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DEVELOPMENT OF THE METHODS OF COMMERCIALIZATION OF INNOVATION IN UKRAINE

ABSTRACT

Innovations contribute to producing products with new or improved characteristics, providing better services that best meet human needs. However, it is necessary not only to develop innovation but also to commercialize it. During commercialization, Ukrainian enterprises face political and economic problems, social instability, economic stagnation, lack of established practice of marketing research to understand market needs, financial problems in finding investors, and more. There are currently some methods for commercializing innovation. All of them are developing differently in Ukraine. Scientific interest in the commercialization of innovations is growing every year. Thus, there were found more than 2700 publications on the commercialization of the innovation in the Web of Science database, half of which have been published in the last five years. The work aims to study the development of some commercialization methods of innovations in Ukraine. The study was conducted based on the State Statistics Service of Ukraine reports. The number of innovation-active enterprises and enterprises that implemented innovations in 2019 has halved (compared to 2010). At the same time, the number of enterprises that implemented innovations is 12-13% less than that of innovation-active industrial enterprises. The number of new technological processes introduced into production of industrial enterprises increased by 13%, and the number of introduced innovative products decreased by 11%. Expenditure on the innovation of industrial enterprises increased by 75%, and the volume of sold innovative industrial products increased by only 1%. The number of cooperatives in 2022 decreased by 13% (compared to 2013). The number of franchisors in 2020 increased by 42% (compared to 2010). The number of companies providing financial leasing services in Ukraine during 2015-2019 decreased by 42%. The domestic engineering market remains in its infancy but has considerable room for introducing international practice in the implementation of engineering projects. In general, since 2016, franchising and cooperation have been growing, among other ways of commercializing innovations, declining.

Keywords: technology transfer, commercialization, innovation, franchising, leasing, engineering, cooperation

JEL Classification: O32, O33

INTRODUCTION

Innovation plays an important role in the development of society. Innovative products contribute to producing products with new or improved characteristics, providing better services that best meet human needs [1].

The dynamic development of innovations in the world's leading countries encourages us to look for ways to develop and implement innovations because the innovation and technical sphere are considered a catalyst for the development of many countries [2].

Thus, according to the Global Innovation Index, Ukraine in 2021 took 49th place, entering the TOP-3 countries of the economic group of lower-middle-income [3]. The report named Switzerland, Sweden, the United States, the United Kingdom, and the Republic of Korea as the most innovative countries. [3].

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Table 1. Ukraine in the Global Innovation Index. (Developed by the authors based on [3])

Indicator for years	2019	2020	2021
GII	47	45	49
Innovation inputs	82	71	76
Innovation outputs	36	37	37

Compared to 2020, Ukraine performs better in innovation outputs than innovation inputs in 2021. In 2021, Ukraine ranked 76th in innovation inputs, lower than last year but higher than in 2019. As for innovation outputs, Ukraine ranks 37th. This position is the same as last year but lower than in 2019.

The enterprise's innovative activity plays a key role in developing the economy of any country in the world. However, it is not enough to create innovative products; it is very important to commercialize them in the market [4].

In the commercialization process, Ukrainian enterprises face several problems, including political, economic, social instability, economic stagnation, low level of technological structure, lack of consistent government policy in the field of innovation, and effective support of innovators from the state. Due to the lack of established practice of marketing research to understand the needs of the market, most scientific and technical developments are incomplete. It makes commercialization impossible. Ukraine lacks an intellectual property market and an underdeveloped stock market. There are financial problems in finding investors willing to take risks associated with an innovative project. Socio-cultural problems often arise - there is a lack of experience and knowledge on technology commercialization. As a result, business representatives do not adequately assess the potential of scientific and technical development. There is also a low level of knowledge and lack of developers' experience in the legal protection of intellectual property and commercialization of technology [5].

Currently, there are a large number of methods of commercialization of innovations: independent use of innovations (manufacture and sale of innovative products; service for domestic production; creation of a subsidiary; sale of a patent), transfer of innovation rights (industrial cooperation, joint venture, licensing, leasing, engineering, and franchising) or full transfer of ownership (outsourcing). However, they are at different stages of development in Ukraine and are used in various fields. Therefore, the study of the development of commercialization methods in Ukraine is becoming relevant [6].

LITERATURE REVIEW AND PROBLEM STATEMENT

Scientific interest in the commercialization of innovations is growing every year. Thus, in the Web of Science database, we found 2783 publications on the commercialization of innovations, published since 1994. Moreover, 48% of all works have been published in the last five years, which indicates a significant interest in this topic.

Most research is conducted in Business Economics, Engineering, Science Technology Other Topics, Environmental Sciences Ecology, and Public Administration.

Almost 19% of papers have been published in Research Policy, Journal of Technology Transfer, Technovation, Technological Forecasting, and Social Change, International Journal of Technology Management, Technology Analysis Strategic Management, and Sustainability.

Researchers from the USA, Great Britain, China, Germany, and Canada are most interested in commercialization. Only 2% of publications belong to authors from Ukraine.

The authors investigating the biggest issue of commercialization are Link A.N., Lichtenthaler U., Shapira P., Maine E., Wonglimpiyarat J., Wright M., Audretsch D.B., Siegel D.S., Youtie J., Rasmussen E. Each of them has more than ten publications on the commercialization of services.

The works of domestic scientists Ilyashenko S.M. [7], Kuzmina O.E. [8], Kostsyka R.S. [9], Perminova S.O. [10], Melnyk Yu.M., and Saher L.Yu. are devoted to the problems of commercialization. Yu., Sigida LO [6] and others.

The work aims to study the development of some commercialization methods of innovations in Ukraine.

RESULTS

The level of innovative development of the country is one of the key factors in attracting investment and the country's economic growth. Central to economic development in the world is industry. Manufacture and sale of innovative products;

domestic production is mostly used in industry. Let's analyze the leading indicators of innovation activity of industrial enterprises based on data from the Department of Statistics.

The number of innovatively active industrial enterprises and those that have implemented innovations (products and/or technological processes) is presented in Fig. 1.

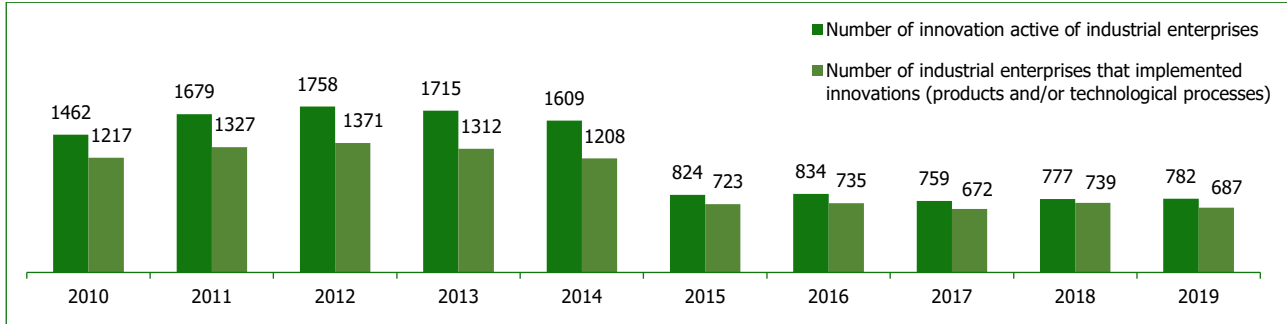


Figure 1. Dynamics of the number of innovative industrial enterprises. (Developed by the authors based on [11])

As shown in Fig. 1, the most significant number of innovative enterprises and those that implemented innovations was in 2012. And by 2019, their number has almost halved, which is a negative trend.

The number of new technological processes introduced into production and innovative products (goods, services) introduced by industrial enterprises is presented in Fig. 2.

As shown in Fig. 2, the number of introduced innovative products exceeded the number of introduced technological processes, but in 2019 they leveled off.

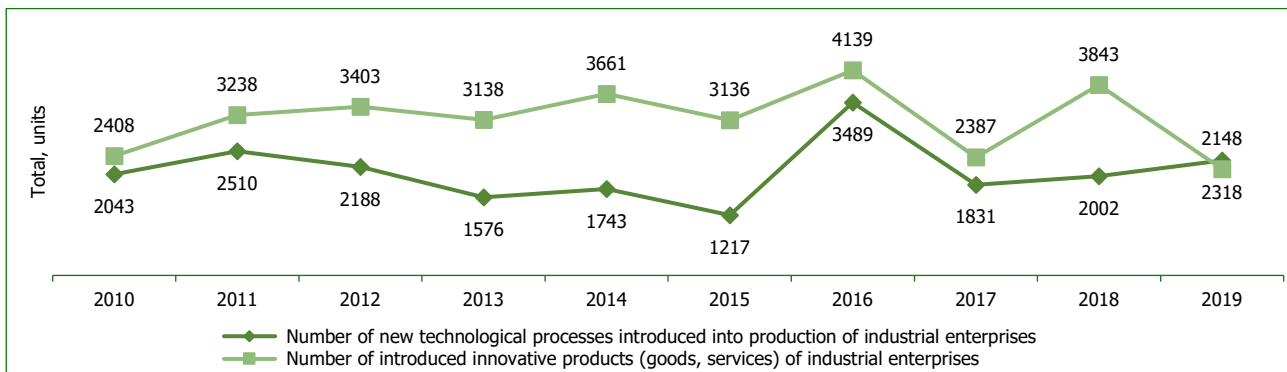


Figure 2. Dynamics of the number of implemented technological processes and innovative products. (Developed by the authors based on [11])

The expenditure on industrial enterprises' innovation and the volume of sold innovative industrial products (goods, services) are presented in Fig. 3.

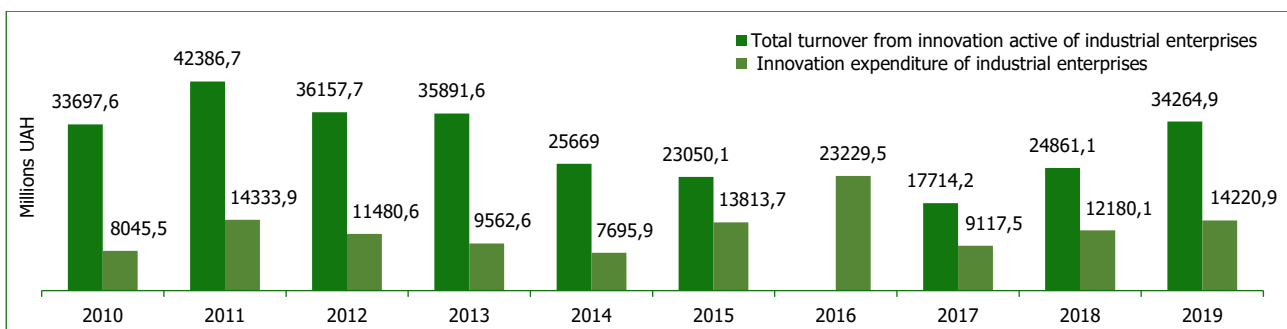


Figure 3. Dynamics of costs for innovations and volumes of sold innovative industrial products in 2010-2019. (Developed by the authors based on [11])

As shown in Fig. 4, the largest amount is invested in the purchase of machinery, equipment, and software (72%) and internal research (17%).

The level of commercialization development through the creation of subsidiaries is evidenced by the number of registered and operating subsidiaries in Ukraine.

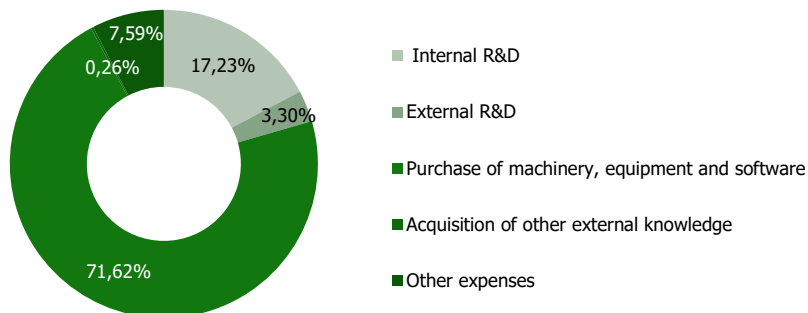


Figure 4. Expenditure on an innovation of industrial enterprises in 2019 by areas of innovation. (Developed by the authors based on [11])

As shown in Fig. 4, the largest amount is invested in the purchase of machinery, equipment, and software (72%) and internal research (17%).

The level of commercialization development through the creation of subsidiaries is evidenced by the number of registered and operating subsidiaries in Ukraine.

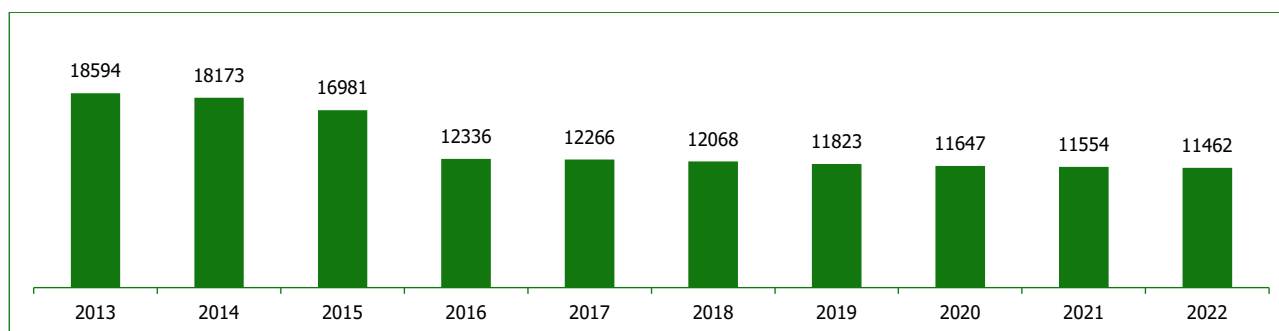


Figure 5. Total number of a subsidiary in 2013-2022. (Developed by the authors based on [12])

As shown in Fig. 5, after 2015, there was a significant decline in the number of subsidiaries. Since 2016 their number has been almost at the same level with a tendency to gradually decrease (by 8% compared to 2015).

One of the commercialization methods, which involves the transfer of property rights and is actively developing in Ukraine is franchising. This is evidenced by the growing number of franchisors (Fig. 6). Companies with 5-7 facilities choose this strategy; they are profitable and have been operating for more than three years. When you have experience and understand your business model, the next task is to create an "intellectual component" for your franchise partners.

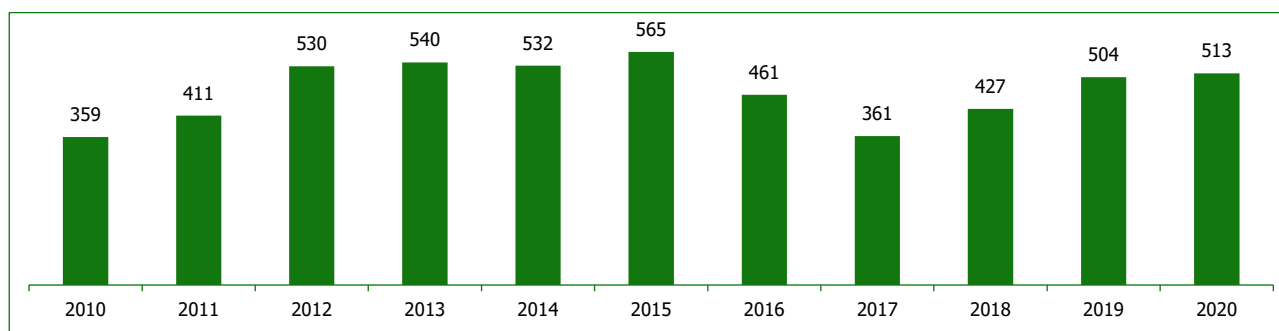


Figure 6. The number of franchisors in Ukraine in 2009-2020. (Developed by the authors based on [13])

Franchising is beginning to develop in Ukraine. There was a downturn in 2016-2017 due to the exit of the "fake franchise" market. Starting in 2018, the number of franchises has been gradually growing.

According to the number of franchised objects, the first place is occupied by services, the second is catering, and the third is retail [13]. Retail mainly develops itself. Restrains the lack of own production. For Ukrainian retail to overgrow through a franchise, you need to have your own production, your own or well-established logistics, design departments (if it is fashion retail), etc. Therefore, not the first year in the first place is the provision of services: children's education, beauty salons, and other services for the population. In retail, only grocery retail is well developed in the franchise since it is least limited by the need to have its own production base.

The Ukrainian leasing market is traditionally mainly focused on vehicle leasing. The value of this type of asset was 63% of the leasing portfolio at the end of 2019. Agricultural machinery also has a significant share in the portfolio - 18.5%. These two groups formed more than 80% of the leasing portfolio in Ukraine [14].

In addition to transport and agricultural machinery and equipment, the leasing portfolio includes the following types of assets: real estate (6.5%), construction equipment (4%), and industrial equipment (2.7%) [14]. There have been no significant changes in the structure of leasing portfolio assets in Ukraine over the past couple of years.

Leasing is also developing in the financial sector (Fig. 7).

The number of lessors, legal entities, and financial companies providing financial leasing services in Ukraine during 2015-2018 decreased. Thus, as a result of 6 months of 2019 in Ukraine, there were 167 legal entities - lessors; As of July 1, 2019, the State Register of Financial Institutions included information on 121 institutions that have a valid license for the right to provide financial leasing services, which is 4.3% more than for the whole of 2018 (Fig. 7). Financial leasing in Ukraine is carried out mainly by banks, financial companies, and legal entities that have received a license from Natskomfinposlug to conduct financial leasing.

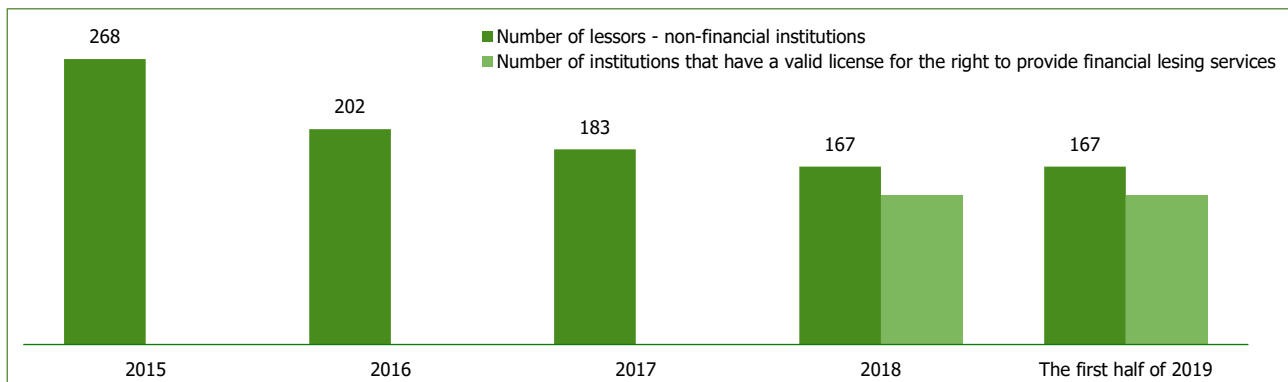


Figure 7. Number of lessors operating in the field of financial leasing. (Developed by the authors based on [15])

At the end of 2019, 630 institutions had the right to provide financial leasing services in Ukraine. This number included 78 banks, 439 financial companies, and 113 so-called legal entities - lessors [14].

Financial companies account for 71% of the total number of licensees to conduct leasing business. But they hold only about 3% of the portfolio's total value. Another 26% is in the hands of banks. Both of these market participants do not consider leasing as a core business [14].

The most active players in the domestic leasing market are members of the Ukrainian Association of Lessors, and they generate 80% of new business in leasing [14].

Engineering in Ukraine has not yet gained significant momentum as in industrialized countries. But the market for engineering services is developing mainly through foreign capital. Many well-known companies are operating in Ukraine, whose activities are directly or indirectly related to providing engineering services both in Ukraine and abroad. Among them are Concordcode Engineering, Financial and Industrial Group "Altcom," SE "Ukrainian Scientific and Technical Center of Metallurgy," SE "Hydrocoke," and C-engineering [16].

The domestic engineering market has been in its infancy for a long time. With the appropriate human resources and experience of successful activities in this field, Ukrainian engineering companies are in low demand in the domestic market due to the low innovation activity of domestic enterprises [17].

However, the engineering business in Ukraine has a considerable reserve for introducing international practice in the implementation of engineering projects. Prospects for further research in this area are to identify priorities for the development of domestic engineering in the near future, taking into account foreign experience.

The number of cooperatives testifies to the development of cooperation in Ukraine (Fig. 8).

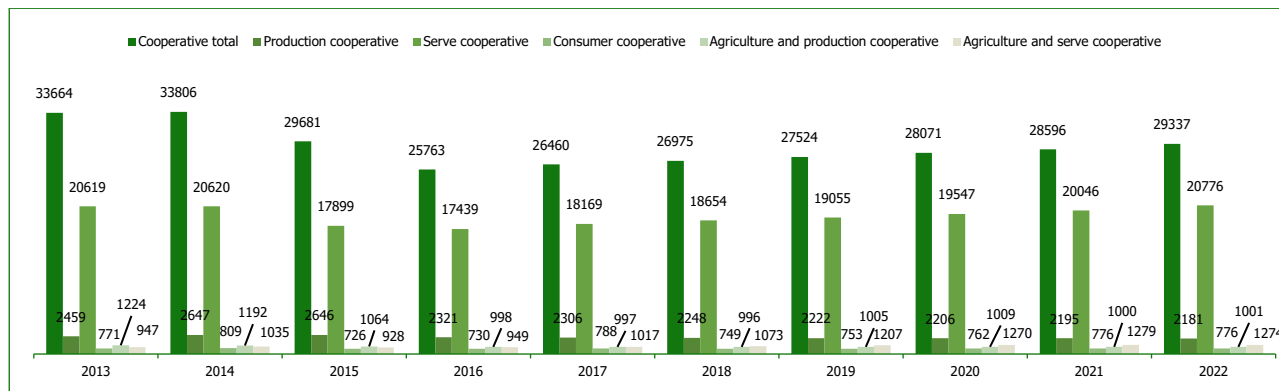


Figure 8. Number of cooperatives-legal entities by organizational and legal forms of management in 2013-2022.
(Developed by the authors based on [12])

Cooperation is most common in the service sector (61.7%). At the same time, agricultural cooperation is not widespread in Ukraine. As of January 1, 2022, agricultural cooperatives account for 6.8% of the total number of cooperatives. Production cooperatives also account for a small share - only 6.5%.

CONCLUSIONS

The innovative activity of the enterprise plays an important role in the development of the economy worldwide. It is the commercialization of innovations in the market that ensures the company's stable growth, maintaining competitive advantages in the market.

Scientists identify the following methods of commercialization of innovations: independent use of innovations (manufacture and sale of innovative products, service for domestic needs, creation of subsidiaries, sale of patents; transfer of part of innovation rights (industrial cooperation, joint venture, licensing, engineering, franchising, leasing, and leasing) complete transfer of ownership (outsourcing).

Each of these methods has its advantages and disadvantages and different application areas. And their development in Ukraine is happening at different rates.

According to the Global Innovation Index, the level of Ukraine in 2021 deteriorated by two units and took 49th place, taking 3rd place in the countries of the economic group lower-middle-income.

The number of innovative enterprises and those implementing innovations remains almost unchanged. At the same time, the number of enterprises that implement innovations is 12–13% less than that of innovative active industrial enterprises. In 2018 alone, this gap narrowed to 5%.

The number of new technological processes and innovative products introduced into production increased significantly in 2016, but since 2017 there has been a significant decline again. For the first time in 2019, the number of new technological processes introduced into production exceeded the number of introduced innovative products.

Until 2017, the volume of sold innovative industrial products decreased, but from 2018 it began to increase and almost reached the level of 2012-2013. Industrial enterprises' innovation cost is twice fewer sales and has increased since 2017.

After 2015, there was a significant decline in the number of subsidiaries. Since 2016 their number has been almost at the same level with a tendency to gradually decrease (by 8% compared to 2015).

Franchising is beginning to develop in Ukraine. During 2016-2017, there was a decline due to the exit from the "fake franchises" market. Starting in 2018, the number of franchises has been gradually growing.

80% of the Ukrainian leasing market is leasing vehicles and agricultural machinery. Financial leasing is also developing.

Engineering in Ukraine has not yet gained significant momentum as in industrialized countries. But the market for engineering services is developing mainly through foreign capital.

Since 2016, the total number of cooperatives has been gradually growing. Cooperation is most common in the service sector (61.7%). At the same time, agricultural cooperation is not widespread in Ukraine (6.8%). Production cooperatives also account for a small share of only 6.5%.

Thus, since 2016, franchising and cooperation have been growing; there is a decline among other ways of commercializing innovation.

ADDITIONAL INFORMATION

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РОЗВИТОК МЕТОДІВ КОМЕРЦІАЛІЗАЦІЇ ІННОВАЦІЙ В УКРАЇНІ

Інновації сприяють виробництву продуктів із новими або покращеними характеристиками, наданню більш якісних послуг, максимально відповідних людським потребам. Однак необхідно не лише розробити інновацію, а ще й комерціалізувати. Українські підприємства під час комерціалізації стикаються з проблемами політичної, економічної, соціальної нестабільності, стагнації економіки; відсутністю усталеної практики маркетингових досліджень для розуміння потреб ринку, фінансовими проблемами з пошуком інвесторів тощо. Нині існує ряд методів комерціалізації інновацій. Усі вони по-різному розвиваються в Україні. Науковий інтерес до комерціалізації інновацій зростає щороку. Так, у базі даних Web of science знайдено 2783 публікацій щодо комерціалізації інновацій, половина з них опубліковані протягом останніх 5 років.

Метою цієї роботи є дослідження розвитку деяких методів комерціалізації інновацій в Україні. Дослідження проводилося на основі звітів Державної служби статистики України. Проти 2010 року кількість інноваційно активних підприємств та підприємств, що впроваджують інновації, 2019 року скоротилася вдвічі. При цьому кількість підприємств, що впроваджують інновації, на 12-13 % менша, ніж кількість інноваційно активних промислових підприємств. Кількість нових технологічних процесів, упроваджених у виробництво промисловими підприємствами, збільшилася на 13 %, а впроваджені інноваційної продукції скоротилася на 11 %. Витрати на інновації промислових підприємств зросли на 75 %, а обсяги реалізованої інноваційної промислової продукції лише на 1 %. Кількість кооперативів 2022 року скоротилася на 13 % (до 2013 року). Кількість франчайзерів 2020 року зросла на 42 % (до 2010 року). Кількість лізингодавців, юридичних осіб та фінансових компаній, що надають послуги фінансового лізингу в Україні, протягом 2015-2019 років зменшилася на 42 %. Вітчизняний ринок інжинірингу залишається на стадії становлення, однак має чималий резерв запровадження міжнародної практики реалізації інжинірингових проєктів. Загалом, починаючи з 2016 року, франчайзинг та кооперація зростають, серед інших способів комерціалізації інновацій спостерігається спад.

Ключові слова: трансфер технологій, комерціалізація, інновації, франчайзинг, лізинг, інжиніринг, кооперація

JEL Класифікація: O32, O33