

ECONOMIC'S DIGITALIZATION AND ENTRY BARRIERS IN HIGH-TECH INDUSTRIES: CHANGES DYNAMICS EVALUATION

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The article considers approaches to future forecasting on the basis of the economy digitalization. In this aspect, the entry barriers into high-tech industries are discussed, including their dual nature - the advantages that they provide and the risks that they carry. Ten main barriers were identified: intellectual property, marketing strategy, giants' market power, infrastructure, political confrontation, national security, high-tech product life cycle, staffing, global value chains, technological saturation. The main results of the study are:

- The digitalization of the economy brings changes in the traditional entry barriers into the industry, since the physical boundaries of production, storage, trade and any other traditional principles of doing business are erased.

- The main barrier to free economic space is an intellectual property. Already today, along with goods, works and services, it is included in the trade turnover, and its importance is growing more and more every year.

Keywords: digital economy, high-tech industries, barriers to entry into the industry, intellectual property.

Introduction

Currently, not a single economy in the world can exist separately from other economic agglomerations; industrial cooperation is observed, tied to geography, national markets, and the main factors of production.

In these conditions, on the one hand, enterprises get opportunities to enter the target industries, since multinational companies are interested in a synergistic effect, on the other hand, new conditions for functioning on the market to a large extent create new barriers. The issues of digitalization of the economy are the most actively discussed in business and scientific circles in recent years.

Many scientific articles and a number of providable conferences abroad are devoted to these issues. The moment of the beginning of the digital-information revolution is the creation of electronic computers, which without human intervention began to generate, process and transmit information [3, p.70].

As VV Akberdina notes, the digitalization of industrial markets is integrated into the general process of digital transformation of industry, starting with primary information and communication digitalization and ending with the industrial Internet [1, p. 78]. Significant characteristics of the digital economy are its widespread use; robotic labor; distribution of 3D printers; decrease in the role of production, retail, office premises; internet of things; digital platforms; renewable energy sources and others [10, p.16].

Habitual relationships in society are replaced by an electronic counterpart. These changes are accompanied by the need to transform classical public institutions in order to provide a level of trust in the electronic sphere [2, p. 7]. The transformation of production,

economic and social relations carries both certain opportunities for market entities and certain risks associated with various options for projected trends in the development of industries.

At the same time, existing classic barriers may suddenly disappear, an example is the large-scale development of online sales. This tool instantly erased the boundaries of geographic markets and opened up great opportunities for all sellers to reach new markets.

In foreign literature, barriers to entry into the industry are defined as the cost of production that should be paid by a company seeking to enter the market, but should not be paid by firms already on it [12, p.4]. Existing barriers allow firms already working in this industry to set prices below average costs, and newly created firms are not allowed to make profit in the same amount as existing firms receive [8, p. 103].

Main focus of the study

The main barrier that we single out as an obstacle for an economic entity to enter the high-tech industry is intellectual property. Initially, the Institute of Intellectual Property, which limits the use of technology as a factor of production through the payment of patents and know-how, is designed to stimulate and protect investment in innovation.

Intellectual property allows legally securing the right to use the results of intellectual activity, thereby ensuring a return on investment. The authors even point out the role of intellectual property in creating a monopoly. So, patents create a monopoly on the use of the results of intellectual activity, thereby closing the market for competitors [13].

A high-tech enterprise can obtain intellectual property in the following ways:

- own expenses for research and development;
- mergers and acquisitions (acquisitions of a business entity with IP);
- stimulation of internal invention with the allocation of a share of profit.

When patenting, we disclose a certain part of the result of intellectual activity, in exchange for this, the state gives us a patent that guarantees an exclusive right to use intellectual property for a certain period of time.

However, with the current terms of patenting (and they are unreasonably large), companies and other structures acting in their interests, engaged in industrial espionage, get opportunities to implement their non-competitive ways of doing business.

According to statistics in the United States there are more than 158 thousand patents in the field of software products. Moreover, if any company in this industry, such as Apple, will conduct patent research on the release of each new product, taking into account the cost of the standard hour of work of a patent attorney of \$ 314, the total cost will be close to 10% of US GDP. For this reason, high-tech companies today do not even carry out patent research. Today, it becomes apparent that the transaction costs associated with patent research are not feasible not only to small players, but also to large ones. However, for society, for many reasons, not only large companies, but also small ones are necessary [9, p. 107].

For this reason, all the largest high-tech companies are facing patent trolling.

The level of technology makes it possible to put many developments into mass production today, but the very idea of the existence of large transnational players implies a phased introduction of technology into the market.

Companies such as Samsung and Apple, despite the apparent competition, of course, adhere to certain agreements on the life cycle of high-tech products. Here we see

oligopolistic agreements correlated with the marketing strategy of launching a new product on the market with a gradual coverage of each target segment, with a profit at each stage of the life cycle.

These examples confirm the existence of certain arrangements between transnational players. From these arrangements, everyone but the shareholders lose. Since during this time a more unique portfolio of products and services could be created. As the next barrier to entry into the high-tech industry, we highlight the dematerialization of value, which leads to a shift in the proportions between the secondary and tertiary sectors of the economy in favor of the latter, and the huge market power of the existing giants.

Market power is a classic example of entry barriers to an industry. In the framework of economic theory, it is interpreted as exclusive control over sources of raw materials or cheap energy [5, p.13]. However, in high-tech industries, value is often created ephemerally. One of the largest capitalization companies, Facebook has no machine tools or production facilities, has an office of 350 people and a huge impact on the market.

And the fastest growing companies in the world are those that work in the Internet environment. Market trends are formed by the activity of the largest players in the market of high-tech products, even in industries such as petrochemicals, pharmaceuticals, and mechanical engineering.

In markets dominated by industrial giants, it is impossible for small companies without targeted financing, without breakthrough technologies to overcome entry barriers. As an illustrative example of a small company entering a high-tech industry, here is an example of a Chinese DJI. Today it is the market leader in unmanned aerial vehicles, with a share of 70% [14]. The implementation of the Chinese strategy for entering the market is completely unique, at first the product is displayed on it, and only then is it tested on the market. However, the implementation of such a strategy requires an appropriate market potential.

If the market is already overloaded with similar products, or their alternative counterparts - a breakthrough is impossible. When the level of technology in an industry is nearing its peak (in accordance with Kondratyev's theory of economic waves), with a state of little change, it's difficult to enter the industry.

Since the industry has a certain number of oligopolistic companies that previously occupied their niches. However, the emergence of breakthrough technology in the industry makes it possible for absolutely any company that owns it to enter this industry and contribute to its qualitative leap. As noted by Konina N. Yu., A change in technological patterns generates its leading companies, which are more likely to realize their capabilities and receive "intellectual rent" [7, p. 44]. The accessibility of the conditions created by the state for the business environment can also be a serious barrier to entry into the high-tech industry. They are characterized by the availability of financing, free access to industry information, the legislative framework, tax incentives and other preferences.

In the digital economy, the role and place of information is greatly enhanced. And in these conditions, one who owns unique information earns. Another barrier to entry into high-tech industries is political confrontation. We all remember the sensational scandal when the Huawei fund director was arrested in Canada at the request of the US authorities. At the state level: the USA, Europe, Canada and Australia there is a strict taboo, calls for abandoning Huawei products. This undermines the basic foundations of free competition and consumer society.

The principles of free movement of capital are violated, the system of interaction in international markets is changing. Similarly, China does not let Apple enter its domestic market.

The next barrier is national security issues and lobbying for the national interests of states.

Another barrier, which will be discussed later, is the shortening of the life cycle of a high-tech product. Today, one year passes from the stage of introducing it to the market to the beginning of the recession in the telecommunications industry, and in 3-4 years in mechanical engineering. But the general trend is to reduce. The new company does not have time to "swing". Personnel, as a barrier to entry into high-tech industries, are the basis for the development of new technologies.

Large transnational players from the school bench are trying to track talented and promising children for subsequent employment in their structures.

Similar companies are encouraging states to create dedicated scientific and industrial agglomerations, such as Silicon Valley in the USA, Skolkovo in Russia, which accelerate the process of introducing new technologies into production areas, and achieve a synergistic effect from the fusion of science, business and human resources, innovative sectoral cooperations are formed that are inaccessible to anyone before.

The next barrier is the level of technology and the existing global value chains. If in the 70s the history of Apple began with the fact that they assembled the first computer in the garage, today it is not possible to imagine the appearance of a high-tech company from the garage. At the moment, the height of technology determines a broad, industrial cooperation.

This is a certain kind of distributed base. Issued in one place, assembled in another, packaged in a third, funded and managed in the fourth. When moving to the next technological mode, states that will lag behind leaders with technology can go into active confrontation, including the military.

The risks of using global value chains are discussed in [4, p.24]. In addition to the described risks, we highlight that the distributed model of production of multinational companies can lead to provocation of states to conflicts. Thoughtless extraction and use of natural resources can ultimately lead to disaster.

Technologies should guard the conservation of the natural environment, the reproduction of biological resources, the creation of such an ecosystem in which a person will continue to harmoniously develop and exist in constantly changing conditions. Since a person, as a unit of the biosphere, may very well cease to exist.

As the final barrier, we single out the very idea of creating new technologies in conditions close to technological saturation, which are characterized by approaching the border of production capabilities, a shift of which is possible in the long term.

Conclusions

There are various tools for creating technologies, but from an evolutionary point of view, insufficiently harmonious development can lead to stagnation of any industry. The question arises of how often the data transfer standard will change in the future, since 5G technology is currently entering the market, and Chinese enterprises are working as actively as possible on the next generations of equipment. What is the further development of audio and video transmission technology.

Given the fact that in the near future aircraft will begin to enter the nearest near-Earth orbit, it is also necessary to maintain communication there. Accordingly, at orbital latitudes, different wave frequencies, and possibly new technological principles, will also be needed. And if airplanes fly in hypersonic, will this be a challenge to existing information transfer technologies?

Technologically, it is necessary to improve the means of information transfer, data transfer packets, the form of the packets themselves, and possibly the speed of their transmission. In this regard, it is necessary to continue further research in various environments, at various heights and to study the nature of sound transmission and its behavior at such heights and speeds. Today, the problem of technology development is in the man himself. Mankind is actively creating self-learning intelligent systems, designed over time to replace a person with the so-called artificial intelligence.

Minimizing obstacles, according to the theories of David Ricardo [15], contributes to the fullest and most effective use of existing potential, which in competitive markets pushes the curve of production opportunities and contributes to economic growth on a global scale.

The uneven development, noted at present, contains reserves of growth, allowing to bring both technology and other factors of production to a qualitatively new level. In the context of globalization, this task can only be accomplished by the entire world community, which implies minimizing conflicts on the basis of resource support for the global economy.

According to Glazyev S. Yu.'s assumptions, the imperial world order will be replaced by an integrated world economic order in which each state will arrange the economy in accordance with its ethical standards. [3, p. 83]

People, as the main element of any state in this aspect, will be creative leaders capable of independent intellectual activity.

References:

1. Akberdina V.V. (2018). Digitalization of industrial markets: regional features. *Manager*. 9, 6: 78–87.
2. Voskanyan E., Krivoschapka I. (2016). Digitalization of the economy: impact on management. *Effective crisis management*. 6 (99): 6–11.
3. Glazyev S. Yu. (2018). Digital Information Revolution. *Eurasian integration: economics, law, politics*. 1 (23): 70–83.
4. Dementiev V., Ustyuzhanina E. (2016). Inclusion of the domestic economy in global value chains: creative potential and risks. *Journal of Economics*, 2: 19–34.
5. Ergin S.M. (2016). Identification of market entry barriers for the choice of organizational forms of a monopolized market. *Theoretical Economics*. 5 (35): 7–16.
6. Ziganshina L.E., Niyazov R.R. (2013). The unethical promotion of drugs by the pharmaceutical industry is a major barrier to their rational use. *Kazan medical journal*. 94, 2: 240-244.
7. Konina N. Yu. (2014). Sixth technological structure and management of modern companies. *Issues of Economics and Law*, 69: 43–46.
8. Lukyanov S., Kislyak N. (2007). Industry barriers to entry as an essential tool in competition restriction policies. *Economic issues*. 2: 101–110.
9. Trubnikov D.A., Trubnikova E.I. (2014). Intellectual property rights: motivation or barrage? *Infocommunication technologies*. 12, 4: 106-110.
10. Ustyuzhanina E.V., Sigarev A.V., Shein R.A. (2017). The digital revolution and fundamental changes in economic relations. *Bulletin of Chelyabinsk State University*. 10 (406): 15–25.
11. Tsvetkov V.A., Stepanov I.M., Kovalchuk Yu.A. (2016). Implementation of the strategies of the new industrialization of the economy. *Bulletin of the University of Finance*. 6 (96): 19-30.
12. Preston McAfee R., Mialon H., Williams M. (2004). What is a Barrier to Entry? *The American Economic Review*. 94.2.