ORIGINAL PAPER

DOI: 10.26794/2308-944X-2022-10-3-33-55
UDC 658.148(045)
JEL E22, G31, O22

The Investment Analysis of IT Companies: A Case Study of Yandex

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ABSTRACT

This research **aims** to find out the peculiarities of information technology (IT) companies as an object of investment attractiveness assessment, to present and apply alternative approaches to the evaluation of the investment attractiveness of these companies based on internal and external factors. We have employed **the methods** of statistical and comparative analysis, deductive analysis, as well as the analysis of historical data and the current state of the problem. The paper examines the peculiarities of IT companies, their activities' results, and existing methods for evaluating investment attractiveness. As a **result** of the study, data were obtained from the analysis of external and internal factors of the investment attractiveness of Yandex for the period from 2019 to 2022. **The key conclusion** is that to make investment decisions, a comprehensive assessment is required, including considering external and internal factors.

Keywords: investment analysis; IT companies; assessment factors; investment attractiveness

For citation: **Dolgaia A.A., Sorokina V.V. The investment analysis of IT companies: A case study of Yandex.** ***Review of Business and Economics Studies*****. 2022;10(3):33-55. DOI: 10.26794/2308-944X-2022-10-3-33-55**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Инвестиционный анализ IT-компаний: исследование на примере Яндекса

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АННОТАЦИЯ

Целью данного исследования является изучение особенностей IT-компаний как объекта оценки инвестиционной привлекательности, разработка и представление альтернативных подходов по оценке инвестиционной привлекательности компаний на основе внутренних и внешних факторов. В статье использованы **методы** статистического и сравнительного анализа, дедуктивного анализа, а также анализ исторических данных и современного состояния проблемы. В исследовании представлены основные характеристики IT-компаний, результаты их деятельности, а также проанализированы существующие методы оценки инвестиционной привлекательности. В результате исследования получены данные анализа внешних и внутренних факторов инвестиционной привлекательности компании Яндекс за период с 2019 по 2022 г. **Ключевым выводом** является необходимость комплексной оценки при принятии инвестиционных решений, учет внешних и внутренних факторов.

Ключевые слова: инвестиционный анализ; IT-компании; факторы оценки; инвестиционная привлекательность

Для цитирования: **Долгая А.А., Сорокина В.В. Инвестиционный анализ IT-компаний: исследование на примере Яндекса.** ***Review of Business and Economics Studies*****. 2022;10(3):33-55. DOI: 10.26794/2308-944X-2022-10-3-33-55**

Introduction

Investments enable various organizations to carry out their activities and develop. At the same time, investing funds can bring, investors a certain effect, both monetary and socially significant, in the future. Investors try to reduce risks to an acceptable level as well as extract the maximum possible benefit from the investment process. Nowadays, investors assess whether the effect they will receive from the investments will be able to sufficiently compensate for the refusal to use the funds now in uncertainties. They must do more to respond appropriately to risks at a time when available information has never been more abundant, more complex, or more difficult to interpret. There are many approaches to evaluating the effectiveness of investments. Several studies emphasized the importance of the investment attractiveness of enterprises. At the same time, among the approaches to assessing the investment attractiveness of enterprises in general and the companies belonging to the information technology industry in particular, there is no single solution on whether to consider only the financial component of the company's activities or to take into account various factors of its internal environment, or the combination of factors comprising the internal and external environment. This paper aims to present and apply a new approach to the assessment of investment attractiveness and apply it to one of the IT companies -Yandex.

The concepts of investment attractiveness

Driven by business development goals, management in many companies attract external investments. To ensure economic growth, improve products and processes and maintain their competitive advantages, companies can raise funds using credit products issued by a bank, receiving government support and attracting funds from investors.

On the one hand, the company cannot refuse external investments as it could make its bankruptcy possible [1]. On the other hand, investors must know the investment decision-making process and related risks. Many scholars have been engaged in the study of capital raising and problems related to investment attraction [1–7]. Some scholars claim that investment attractiveness is the financial stability of the enterprise and the benefit of its activity [8, 9]. Other scientists consider it important to add a risk adjustment to this concept. The lowest possible level of risk should be determined based on an enterprise's financial and economic characteristics, indicators of the company's market activity [10]. Referring to the previously mentioned definitions, we can offer the following characteristic of this concept: Investment attractiveness is the combination of quantitative and qualitative assessments of the organization's activity based on internal and external factors and guaranteeing stability, solvency, as well as further growth of the company and enabling the company to provide its investors the desired income or other benefits thereby making this investment effective, ensuring an acceptable risk level.

Factors determining the assessment of investment attractiveness

The investment attractiveness assessment is based on a number of factors: external and internal [11].

External factors determine the organization's activity, strategic decision-making, and development potential, but the organization has no direct control over these factors. External factors can be considered in the context of different levels: a macro-level (region, country) and an industry-level (enterprise) [12].

The most significant macro-level factors are the country's governance system, the economic situation in the country, the legal regulation, tax policy, the level of economic development, the degree of dependence of the country's economy on the resources produced, the development of the financial system and financial institutions, the availability of the stock market, business culture as a whole, etc. International agencies consider the following factors during the assessment of sovereign credit ratings: nominal GDP, GDP per capita, GDP growth, investment growth, Investment/GDP, Savings/GDP, Exports/GDP, inflation and unemployment rates.[1]

The most significant industry (enterprise) level factor of investment attractiveness is the role of

[1] Sovereign Risk Indicators. S&P Global Ratings. URL: https://www.spglobal.com/ratings/en/research/articles/201214-sovereign-risk-indicators-11774352 (accessed on 25.11.2021).

this particular industry in the country's economy. It is important to consider the prospects for the development of this industry; the competition in the industry; the stability of enterprises in this industry, their exposure to risks, and the return on investment in the enterprises of this industry. Researchers also take into account the factors such as: market size; the resilience of companies in the industry (the ratio of the dynamics of the volume of sales to the dynamics of the country's GDP); effectiveness of supply chain management and resource availability; environmental impact, production profitability, etc.

The following internal factors (factors that are formed as a result of the actions of the organization) can be considered when assessing investment attractiveness: financial state, a ratio of fixed and variable costs for each type of product, the efficiency of the management system, investment activity, innovation, marketing strategy effectiveness, risk management, corporate social responsibility.

The financial state is a key aspect in assessing investment attractiveness which reflects the availability of financial resources and the effectiveness of their use [13–15]. The main indicators of financial stability are profitability; financial solvency; liquidity; turnover or business activity; capital structure; cash flows.

The production aspect includes assessing resources that ensure the effectiveness of the processes of creating quality goods or services.

The effectiveness of the management system reflects the ability of managers to timely adapt to changes in the market (how long and how effectively the company will be able to operate in the market) and to identify the existing needs of potential consumers, as well as to create new needs themselves. At the same time, the factor of the reputation of individual top managers can greatly impact the investment attractiveness of the company as a whole.

Company's investment activity of the company is expressed in the availability of investment projects, investment policy and the quality of their implementation (the riskiness, the volume of investment) [16–18].

The introduction of innovations is one of the important aspects of the company's rapid development and the improvement of its performance. It is a fundamental element of the company's strategic management [19, 20].

Marketing strategy effectiveness specifies activities (creation, communication, etc.) aimed at enhancing value for customers, clients or even society.[2] Among the factors which can significantly affect the company's performance are brand awareness; the speed of entry into new markets; effectiveness of marketing communications (interaction in social networks, the ratio of real and potential buyers, the cost of attracting new customers, customer loyalty).

Risk management is a "protection" from emerging risks as well as a guarantee of receiving a return on the invested funds of investors. The risk management system can also be identified as a separate factor of the company's activity, which should be considered in the mechanisms of investment attractiveness assessment. A company's "protection" from emerging risks can serve as a guarantee of receiving a return on the invested funds of investors, as well as minimizing the risk of their losses. The main types of risk management may include termination of risk-related activities (avoidance); use of various measures and tools to minimize risk (reduction); assumption of increased risk to increase productivity.[3] Factors that a potential investor pays attention are: the level and type of risk a firm is able and willing to assume in its exposure and business activities (risk "appetite"), availability and effectiveness of risk management tools.

Corporate social responsibility (CSR) is the solution to environmental and social issues within the framework of the company's activities. The United Nations Industrial Development Organization (UNIDO) helps companies around the world to become more socially responsible by taking into account stakeholder expectations.[4] The following CSR factors can be considered when assessing the company's activities: the

[2] AMA's Definition of Marketing. The Marketing Study Guide. URL: www.ama.org/the-definition-of-marketing-what-is-marketing. (accessed on 03.01.2022).

[3] Enterprise Risk Management. Integrating with Strategy and Performance. Committee of Sponsoring Organizations of the Treadway Commission. 2017.

[4] Competitive trade capacities and corporate responsibility. United Nations Industrial Development Organization. URL: www.unido.org/our-focus/advancing-economic-competitiveness/competitive-trade-capacities-and-corporate-responsibility/corporate-social-responsibility-market-integration/what-csr (accessed on 26.12.2021).

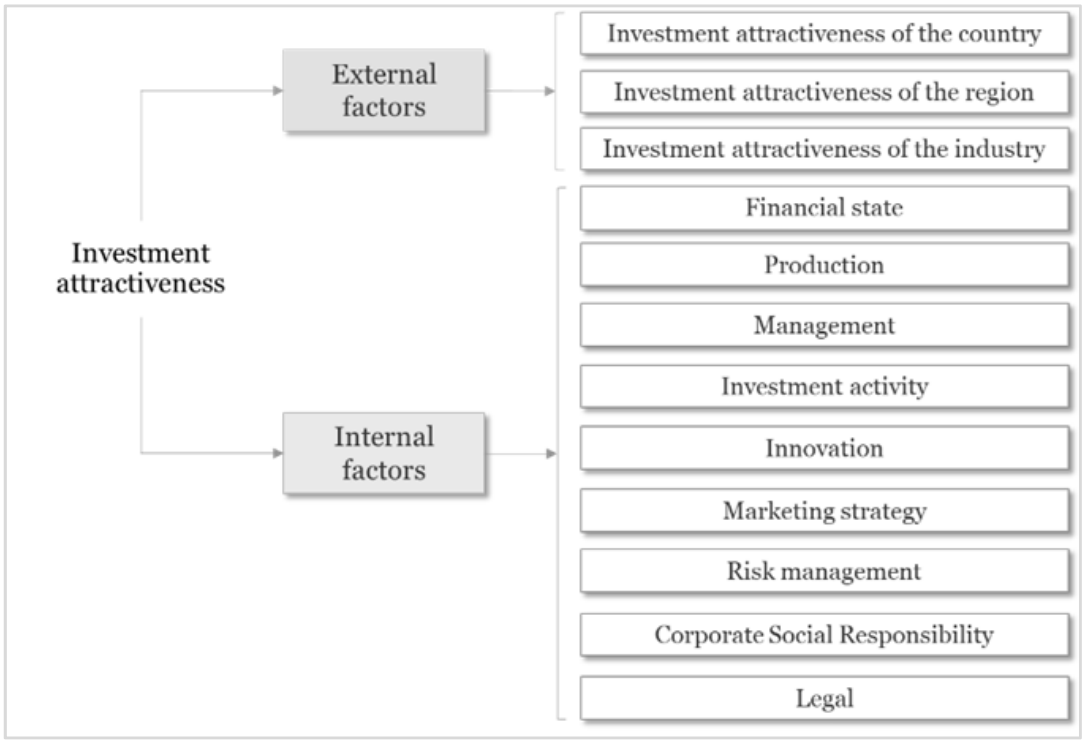

Fig. 1. **Factors of investment attractiveness of an enterprise**

Source: compiled by the authors.

reduction of non-ecological production, responsible use of resources, improvement of working conditions and employee relations, respect for human rights, the effectiveness of anti-corruption measures, etc.

Factors to be taken into account in assessing investment attractiveness may differ depending on the type of potential investors (government, credit organizations, investment funds / individual investors. If the investment goal is to contribute to the development of society, then the main factor will be the level of corporate social responsibility. Investors whose main goal is to get a stable income from the potential investment will consider the dynamics of performance indicators, the company's ability to develop, and the factors which influence the company's market stability and level of risk.

The general overview of the factors affecting the investment attractiveness of the company are shown in *Fig. 1*.

Peculiarities of IT companies as an object of investment attractiveness assessment

In this article, we focused on the factors of investment attractiveness assessment of IT companies, in particularly Yandex, as an object of complex assessment. IT company oversees the use of devices storing, retrieving, and sending information, engaged in research and development of technological products.

Among the biggest IT global market companies are Apple, Microsoft, Alphabet, Visa, Taiwan Semiconductor, Samsung Electronics (*Fig. 2*).

Despite the rapid development of the IT market, there are a number of distinctive industries barriers, among which: high turnover of qualified specialists, an increased competition which contributes to a need for constant innovation, the enhanced control imposed by regulatory bodies, difficulties in purchasing or manufacturing parts of equipment abroad during periods of instability.

When analyzing the investment attractiveness of IT companies, the same principles and indicators that are used for other industries should be taken into account. In addition, some investors consider such factors as gross profit margin, revenue growth, as well as operating leverage (how sensitive the operating profit is to changes in sales).

The gross profit margin determines how profitable and efficient the company's business model is. The higher this indicator is — the more effective the company's management. If this indicator fluctuates significantly over time, it may be evidence of company "unhealthy" (problems with products or services provided). Gross profit

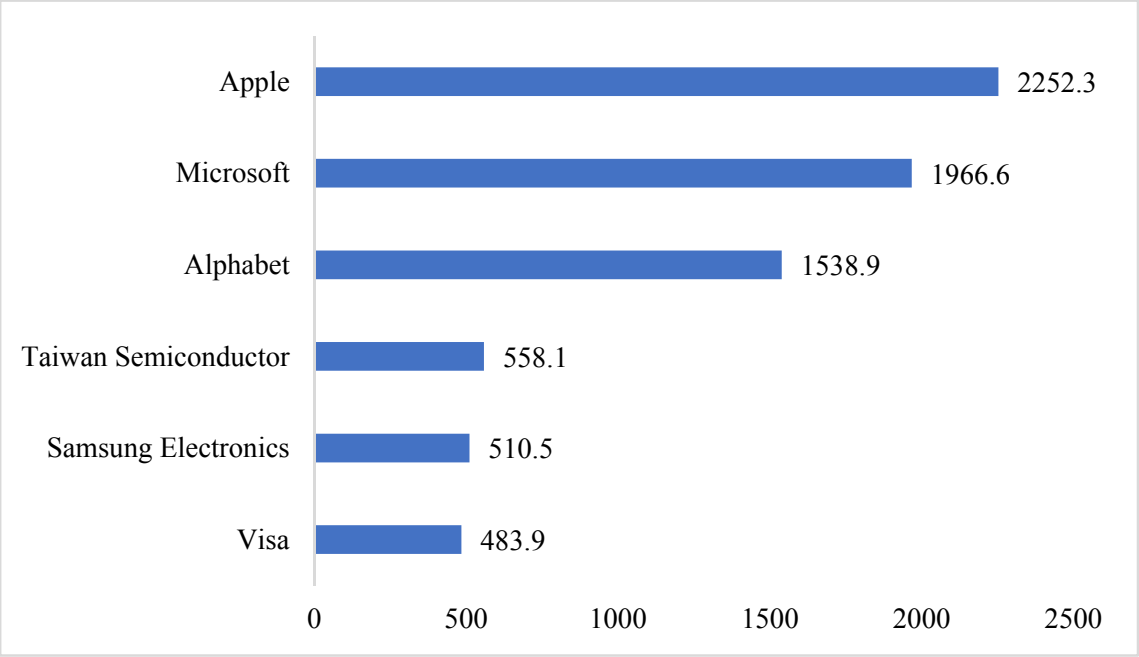

Fig. 2. **Largest global IT companies by market capitalization, in billion U.S. dollars**

Source: compiled by the authors based on the project Statista. URL: https://www.statista.com/statistics/263264/top-companies-in-the-world-by-market-capitalization/ (accessed on 16.04.2022).

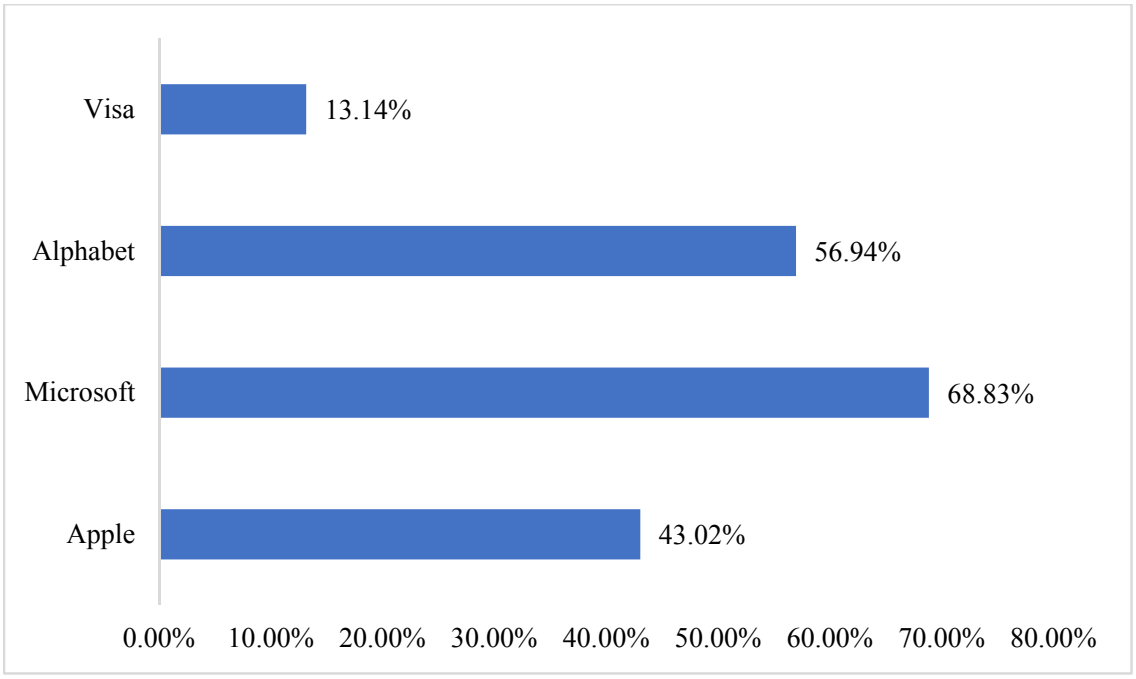

Fig. 3. **Gross profit margin in the largest global IT companies**

Source: compiled by the authors.

margin for the biggest IT companies is more than 40% (*Fig. 3*).

Use of revenue growth to assess the stages of growth. The largest IT companies, such as Apple, Microsoft and Google (Alphabet) have considerable positive revenue growth in 2020/2019 and 2021/2020 (Visa in 2021/2020) (*Fig. 4*). It can be concluded that the companies have some factors contributing to their development and competitive advantages.

Some international investment banks offer the "Rule of 40" method for evaluating software companies (*Fig. 5*). The "Rule of 40" is usually calculated by adding a growth indicator (revenue growth, Annual Recurring Revenue, or Annual Contract Value) to a profitability indicator (EBIT-

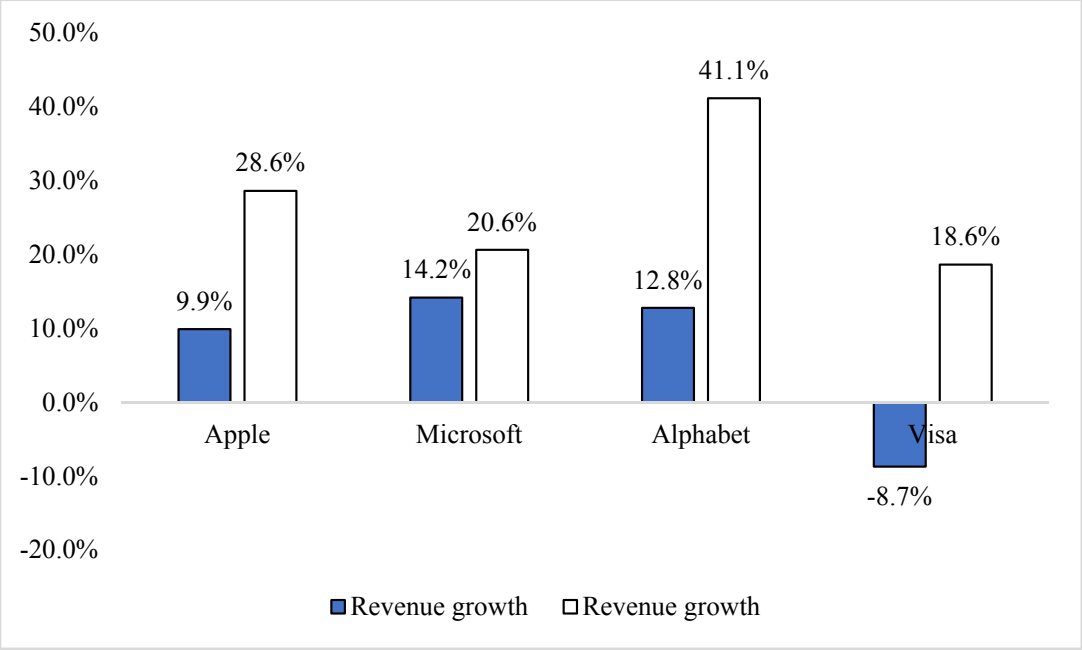

Fig. 4. **Revenue growth in the largest global IT companies**

Source: compiled by the authors.

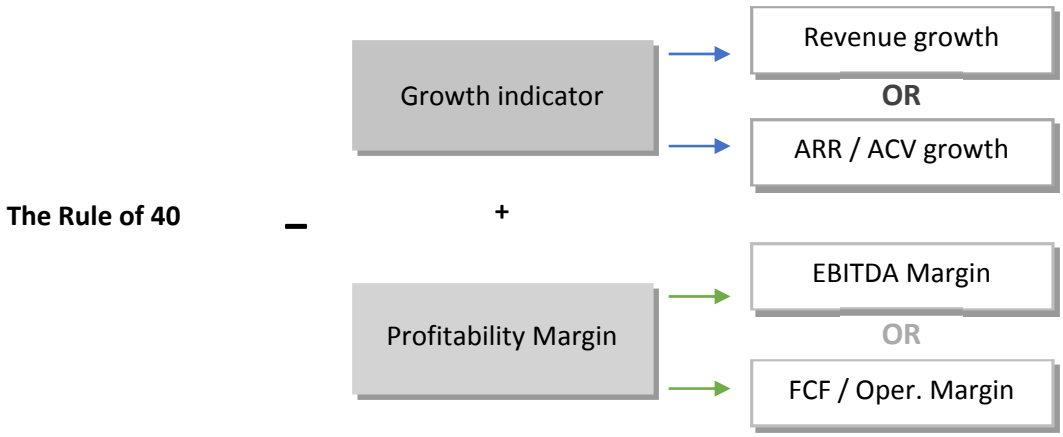

Fig. 5. **The Rule of 40**

Source: compiled by the author using: Hacking Software's Rule of 40. Bain. URL: https://www.bain.com/insights/hacking-softwares-rule-of-40/ (accessed on 25.01.2022).

DA, operating margin, or FCF profitability). The rule does not have a strict formula. It is flexible in terms of the choice of metrics. This method served as an indicator used by a "healthy" software company and makes it possible to compare companies whose stages of growth differ.[5]

Experts consider that the sum of the two most important characteristics of software companies (i.e., growth and profitability) allows for comparing companies at different life cycle stages. For example, a startup with 60% growth and a 20% cash loss can be compared with a mature company with 20% growth and 20% FCF margin.

Evaluation of investment attractiveness of Yandex

IT company Yandex N.V. was founded in 2000 by Russian entrepreneurs and scientists in of information technology Arkady Volozh and Ilya Segalovich. The company is registered in the Netherlands. It is a multinational corporation. *Fig. 6* shows the structure by shareholder. In terms of economic ownership, the most significant part

[5] SaaS and the Rule of 40: Keys to the critical value creation metric. McKinsey. 2021. URL: https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/saas-and-the-rule-of-40-keys-to-the-critical-value-creation-metric (accessed on 25.01.2022).

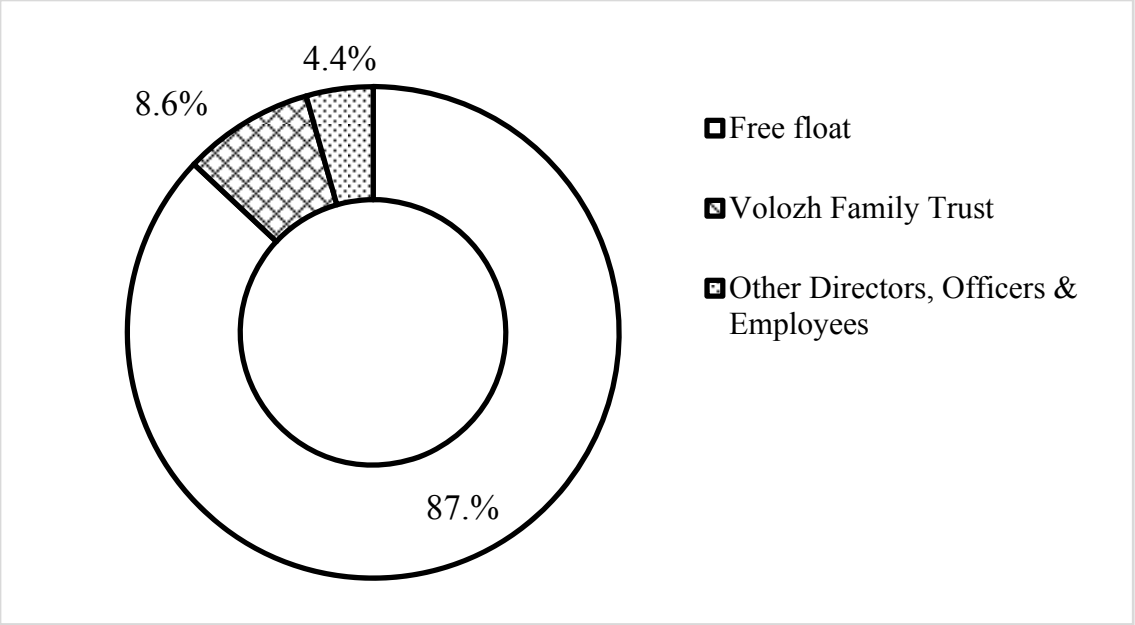

Fig. 6. **Yandex management structure (economic ownership)**

Source: compiled by the author using: Search engines in Russia. Yandex.Metrica. URL: https://radar.yandex.ru/search?group=day (accessed on 15.03.2022).

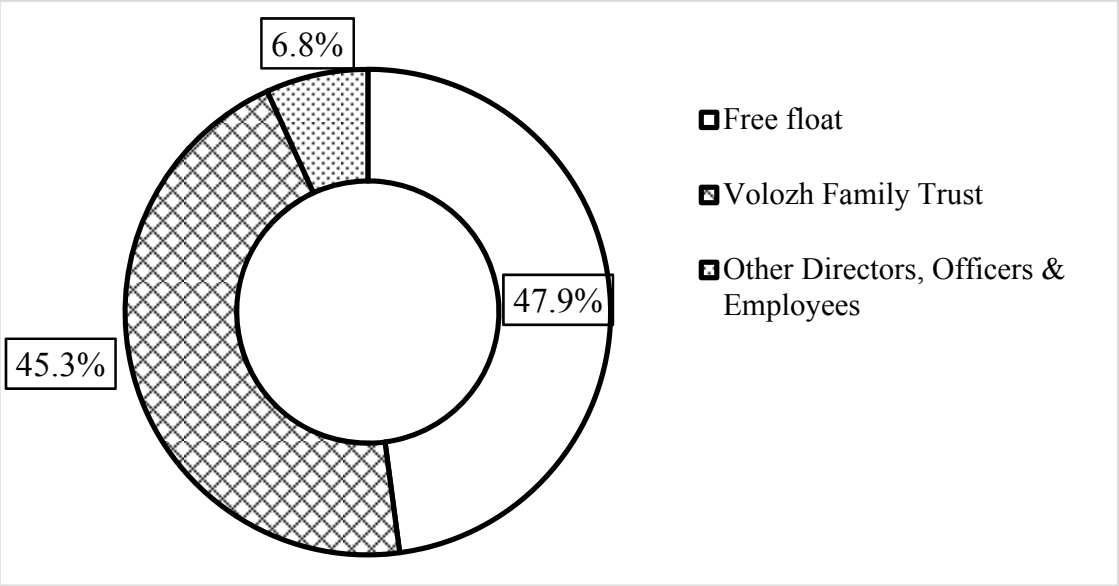

Fig. 7. **Yandex management structure (voting power)**

Source: compiled by the author using: Search engines in Russia. Yandex.Metrica. URL: https://radar.yandex.ru/search?group=day (accessed on 15.03.2022).

of the shares is in free float (87%) and 8.6% of the shares belong to the Volozhsky family trust.

Fig. 7 shows the company's management structure, where the circle reflects voting power. In term of voting power, 45.3% of the stake belong to Volozh Family Trust, which makes it the most influencing stakeholder.

Yandex N.V. has offices in 10 countries worldwide, and various services have been launched in 28 countries. There are some significant markets for Yandex N.V. besides Russia. For example, Belarus, Uzbekistan and Kazakhstan.

Yandex's activities include segments related to information technologies. It oversees the use of devices storing, retrieving, and sending information. The Yandex segment structure includes: The Search and Portal segment, E-commerce, Taxi segment, which includes the Ride-hailing business and FoodTech business, Classifieds segment, which includes Auto.ru, Yandex.Realty

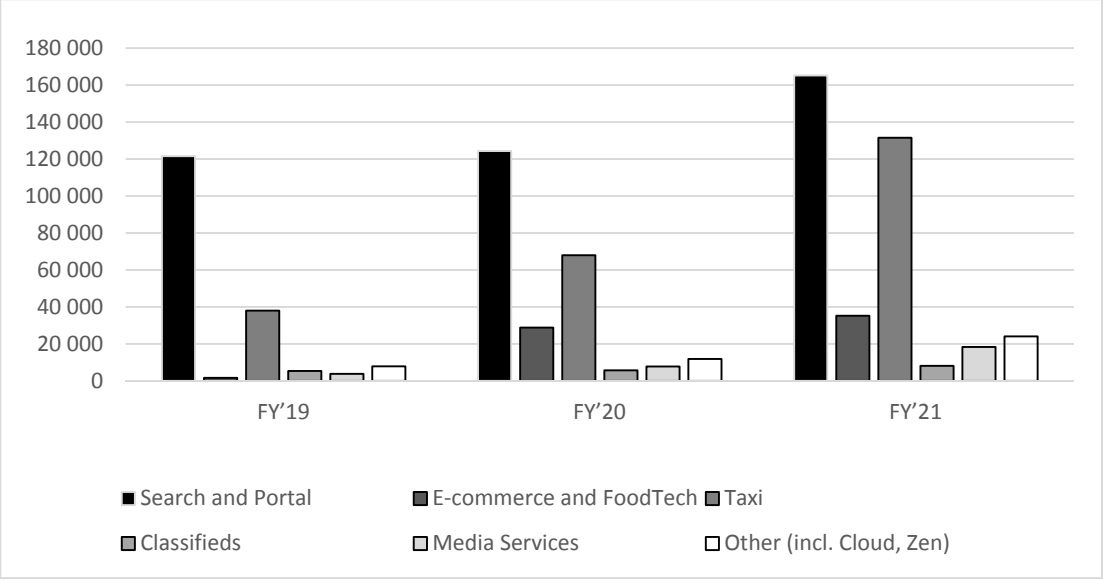

Fig. 8. **Revenue by segment, 2019–2021, RUB mln**

Source: compiled by the author using: Investor Presentation. Yandex. URL: https://ir.yandex/ (accessed on 15.03.2022).

and Yandex.Jobs, Media Services segment, which includes KinoPoisk, Yandex.Music, Yandex.Afisha, Yandex.TV program ets., other Bets and Experiments category, which includes Zen, Yandex.Cloud, Yandex.Drive.[6] IT company's investment attractiveness is evaluated as of the end of 2021 in our research. The dynamics of revenue by the company's segments are shown in *Fig. 8*.

In according to the data, one can observe revenue growth in all segments of the company. Moreover, the trend towards increasing market share in the segment search and advertising continues.

Revenues in Search and Portal segment increased by 32% year-on-year in Q4 2021. The increase was primarily driven by product development, improved search share, and increased investments in further enhancements of advertising products, instruments and technologies.

According to a study by Yandex.Metrica,[7] the share of user visits in the Yandex search engine in Russia was ~60.3% on the 1st of November, 2021, compared to ~38.23% share of the Google search engine. The share of user visits as of March 2022 is about ~61.79% in Yandex and ~37.03% share of the Google search engine, respectively.

As for total E-Commerce (Yandex Market marketplace, e-grocery business and grocery-originated), it increased by 192% year-on-year in Q4 2021. Considering E-commerce and FoodTech, these segments experienced a 2-fold increase in buyers in 2021.

In 2021, the Taxi segment included mobility businesses, which consist of the Ride-hailing business, Yandex Drive (car-sharing business), Yandex Delivery (Logistics), Taxi Services. A key operational trend is that the number of rides in the Ride-hailing service increased by 48% compared with Q4 2020. The number of Yandex Go Monthly active users is 35.3 million, and the share of the Russian economically active population who uses Yandex Taxi at least once per month is 36%.

The Classifieds revenues increased by 27% in Q4 2021 compared with Q4 2020 and were driven mainly by the increase in revenues from auto dealers' listings. The company increases investments in the development and marketing of new products and services in order to expand end-to-end value proposition for both customers and consumers, as well as overall enhancement of the Classifieds segment's offering.

The Media Services segment (Yandex Plus, KinoPoisk, Yandex Afisha, etc.) revenues increased by 117% in Q4 2021 compared with Q4 2020. The Key trend is that the number of Yandex Plus subscribers reached 12 million as of the end of Q4 2021, up 79% from the end of Q4 2020.

We combined several methods and approaches for assessing investment attractiveness that we considered the most appropriate for the analysis

[6] URL: https://ir.yandex

[7] Search engines in Russia. Yandex.Metrica. URL: https://radar.yandex.ru/search?group=day (accessed on 15.03.2022).

Table 1
Factors used within the industry analysis

	Factor	Indicators	Grading system
1	Current development	Ratio of number of users to total number of citizens	Depending on the values of the indicators, each indicator is assigned a score from 1 to 5. The weight of each parameter from the "Current development" section is 0.05, and for the other parameters — 0.1, since the potential for growth is more important when considering investments. The overall indicator is calculated as a weighted average
		Connection speed	
		Market volume growth	
		Number of people employed, its share in the total number of employees in the country	
		Resource availability	
		Trust in internet privacy	
2	Importance of industry for the country's economy	Gross value added	
		Industry spending	
3	Resistance to negative changes in the economy	The ratio of the dynamics of the sales of goods and services in the industry to the dynamics of the country's GDP	
4	Industry development prospects	Growth in demand for products/services produced in this industry, its variability	
		The volume of capital investments in this industry	
		Availability and volumes of government incentives (financial, tax, resource)	
5	Investment profitability	The average return on investment in the enterprises of this industry	

Source: compiled by the author.

of. We use both external and internal factors within the assessment.

For the analysis of external factors of the investment attractiveness of Yandex, we considered the dynamics of the IT industry in relation to Russia, where most of the activities are carried out.

As external factors, we considered the investment attractiveness of the IT industry based on related factors. We grouped external factors in *Table 1* below. The evaluation system was applied to all indicators of external factors based on the expert opinion. Indicators can be assigned a score from 1 to 5.

1. *Current development.* This indicator allows for evaluation of how broadly IT services are demanded in Russia compared to other countries. In 2020, the percentage of people using the Internet in Russia was 4.1% higher than the average in the world, and 2.4% higher than in 2019 (see *Table 2*).

However, this indicator is 11.2% lower than the average for the top-20 countries in 2020. Based on this data, the IT industry in Russia can be awarded 4 points out of 5 in our system.

Internet speed shows current development and the readiness of the systems for innovative products and prospects for the development of the industry. Using the data from Cable.co.uk, we calculated the highest Internet speed among all countries for each year in the period 2019–2021 (224 in 2021, 222 in 2020, 208 in 2019), the average value for the top 20 countries, the average value for all countries, as well as the percentile for Russia. The data in *Table 3* show that the Internet speed indicator for Russia is higher than the global average. However, this indicator is 89.2 Mbps lower than the average for the top-20 countries in 2021, and is 238.74 Mbps lower than the maximum speed among all countries observed in 2021 (*Table 3*).

At the same time, the percentile calculation helped to determine that the percentage of countries among, all the analyzed ones, exceeded the indicator of Russia by about 26–30 percent for

Table 2
Percentage of users in total number of citizens, %

	2014	2015	2016	2017	2018	2019	2020
Russia	70.5	70.1	73.1	76.0	80.9	82.6	85.0
World	38.1	40.5	43.3	45.8	49.4	54.0	59.9
Europe & Central Asia	69.0	70.0	72.4	74.5	78.9	81.8	83.9
OECD members	73.1	75.7	79.8	81.5	83.4	85.2	86.3
Country with the highest value	98.2	98.3	98.2	99.5	99.6	99.7	100.0
Average for top-20 countries	91.7	92.9	94.5	96.0	94.5	95.6	96.2
Average for bottom-20 countries	-	5.1	5.5	8.2	13.1	15.5	18.9

Source: compiled by the author using: Individuals using the Internet (% of population) — Russian Federation. The World Bank. URL: https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=RU (accessed on 17.03.2022).

Table 3
Average Internet speed among countries

	2019	2020	2021
Russia (Mbps)	14.89	24.26	35.73
Max speed among all countries observed (Mbps)	85.02	229.98	274.27
Average for all countries observed (Mbps)	11.33	25.74	29.92
Average for top-20 countries (Mbps)	43.54	115.46	124.93
Percentile	73.16	69.61	70.54

Source: compiled by the author using the data: the fastest and slowest countries in the world for broadband speed. Cable.co.uk. URL: https://www.cable.co.uk/broadband/speed/worldwide-speed-league/#speed (accessed on 24.03.2022).

each year. As a result of the analysis, this indicator accounts for 3 points out of 5.

Considering *market volume growth*, we can observe the growth of the IT market in Russia for the period 2017–2020 in both dollar and ruble terms. These dynamics are higher than in the whole world (*Table 4*). This indicator demonstrates that the industry is developing and can further develop to a good level. This indicator accounts for 5 out of 5.

People employed factor. Based on the data described by the HeadHunter career service, we calculated and analyzed the growth in demand for IT specialists in Russia (see *Table 5*). The growth was calculated as the ratio of the value for the quarter of one year to the value for the quarter of the previous year.

The demand for IT specialists is characterized by a growth in all the analyzed periods. However, the percentage of the growth decreases significantly in some periods, which is most often associated with general economic and political events.

HR specialists note that with such a demand, there is still a shortage of qualified specialists..[8] Also, the level of competition among IT specialists is two times lower than in the entire market: the ratio of active resumes to active vacancies in 2022 was 2 for IT specialists and 4 for the market as a whole.[9] Therefore, 3 out of 5 can be assigned to this item as part of the consideration of the current industry development level.

In the current conditions, it is important to pay attention to *resource availability* in relation to IT industry (software and technologies). After implementing the transition plan to Russian software, Rosreestr publishes the amount of Russian software companies can use. As of the beginning

[8] Rosstat: Rossii dopolnitel'no trebuetsja bol'she milliona IT-specialistov. Rossijskaja gazeta. URL: https://rg.ru/2022/04/27/rosstat-rossii-dopolnitelno-trebuetsia-bolshe-milliona-it-specialistov.html. (accessed on 30.04.2022).

[9] Sverhnovaja real'nost' rynka truda IT. HeadHunter. URL: https://habr.com/ru/company/hh/blog/656981/ (accessed on 27.03.2022).

Table 4
IT market volume and its dynamics in Russia and globally

	2017	2018	2019	2020
World (USD bln)	3,540	3,720	3,810	3,870
Russia (USD bln)	21,8	24,0	24,9	25,4
Russia (RUB bln)	1,3	1,5	1,6	1,8
World — dynamics (%)	-	5.1%	2.4%	1.6%
Russia (USD) — dynamics (%)	-	10.1%	3.7%	2.0%
Russia (RUB) — dynamics (%)	-	18.9%	6.6%	13.7%
Share of Russian IT market to Global market (%)	0.62%	0.65%	0.65%	0.66%

Source: compiled by the author using the data: IT-uslugi (rynok Rossii). TADVISER. URL: https://www.tadviser.ru/index.php/ (accessed on 25.03.2022).

Table 5
Growth in demand for IT specialists in Russia, %

	Q1 2018 — Q1 2017	Q1 2019 — Q1 2018	Q1 2020 — Q1 2019	Q1 2021 — Q1 2020
Growth (%)	37%	14%	7%	38%

Source: ccompiled by the author using: Obzor rynka truda в IT-sfere в nachale 2021 goda v Rossii i Sankt-Peterburge. HeadHunter. URL: https://hh.ru/article/28685 (accessed on 25.03.2022).

Table 6
Russian software companies' sales

	2015	2016	2017	2018	2019	2020
Total sales, bln RUB	630	802	834	997	1,174,5	1,368,3
Domestic sales, bln RUB	220	294	321	387	587	684
Domestic sales dynamics,%	–8.3%	33.6%	9.2%	20.6%	51.7%	16.5%

Source: compiled by the author using: Informacionnoe obshhestvo v Rossijskoj Federacii. 2019: statistics digest / M.A. Sabelnikova, G.I. Abdrahmanova, L.M. Gohberg, O. Ju. Dudorova et al.; Federal State Statistics Service; National research. un-t "Higher School of Economics". Moscow: NRI HSE; 2019.

of 2022, about 13.2 thousand programs were registered in the registry, compared with 5.8 thousand in 2019 (an increase of more than two times). At the same time, it can be seen from the data in *Table 6* that since 2016 there has been an increase in sales volume in terms of software of Russian companies in the home market. *Table 7* shows data on the availability of information technology products to companies (according to the Federal State Statistics Service and the Higher School of Economics). The availability of personal computers, Email and Global networks is quite high — more than 90%; however, there is a shortage of servers and local networks among companies.

The use of various software tools by a number of companies is demonstrated in *Fig. 9*. In 2019, the companies actively used specialized business programs: for example, for the companies using programs to solve organizational, managerial, and economic tasks, the indicator was more than 50%, and the use of CRM-, ERP-, SCM-systems was only at 20.5%.

Regarding Russian software, experts note that although state-owned companies were supposed to demonstrate 50–70% under the transition program, however, this indicator was equal to 30–35% at the end of 2021.[10]

[10] Importozameshhenie programm otstalo ot programmy. RBK. URL: https://www.rbc.ru/newspaper/2021/12/28/61c21e289a79479e8562641b (accessed on 25.03.2022).

Table 7
Coverage of companies with information technologies, % in total

	2016	2017	2018	2019
Personal computers	92.4%	92.1%	94.0%	93.5%
Servers	50.8%	50.6%	53.4%	53.8%
Local networks	62.3%	61.1%	63.9%	63.5%
Email	87.6%	88.3%	90.9%	91.1%
Global networks	89.6%	89.7%	92.0%	92.0%
Website	45.9%	47.4%	50.9%	51.9%

Source: compiled by the author using: Sabelnikova M.A., Abdrahmanova G.I., Gohberg L.M., Dudorova O. Ju. et al.; Federal State Statistics Service Informacionnoe obshhestvo v Rossijskoj Federacii. 2020: statistics digest; National research. un-t "Higher School of Economics". Moscow: NRI HSE; 2020.

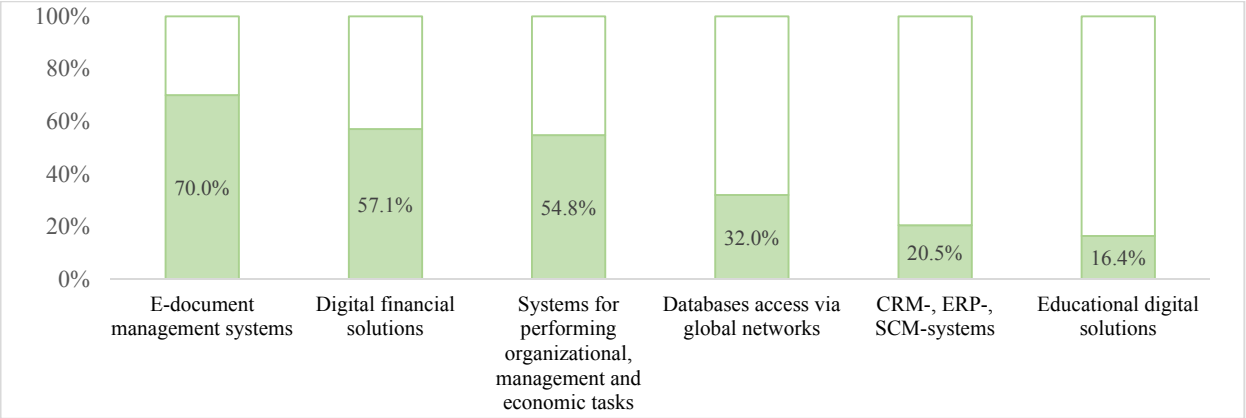

Fig. 9. **Coverage of companies by software tools in Russia in 2019, % of total**

Source: compiled by the author using: Sabelnikova M.A., Abdrahmanova G.I., Gohberg L.M., Dudorova O. Ju. et al.; Federal State Statistics Service Informacionnoe obshhestvo v Rossijskoj Federacii. 2020: statistics digest; National research. un-t "Higher School of Economics". Moscow: NRI HSE; 2020.

So, the software market in Russia is gradually developing, but does not meet all the needs of the companies, so this aspect accounts for 3 points out of 5.

Considering *Trust in online privacy*, with regard of the Inclusive Internet Index, which The Economist created to analyze internet inclusiveness in different countries, 'Trust in online privacy' indicator for Russia declined by 17% in 2020 compared to 2019, and by 10% in 2019 compared to 2018 (see *Table 8*). Russia came 117th out of 120 countries analyzed by this indicator.

Additionally, there is a lack of regulation for personal data security in Russia. These factors can, on the one hand, limit the use of some IT products and, on the other, give rise to new developments in the field of cybersecurity. However, as part of the assessment of the current IT industry development level, a low indicator of trust in online resources and products has a negative impact. This indicator accounts for 2 out of 5.

2. *Importance of industry for the economy of the country*. First of all, the gross value added attributable to this industry was analyzed, which shows its contribution to the country's GDP (see *Table 9*). Even though this indicator for the IT sector is only 1.3 percent of the total value added and takes the 19th position out of 61 industries, its growth is one of the largest in 2020 and 2019 (15.4% and 18.2%, respectively). This demonstrates that the industry is increasingly important for the country's economy. However, its share, compared to some other industries is relatively small. The indicator takes 4 out of 5.

In addition, we reviewed the volume of investments in information technology by industry

Table 8
Confidence in online privacy, % of total

	2017	2018	2019	2020
Share of respondents who are confident in online privacy	22%	40%	36%	30%
Dynamics of share	-	+82%	–10%	–17%

Source: compiled by the author based on: The Inclusive Internet Index. The Economist Intelligence Unit. URL: https://theinclusiveinternet.eiu.com/ (accessed on 10.04.2022).

Table 9
Gross value added by industry

Industry	2018	2019	2020	2019/2018	2020/2019
Manufacture of textiles, clothing, leather and leather products	0.2	0.2	0.3	0.0%	50.0%
Production of electrical equipment	0.3	0.2	0.3	–33.3%	50.0%
Production of medicines and materials used for medical purposes	0.3	0.3	0.4	0.0%	33.3%
Metallurgical products	2.4	2.5	3.0	4.2%	20.0%
Information technology	1.1	1.3	1.5	18.2%	15.4%

Source: compiled by the author based on: Struktura valovoj dobavlennoj stoimosti po otrasljam jekonomiki. Rosstat. URL: https://rosstat.gov.ru/storage/mediabank/tDfpHWR 9/str2.xls (accessed on 10.04.2022).

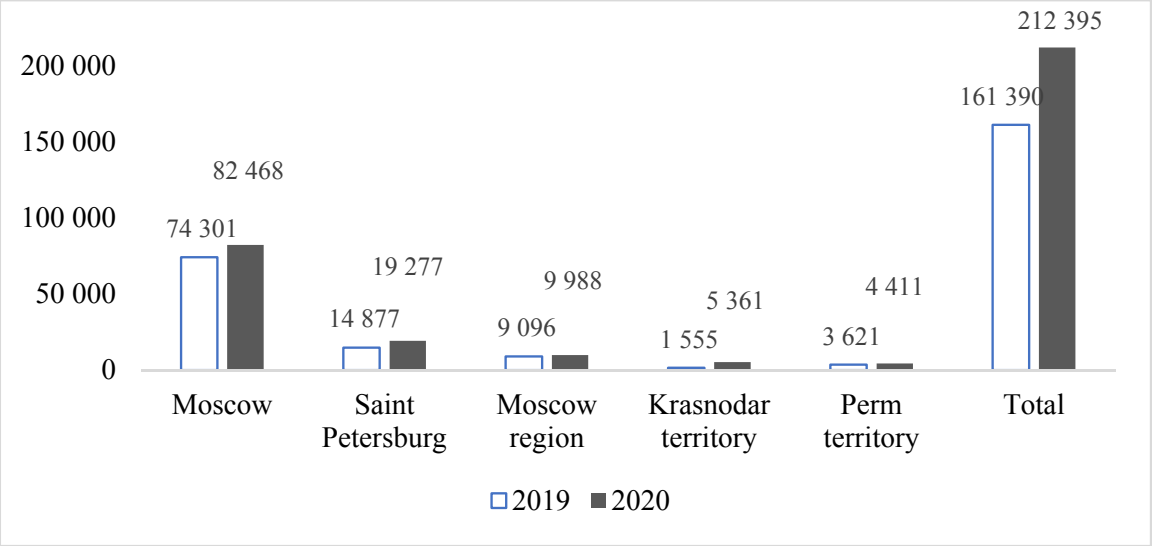

Fig. 10. **IT spendings by region**

Source: compiled by the author based on: CNews Analytics. URL: https://gov.cnews.ru/articles/2020–05–22_regiony_planirovali_uvelichit_itrashody (accessed on 16.04.2022).

in 2020 and their growth relative to 2019. As it can be seen in *Fig. 10*, IT industry spending in each of these regions (top 5 in IT spending) is growing, while total costs by region increased by 36%. This indicates that the need of the regions for IT products and services is growing, showing the importance of the sector for the economy.

The growth of digitalization of all public services and the introduction of new technologies in healthcare, transport, education, etc., are also worth noting. Thus, the importance indicator has 5 points out of 5.

3. *Resistance to negative changes in the economy.* Based on data from Rosstat and analytical agen-

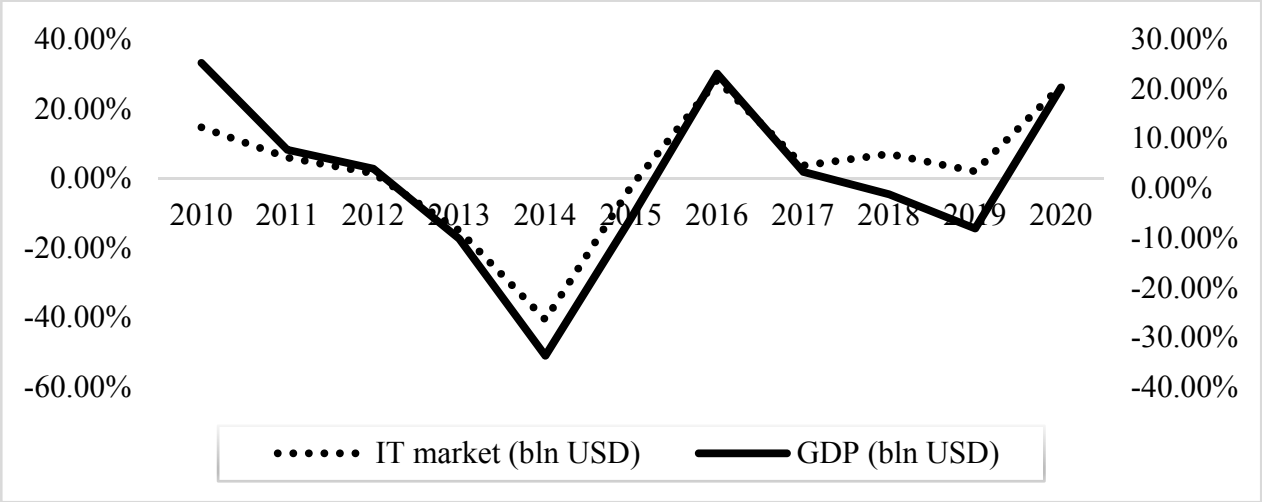

Fig. 11. **Dynamics of Russia's GDP and IT industry volumes changes**

Source: compiled by the author based on: GDP years (from 1995). Federal State Statistics Service. URL: https://rosstat.gov.ru/search?q=ввп (accessed on 16.04.2022).

cies, we developed a graph of the dynamics of changes in Russia's GDP and IT industry volumes (*Fig. 11*).

The industry has a weak Resistance to negative economic changes — with a considerable drop in the overall market, the IT market will also fall significantly. Despite this, the recovery is taking place almost together with the general market. This indicator accounts for 3 points out of 5.

4. *Industry development prospects.* Investments from the budgetary funds were constantly growing in the period 2018–2020 — the increase in 2019 was 49.8% and in 2020–57.5% compared to 14.3% and 23.7% for all the companies, respectively (*Table 10*). Also, there was a sharp increase in foreign investment in 2020, while this indicator is negative for all the companies in total. Overall capital investments experienced considerable growth during 2018–2020. This indicator accounts for 5 out of 5.

As for government incentives, the government is currently taking active measures to support the IT industry. Among such measures: allocation of grants for development; stimulation of the use of Russian developments for state needs; exemption from income tax; provision of loans for work and development at a rate under 3%; allocation of funds to improve the living conditions of employees; deferral from the army for employees under 27 years of age; popularization of the programmer profession, the launch of retraining programs.[11]

Also, one of the incentive measures is the decree on the transition of state-owned companies to domestic software, according to which companies must provide about 70% of Russian software. Thus, the state is taking significant measures for the development of the industry 5 points out of 5 on this aspect.

As for the demand for IT products and services, according to the survey[12] conducted by PwC in 2019, 72% of the respondents noted that in 2020–2023, data analysis technologies will be relevant for corporate treasuries, 64% noted the same about robotic solutions, 61% — about artificial intelligence solutions. Based on the survey, the indicator showing demand prospects for products/services produced in this industry accounts for 5 out of 5.

5. To assess *Investment profitability,* we use market prices of one Exchange Traded Fund (ETF) created from a combination of data from large US IT companies — FXIT (*Fig. 12*), and an index of Russian IT companies created by the Moscow Exchange — MOEXIT (*Fig. 13*).

American IT companies' share prices were growing in 2019–2022. The index of Russian

[11] Decree of the President of the Russian Federation No. 83 dated 02.03.2022 "On measures to ensure the accelerated development of the information technology industry in the Russian Federation". Official Internet portal of legal information.

[12] Digital Treasury: Interaction as the key to success. International comparative study of the Treasury Function for 2019. Pw C. 2019.

Table 10
Capital investments in Information and communication companies and in all companies in Russia, RUB

	2017	2018	2019	2020
Information and communication companies				
Owned capital	307,954,747	396,218,573	465,130,116	473,067,825
Borrowed funds	121,827,533	161,024,904	229,919,093	295,129,564
Budgetary funds	26,498,065	36,079,729	54,044,869	85,112,324
Dynamics		36.2%	49.8%	57.5%
Foreign investments	153,590	156,523	156,743	1,065,546
Dynamics		1.9%	0.1%	579.8%
Total	429,782,280	557,243,477	695,049,209	768,197,389
Dynamics		29.7%	24.7%	10.5%
All companies				
Owned capital	6,290,652,86	729,466,693	8,099,074,250	8,525,052,663
Borrowed funds	5,971,530,177	6,411,274,273	6,626,324,762	6,912,519,957
Budgetary funds	2,003,404,740	2,085,823,486	2,385,014,983	2,950,685,613
Dynamics		4.1%	14.3%	23.7%
Foreign investments	95,874,282	86,489,948	64,967,737	50,476,217
Dynamics		-9.8%	-24.9%	-22.3%
Total	12,262,182,563	13,640,740,966	14,725,399,012	15,437,572,620
Dynamics		11.24%	7.95%	4.84%

Source: compiled by the author based on: Investments in fixed assets by type of economic activity for the full range of economic entities. Unified Interdepartmental Information and Statistical System (EMISS). URL: https://www.fedstat.ru/indicator/59048 (accessed on 16.04.2022).

IT companies from its inception until the end of 2021 was approximately at the same level with a slight downward trend, however, due to changes in the market, it began a strong decline in 2022.

However, potential opportunity to receive income which is reflected in profitability ratios (Return on Assets, Return on Equity), is relatively high on average for the industry in 2021 (in 2021, ROA was 12.1 and ROE was 38.8). Based on this, this aspect accounts for 3 out of 5 points.

In order to calculate the total score for the attractiveness of the industry (external factors), we made a cumulative score table and derived the total score for the industry, which was 4.0 (*Table 11*).

As for the internal factors of the Yandex company, analysis is based on the traditional methodology and includes:

- profitability ratios (Return on Sales, Return on Assets, Return on Capital Employed, Return on Equity, Gross profit margin);
- solvency ratios (Debt ratio, Financial leverage, Interest coverage ratio);
- liquidity ratios (Current ratio, Quick ratio);
- activity ratios (Asset turnover, Inventory turnover, Receivables turnover).

In addition, some indicators proposed by specialists of NASDAQ exchange and investment banks which are suitable for IT companies, are applied; namely, multipliers based on company shares:

- Earnings per Share (EPS);
- Price to Earnings (P/E);
- Price to Sales (P/S);
- Enterprise value to EBITDA (EV/EBITDA).

The calculation of the aggregate indicator for internal factors is identical to the calculation for external factors. However, the weight of all

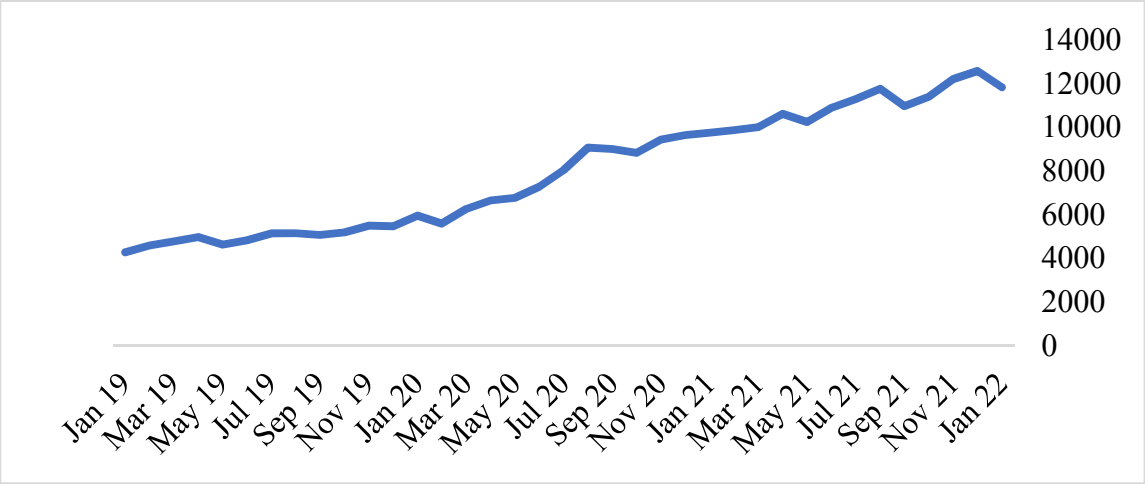

Fig. 12. **FXIT historical prices**

Source: compiled by the author based on: FinEx MSCI USA Information Technology UCITS ETF USD Share Class (FXIT). URL: https://ru.investing.com/etfs/finex-msci-usa-info-tech-ucits-usd (accessed on 16.03.2022).

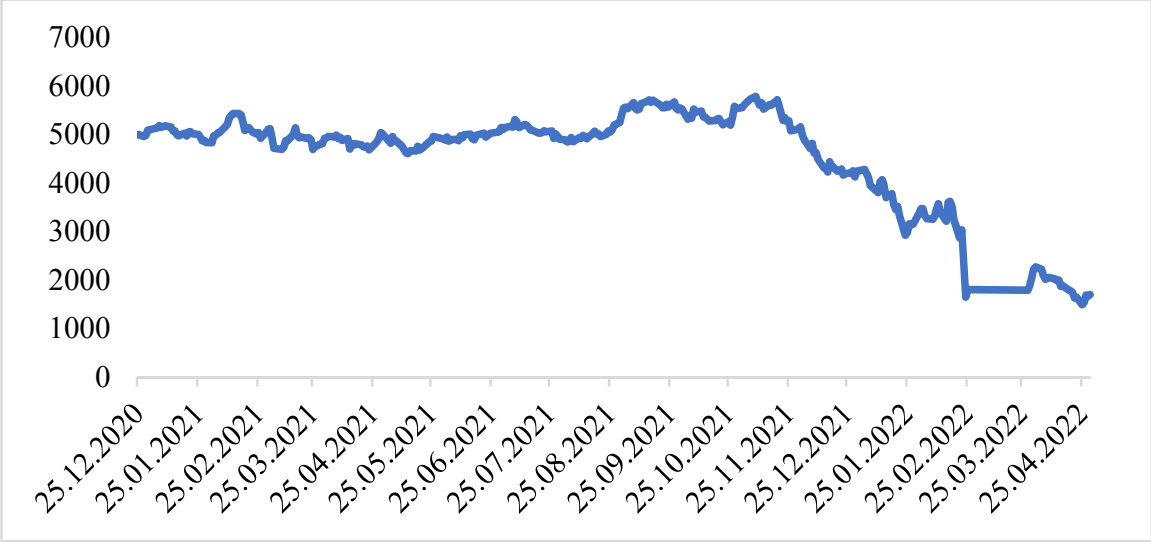

Fig. 13. **MOEXIT historical prices**

Source: compiled by the author based on: Industry indexes. MOEX. URL: https://www.moex.com/ru/index/MOEXIT/archive/?from=2018-01-01&till=2022-05-04&sort=TRADEDATE&order=desc (accessed on 27.03.2022).

indicators in this section is equal to 1 in our research. The overall investment attractiveness is calculated as a weighted average of external and internal factors with the weight equal to 1 for both of them (except factor "Competitive advantages — risks"), as we believe they are equally important.

To Assess Yandex's internal factors affecting investment attractiveness, we use the concept of competitive advantage (formed by M. Porter), which means that the company has unique characteristics in this regard. We conducted a VRIO (valuable (V), rare (R), inimitable and non-substitutable (I), organized to exploit (O) analysis), which helps to assess the company's resources and capabilities and understand which of them form temporary or sustainable competitive advantages. Each resource and capability is evaluated in terms of whether it is valuable (V), rare (R), inimitable and non-substitutable (I), organized to exploit (O). Identified resources and capabilities, and their assessment, are presented in *Table 12*.

According to the results of this analysis, Yandex can retain and strengthen its position in the market. The possible weak points for Yandex are the equipment supply chain, employee migration, strengthening competitors, data protection issues, the risk of low innovation, currency and commodity risks, reputation risk. Considering

Table 11
Industry attractiveness calculation

Factor	Indicators	Grade (max 5)	Weight
Current development	Users	4	0.05
	Average connection speed	3	0.05
	Market volume growth	5	0.05
	People employed	3	0.05
	Resource availability	3	0.05
	Trust in internet privacy	2	0.05
Importance of industry for the country's economy	Gross value added	4	0.1
	Industry spending	5	0.1
Resistance to negative changes in the economy	Industry volumes of sales dynamics in relation to country's GDP dynamics	3	0.1
Industry development prospects	Demand prospects for products/ services produced in this industry	5	0.1
	Volume of capital investments in this industry	5	0.1
	Availability and volumes of government incentives	5	0.1
Investment profitability	Average return on investment in the enterprises of this industry	3	0.1
Total grade (weighted average)		4.0	

Source: compiled by the author.

weak points, for these factors, the total score is 3.59. Further, as part of the analysis, we examined financial ratios, which are often used in the framework of financial analysis of companies. The results of the calculations are presented in *Table 13*.

As for profitability ratios, in 2021, there is a strong decline in all profitability indicators, which can take even negative values. This can be explained by the fact that the company's profit that year was negative due to a strong increase in operating costs. Overall, in terms of profitability ratios, it is necessary to look at further dynamics, but currently, these indicators receive 2 out of 5 points.

Considering Solvency ratios, financial leverage indicates that, compared to the average companies in the industry, the company is more dependent on borrowed capital, and this dependence is growing. Despite this, it is generally considered acceptable for this indicator to reach 1. Though debt, in general, grew significantly from 2019 to 2020, the debt ratio is quite low, indicating a relatively weak dependence on creditors. In 2021, the interest coverage ratio was negative due to negative profits. According to these indicators, the company receives 4 points out of 5.

Liquidity ratios reflect the ability to cover current liabilities, while this ratio considers only highly liquid assets. In 2020, this indicator increased significantly and was more than twice as high as the industry average, but in 2021 it decreased due to a general decline in performance this year. The indicator is 4 out of 5.

Considering Activity ratios, Turnover coefficients reflect the intensity of available resources utilization. The asset turnover ratio shows the period expected for the return of the funds invested in assets to conduct the economic activity — it is much higher than the industry average for Russia but lower than the figures calculated for the United States, where there are many IT companies. The same thing can be observed with inventory turnover. The turnover of accounts

Table 12
VRIO analysis for Yandex

	V	R	I	O	Competitive advantage
Wide diversification of business	+	+	+	+	Sustainable
Proprietary technologies built in-house	+	+	+	+	Sustainable
The scientific and educational laboratory of the Yandex company, created jointly with one of the leading universities of the country	+	+	-		Temporary
Sustainable business model	+	+	-		Temporary
Quality of products and services	+	-			Competitive parity
Brand	+	+	+	+	Sustainable
Both B 2B and B 2C services	+	-			Competitive parity
Innovation	+	+	+	-	Unused
Search engine adapted to a specific audience (Russian-speaking)	+	-			Competitive parity
Representation in different countries	+	+	+	+	Sustainable
Qualified specialists undergoing serious selection (18,000 employees, with 38% being IT-developers)	+	+	+	+	Sustainable
Strong employee motivation system	+	+	+	+	Sustainable
Employees training	+	-			Competitive parity
Partner network expansion	+	-			Competitive parity
Loyalty programs for some services	+	-			Competitive parity
Systemic company status	+	+	+	+	Sustainable

Source: compiled by the author.

receivable in days is very low, indicating a faster repayment of debts by buyers. The indicator based on these ratios is 2 out of 5.

The fulfillment of the conditions specified in *Table 14* helps to determine the liquidity of the company's balance sheet. Based on the calculations, both in 2020 and 2021, the company's balance sheet is liquid only according to one out of four indicators, which reflects the ability of the most urgent obligations to quickly cover, if necessary. A fairly high level of debt characterizes the company, so the remaining conditions are not met. Perhaps the specifics of IT companies' activities can justify this, but this indicator is higher for the company than the industry average. According to this criterion, the company receives 1 out of 5 points.

Since Yandex is listed on the stock exchange, as part of the analysis, market multipliers that will be useful for investing in the stock market can also be considered — they allow for assessing the profitability of shares and how much they are overvalued or undervalued. Among such multipliers are EPS, P/S, P/E, P/FCF, EV/EBITDA — results of their calculation for Yandex and for its global competitor Google (Alphabet) are presented in *Table 15*.

The P/S ratio is important as part of the assessment since IT companies often have negative profits when they invest in the development and implementation of innovations. Sales revenue can show a promising profit for the company, as well as the demand for the company's products in the market. In comparison to Google, which P/S multiplier has been steadily growing from year to year in the last few years, Yandex's multiplier is volatile: this indicator increased significantly in 2020 but fell in 2021. However, despite the fall, the indicator is higher than the indicator considered average for Russian IT companies

Table 13
Yandex financial ratios

	2019	2020	2021	2020	2021
		Yandex		Industry benchmark	
Profitability ratios					
Return on Sales	7.3	11.3	–4.1	8.7	9
Return on Assets	4.4	4.8	–2.8	10.8	12.1
Return on Capital Employed	9.9	8.1	–1.8	-	-
Return on Equity	6.0	7.2	–5.4	38.4	38.8
Gross profit margin	14.1	7.2	–3.7	-	-
Solvency ratios					
Debt ratio	0.2	0.3	0.5	<0.7	<0.7
Financial leverage	0.3	0.5	0.9	0.36	0.32
Interest coverage ratio	1.0	16.4	–0.9	6.01	7.94
Liquidity ratios					
Current ratio	2.6	4.6	1.8	2.1	2.3
Quick ratio	2.6	4.5	1.7	1.86	2.03
Activity ratios					
Asset turnover, days	605.9	861.9	528.3	160 (894)	157 (945)
Inventory turnover, days	2.0	8.7	7.1	0 (28)	0 (35)
Receivables turnover, days	0.0	0.0	0.0	65 (64)	62 (45)

Source: compiled by the author.

(which equals 2) and almost equal to Google's multiplier in 2020.

Regarding P/E, Yandex was in one of the leading positions in the Russian market. Yandex's multiplier was also almost 2.5 times higher than Google's. Many experts consider this indicator to indicate how much investors are willing to pay for the expected future profit. At the same time, the higher this multiplier is, the longer the payback period of these investments turns out. During the IT bubble period, many investors, in anticipation of the rapid growth of IT companies, did not consider this indicator, although at that time it could reach 800. For Yandex, this indicator was relatively high in both 2019 and 2020, and even though it reached a negative value in 2021, it means that the shares were overvalued, and it signaled that it was better to refrain from buying.

As for EV/EBITDA, Yandex shares are also overvalued: even Google, with its value of 20.9, overperforms its main market by 5 times, while the multiplier for Yandex is much higher than the one for Google. At the same time, Yandex's market capitalization demonstrated a growing trend in 2019–2020, which was most likely justified by the investors' high expectations. However, there was a slight decrease in 2021. In contrast, Google maintained steady growth in the corresponding period. In addition, EPS indicator was growing for Yandex in 2019–2020, and it was relatively high, taking into account the size of the company.

We believe that for such investments, although they may be profitable, the company's shares are highly overvalued, which may eventually lead to a big drop. The comparison with one of the global IT giants fortifies this finding. Currently, the company's shares are also subject to strong fluctuations due to the changes in the economy and politics, and they are not resistant to market changes. However, earnings per share have been following a growing trend which is important for investors. This aspect accounts for 2 out of 5.

Table 14

Yandex balance sheet liquidity indicators, mln RUB

	Type	Condition	2020		2021	
A1	Most liquid assets	A1>P1	238,185	Good	102,690	Good
P1	Most urgent liabilities		43,634		84,495	
A2	Quick- liquidating assets	A2>P2	25,440	Bad	43,568	Bad
P2	Short-term liabilities		62,852		111,106	
A3	Slow-liquidating assets	A3>P3	17,760	Bad	30,373	Bad
P3	Long-term liabilities		104,658		131,465	
A4	Hard-to-liquidate assets	A4<P4	225,211	Good	315,521	Bad
P4	Permanent liabilities		306,924		244,711	

Source: compiled by the author.

Table 15
Yandex and Google multipliers

	Yandex			Google	
	2019	2020	2021	2020	2021
Market capitalization	₽792 bln ($ 14.35 bln)	₽1 673 bln ($ 24.68 bln)	₽1 480 bln ($ 21.71 bln)	$ 1.19 trln	$ 1.92 trln
EPS	₽34.03 ($ 0.48)	₽68.5 ($ 0.98)	-	$ 49.16	$ 112.2
P/S	4.5	7.7	4.2	7.05	8.15
P/E	70.7	71.6	-	29.9	25.82
EV/EBITDA	15.7	34.1	45.7	22.1	20.9

Source: compiled by the author.

Table 16
Calculation of investment attractiveness of Yandex internal factors

	Weight	Total grade (max 5)
Competitive advantages — risks	15	3.59
Profitability ratios	1	2
Solvency ratios	1	4
Liquidity ratios	1	4
Liquidity ratios (additional)	1	1
Activity ratios	1	2
Multipliers	1	2
Investment attractiveness by internal factors	3.32	

Source: compiled by the author.

Table 17
Calculation of overall Yandex investment attractiveness

	Grade	Weight
Investment attractiveness by external factors	4	1
Investment attractiveness by internal factors	3.32	1
Overall grade	3.66	

Source: Compiled by the author

Thus, based on the results of the analysis, a cumulative assessment of the investment attractiveness of Yandex by internal factors has been made. The calculation results are presented in *Table 16*.

Table 17 shows the overall grade of investment attractiveness grouped by factors of the external and internal environment: overall grade = 3.66.

Conclusion

Economic development cannot be imagined without information technologies nowadays. They contribute to the growth and development of business and contribute to the development of countries. There are two factors influencing the upsurge in the popularity of IT companies and, accordingly, leading to improving their performance. The second reason is the introduction of e-commerce in many areas of activity. IT companies, serving as suppliers of these technologies, play an important role in providing comfortable living and working conditions. They provide a wide range of services and goods and are now in high demand affecting their performance indicators. The formation of the IT industry was largely due to venture capital investments. As IT companies are characterized by high growth rates and considerable potential for further development, they remain a popular investment object. The popularity of investing in IT industry is explained not only by the importance of this area as a whole, but also by the fact that a short development period, opportunities for relatively easy relocation of personnel, as well as the lack of physical assets in many IT companies, reduces the level of political and country risks. So, a large number of factors affect the investment attractiveness of an enterprise.

The assessment of investment attractiveness is a pivotal stage in the process of making investment decisions during which an investor should carefully analyze all factors that can influence the possibility of the investment object to bring such an effect that compensates for omitting these funds now, which means bringing positive financial or other effect.

We have proposed an approach to assessing the external factors: investment attractiveness of an enterprise based on the assessment of the industry in the country in which the most considered part of operations is carried out, as well as an assessment of the internal factors of the company itself. When evaluating the industry, we suggested using the following factors: Current development, Importance of industry for the country's economy, Resistance to negative changes in the economy, Industry development prospects, Possible investment profitability. When assessing the internal environment, we considered the company's competitive advantage, which will continue to hold its position in the market adjusted for potential weak points, financial factors (Profitability ratios, Solvency ratio, Liquidity ratios, Activity ratios), as well as market multipliers which are considered suitable for IT companies. The assessment of the above-mentioned parameters was carried out on the basis of available statistical and expert data, according to which we performed the analysis and gave an expert assessment. We applied this approach to the IT company Yandex, using the evaluation system, which implies assigning scores to each indicator based on the expert opinion formed after a thorough analysis. We found that the external factors, based on the assessment of the industry in the country, are characterized by a fairly high growth potential and above-average attractiveness for investors. At the same time, there are certain problems that the industry may face, especially being exposed to the risks associated with the coun-

try of operation. A cumulative assessment of the investment attractiveness of Yandex by internal factors shows the result 3.32 out of 5. Yandex has a number of advantages, such as its own technologies, business diversification, qualified employees, the status of a backbone enterprise, and others that can ensure its sustainable growth and development in the future. However, despite the fact that Yandex is one of the leaders in the Russian market, several points of concern affect investment attractiveness of Yandex negatively. One of which is that the company's shares on the stock exchange for 2021 were highly overvalued, which also indicates the possibility of a strong fall in case of instability in the market. We assessed the investment attractiveness of this company as average and found that it is better to consider its inclusion in the investment portfolio for diversification and stability rather than individual investment. Nevertheless, when considering investments, it is worth factoring in the investment goals and the horizon; because some factors may become less important when an investor has a high-risk appetite or wants to receive a profit in a short-term period.

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Conflicts of Interest Statement: The authors have no conflicts of interest to declare.
Конфликт интересов: авторы заявляют об отсутствии конфликта интересов.

The article was submitted on 20.09.2022; revised on 12.11.2022 and accepted for publication on 27.11.2022.
The authors read and approved the final version of the manuscript.
Статья поступила в редакцию 20.09.2022; после рецензирования 12.11.2022; принята к публикации 27.11.2022.
Авторы прочитали и одобрили окончательный вариант рукописи.