streams as collateral.” At the same time, “the use of receivables as collateral is subject to different rules and raises substantively diverse issues” [8].

Researchers from different countries actively discuss the issues of using organizational and economic tools based on collateral schemes concerning IP objects: e.g. J. Marshall, R. Caldwell & B. Cain (“Taking security over patents”), L. Esposizione (“IP rights and loan financing: European perspective”, 2012), A. Kukrus & V. Antonova (“Valuation of intellectual property as pledge object: theoretical aspects”), Jie Chen & Zeming Yuan (“Research on the Evaluation Pattern of Intellectual Property Pledge Financing”, 2012), B. Amable, J.-B. Chatelain & K. Ralf (“Patents as collateral”, 2010), Du Qunyang, Shi Jicong & Xu Xia (“The IPRs Pledge Loan for the High Tech SMEs and Its Development Prospects in Hangzhou”) [9-13].

The works of Russian scientists also reflect some aspects of pledge of exclusive IP rights from the standpoint of organizational, legal and economic aspects [14; 15].

In developed countries, crediting with pledge of license agreements (royalties) and direct pledge of patents or trademarks is considered a traditional financial instrument [16, p. 24]. The experience of foreign countries shows that business crediting secured by IP rights today acts as one of the most common credit instruments. The object of such transactions is the right to intellectual property (e.g. patents and patent applications) used as collateral for credit agreements. Both formal IP rights (patents and trademarks, which are the objects of the official registration system) and informal IP rights (copyright) may be used as collateral [12].

The authors’ study shows that the practice of loans secured by IP rights as collateral is common in the United States and Europe (in particular, in Austria, the UK, Spain, Italy, the Netherlands and France). The experience of the EU shows that trademarks, patents and IP rights, as well as applications
for their registration, can be used as collateral for loans. At the same time, in Europe lending transactions with IP rights as collateral are regulated by common (e.g., the Dutch Civil Code) and special legislation (e.g., the UK Patent Law, the Italian Code on Intellectual Property, the French Intellectual Property Code, the French Commercial Code) [12; 13; 17-19].

In the literature there are references to the existing experience of collateral transactions involving IP rights in India, Hong Kong, China, and Taiwan [10; 20].

3. The Russian practice of pledge of rights to intellectual property

Similarly to the developed countries, the focus of the Russian economy on innovative development involves the formation of a civilized market of intellectual property as a tool for creating high-tech sectors of the economy, a means of capitalization of assets of enterprises, as well as investment resources. Sustainable development of the economy depends on market priorities and is inevitably associated with the use of a set of promising technologies, the need for which is experienced by the main industries.

In this case, pledge of intellectual property rights is an opportunity for innovative companies with small tangible assets to obtain financing, and for banks it is a new credit product, the demand for which is steadily rising abroad. There are also positive developments in the Russian practice: the Russian Federal Agency for Intellectual Property, Patents and Trademarks (Rospatent) and the Russian Ministry of Economic Development have launched a pilot project on crediting small and medium-sized technological companies secured by intellectual property. The main barrier for the development of such projects is that it is unusual for banks to work with intellectual property as an intangible asset since it requires certain knowledge and skills from the bank staff: how to assess the value of such assets, how to take them as collateral, etc. [21; 22].

However, since 2009, Russia has accumulated some experience in collateral transactions with IP rights. Table 1 provides information on the number of registered agreements of pledge of IP rights in 2013-2016 for the most active pledgee banks.

| №  | Bank                                           | Number of registered pledge agreements | Position in the ranking of Russian banks by brand value (2014)b |
|----|------------------------------------------------|----------------------------------------|---------------------------------------------------------------|
| 1  | PAO Sberbank of Russia (former OAO)            | 3 14 20 9 46                          | 1                                                             |
| 2  | Moscow Credit Bank (OAO)                       | 2 3 4 1 10                            | 23                                                            |
| 3  | PAO Financial Corporation Otkritie Bank (former OAO) | 2 0 3 2 7 | 15                                                             |
| 4  | PAO Joint Financial Capital Bank               | 0 0 2 5 7 n/a                         | n/a                                                           |
| 5  | OAO International Financial Club Joint-Stock Commercial Bank | 1 2 1 2 6 | n/a                                                           |
| 6  | AO Russian Agricultural Bank                   | 1 0 0 4 5                             | 8                                                             |
| 7  | Probusinessbank Joint-Stock Commercial Bank    | 5 0 0 0 5                             | 21                                                            |

aBased on the data of Rospatent
bBased on the ranking of www.banki.ru

Table 1 shows that Sberbank leads in the number of agreements of pledge of IP rights in the group of the most active banks (46 agreements in the selected period), followed by Moscow Credit Bank which ranked second (10 agreements). In general, the study revealed that in Russia both Russian and foreign banks are involved in collateral transactions secured with IP rights.
4. Intellectual property as a promising resource for innovative economy development

The analysis of the publications of Russian specialists revealed a number of studies on IP objects as intangible assets (IA), their importance for business structures, financial organizations and subjects of the Russian Federation (municipalities). In particular, such aspects are reflected in the articles of E. N. Valetdinova (“Intellectual property as a collateral in bank crediting”), N. A. Kazakova (“Evaluation of the commercial significance of the results of intellectual activity”), S. M. Nikitenko, E. V. Goosen and S. V. Kovrigina (“The order of formation of an economic society by the municipality on the basis of intellectual property objects”), etc. At the same time there are works in which the authors apply the methods of economic and mathematical modeling, revealing the correlation and the key influence factors and, based on this, seek to find the possibility of using the results in order to improve the efficiency of management and innovative economy development.

The existing studies of Russian specialists using the tools of economic and mathematical modeling in relation to IP show the following results. The work of Z. A. Koreisha and V. S. Parshina reveals that the largest share of applications for inventions and utility models is filed by organizations—producers, and their share in the amount of innovative products of the Russian Federation significantly exceeds the amount of innovative products of the service sector organizations. In addition, the calculated linear correlation coefficients reveal the relationship between the amount of innovative goods, works and services and amount of used IP objects for the majority of subjects of the Russian Federation [23]. The article of M. Yu. Arkhipova and E. Karpov discusses the possibility of using patent statistics for the analysis of innovation activity in the country, in particular, with the help of pair correlation coefficients [24]. The methods of pair and multiple correlations were used in both articles.

In E. Mayaorova’s article correlation is applied to the analysis of intangible assets in relation to indicators in the retail trade. The correlation revealed the existence of a linear relationship between the share of intangible assets in total amount of assets and the profit of the retail trading business. The correlation coefficient between these indicators is 0.6, which proves the impact of a company’s intangible assets on the formation of its profits [25].

A significant share of correlation analysis in articles discussing intangible assets, including the articles mentioned above, is represented by indicators of parametric statistics (i.e. the authors examine indicators with normal distribution), as well as by the method of pair correlation. This may mean that the relationship between the indicators is visible or has been found by other less accurate methods, and correlation analysis was needed to prove the relationship. Yet, the studies where correlation analysis is applied if the relationship between the variables is implicit or absent at first glance are rare in Russian practice.

Currently, given the nature of the existing Russian researches related to the IP market, banking sector and pledge operations, it should be emphasized that little attention is paid to the importance of the IP as a product of the banks’ crediting activities, as well as the relationship between the positions of banks in the rankings and the number of agreements of pledge of IP rights signed by those banks. The share of agreements of intangible assets pledge is much lower than that of tangible assets pledge. Not every bank can expand the range of crediting services through the pledge of IP rights, as there are huge risks for credit institutions [14; 26]. In this regard, it becomes obvious that intangible assets and their importance for enterprises and banks as financial instruments or credit products should be assessed. In particular, it is necessary to identify how intangible assets can affect the performance indicators, namely the bank’s place in the ranking among other banks.

5. Correlation analysis

The authors aimed to identify the relationship between the number of agreements of pledge of IP rights signed by the pledgee bank and its position in the ranking. To determine this relationship, the information on the number of registered pledge agreements for the four-year period from 2013 to 2016 (according to Rospatent) was used.

Table 2 includes only the pledgee banks whose position in the ranking is specified, according to www.banki.ru (2014). At the same time, in order to identify the general pattern, OAO VTB Bank was
excluded from this list of banks (as having the extreme value of the indicator). With this in mind, Table 2 contains the information on the number of pledge agreements for 17 banks. This table was the source for the statistical processing of the studied indicators.

The data from table 2 were processed using the computer program “STATISTICA for Windows”. The Kolmogorov-Smirnov and Shapiro-Wilk normality tests were used to assess the distribution of the studied quantitative indicators. Since the distribution law of the studied parameters differed from the normal one, Spearman correlation coefficient (r) was used to determine the existence of links between the parameters. Differences were considered statistically significant at p < 0.05.

Table 2. The initial statistics on pledge agreements of pledgee banks.

| №  | Bank                                      | Number of registered pledge agreements | Position in the ranking of Russian banks by brand value (2014) |
|----|-------------------------------------------|----------------------------------------|-------------------------------------------------------------|
|    |                                           | 2013  | 2014  | 2015  | 2016  | Total in 2013-16 |                                           |
| 1  | PAO Sberbank of Russia (former OAO)       | 3     | 14    | 20    | 9     | 46               | 1                                           |
| 2  | Moscow Credit Bank (OAO)                  | 2     | 3     | 4     | 1     | 10               | 23                                          |
| 3  | PAO Financial Corporation Otkritie Bank (former OAO) | 2     | 0     | 3     | 2     | 7                | 15                                          |
| 4  | AO Russian Agricultural Bank Probusinessbank Joint-Stock Commercial Bank | 1     | 0     | 0     | 4     | 5                | 8                                           |
| 5  | OAO MDM Bank                              | 5     | 0     | 0     | 0     | 5                | 21                                          |
| 6  | PAO Saint-Petersburg Bank (former OAO)    | 2     | 0     | 2     | 0     | 4                | 22                                          |
| 7  | OAO Nanosbank Joint-Stock Commercial Bank (OAO) | 0     | 1     | 2     | 0     | 3                | 14                                          |
| 8  | PAO URALSIB BANK (former OAO) Bank of Moscow Joint-Stock Commercial Bank (OAO) | 0     | 0     | 1     | 2     | 3                | 12                                          |
| 9  | OAO Promsvyazbank                         | 0     | 1     | 0     | 1     | 2                | 4                                           |
| 10 | OAO MTS-Bank (former OAO)                 | 1     | 0     | 0     | 1     | 2                | 10                                          |
| 11 | OAO Petrokomerts Commercial Bank          | 0     | 1     | 1     | 0     | 2                | 29                                          |
| 12 | OAO NOMOS-BANK                            | 0     | 0     | 2     | 0     | 2                | 25                                          |
| 13 | Moscow Industrial Bank                    | 0     | 1     | 0     | 0     | 1                | 9                                           |
| 14 | ZAO Credit Europa Bank                    | 1     | 0     | 0     | 0     | 1                | 27                                          |
| 15 | Absolut Bank Joint-Stock Commercial Bank  | 1     | 0     | 0     | 0     | 1                | 31                                          |
| 16 | OAO Center-Invest Commercial Bank         | 0     | 0     | 0     | 1     | 1                | 43                                          |
| 17 | OAO Center-Invest Commercial Bank         | 0     | 1     | 0     | 0     | 1                | 48                                          |

aBased on the data of Rospatent
bBased on the ranking of www.banki.ru

The inverse correlation between the number of agreements of pledge of IP rights and the position in the ranking of banks has been established. The results are presented in table 3.

Table 3. Correlation analysis results.

| Years       | Number of banks | Spearman coefficient | p       |
|-------------|-----------------|----------------------|---------|
| 2013 – 2016 | 17              | -0.507602            | 0.037524 |
| since 2016  | 17              | -0.569796            | 0.016948 |
| since 2015  | 17              | -0.151817            | 0.560791 |
6. Conclusions
The study conducted by the authors allows them to draw the following conclusions:

- the experience of Russia and foreign countries shows the growing role of the IP objects as a promising resource and a potential asset in the development of high-tech sectors and innovative development of the economy as a whole;
- it should be borne in mind that there are legal and economic features in executing collateral transactions involving IP rights (compared to contracts where tangible assets are involved);
- the presence of a close relationship between the number of signed agreements of pledge of IP rights and the investment attractiveness of commercial banks has been revealed, which may also indicate the existence of a common influencing factor on the two studied indicators.

All of the above demonstrates the need for further study, primarily, concerning the legal aspects of transactions with the use of IP rights as an active resource for the development of an innovative economy.

Acknowledgments
The authors express their gratitude to E. Poltavtseva for processing the information in this study.

The authors’ work on this article was supported by the Russian Foundation for Basic Research (Project No. 18-410-420004 “Intellectual Property as the Basis for Sustainable Development of the Coal-mining Region (case study Kemerovo Region)”) and the Kemerovo Region Administration’s Department for Education and Science (Agreement No. 21 dated 14.08.2018).

References
[1] Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)
https://www.wto.org/

[2] Stewart T A 1997 Intellectual Capital. The New Wealth of Organizations (N.Y.-L., Doubleday / Currency)

[3] Civil Code of the Russian Federation Part 4 Article 1234 www.consultant.ru/

[4] Federal Law “On amendments to certain legislative acts of the Russian Federation on the issues of creation of business entities by public-funded scientific organizations and educational institutions for practical implementation of the results of intellectual activity” No. 217-FZ of dated 2 August 2009 www.consultant.ru/

[5] Civil Code of the Russian Federation Part 4 Article 336 www.consultant.ru/

[6] Matthew J. Pinkerton 2010 Considering the Next Generation of Innovators: Incorporating the Needs of Start-ups into the United States Patent and Trademark Office's Intellectual Property Strategy (23Pac. McGeorge Global Bus. & Dev. L.J.313) http://digitalcommons.mcgeorge.edu/globe/vol23/iss2/6

[7] Contreras Jorge L 2015 A Utah Law Review vol 2015 No 2 article 5 787–792

[8] Andrea Tosato 2018 Law and Contemporary Problems vol 81:155 161

[9] Bruno Amable, Jean-Bernard Chatelain and Kirsten Ralf 2010 Journal of Economic Dynamics and Control vol 34 issue 6 1092–1104

[10] Jie Chen and Zeming Yuan 2012 Proc. of 2nd International Conference on Industrial Technology and Management vol 49 (IACSIT Press, Singapore)

[11] Kukrus A and Antonova V 2005 Proc. 13th Sci. Conf. on Economic Policy (Berlin, Tallinn) pp 248–256

[12] Livio Esposizione IP rights and loan financing: European perspective http://techlaw.org/wp-content/uploads/2011/05/110426_IP-rights-and-loan-financing_1.pdf?x13654

[13] Marshall J, Caldwell R and Cain B Taking security over patents https://united-kingdom.taylorwessing.com/synapse/march14.html

[14] Maslenkova O F 2017 Economy of Region 13(4) 1291–1303

[15] Nikitenko S M, Mesyats M A 2017 IOP Conf. Series: Materials Science and Engineering 253 012024

[16] Valletdinova E N 2014 Intellectual Property Right 2(34) 23–29

[17] Loans & Secured Financing 2016 / Contributing editor George E Zobitz Cravath, Swaine & Moore LLP (London: Law Business Research Ltd) p 120

[18] Code de la propriété intellectuelle http://www.wipo.int/wipolex/ru/text.jsp?file_id=363403

[19] Dutch Civil Code, Book 3 http://www.dutchcivillaw.com

[20] Employers, Employees, and Intellectual Property Rights. Intellectual Property Assignment Agreements: Are there any limits on these “Brain Trust Mortgages?” (Prepared by: John P. McNeill, Law Office of John P. McNeill, P.C. / Admitted in North Carolina and Virginia, Cary, North Carolina, USA) 2011, 2015

[21] Nikitenko S M 2010 Innovations 6 15–21

[22] Nikitenko S M, Mesyats M A and Lovchikov V P 2018 Innovations 8(238) 66–73

[23] Koreysha Z A, Parshina K S 2017 Issues of Innovative Economy 1 31–39

[24] Arkhipova M Yu and Karpov E A 2012 Analysis and modeling of patent activity in Russian and in developed countries https://www.hse.ru/data/2013/02/26/1307344743/Архипова_Карпов_2012.pdf

[25] Mayorova E A 2016 International Journal of Applied and Fundamental Research 5-1 146

[26] Mesyats M A 2017 Fundamental Research 3 160–165