

THE ROLE AND ANALYSIS OF VENTURE FINANCING IN THE DIGITALIZATION OF THE ECONOMY

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Abstract. *The increase in business digitalization is inextricably linked with the emergence of new innovative companies. Technological projects successfully implemented on the market are the basis for the development of high technology and one of the most effective elements of accelerating innovation processes. The mechanism of influence of different types of diversification indexes on the level of capitalization of the enterprise depending on the economic cycle was analyzed. This analysis revealed that during the COVID-19 pandemic, the most attractive sectors of the economy for venture capital were information technology, telemedicine and online education. This study focuses on the importance of investment in technological projects, which are the main factor in the competitiveness of enterprises, industries and national economies as a whole. It provides examples of successful venture projects in Ukraine and analyzes the effectiveness of the development of their technological areas by various companies in the non-technological sector. The types of technology investments were considered in terms of the classification of venture investment funds, the differences in the strategies of venture funds and traditional private equity funds in technological companies, as well as the development of corporate technology projects or startups. The study also considered the processes of diversification of enterprises in the face of the ever-increasing influence of the technology sector in other industries. The study discusses the features of venture financing of innovative projects in modern economic conditions. By examining different types of technology investment strategies, the introduction of innovations into existing business processes was analyzed. An analysis of the structure of the distribution of investment flows in the most popular areas of venture capital distribution was carried out. The dependence of the level of diversification of the company and its activities regarding the distribution of funds for the development of high-tech areas was studied. Recommendations regarding the development of the Ukrainian market for technological investments are provided, and the method of research of the investment directions of diversified enterprises in the introduction of innovations is offered.*

Keywords: *digitalization, economics, venture financing, startup, innovations.*

Introduction

In today's world, information and digital technologies are becoming powerful drivers in all areas: manufacturing, trade, logistics, medicine, education and more. Every day, we are witnessing numerous examples of how digital technologies contribute to peace, human rights and sustainable development for the benefit of society as a whole (Nigam et al., 2020). Venture capital is recognized as one of the priority mechanisms in financing innovation activities. Global practice has shown that the emergence of venture capital has led to the significant intensification of innovation processes, and venture capital itself is increasingly becoming a factor in accelerating the development of scientific and technological progress (Lerner & Nanda, 2020).

The purpose of this work is to analyze the impact and importance of venture financing for the development of the digitalization of a country's economy.

In the process of writing this work, the author used general and special methods, which made it possible to systematically study venture financing and technological development in the digital economy.

The main body of the paper

The global economy has been affected by digitalization and the widespread introduction and dissemination of information technologies. The digital economy is a set of social relations formed by the use of electronic technologies, electronic infrastructure and services, the technologies of large data analysis and forecasting to optimize production, distribution, exchange, and consumption in order to increase the socioeconomic development of states.

Digitalization has stimulated an influx of investment support for startups. Between 2011 and 2020, the amount of venture capital invested at all stages increased fivefold. Even the COVID-19 pandemic saw an increase in venture capital. At the same time, private funds have been active for a long time and the amount of corporate investments has been increasing. A fall in the average investment in this area was recorded only in the segment of public investment. There are several very important reasons to consider the possibilities of private capital or venture capital in Ukraine. Many of the country's former problems have already been solved, and there are many who jump to provide creative opportunities within risk factors that are at least reasonable. Today, the backwardness of the venture capital industry in Ukraine is due to a weak legal framework, an imperfect stock market, the non-transparent financial activities of companies, a lack of guarantees for investors, a lack of experts in venture fund management, and a lack of tax benefits for venture capital. Successful experience in developing a venture capital system and a mechanism approved in other countries can and should be used in Ukraine, but practical examples of the US experience should be taken into account – such as venture capital being postponed in its purest form, without changing the infrastructure environment, legal environment, etc. In Western European countries, however, this model was not successful and did not produce the necessary economic effect.

Creating a favorable investment climate and improving the legal framework will increase the amount of venture financing of the Ukrainian economy, and recommendations can be made to make proposals to improve the tax regulation of venture funds. These recommendations consist: in determining the tax base of income tax on non-property assets on the basis of a special agreement; in establishing a special regime of taxation of wage payments in companies that are professionally engaged in venture fund management; in the development of tax benefits for industrial corporations that invest in venture funds that invest in the main profile of industrial corporations; in tax benefits and preferences for small and medium enterprises – including VAT on the sale of new products; in insurance premiums for small and medium-sized innovative enterprises from the property tax of the organization related to new equipment used in the production of knowledge-intensive products; in land tax benefits for research organizations and innovative enterprises; in exemptions from taxation of income from the implementation of exclusive rights and additional preferences for innovative enterprises when issuing an account and annual accounting of intellectual property, which is the basis of innovation; and in subsidies for the payment of interest on bank loans aimed at purchasing new processing equipment and creating modern facilities used in the production of knowledge-intensive products.

It is proved that technologies and technological investments are aimed at improving the development of the following economic categories: making organizational management more efficient; improving other sectors of the economy (the ability to optimize processes such as the capabilities of the Internet have changed industries as such retail, and have given impetus to the development of the delivery of goods); influencing macroeconomic indicators (investments in technology are usually made through public funding, also often through the interaction of teams from different countries, which is positively reflected in the country's foreign trade balance); improving financial markets; developing social initiatives; developing technology – today, thanks

to the development of technology, tourism, ease of telecommunications, transparency of social activity, accessibility of media content have become very popular among all social groups; and developing regulatory procedures – today, with the development of technology, businesses' control over their activities increases, facilitating the social control of businesses, which encourages them to be more responsible and to promote the globalization of socioeconomic processes.

There is a growing level of mutualism among individual companies and even industries around the world. As such, the areas of responsibility of the organization to which attention should be paid in case of the decision to introduce technologies in the business process are defined.

In today's world, there are a huge number of techniques and methods of promoting and selling goods and services. The main task of any business is to meet the needs of its customers and shareholders by strengthening its economic potential and competitiveness (Mason & Harrison, 2017). However, with each passing day, competition between enterprises is intensifying and there is a need to use increasingly sophisticated technologies to improve the marketing, financial and operational level of competitiveness of the organization. Particular attention can be paid to multidisciplinary enterprises, for which today most technological investment is used as a marketing tool to attract additional investors.

Today, technology is one of the most important factors in the competitiveness of enterprises of different forms of ownership and areas of activity. Diversified businesses are one of the most common ways of doing business in many countries around the world. The most important aspect of the company's sustainable development is the ability to create value for shareholders and be able to develop in a competitive environment.

Technological investments are aimed at improving the development of the following economic areas:

1. Organizational management, which helps to optimize many processes that require less time spent by workers such as accounting and internal communication.
2. Improving other sectors of the economy (the ability to optimize processes such as via the capabilities of the Internet has changed industries such as retail, and has given impetus to the development of the delivery of goods).
3. The ability to influence macroeconomic indicators (investments in technology are usually made through public funding, also very often via the method of interaction of teams from different countries, which has a positive effect on the foreign trade balance of the country).
4. Improving financial markets (in many cases, the financing of innovation processes and new technologies is through the attraction of capital or venture capitalists or financing by so-called "angel investors," which gives impetus to the protection of investors, mutual funds, banking, insurance, consulting, etc.).
5. Developing social initiatives (social habits can change with the further development of technology, so today due to the development of technology they have become very popular (Koski et al., 2020) among all social groups. These habits include tourism, ease of telecommunications, transparency of social activity, and the accessibility of media content).
6. Regulatory procedures (today, with the development of technology, the possibility of the business controlling its activities increases, facilitating the social control of the business, which encourages it to be more responsible).
7. Contributing to the globalization of socio-economic processes (increasing the level of mutualism among individual companies and even industries around the world).

The technological factor is able to increase the economic potential of enterprises.

The technology sector includes everything from large, well-known companies to small players who work largely behind the scenes. This category also includes emerging companies of all sizes,

startups, multibillion-dollar technology and consumer brands, and various conglomerates (Conti et al., 2019).

In a broad sense, this category includes enterprises engaged in the research, creation and distribution of goods or services based on technology. This can be anything from computers to software, TVs to websites. Hardware is a physical device – a computer, TV, smartphone, etc. Software is computer code or platform that makes these devices work.

Investing in the technology sector offers investors many opportunities. In fact, this sector offered the highest profits of all rated market sectors in 2017 – 34.28%.

However, these strong profits mean that the technology sector has many risks. Technology is changing rapidly, and one-time leaders can quickly fall behind or even stop. In addition, promising emerging companies can see huge spikes, only to disappear quickly.

Technology is an exciting space that includes trends from artificial intelligence (AI) to smartphones, blockchain, self-driving technologies, constant trends in software as a service (SaaS), the Internet of Things (IoT), media streaming and others. This is an area full of opportunities, but also a certain risk.

Every organization will need to become a digital organization in the near future, but our research shows that most still have a long way to go. Organizations need to upgrade their technology to take part in an unprecedented opportunity for digital transformation (Bonini & Capizzi, 2019).

Today, we can determine that the four best technological areas in which the company should invest are:

- cybersecurity;
- IoT technology;
- cloud services;
- artificial intelligence (AI).

Implementing technology in business processes is quite a difficult process and often involves significant financial and time costs, so businesses should identify areas of responsibility for the organization to pay attention to when deciding to implement technology in business processes, or investing in the technology sector. These areas are as follows:

1. Staff readiness.

Analyzing talent technology, technology size, and quality serve as a barometer for talent readiness. Careful evaluation and management of the talent fund ensures consistent technical and strategic skills throughout the technology implementation period. It also requires businesses to ask important questions about opportunities. For example, do they have sufficient access to people, both inside and outside the organization, who understand the technology and apply it to the business and industry context?

2. Research on the availability of capital.

The amount of capital invested in technology development and its application in different sectors measures the adequacy of capital in relation to technology. Venture capital investment, for example, is one of the indicators of money transferred to startups and incubation centers for future development. Mergers and Acquisitions (M&A) are another excellent barometer and a worthy source of market analysis for the degree of development of the business, and the attractiveness of technologies being developed and implemented.

3. Ecosystem maturity.

The business must share the same vision of artificial intelligence enhancement supply chains as its major distributors. Ecosystem assessment should also include the study of existing standards and protocols, such as current technology applications and uses (Corredoira & Di Lorenzo, 2019).

Research is needed on how these regulatory standards promote or hinder the integration of technologies.

4. Intensity of adaptation.

Evidence of successful technology integration within existing or related industries can also guide businesses' investment decisions. It is estimated that the average industry spends significantly on digital technology that can help companies to decide how much to invest and for what outcome. Research is also needed to determine the projected increase in the cost of implementing the technology in the market.

5. The potential value of technology.

Value potential is focused on assessing the return on investment in digital and other technologies, which sets expectations for both managers and shareholders.

Quantifying the expected profits of the top and bottom lines can serve as a useful guide in the entire process of implementing technological investment.

The directions that are the most popular among investors are determined on the basis of the analysis of European venture investments (Table 1).

If diversified companies want to stay relevant and successful in future digital transformation projects, then technology investment should be prioritized. Even the largest public asset conglomerates in many countries are focused on technology investment.

Now consider the amounts of investment in technological innovation of these companies (Table 1). It should be noted that they are very different. Furthermore, it is difficult to compare the level of investment in technology conglomerates such as Berkshire Hathaway and Alphabet, because the former never positioned itself as a technology company and the latter, on the contrary, started as a specialized Internet search company (Google).

Table 1. The most popular areas of investment of venture capital funds

Source: developed by the author

| No. | Direction | Features | Fraction |
|-----|-----------------------------|--|----------|
| 1 | Software (mostly SaaS) | Financial software, business software, software for operational processes, mobile software | 36.2% |
| 2 | Biotechnology | Creation of new drugs, focus on a new generation of antibiotics | 17.3% |
| 3 | Media and entertainment | Social media, video hosting, interactive media | 9.5% |
| 4 | Medical equipment | New generation of prosthetics, laser technology | 7.1% |
| 5 | IT services | Outsourcing of IT processes | 6% |
| 6 | Energy sector | Horizontal drilling, shale drilling investments, traditional energy, green energy | 5.8% |
| 7 | Consumer goods and services | Eco-food and FMCG products | 3.9% |
| 8 | financial services | Online banking technology, insurance | 2.6% |
| 9 | Equipment | 3D printers, robotics | 2.1% |
| 10 | Telecommunications | Internet of Things, new means of communication | 2% |

Table 2 shows the capitalization, number of staff and technological sectors in which the investments of these enterprises are directed.

Traditional conglomerates such as Danaher, Honeywell, GE, and Berkshire Hathaway today have a dual view of technology investment. First, they try to use technology in their traditional businesses to gain a competitive advantage by reducing costs or increasing productivity. Also, these companies direct retained earnings as financial investments in high-tech enterprises under the strategy of venture capital funds. This allows them to bring additional income to their shareholders by increasing investment capital.

Such investments also play a very important marketing role in attracting investment. Because technology investments have associations with high profitability in the psychology of investors, this allows such diversified companies to position themselves as technology investors and attract the attention of a younger generation of investors, who are also able to significantly increase their shares and thus further profit their shareholders. Table 2 provides an overview of the largest conglomerates in the world that actively invest in technology.

Table 2. Public conglomerates that actively invest in technology, 2018

Source: Forbes (2021)

| Corporation | Capitalization, billion \$ | Staff, pers. | Turnover, billion \$ | Net income, billion \$ | Assets, billion \$ |
|---------------------------------|----------------------------|--------------|----------------------|------------------------|--------------------|
| Johnson & Johnson [NYSE: JNJ] | 366.2 | 135,100 | 81.6 | 14.7 | 153 |
| 3M [NYSE: MMM] | 126.1 | 93,516 | 32.8 | 5.3 | 36.5 |
| Berkshire Hathaway [NYSE; BRK] | 516.4 | 389,000 | 247.8 | 4 | 707.8 |
| GE [NYSE: GE] | 81.4 | 283,000 | 121.6 | -22.4 | 317.7 |
| Alphabet [NASDAQ: GOOG] | 863.2 | 98,771 | 137 | 30.7 | 166.3 |
| The Walt Disney Co. [NYSE: DIS] | 238.1 | 201,000 | 59.4 | 11 | 99.9 |
| Danaher [NYSE: DHR] | 90.7 | 71,000 | 20.1 | 2.4 | 47.8 |
| Honeywell [NYSE: HON] | 123.1 | 114,000 | 40.3 | 6.7 | 58.6 |

The effect of technology can be felt through business. Scientific discoveries make little or no sense if there are no competent business units to produce for people what science has discovered. The organization of a diversified business must not only attract huge amounts of capital, but the proper use of funds for useful purposes is also mandatory. This requires efficient and effective financial management together with qualified and competent financial managers.

Table 3. The main areas of activity of diversified enterprises and areas of their technological investment

Source: Forbes (2021), World Bank (2022), UkrMetallurgProm (2020), Fedorov (2018)

| Corporation | Main areas of activity | Technological investments |
|---------------------------------|---|-------------------------------------|
| Johnson & Johnson [NYSE: JNJ] | Production of cosmetic and sanitary products | Medical equipment |
| 3M [NYSE: MMM] | Building materials, passive fire protection equipment, dental products, car care products | Electronics |
| Berkshire Hathaway [NYSE; BRK] | Financial services, confectionery production, publishing, jewelry business, production of furniture, carpets, building materials, etc. | Energy |
| GE [NYSE: GE] | Power plants (including nuclear reactors), gas turbines, aircraft engines, medical equipment, also manufactures lighting equipment, plastics and sealants | Engineering |
| Alphabet [NASDAQ: GOOG] | Internet, computer software, telecommunications, healthcare, biotechnology | Online search, IT |
| The Walt Disney Co. [NYSE: DIS] | Hollywood studios, theme parks, water parks, as well as television and radio networks, cruise liners | Interactive media and entertainment |
| Danaher [NYSE: DHR] | Industrial products | Engineering |
| Honeywell [NYSE: HON] | Space systems, automatic and control systems, engineering services, transport systems. | Aerospace engineering |

For multidisciplinary companies, technological change can have many consequences. Technological changes can create new products and accelerate the aging of existing ones. Thus,

technological changes affect the boundaries and structure of the industry, the replacement and differentiation of products, and the ratio of price and quality between products.

The bottom line is that the pace of technological progress is accelerating, and survival, regardless of the size of the company, will depend on being aware of and connecting to the ecosystem of existing technologies such as management decisions, marketing, supply chains and others. This also depends on whether the company controls this process or is a simple follower. It is important that companies carefully evaluate potential technology options and allocate funds to help their businesses evolve over time.

Although customer-centric business is changing the types of technologies that organizations need to invest in, it is also transforming the composition of internal marketing teams and requires different skill sets.

Businesses must fight for competitive positions. It is difficult to hire new marketers with the necessary talents and technical skills, but this type of management can create gaps in the sets of tools that are sought to fill these roles.

Retraining is definitely on the agenda for many marketers, as 40% say they will focus equally on recruiting and retraining the available workforce. There is an important lesson in understanding the real long-term value of an invested employee as opposed to simply investing in employees.

Of course, hiring and retraining is not just about having the skills to use new technologies. Soft skills are also growing in importance.

This is a departure for both employers looking to invest in their internal skill sets and employees – or future employees – making themselves available to work in tomorrow’s marketing world.

This shows that technological innovations are becoming more widespread, and their implementation is becoming less costly both in terms of investment and in terms of staff and time. Ukraine remains an integral part of the global technology and innovation market and a participant in investment agreements. The volume of venture investments and M&A transactions among Ukrainian IT companies and startups decreased significantly in 2020 and amounted to \$167 million, compared to \$658 million in 2019. At the same time, the number of transactions increased from 25 transactions in 2019 to 46 in 2020. Local investors, including CU Ventures, Horizon Capital, TA Ventures, Genesis Investments, SMRK VC Fund, Fedoriv Group, SMRK VC Fund, Quarter Partners, Pragmatech and others, remain active investors in Ukrainian startups.

The main positive and significant news for the Ukrainian IT industry in 2020 was the continuation of optimistic dynamics of growth in exports of Ukrainian IT services. In 2020, this figure was for the first time at a record high of \$5 billion, which is almost 20% (\$853 million) higher than the previous year (\$4.2 billion). In general, compared to 2013, the IT industry is confidently showing positive dynamics year by year – today, the share of IT in total exports of the country has reached 8.3% (1.58% in 2013). Also, the export of IT services has already outpaced the export of chemical products in volume, reaching the level of exports of mineral products and approaching the indicators of exports of metallurgical products (DLF, 2021).

This is against the background of falling national GDP (–4.2% in 2020, compared to the previous year), as well as the falling consolidated index of production of goods and services by main economic activities (SIP; –4.4% over the same period) (all statistics according to the Ministry of Economy). The indicators for 2020 in other sectors that are crucial for the Ukrainian economy are as follows: industry – 5.2%, agriculture – 11.5%, transport – 14.2%.

Growth dynamics is a key factor that attracts a lot of attention to the Ukrainian IT industry both domestically and abroad.

Through the mediation of the venture business in Ukraine, the volume of funding has been constantly growing in both new industries and traditional sectors of the national economy, where

venture capital previously did not participate in financing. The preferences of venture investors for more liquidity and less risk are changing. Its expansion into traditional spheres of financial activity has begun – including 188 derivatives, government securities and domestic local bonds.

In Ukraine, a significant part of venture capital is used for financial investments not related to innovation. These involve, first of all, granting loans to business entities, investing in government securities, domestic local bonds, real estate, bank metals, etc. Such a venture capital investment mechanism, associated with risk diversification, is reminiscent of self-insurance, where investors protect themselves from significant financial losses.

Venture capital has not yet become an effective mechanism for financing innovative business in Ukraine. The extended reproduction of venture capital is not aimed at the development of the national innovation and technology enterprises of Ukraine. There is an urgent problem of reorienting venture funds to finance innovative projects.

Methods of research into the investment directions of diversified enterprises regarding the introduction of innovations are numerous.

Because corporate entrepreneurs play a key role in corporate innovation and enterprise growth, a nation's economic growth depends largely on enterprise growth. The productive contribution of the entrepreneurial activity of society varies depending on the relative payments from the types of entrepreneurial activity. Thus, to promote economic growth, society and politicians must create an environment for productive entrepreneurship.

Table 4. Growth of assets of venture funds of Ukraine in 2019–2020, million UAH

Source: Report of the National Commission on Securities and Stock Market for the relevant years / National Commission on Securities and Stock Market (<https://www.nssmc.gov.ua/>)

| Assets | 2019 | 2020 |
|--------------------------------------|----------|----------|
| Shares of Ukrainian issuers | -4,517.6 | -661.2 |
| Other investments | 10,431.6 | 9,012.1 |
| Real estate | 2,640.7 | -306.1 |
| Government securities | 126.4 | 2,763.8 |
| Rights requirements | -1,374.7 | 2,023.5 |
| Corporate rights (except securities) | 2,830.6 | 1,083.1 |
| Loan | 21,335.1 | 35,816.6 |
| Accrued but unpaid interest | 2,784.6 | 3,481.8 |
| Enterprise bonds | 5,201.5 | 158.5 |
| Derivatives | 370.3 | 1,891.8 |
| Total | 42,126.9 | 75,817.5 |

Modern researchers of economic processes pay much attention to stimulating the development of innovative enterprises. The international rankings of both countries and individual enterprises indicate the importance of the innovation component in their activities. We can say that today employment in innovation helps to increase the investment attractiveness of enterprises and countries. From the point of view of management, it is very difficult to focus solely on innovation. Any company is based on the effective interaction of three components: finance, operations and marketing policy, and it is very important to maintain balanced governance in these three areas. Therefore, there is a need to study how innovative enterprises are able to attract investment, how it affects their operations management, and what marketing tools they use to communicate with investors and consumers. An important issue in technology management is the financing of technological development and innovation. A feature of innovation financing is the need for constant refinancing of various projects aimed at improving the efficiency of the business

processes, products and services of the enterprise. The problem of financing is present in all enterprises. Even in large firms, managers who aim to implement certain innovations (technological, operational, marketing, etc.) often report that the innovative projects they would like to implement cost much more than the funds they operate with. This is partly an explanation for the constant increase in investment in innovation.

From the point of view of investment theory, innovative investments have a number of characteristics that distinguish them from traditional investments. First and foremost, a 50% or more share of R&D in this investment is the salary of highly educated scientists and engineers. Their efforts create an intangible asset and form a knowledge base from which to make a profit in the coming years – so much so that this knowledge is not fixed, it is embedded in the human capital of employees, and therefore it is lost if they are fired. This fact is important for R&D investment. Because part of a firm's resource base disappears when such employees leave or are laid off, firms seek to smooth out R&D costs over time to avoid the need for employee dependence.

The second important feature of R&D investment is the degree of uncertainty associated with its output. This uncertainty is usually greatest at the beginning of a research program or project, suggesting that the optimal R&D strategy is similar to the other options, and should not in fact be analyzed in the usual way. R&D projects with a low probability of success in the future may need to be continued, even if they do not pass the expected rate of return. Uncertainty here can be extreme – not an easy question of a well-defined distribution with mean and variance. There is evidence that the distribution of profits from innovation sometimes takes the form of a Pareto distribution when variance does not exist. In this case, standard risk adjustment methods will not work.

The natural starting point for the analysis of any type of investment financing is the “neoclassical” marginal profit margin, modified accordingly to take into account the peculiarities of R&D. This condition sets the marginal return on capital equal to the rate of return on taxation of investment in this capital, because financial markets provide capital at an interest rate that depends on corporate tax, depreciation rates and the tax regime of a particular asset. The formulation of investor costs draws attention to the following determinants of R&D financing:

1. A tax regime, such as tax credits, that should not be subject to government interference.
2. Economic depreciation, which in the case of R&D is more correctly called obsolescence. This amount is sensitive to the realized speed of technical changes in the industry, which in turn is determined by such things as market structure and the pace of development of subsequent products and services. Thus, it is difficult to interpret it as an invariant parameter in this context.
3. The marginal cost of adjusting the level of R&D program.
4. The required rate of return of the investor.

The last point was the subject of considerable theoretical and empirical interest to economists in industry and corporate finance. Two broad theories need to be observed: the focus should be on the role of asymmetric information and moral hazard in raising the required rate of return higher than that normally used for conventional investment; and the focus should be on the requirements of different funding sources and their different tax rates.

There is a contrast between stock market-oriented markets (such as the USA and the United Kingdom) and banking capital-oriented markets (such as much of continental Europe and Japan) that view venture capital as a combination of system strengths as it provides strength incentives for the manager-entrepreneur, typical for the stock market system, and monitoring of the informed investor, typical for the system focused on bank loans. They emphasize the importance of an active stock market, especially for new and young firms, to provide an exit strategy for investors in venture capital firms and allow them to move on to finance new startups. Thus, there is an industry

of VC that promotes innovation and growth and requires the existence of an active IPO market (initial public offerings).

In order to prove the role of innovation for diversified enterprises, 25 public enterprises with a turnover of more than \$1 billion were analyzed. Table 5 represents the most innovative enterprises. The innovativeness of these enterprises is determined by the percentage of their market capitalization that is higher than their net cash flow. This technique was chosen because of the difficulty of identifying the innovative component of the activity. Table 5 also shows the growth rate of sales for the last 12 months of 2019.

Table 5. Innovation award of the world's leading companies

Source: Forbes (2021)

| No. | Company | Country | Sales growth | Innovation award |
|-----|---------------------------|-------------|--------------|------------------|
| 1 | ServiceNow | USA | 39.02% | 89.22% |
| 2 | Workday | USA | 36.07% | 82.84% |
| 3 | Salesforce.com | USA | 24.88% | 82.27% |
| 4 | Tesla | USA | 67.98% | 78.27% |
| 5 | Amazon.com | USA | 30.80% | 77.40% |
| 6 | Netflix | USA | 32.41% | 71.23% |
| 7 | Incyte | USA | 38.93% | 70.59% |
| 8 | Hindustan Unilever | India | 11.49% | 67.2% |
| 9 | Naver | South Korea | 19.36% | 64.62% |
| 10 | Facebook | USA | 47.09% | 64.42% |
| 11 | Monster Beverage | USA | 10.67% | 64.26% |
| 12 | Unilever Indonesia | Indonesia | 2.25% | 63.91% |
| 13 | Adobe Systems | USA | 24.56% | 62.38% |
| 14 | Celltrion | South Korea | 45.25% | 62.3% |
| 15 | Autodesk | USA | 1.33% | 62.04% |
| 16 | Regeneron Pharmaceuticals | USA | 20.82% | 61.11% |
| 17 | Vertex Pharmaceuticals | USA | 46.2% | 60.93% |
| 18 | Amorepacific | South Korea | -6.86% | 60.81% |
| 19 | AmerisourceBergen | USA | 4.29% | 58.69% |
| 20 | Illumina | USA | 14.74% | 58.33% |
| 21 | Marriott International | USA | 34.10% | 58.15% |
| 22 | Alexion Pharmaceuticals | USA | 17.32% | 58.04% |
| 23 | CP All | Thailand | 12.67% | 57.32% |
| 24 | Red Hat | USA | 21.09% | 57.00% |
| 25 | Tencent Holdings | China | 53.83% | 56.77% |

Investors are willing to overpay for shares of innovative companies much more than for more conservative companies. Absolute dominance belongs to the USA in this regard. It is very interesting that there are no companies from Europe in this table. In fact, there are innovative companies in European countries, but they are either quite small against the background of technology giants from the USA and Asia, or their financial performance is not as impressive as the performance of the companies represented above. Also, most of their innovations are highly dependent on infrastructure. The USA and Asia have the best infrastructure for technology companies, which is why most new players in the industry are trying to be closer to their competitors and the overall startup ecosystem.

With regard to Asian countries, it is possible to argue about the importance of government programs for the development of innovative enterprises. This path is quite debatable, because it is

not always market-based. The investment attractiveness of European startups is lower because, on the one hand, they are not as strongly supported by the state as Asian competitors and, on the other hand, they do not have such a developed infrastructure of venture capital funding as American companies.

It should also be noted that because the European market is quite segmented and regulated by a large number of local authorities in each country and in terms of tax law, European companies are in a less competitive environment. There is a need for more universal state regulation, or rather its absence in this area.

It should also be noted that in many cases, American companies engaged in innovation are largely overvalued, as evidenced by low profits or losses. Investors are more motivated for the future competitive position of these companies in the market. Very interesting is the tendency that in essence most technology startups are by nature monopolies. Most IT companies are focused on the global scale. There is no need to stimulate competition in, say, social networks, because they are effective in a society where everyone will be a user. The same can be said about software development companies.

Table 6 shows the financial indicators of asset value, profit, sales, number of staff and years of establishment. To understand the further vectors of investment by Ukrainian diversified enterprises, Table 7 also provides the areas of activity of these enterprises.

It is possible to distinguish that there are companies from rather traditional spheres of business such as hotel chains, retail trade, and consumer goods. This leads to the conclusion that it is very difficult to constantly generate fundamentally new industries that can be characterized as innovative. Hotel chains are constantly introducing new methods of operational management, the same can be said about the field of consumer goods, and all of these companies are focused on the formation of a very strong marketing policy. Despite the strong marketing activities of technology and pharmaceutical companies, they are actually less dependent on marketing than the FMCG industry (consumer goods, often light and food industries, are those represented in traditional hypermarkets). High-tech companies are constantly competing with each other in their developments. When a company has a promising development, it will be primarily protected from competition by its copyrights, patents, licenses, etc. Then, when promoting in the market, it will usually use marketing technologies that will be useful, and the company's market share is likely to grow, but in the case of new technologies that make the use of goods and/or services more efficient, the company will quickly lose market share.

This is after the 1980s, when the deregulation of financial markets took place and young people realized that it became possible to use investors' funds through contact with venture funds.

Table 6. Performance indicators of innovative enterprises in 2018

Source: Forbes (2021)

| No. | Company | Sphere of activity | Year founded | Assets, million \$ | Profit, million \$ | Sales, million \$ | Staff |
|-----|----------------|----------------------------|--------------|--------------------|--------------------|-------------------|---------|
| 1 | ServiceNow | IT and software | 2004 | 3,900 | -27 | 2,600 | 8,154 |
| 2 | Workday | IT and software | 2005 | 5,500 | -418 | 2,800 | 10,500 |
| 3 | Salesforce.com | IT and software | 1999 | 30,700 | 1,100 | 13,300 | 35,000 |
| 4 | Tesla | Car production | 2003 | 8,100 | -976 | 21,500 | 48,817 |
| 5 | Amazon.com | Technological conglomerate | 1994 | 162,600 | 10,100 | 232,900 | 647,500 |
| 6 | Netflix | Online media | 1997 | 26,000 | 1,200 | 15,800 | 7,100 |
| 7 | Incyte | Biotechnology | 1991 | 2,600 | 109 | 1,900 | 1,367 |
| 8 | Hindustan | Consumer goods | 1931 | n/a | 630 | 4,800 | 18,000 |

| | Unilever | | | | | | |
|----|---------------------------|-----------------------------|------|--------|--------|---------|---------|
| 9 | Naver | IT and software | 1999 | n/a | 696 | 3,650 | 8,105 |
| 10 | Facebook | Social networks | 2004 | 97,300 | 22,100 | 55,800 | 35,587 |
| 11 | Monster Beverage | Consumer goods | 1985 | 4,700 | 993 | 3,800 | 3,142 |
| 12 | Unilever Indonesia | Consumer goods | 1933 | n/a | n/a | 2,800 | 6,000 |
| 13 | Adobe Systems | IT and software | 1982 | 19,500 | 2,700 | 9,500 | 21,357 |
| 14 | Celltrion | Biotechnology | 1991 | 3,300 | 243 | 892 | n/a |
| 15 | Autodesk | IT and software | 1982 | 5,500 | -81 | 2,600 | 9,600 |
| 16 | Regeneron Pharmaceuticals | Biotechnology | 1988 | 11,700 | 2,400 | 6,700 | 7,400 |
| 17 | Vertex Pharmaceuticals | Biotechnology | 1989 | 6,200 | 2,100 | 3,000 | 2,500 |
| 18 | Amorepacific | Consumer goods | 2006 | 5,300 | 312 | 4,500 | 6,267 |
| 19 | Amerisource Bergen | Pharmaceutical distribution | 2001 | 39,300 | 1200 | 172,900 | 21,000 |
| 20 | Illumina | Biotechnology | 1998 | 7,000 | 826 | 3,300 | 7,300 |
| 21 | Marriott International | Hotel chains | 1927 | 23,700 | 1,900 | 20,800 | 176,000 |
| 22 | Alexion Pharmaceuticals | Biotechnology | 1992 | 13,900 | 78 | 4,100 | 2,656 |
| 23 | CP All | Retail | 1988 | 11,500 | 616 | 15,700 | n/a |
| 24 | Red Hat | IT and software | 1993 | 5,600 | 434 | 3,400 | 13,360 |
| 25 | Tencent Holdings | Technological conglomerate | 1998 | 47,200 | 11,900 | 47,200 | 54,309 |

There has also been a significant increase in the supply of capital in world markets and falling margins in traditional business areas. Therefore, in the 1980s there was a very favorable situation for continuous innovation and the interest of financial markets in financing this activity despite high risks, because of the confidence that even a small share of investment in these companies will be successful and returns will be so high as to compensate all costs to other companies.

However, most foreign investors in 2020 invested their assets in the agriculture and processing industry of Ukraine (22% and 21%). Real estate transactions were also popular at 18%, as was investing in information and telecommunications at 10%. FDI has a significant geographical diversification of exporting countries (OECD, 2021).

The largest investors in Ukraine's economy in 2020 were: Switzerland – \$480.5 million; the UK – \$282.9 million, and Luxembourg – \$214.4 million. It is worth noting that 2020 was one of the worst in recent years in terms of investment in Ukraine's economy.

The degree of diversification of enterprises was grouped and the following classification was obtained: non-diversified (single line of business); vertically integrated (presence of controlled technological chain); differentiated (wide choice of product groups or goods in one industry); diversified (presence of indirect economic relations from different industries); and conglomerate (presence of unrelated businesses in the portfolio without dominance, as an extreme degree of diversification). There was some disparity within diversification among the fact that diversification is also a source of profit, assets and income. For each group, the index of diversification was created based on income, net profit and assets, as well as its impact on the capitalization of the enterprise. The multiplier is calculated as the weighted average of enterprises in different industries and countries based on those that are most successful in terms of annual income, net income, and asset value – in each individual industry and diversified. This impact was calculated for each type of diversification index, as well as for private and public types of enterprise. The study did not take into account state-owned enterprises, nor enterprises that are natural monopolies. An intended

feature of the study was to establish a link between the effectiveness of managing the expansion of private and public enterprises at different stages of the economic cycle. Hence, it is possible to set the recommended range of degrees of diversification,

The mechanism of influence of different types of diversification index on the level of enterprise capitalization depending on the economic cycle was analyzed, which takes into account different types of diversification index calculation, enterprise publicity and economic cycle in the national and global economy (Table 7).

Table 7. The mechanism of interdependence of components of diversification in terms of investment attractiveness

Source: Forbes (2021), World Bank (2022), UkrMetallurgProm (2020), Fedorov (2018)

| | Degrees of diversification | IDR | MID RPRi | MID RPUBi | BC | IDP | MID RPRi | MID RPUBi | BC | IDA | MID APRI | MID APUBI | BC |
|---|---|-------|----------|-----------|------|-------|----------|-----------|------|-------|----------|-----------|------|
| 1 | Non-diversified (Single line of business) | >0.9 | 3–4 | 5–6 | alws | >0.85 | 3 | 7 | alws | >0.8 | 3 | 7 | alws |
| 2 | Vertically integrated (Presence of a controlled technological chain) | >0.85 | 4–5 | 7–8 | lift | >0.5 | 6 | 9 | alws | >0.6 | 6 | 9 | lift |
| 3 | Differentiated (Wide choice of product groups or products in one industry) | >0.7 | 4–5 | 4–5 | alws | >0.65 | 5 | 6 | alws | >0.5 | 5 | 6 | alws |
| 4 | Diversified (Existence of indirect economic connection of subsidiaries from different industries) | >0.4 | 4–5 | 7–8 | lift | >0.3 | 5 | 7–9 | alws | >0.4 | 5 | 7–9 | lift |
| 5 | Conglomerates (Presence of unrelated businesses in the portfolio without dominance. This is an extreme degree of diversification) | <0.2 | 5–6 | 3–4 | alws | <0.12 | 5 | 4 | alws | <0.25 | 5 | 4 | alws |

* *IDR* - index of income diversification; *MIDRPRi* – a multiplier that gives *IDR* to the assessment of capitalization for private enterprises; *MIDRPUBi* – a multiplier that gives *IDR* to the assessment of capitalization for public enterprises; *IDP* – net income diversification index; *MIDPRi* – a multiplier that gives *IDP* to the assessment of capitalization for private enterprises; *MIDPPUBi* – a multiplier that gives *IDP* to the assessment of capitalization for public enterprises; *IDA* - asset diversification index; *MIDAPRI* – a multiplier that gives *IDA* to the assessment of capitalization for private enterprises; *MIDAPUBi* – a multiplier that gives *IDA* to the assessment of capitalization for public enterprises; *BC* – the state of the economic cycle of the economy.

To determine the general direction of market movement, it is necessary to analyze several key fundamental indicators. These are primarily general macroeconomic indicators, such as production growth, inflation, sales, budget deficit, and money supply.

The result should be an answer to the following question: are the conditions for growth of the issuer's profit created at the macroeconomic level?

Then, the analysis of industries is carried out in order to rank them according to the potential for growth (decline), and the main factors that are decisive for a particular industry are identified. At the final stage, the most promising issuers should be selected from those that are the most attractive

from the investor's point of view. Here, special attention should be paid to accounting standards, which present the main financial and economic indicators of the issuer.

Thus, in the digital economy, education, medicine and IT projects are a priority for venture capital investors. In the COVID-19 pandemic, these sectors became even more developed.

Venture capital is one of the most effective mechanisms for financing innovation and scientific and technological progress. Venture financing helps to create new products, technologies, services or management decisions, and is unique because it provides a number of related additional services (management, marketing, consulting, etc.). Venture structures are becoming intelligent centers for innovation, whose experience is valuable and contributes to the diffusion of innovation into the business environment.

A special role in stimulating the development of venture entrepreneurship in Ukraine belongs to the state, which should create appropriate institutional conditions by providing state aid to venture business, encouraging the creation of venture funds, improving the legal framework and tax system for venture fund taxation, and promoting financial markets.

For the effective functioning of venture funds in Ukraine, it is necessary to create a system of appropriate guarantees from the state to provide for participation in venture funds of insurance companies and amend the Law of Ukraine "On Joint Investment Institutions (Mutual and Corporate Investment Funds)," taking into account current trends in the development of global venture capital.

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