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Effect of Sales Revenue Growth on the Corporate Performance of Nigerian Listed Foods and Beverages Manufacturing Firms

Festus Oladipupo Olaoye
Ayoola Azeez Olaoye

ABSTRACT

This study investigated the effect of sales revenue growth on the corporate performance of listed Nigerian foods and beverages manufacturing firms. The study used secondary source of data to collect panel data from the financial statements of the selected firms between 2011 and 2020. The population of the study is made up of the eight (8) listed foods and beverages companies listed on the Group Stock Exchange Nigerian Limited. The sample four (4) of the firms were obtained using a purposive sampling technique. The study employed the correlation analysis and the ordinary least square technique for data estimation. The research work found that the co-efficient of the sales revenue on the return on assets is positively and significantly signed (0.17548, P-value of 0.02 < 0.05) with the correlation result of 0.8965. The study therefore concluded that sales revenue growth has a positive effect on the corporate performance of listed foods and beverages manufacturing firms in Nigeria with a strong positive correlation between the turnover and the firms' performance. Therefore, the research work recommended that the directors of the foods and beverages firms should strategize on how to improve on their advert coverage to increase their markets share that will improve the level of their firms' turnover in Nigeria.

Keywords: corporate performance; foods and beverages firms; sales revenue growth

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Влияние роста выручки от продаж на корпоративные показатели нигерийских компаний — производителей продуктов питания и напитков

Фестус Оладипупо Олаойе
Айоола Азиз Олаойе

АННОТАЦИЯ

Целью статьи является презентация метода и результатов исследования, связанных с определением влияния роста выручки от продаж на корпоративные показатели нигерийских фирм — производителей продуктов питания и напитков, зарегистрированных на фондовым рынке. В качестве методической базы исследования были использованы панельные данные из финансовой отчетности выбранных фирм за период с 2011 по 2020 г. Данные четырех фирм были получены с использованием метода целенаправленной выборки. В исследовании применялись корреляционный анализ и обычный метод наименьших квадратов для оценки исходных данных и результатов исследования. Исследованием также были охвачены восемь компаний по производству продуктов питания и напитков, котирующихся на нигерийской фондовой бирже. Результаты исследования показали, что коэффициент выручки от продаж по фондоот-

даче имеет положительный и значимый знак (0.17548, P-значение 0.02 < 0.05) с результатом корреляции 0.8965. Авторы пришли к выводу, что рост выручки от продаж оказывает положительное влияние на корпоративные показатели зарегистрированных на бирже нигерийских фирм по производству продуктов питания и напитков с сильной положительной корреляцией между оборотом и эффективностью фирм. В рамках разработанных авторами рекомендаций директорам фирм по производству продуктов питания и напитков было предложено разработать новую стратегию, включающую в себя агрессивную рекламную кампанию в работе с потенциальными клиентами, чтобы увеличить свою долю на рынке и тем самым повысить уровень оборота их фирм в Нигерии.
Ключевые слова: корпоративная эффективность; производители продуктов питания и напитков; рост доходов от продаж

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Introduction

Attaining higher and adequate level of corporate performance is imperative for the success of foods and beverages as a business. Greater corporate performance can be achieved in the short-run by disposing part of the companies' assets for immediate survival. However, this type of performance is not sustainable in the long-run. Therefore, foods and beverages manufacturing firms must possess the business strategies that will enable their normal operations to generate higher profits. One of the most common measure of performance is the return on assets by dividing net profit after tax and interest by the total assets Ball et al. [1]. This model can tell how much of the profit was used to finance the assets of the company Ball et al. [Ibid.]. A company's performance can be measured using net profits ratio to total assets. Mansa [2] is of the opinion that the performance can be measured as the return on assets which is the earnings' after interest and tax divided by total assets. Measuring the return on assets is an evaluation of the how much of revenue contributed to the assets growth Ani et al. [3]. Profit making is a may issue in every business all over the world as a measure of the growth in sales revenue. Firms engaging in foods and beverages cannot do well without generating revenue that will generate cash inflow to meet their short term debts and invest the excess of it in corporate assets.

1. Background

Foods and beverages manufacturing industries playing significant roles in the economic growth of Nigeria by creating more employment opportunities and improve social-economic welfare of the populace in the country as the producers of the final households goods Ani et al. [4.]. Failure on the part of the foods and beverages companies in Nigeria and around the world to generate adequate revenue can cause them to seize to continue their business activities as no firm can survive without making enough sales Alao and Oloni [5]. The two industries have been recording highest performance like other industries such as the oil and gas, brewery and telecommunication Okwo et al. [6]. Growth of the foods and beverages firms' sales revenue is very paramount as most of the successful businesses in the world are those that have superb selling strategies Garison and Noreen [7]. Evaluating the growth in the revenue of the foods and beverages firms will expose how the business has performed. Revenue means the income a company got before removing any expenses. Sales revenue is an important component determining and accounting for about 85% of business success or failure in Nigeria and in the world Aashist [8]. Companies may get revenue that is higher than the sales figures with other income sources. Sales revenue refers to the economic value received after when goods were sold or services rendered to another party for money consideration Mansa [2]. Sales could be done on cash or credit and advance payment Osundina and Osundina [9]. Cash sale means cash on delivery Osundina and Osundina [ibid.]. Foods and beverages firms do sell goods or deliver services on credit basis to increase their volume of sales Osundina and Osundina [ibid.]. That means if the company could achieve the same level of sales with receivables, it is necessary to sell on credit Rashiul et al. [10]. The aim of managing accounts receivables is to maximize sales revenue, speed up the cash flow and improve firms' performance (Nzewi, 2007) [11].

A review of related literature also has discovered that some studies like Ball et al. [1]; Nzewi [11]; Rashidul et al. [10]; Mansa [2]; have used return on sales, earnings per share, return on investment among others to measure performance, but this study will use return on assets. The performance of foods and beverages industries were seriously affected by the poor state of Nigeria economy which reduced the number of the operating listed foods and beverages firms to almost eight (Ani, et al, 2012) [3]. However, the revenue growth of the firms is very imperative to avoid their failures as it was recently happened to the industry. All these issues required continuous studies to investigate the corporate performance level of the foods and beverages companies in Nigeria between 2011 and 2020. It is based on these identified gaps that this study is examining the effect of sales revenue growth on the corporate performance of listed foods and beverages manufacturing firms in Nigeria.

1.1. Objective of the study

The main objective of this study is to examining the effect of sales revenue growth on the corporate performance of listed foods and beverages manufacturing firms in Nigeria. Specifically, the study evaluates the effect of sales revenue on the return on assets of the listed foods and beverages manufacturing firms in Nigeria.

1.2. Hypothesis of the Study

Thus the study hypothesized that:

a. Ho: sales revenue has no effect on the return on assets of the listed foods and beverages manufacturing firms in Nigeria.

2. Literature Review

2.1. Corporate Performance

Corporate performance is an economic result achieved by a business. Corporate performance is the degree to which the business activity yields enough financial gain. Corporate performance is a measure that can be used to assess the value of a business. Corporate performance is the economic outcome of doing a business. Corporate performance is a situation when a company is generating better profit. Corporate performance can be defined as the financial benefit accrued to the company in ordinary course of business. Corporate performance reveals the healthy position of a business in financial term over a period of time as in Halabi and Lussier [12]. Corporate performance is the ability of a business to do investment and generate a return from its [1]. The main objective of firms is to enhance corporate performance Helen et al. [13]. Due to the prevailing market competitive conditions, business managers need to learn how to achieve a sustainable level of corporate performance for its survival in Helen et al. [ibid.]. Corporate performance is a measure of the efficiency of a business organization Helen et al. [ibid.]. Measuring the company's corporate performance will provides information on how to achieve business growth in Oladejo [14]. Corporate performance can be defined as the profit generation based on a doing a business in Weetman [15]. Corporate performance is the measure of efficiency that will guide management to achieve success in business as in Helen et al. [13]. Corporate performance is the ability to generate profit from the business activities [5]. Return on assets is a ratio used to evaluate the foods and beverages firms' operational efficiency in the study to provide an insight into how much profit is being generated from sales. An increasing in the return on assets is an indication that a company is growing more efficiently, while a decrease in return on sales could sound as a signal of impending financial troubles. Return on assets could be estimated to evaluate a company's operational efficiency in Mansa [2].

2.2. Sales Revenue Growth

Growth in the sales revenue will improve corporate performance. The terms "sales" and "revenue" in accounting may interchangeably mean the same thing. It is important to note that sales revenue growth does not necessarily mean cash received but sales level that will optimize profits. Sales revenue is the net economic value received by a business in return for the sales of goods or rendering a service through its business operation. Sales revenue is the income received by a company from its sales of goods. Sales revenue is the return on sales of assets, products and properties [5]. The price of goods or services sold to customers is recorded as revenue for the activity in the period of sale and delivery regardless of the period in which the corresponding cash is collected in Al-Qashi & Al-Oqlah [16]. Sale revenue is one of vital means of generating cash flow to upkeep of small, medium and large business enterprises as to settle their fi-

nancial obligation in Ani et al. [4]. Sales revenue is the inflow of economic gain and a product of income statement, which is the total income that the entity receives as cash flows from the sale of its commodity products or services in Ball et al. [1].

Sales revenue growth means the top line number that appears at the top of the firms' income statements Ani et al. [4]. Sales revenue growth is measured at fair value or at the cash equivalent of assets received in accordance with International Financial Reporting Standards in Al-Qashi & Al-Oqlah [16]. In the case of the sale of goods or the rendering of services for goods or services that are not identical, the process is considered revenue generating. Revenue in this case is measured on the basis of the fair value of the goods or services received and adjusted for any cash or cash equivalents to be exchanged Al-Qashi & Al-Oqlah [ibid.]. Cash sale is an immediate payment for the goods and services [5]. Credit sale in the other hand leads to the creation of account receivable represented by trade accounts receivable in the statements of financial position of a the firms Ani et al. [4]. Credit sales are purchases made by customers for whom payment is delayed which may lead to the risk of bad debt losses. If the fair value of the goods or services cannot be reliably measured, revenue must be disclosed on the fair value of the goods and services that the entity relinquishes [16]. Sale revenue is the amount realized by a business from the sale of goods or services Ball et al. [1]. Sales are the proceeds a company generated from selling of goods or rendering a service to its customers. Sales is a process that resulted in a transaction between two or more parties where the buyers receive goods or services and the sellers get something worth of economic value in return usually money (Weetman, 2006) [15]. A portion of sales revenue may be paid in cash and a portion may be paid on credit, through means such as account receivables [5].

2.3. Theoretical Review

2.3.1. Economic Theory of Managerial Capitalization

This study is pinned on the Economic Theory of Managerial Capitalization introduced by Marris [17]. The theory stated that in considering the growth of the companies, manager should choose constant sales revenue growth rate that will ensure continuous growth of the corporate performance in Pandey [18]. This is what the choice of the higher growth rate is all about [ibid.]. Achieving higher corporate performance through the sales revenue growth, advertisement, constant research and sales revenue growth among other criteria are likely to usually influence the firms' performance and their values as in Pandey [ibid.]. As the interest of the business stakeholders is to stimulate sales revenue growth that will attract high returns on their assets. However the managers should play dual roles of satisfying the firms' sales revenue growth and maximize the interests of the stakeholders in Helen et al. [13]. The assumptions made by Marris [17] according to Helen et al. [13] managing the capitalization and performance is based on the price structure and production costs, where the firms assumed to grow through diversification, sales revenue and performance assumed to have increase at the same rate [5]. The theory expressed an optimistic that as the sales revenue continue to grow-up the corporate performance level also increases. Therefore, the theory of Managerial Capitalization is relevant to this study as it assist to determine the effect of sales revenue growth on the firms' corporate performance.

2.4. Empirical Review

Abdullahi [19] investigated "the effectiveness of advertising expenses on the sales revenue and profitability of some selected food and beverages firms in Nigeria". Secondary data was obtained and analyzed using correlation analysis and Ordinary Least Square regression model. The study found that advertising expenses has no positive significant relationship with the sales revenue of the selected companies. While the result. The study concluded that advertising is one of the most vital medium of influencing people to purchase companies products and when the sales improve, companies' performance will also improve. The study recommended that not only advertising should be given adequate attention while formulating sales revenue policies for the promotion, strategies and other related factors such as sales promotion, personal selling, publicity among others should be considered to increase the sales revenue and enhance profitability. Helen et al. [13] conducted a study to investigate "the determinants of profitability in listed consumer goods firms in Nigeria". The study used secondary source of data was used to collect a time series data on firm size, leverage, market share and return on asset between 2006 and 2015 which were sourced from the annual ac-

counts and reports of the selected firms. Data gathered were analyzed using Pearson correlation and ordinary least square regression. Findings from the study indicated that there is strong relationship among the variables used in the study.

Al Hayek [20] investigated "the relationship between the sales revenue and net profit and net cash flows from operating activities in Jordanian industrial joint stock companies". The study carried out an analytical study using a descriptive analytical technique. Data gathered was analyzed using multiple regression equation. The results from the study revealed that there is a significant relationship between the sales revenue and net profit and net cash flows from operating activities of the companies. Ani et al. [4] investigated "the relationship between sales revenue and the profitability of foods and beverages industries in Nigeria". The study adopted an ex-facto design and used panel secondary data from the financial statements of the firms for a period between 2010 and 2018. The study used regression model, ANOVA and Correlation for data analysis. The study found that sales revenue does not have significant impact on return on sales and return on investment but it has significant effect on earnings per share of brewery industries in Nigeria. The study concluded that there is no significant effect of sales revenue on return on sales and return on investment but there is on earnings per share of brewery industries in Nigeria.

3. Methodology

This study adopted an expo-facto research design and focused on foods and beverages industries to examine the effect of growth in the sales revenue on the performance of the listed foods and beverages firms in Nigeria. The study uses secondary data by using panel data from the annual accounts and reports of listed breweries from 2011–2020. A sample of four (4) foods and beverages firms were purposively selected based on the availability of data from the study's population of eight (8) quoted Nigerian foods and beverages firms as at 31st Decameter, 2021. The companies are "Dangote Sugar Plc, Cadbury Nigeria Plc, Honeywell Flour Mill Plc, Multi-trex Integrated Foods Plc, Flour Mills Plc, Northern-Nigerian Flour Mills Plc, Union Dicon Salt Plc and National Salt Corporation of Nigeria Plc".. The study employed the correlation analysis and the ordinary least square methods to analyze data. The study used one explanatory independent variables of sales revenue growth measured in term of net revenue as the log of turnover figure, while the return on assets (ROA) is used as the dependent variable, the proxy for performance.

Table 1
Correlation Analysis Result

	ROA	SR
ROA	1.0000	
SR	0.8965	1.0000

Source: Data Analysis (2021), 5% level of significant.

3.1. Model Specification

This study adopted the model use by Ani et al. [4]. The adopted model is specified below:

$ROA_{it} = \beta_0 + \beta_1 SR_{it} + e_{it}$ 1.1

Where:

SR_{it} = Sales Revenue at time t (independent variable)

ROA_{it} = Return on assets at time (dependent variable)

β0 = Constant

βo, β1

et = Error term.

3.2. Results and Discussion

The study analyzed the data sourced for using the correlation analysis and the common effect model as presented below:

Table 1 presents the result of the correlation analysis showing a positive correlation between the return on assets and the sales revenue measured in term of log of turnover (r = 0.8965).

Table 2 reveals the results of the ordinary least square technique on the effects sales revenue growth measured in term of log of turnover on the performance of the selected listed breweries measured in term of return on assets. The result of Ward's test for heteroskedasticity with a statistic value of 15.86 and a p-value of 1.26 > 0.05 level of significant implies that there is no heteroscedasticity in the residuals. The ordinary least square result in Table 2 indicates the results of the adjusted R-square of 89 per cent implying that even if other variables in the error term were included in the model, sale revenue will still account for 86% of the variation in return on assets. The F-statistics of 14.865 indicates that that the model used is fit has a p-value of 0.0031 less than 0.05 level of significant. Wooldridge test

Table 2
Ordinary Least Square Result

Included 4 cross-sectional units, Time-series length = 10 using 40 observations
Dependent variable: ROA

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
Const	−2.7530	0.6227422	−4102	0.0153
SR	0.17548	0.0243214	4.433	0.0252

Mean dependent var	−0.064321	S.D. dependent var	0.643210
Sum squared resid	3.765300	S.E. of regression	0.456721
R-squared	0.889320	Adjusted R-squared	0.864326
F-stat (2, 27)	14.86540	P-value(F)	0.003102
Log-likelihood	−7.12653	Akaike criterion	19.32145
Schwarz criterion	22.58432	Hannan-Quinn	18.23451
Rho	0.865432	Durbin-Watson	2.247218

Ward heteroskedasticity test-
Null hypothesis: no heteroskedasticity is present
Test statistic: LM = 16.7644
with p-value = P(Chi-square(5) > 15.8644) = 1.26l754
Wooldridge test for autocorrelation in data -
Null hypothesis: No autocorrelation (rho = 0)
Test statistic: t(2) = 375.021 with p-value = P(|t| > 375.021) = 0.796

Source: Data Analysis (2022) @ 5% significant level.

for autocorrelation with a statistic value of 15.86 and p-value of 1.26> 0.01 level of significant and Durbin Watson of 2 and above indicate the absence of autocorrelation in the data. However, the result of the ordinary least square revealed that the coefficient of net revenue of 0.17548 with the P-value of 0.0252 < 0.05 significant level is implying that sales revenue has a positive and significant effect on the return on assets of the listed Breweries companies in Nigeria. This result means a unit increase in the value of the independent variable of sales revenue will also increase the performance of the selected firms by 17 per cent.

4. Conclusion

Finding from the study showed that there exist a strong association between the sales revenue and the return on asset turnover and the performance of the listed foods and beverages firms in Nigeria measured in term of return on assets. Also, the results of ordinary least square revealed that sales revenue has a positive and significant effect on the performance of the listed breweries companies in Nigeria. This study is similar to the result of the study conducted by Al-Hayek (2018) who found a positive relationship between the sales revenue and the net profit and the net cash flow from their operations. The result is implying that is the managers of the foods and beverages companies can try to improve the sales revenue of their firms, the performance of the companies will go up. Therefore, the research work recommended that the Directors of the foods and beverages firms should strategize on how to improve on their advert coverage to increase their markets share that will improve the level of their firms' turnover.

REFERENCES

1. Ball R., Gerakos J., Linnainmaa J.T., Nikolaev V. Accruals, cash flows, and operating profitability in the cross section of stock returns. *Journal of Financial Economics.* 2016;121(1):28–45.
2. Mansa, J. (2020). Return on Sales (ROS). URL: https://www.investopedia.com/terms/r/ros.asp

3. Ani W.U, Okwo I.M., Ugwunta D.O. Effects of working capital management on profitability: evidence from the top five beer brewery firms in the world. *Asian Economic and Financial Review.* 2012:2(8):966–982.
4. Ani T.M., Nwankwo C.N., Ugwu K.O. Sales Revenue and Profitability of Brewery Industries in Nigeria. *Journal of Accounting and Financial Studies.* 2019;2(1):12–23.
5. Alao E.M., Oloni E.F. The effect of total asset turnover changes on return on sale: study of food and drinks service industry in Nigeria. *European Journal of Accounting, Auditing, and Finance Research.* 2015;3(6):26–38.
6. Okwo I.M., Ugwunta D.O., Nweze A.U. Investment in fixed assets and firm profitability: evidence from the Nigerian brewery industry. *European journal of business and management.* 2012;4(20):10–12.
7. Garrison R.H., Noreen E.W. Managerial Accounting. 9th ed. Irwin McGraw-Hill Education; 2000.
8. Aashist P. What is sales? Sales vs. marketing vs. business development. URL: https;//www.feedough.com; 2020.
9. Osundina J.A., Osundina K.C. The Effect of Working Capital Management on Market Value of Quoted Food and Beverages Manufacturing Firms in Nigeria. *International Journal of Business and Social Science*. 2014;4(1):34–89.
10. Rashidul I, Tahsan K, Tonmoy T.C., Ashique M.A. How earning per share (EPS) affects share price and firm value. *European Journal of Business and Management*. 2014;6(17):65–72.
11. Nzewi U.C. Financial Management. Onitsha: Noben Press Ltd.; 2007.
12. Halabi C.E., Lussier R.N. A model for predicting small firm performance, *Journal of Small Business and Enterprise Development*. 2014;21(1):4–25.
13. Helen A., Yusha'u I.A., Idris M.A. Determinants of Profitability in Listed Consumer Good Firms in Nigeria. *Journal of Accounting, Business and Finance.* 2017;(1):272–278.
14. Oladejo M. Essentials of management and accounting. 2nd ed. Johnny Printing Works Ikeja, Peace Concept; 32–93; 2008.
15. Weetman P. Financial and management accounting. An introduction. 4th ed. London, England: Pearson Education Ltd. Wikipedia. Return on investment'. URL: https://en.m.wikipedia.org; 2006.
16. Al-Qashi Z.S., Al-Aqlah M. Impact of compliance of revenue recognition principle on the problems of income resources in Arab satellite channel measuring. *Algerian Journal of Accounting and Financial Studies.* 2015;1(1):34–46.
17. Marris R. Completed micro-models. In: The economic theory of 'managerial' capitalism. London: Palgrave Macmillan; 1964.
18. Pandey I.M. Financial management. 9th ed; New Delhi: Vikas Publishing House PVT Ltd.; 2009.
19. Abdullahi D. Effect of advertising on the sales revenue and the profitability of selected food and beverages firms in Nigeria. *International Journal of Economics, Business, and Finance.* 2015;3(3):1–16.
20. Al Hayek M A. Relationship between sales revenue and net profit with net cash flows from operating activities in Jordanian Industrial Joint Stock Companies International. *Journal of Academic Research in Accounting, Finance and Management Sciences.* 2018;8(3):149–162.

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Asset Management of Transportation Companies: Analysis and Methods

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ABSTRACT

The article deals with gaining some ideas and skills that an investor might use to choose the best opportunities in the market from among the thousands of options concentrated in the transport industry. The authors are also trying to build up a standard set of tools that make up the core of every stock analyst's tool box. From the practical perspective, the ideas and techniques in the discussion part will be useful for analysing just every possible investment. A special focus in the article has been made on the transportation companies struggling with the consequences of the corona-crisis of 2020.

Keywords: transportation company; financial statements; leverage ratios; current ratios; quick ratios; investment portfolio; free cash flow; standard investment-picking toolkit

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Управление активами транспортных компаний: анализ и методы

Михаил Жариков
Ирина Шатская

АННОТАЦИЯ

Статья посвящена исследованию вопросов, связанных с методологией приобретения некоторых идей и навыков, которые инвестор может использовать для выбора наилучших вариантов, представленных на транспортном рынке. Авторы предложили методику создания стандартного набора приемов и методов, составляющего основу инструментария каждого фондового аналитика. Авторы убеждены, что представленные в дискуссионной части статьи идеи и приемы будут полезны для анализа практически всех возможных инвестиций в транспортные компании, преодолевающие последствия пандемии COVID-19.

Ключевые слова: транспортная компания; финансовая отчетность; коэффициенты левериджа; коэффициенты текущей ликвидности; коэффициенты быстрой ликвидности; инвестиционный портфель; свободный денежный поток; стандартный набор инструментов для выбора инвестиций

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Introduction

Although investors tend to associate financial statement analysis with picking stocks, it is actually just as important for bond investors. It does not really matter who is issuing the securities either. Sovereign debt investors do financial statement analysis on governments, and retail lenders do financial statement analysis on households. However, the major stress here will be made on companies from the transport sector of the economy. Financial statement analysis, among other things, is the practice of forming ratios and other statistics using the numbers presented in a set of financial statements, i.e. the firm's financial accounts. The idea is that although the numbers in a borrower's financial statements already tell us a lot of good information, we can learn even more about a borrower's

financial condition and performance if we combine or compare these numbers in creative ways. This information will hopefully give us a clearer picture of which transportation firms are more attractive investment opportunities [5].

In order to find the best investment opportunities in the transport industry, we will have to first make a little bit of reminder on accounting, at least some introductory definitions that are used all the time in practice. In later parts, we will also need to take a brief look at the overall structure of a particular transportation company's financial statements and learn what information is presented where [3]. Once we have done that, we will construct some of the most important ratios and other statistics, and explain what all these numbers are trying to tell us about the condition or performance of the transport company. As we get into knowing about the ratios themselves, we will also explain how to use these numbers when selecting stocks or bonds of the transportation companies. When selecting investments, however, this information is also useful for gaining a better understanding of a transportation company's financial condition and performance which these days of the corona-crisis is not a bad thing to know. In addition, it is of practical importance to put together a set of financial statements for a transportation or infrastructure venture as well as projected values of certain financial ratios into the future for the time when the world will have passed the days of lockdowns and quarantines [12]. The obvious place to start understanding the workings of financial statement analysis is a transportation company's financial statements.

1. Materials and Methods

The financial statements try to show a concise, sometimes even a complete picture of a transportation company's finances. They consist of four main parts: three different tables that correspond to the main financial activities of the transportation firm plus a set of notes that explains a lot of the details that omit it from the three different tables for the sake of brevity [9]. The three tables or statements are the income statement, the statement of cash flows and the balance sheet. We are now going to go through these tables or statements and discuss what they tell investors [13].

We will start with a financial statement containing the information that stock investors seem to pay the most attention to — the income statement. If you stop and think about what you would most like to know about the financial condition of a transportation company, it is probably whether the company is making any money. The income statement, also called the statement of earnings or the statement of operations, presents a detailed answer to that question. It gives an overview of how much revenue the transportation company brings in, how much it pays out as various expenses and then how much profit is left over if any [1].

Since it is much easier to understand financial statements and financial statement analysis with an example in front of you, we are going to introduce that now. We are going to work with the financial statements of the C.H. Robinson. We pick this transportation company, mainly because we have noticed that they always present a very simple and clean set of financial statements. So, they are great for people trying to understand the workings of the financial statement analysis. Besides, its service is one of the best in the industry.

C.H. Robinson has diversified its line of services well beyond simple delivery. There are plenty of other services and prepared items to think about as well. Suppose the first question is where do we get the statement. Go right to the source — the company website and look for links to company information or investor relations. Eventually, we find our way to the latest annual report. The annual financial statements are always in the annual report. Publically traded companies are required to report their financial results quarterly. We can get more up-to-date information by viewing the quarterly financial statements. Most companies these days do link to these on their websites as well. But the US Securities and Exchange Commission (SEC) also has these data as part of their so called Edgar Database, and many financial websites including free ones also post financial statements from publically traded companies [11]. The only complaint about the financial websites is that they take the company's actual financial statements and then move the information into a one-size-fits-all financial statement template. After you get some experience looking at different companies' statements, you will realise that there is actually a lot of variation in how the information

gets reported. Unfortunately, when these financial websites translate the financial statements into their templates, sometimes good information is lost in translation.

So, let us have a look at C.H. Robinson's income statement which they call a consolidated statement of earnings. Earnings is the finance word for profit, and as we will see the income statement shows fairly clearly how C.H. Robinson calculate their profits. The top of the income statement is net sales which is sales minus returns. Other companies will just have a number for sales or even revenues. C.H. Robinson sold nearly 16.2 billion dollars' worth of services in the pandemic year of 2020.

Then below the sales come all the expenses of running the company including production costs, marketing costs, R&D and administrative expenses [10]. After we subtract those expenses, we have a rough statement of earnings which goes by two names. One name is operating income and the other is EBIT, which is an acronym that stands for earnings before interest and taxes. For C.H. Robinson this turned out to be about 628.3 million dollars. You may have also heard the EBIT's cousin — EBITDA which stands for earnings before interest, taxes, depreciation and amortisation. You will notice that you do not see depreciation and amortisation listed on the income statement, and you will have to find it somewhere else. If we take EBIT and subtract off interest, and then income taxes what we call them corporate income taxes but they are actually taxes on corporate profits, then we get to net income or net earnings. This is so called the bottom line on the income statement. For C.H. Robinson this number was 506.4 million dollars in 2020. Net income tells the stock investor all the profits that could be paid out to the shareholders. You may recall, though, that most firms do not pay out all these earnings as dividends, especially in the pandemics year of 2020.

The last thing that an income statement typically does is that it calculates the earnings per share or EPS of the firm. This is done as a convenience, since so many investors want to see the profits on a per share basis. Otherwise investors would have to dig up the information on a number of shares that the firm has outstanding. C.H. Robinson earned 3 dollars 74 cents per share in 2020.

It is tempting to think that as a C.H. Robinson's shareholder you have acclaimed 3 dollars and 74 cents in cash for each share you hold. But you actually do not. The income statement tells you what the accounting measures of profit are, but the truth is that accounting measures of profit are not equal to cash. This is because most accounting is done under the principle of accrual.

Accrual refers to one particular set of procedures for recognising revenue and expenses. Business transactions get pretty complicated, and we need a set of simple rules for making sense of these transactions. Accrual is the most popular way to do this [2]. But one of the costs of its flexibility and simplicity is that accrual-based measures of income and expenses are not equal to the actual cash payments going into and coming out of the transportation firm. For example, suppose C.H. Robinson makes a deal to sell a million dollars of transportation services over the next three years to a company that operates a home office on its outlets. Talk about a seller business. Under the principle of accrual C.H. Robinson can record the entire one million dollars in sales now as soon as it has the signed sales agreement. The accounts at C.H. Robinson do not have to recognise the revenues immediately, but they can if they want to. The sales numbers do not necessarily tell you about the money flowing into and out of the transportation company. Needless to say, investors are really interested in knowing how much cash is being generated by the transportation company. Veteran business owners and anyone who has ever started the transportation business know that companies generally go out of business because they run out of cash, not because they do not necessarily make accounting profits. Fortunately, there is another financial statement that addresses the need to know about cash. It is called the statement of cash flows [6].

2. Results and Discussion

The purpose of this section is to simply give investors a clearer picture of how much cash the transportation company is taking in, and how it is using cash. Investors use the statement of cash flows primarily to see whether the transportation company is bringing in more cash than it is spending. Happiness is positive cash flow. First, note that on the statement of cash flows the transportation company's use of cash

is broken down among operations, investing and financing. One thing that is always worth checking is to see whether the transportation company's operations, the things that it is actually in business to do, are bringing in more cash than they use. For C.H. Robinson this cash flow from operations were net cash provided by operating activities of just over a billion dollars. Also, at the bottom of the statement we can see whether the company as a whole increased or decreased its holdings of cash. Some investors use the statement of cash flows quite intensively, but nearly all investors find two pieces of financial information particularly useful.

The first piece of information is the depreciation and amortisation expense which is counted as a production expense on the income statement. Depreciation and amortisation attempt to keep every company honest about the fact that its factories and equipment are wearing out and will have to be replaced some time. Using up these real assets is a real economic cost but not one it causes any money to change hands. If a transportation company reports a depreciation expense, its earnings fall but its cash is not actually affected [8].

The second item on the statement of cash flows that most investors like to know is called free cash flow. This does not directly appear on the statement of cash flows but it can be calculated directly and easily from it. Free cash flow measures how much cash the firm could be returning to shareholders. It is the cash flow analogue to net earnings on the income statement. Analysts like to calculate free cash flow in different ways but nearly everyone starts with cash flow from operations and then subtracts off capital expenditures, which is usually the first item in the section on cash flows from investing activities. Capital expenditures are purchases of real assets like equipment and factories. Given how most financial statements are laid out, cash flow from operations and capital expenditures are almost always next to or at least close to each other. For C.H. Robinson we know that cash flow from operations is 1.057 billion. And just below it is an item for purchases of plant assets, which is 315 million dollars. The numbers in parenthesis do indicate that it is an expense. So, our basic measure of free cash flow for C.H. Robinson is 1.057 minus 315 or 742 million dollars.

Notice that for C.H. Robinson there is a fairly close correspondence between the accounting measure of profit — net earnings — and the cash measure of profit — free cash flow. But again, given the differences between accounting principles in cash flow, this is not necessarily the case for any given company. Many investors will do all the same things to free cash flow that they do with earnings. Especially, though they are divided up by the number of the shares in the firm to get the free cash flow per share. The income and cash flows of the firm are important, but if we stop there, we leave out an essential part of the firm's financial story [4].

Transportation firms issue financial assets in order to borrow money from investors, so they can buy real assets — rail roads, trucks, ships, etc. The financial statement that lasts — the balance sheet — tells part of the story. A balance sheet is a snap shot of the transportation company's assets, liabilities and equity at a point in time. We use the term assets for anything the firm owns and liabilities for what the firm owes to other parties. Equity or net worth is the difference between assets and liabilities. It tells you in accounting terms what the entire company is worth. On C.H. Robinson's balance sheet it had about 3.3 billion dollars in assets and just over 1.8 billion dollars in liabilities as of March 2020. That implies that C.H. Robinson's equity was 2.2 billion dollars.

Many investors also refer to balance sheet equity as book equity where the book in question is the company's accounting books. The term book value of the company makes clear that we are talking about the accounting value of the firm's equity from the balance sheet rather than the market value of the company [7].

We have seen the financial statements and learned about the basic information they contain. The financial statements already contain a lot of information about a firm's performance, numbers such as EBIT, free cash flow, net earnings and net worth, all tell essential information that helps us understand the company. But there is a lot more we can do with these numbers. In fact, there are entire university courses and entire books on financial statement analysis. Our goal is to give what is considered to be the most important financial ratios that nearly all investors know and use to help them pick stocks. Each ratio represents an entire category of ratios that are designed to measure some crucial aspect of a company's financial performance.

The first category of financial ratios are called liquidity ratios. Liquidity ratios measure whether a company has enough money to pay all the bills coming due. A standard liquidity ratio is the current ratio which is defined as current assets over current liabilities (Formula 1).

$$C_{ratio} = \frac{C_{assets}}{C_{liabilities}} \quad (1)$$

The word current here is an accounting term that means that it comes due within the next twelve months. The current ratio says how many dollars of current assets the transportation company has for each dollar of current liabilities, or in other words, how many dollars the company thinks it will receive in payments over the next year divided up by the number of dollars of bills it thinks it will have to pay during the next year. C.H. Robinson has current assets of 1,687 million and current liabilities of 2,065 million. These numbers give a current ratio of about 81.07. This means that C.H. Robinson currently has about 87 cents in short-term assets for each dollar of liabilities that it expects to have to pay during the current year. These short-term assets should be converted to cash within the next twelve months. For transportation firms like C.H. Robinson the current ratio can be a bit misleading because inventories make up a lot of the firm's current assets. For example, C.H. Robinson has 724 million dollars in inventories which is almost half of its current assets. But it may be hard to liquidate inventories in a hurry, and if the company is forced to do that, it may have to sell the inventories of trucks and ships at very low prices.

For many transportation companies analysts also calculate a related liquidity ratio called the quick ratio. *The quick ratio* still puts current liabilities in the denominator, but the numerator only contains cash, securities and accounts receivable (Formula 2).

$$Q_{ratio} = \frac{(cash,\ securities, accts\ receivable)}{C_{liabilities}} \quad (2)$$

Accounts receivable, by the way, is the amount of money that C.H. Robinson's customers owe it for the services that they have purchased. For C.H. Robinson we calculate the quick ratio this way: cash and investments are 254 million dollars and accounts receivable are 512 million for total of 766 million dollars. Then we divide 766 million by the total current liabilities of 2,065 million. And this gives us a quick ratio of 0.371 or 37.1 cents in cash, securities and accounts receivable for every dollar in current liabilities. What do these financial ratios mean? Taken by themselves, we do not really know whether these ratios are good, bad or indifferent. That is because these ratios have very little meaning by themselves. They are really to be used by comparison with other firms' ratios.

The next set of ratios are leverage ratios. Leverage measures how much the firm is borrowing. Leverage is a two-edge sword. A bit leverage can do you good, but too much leverage is just plain dangerous. That goes for companies as well as individual investors. There are lots of ways to measure leverage. Although some investors like to use debt-to-equity ratios, we tend to prefer leverage ratios expressed as total assets over total equity (Formula 3).

$$L_{ratio} = \frac{T_{assets}}{T_{equity}} \quad (3)$$

C.H. Robinson's total assets are 6,276 million, and their equity is 929 million. That means that total assets over total equity is equal to 6,276 divided by 929 or 6.76. This means that every dollar of equity supports 6 dollars and 76 cents of assets. This view gives you a very clear idea of the extent of the leverage and what it is being used for. You can still take this number and deduce that for every dollar of equity that the shareholders have contributed along the lines, the managers have borrowed another 5 dollars and 76 cents. The next category of ratios is the profitability ratios. One of the profitability ratios that most investors look at is the operating margin which is defined as EBIT divided by sales (Formula 4).

$$O_{margin} = \frac{EBIT}{sales} \quad (4)$$

EBIT is also called operating income which is the connection to operating margin. This ratio simply tells us what fraction of each dollar of sales goes to operating income. It is clear that this is the profit margin. C.H. Robinson's EBIT is 673.3 million. Its sales are 16,207.1 million. So, the operating margin is 673.3 divided by 16,207.1

gives 0.041. That means that 4.1 cents of every dollar of sales is operating profit.

Now we will move on to efficiency ratios. Efficiency describes how well a company utilizes its assets. One of the main efficiency ratios is called the asset turnover ratio, which is defined as sales divided by total assets. Note that many financial analysts use average total assets and the denominator of that ratio (Formula 5).

$$AT_{ratio} = \frac{Sales}{T_{assets}} \quad (5)$$

C.H. Robinson's sales were 16,207.1 million, and the total assets which we saw in the leverage calculation were 5,144.3 million. This makes the asset turnover ratio equal to 16,207.1 divided by 5,144.3 or 3.15. This is literary saying that every dollar of C.H. Robinson's assets produces 3 dollars 15 cents of sales per year.

Finally, the best financial ratios that every investor wants to know right after bet are ROA and ROE which are return on assets and return on equity. These are so called performance ratios. They try to measure in an accounting sense the return that different investors would get by lending a dollar to the company. First, let us start with ROA. This is defined as EBIT minus taxes, their quantity divided by total assets. The numerator measures the profits that are available to be distributed to both the bond holders and to the stock holders of the company (Formula 6).

$$ROA = \frac{EBIT - taxes}{T_{assets}} \quad (6)$$

In fact, ROA calculates the return you would earn again measured in accounting terms and not market terms if you finance a dollar's worth of the company's assets by buying both the company's corporate bonds and its stock. ROA assumes, moreover, that you finance the company by buying its stock and bond in the same proportions as the company has listed on its balance sheet. So, for C.H. Robinson you are buying about five dollars and 76 cents worth of bonds for every dollar you buy of stock. EBIT once again was 628.3 million. Taxes paid were 398 million. This makes the numerator equal to 230 million. Then total assets once again 5,144.3 million. So, the ROA ratio is 230 divided by 5,144.3, which gives 0.045 or 4.5%. Finally, let us do ROE. ROE is defined as net income over equity (Formula 7).

$$ROE = \frac{N_{income}}{equity} \quad (7)$$

C.H. Robinson's net income was 844 million. And its equity was 929 million. This makes the ROE ratio 844 divided by 929, which gives 0.909 or 90.9%. That seems really high. Is it realistic? To answer that, we really need to compare C.H. Robinson's ROE to the ROEs from a similar set of companies such as Brambles or Orient Overseas. C.H. Robinson's financial ratios have very little meaning by themselves. They are really meant to be compared with other firms' ratios. In order to use financial statement analysis to help you pick stocks, you will have to select a set of similar firms and then compare ratios. If one firm's ratios are impressive relative to its peers, then it is probably worth doing further analysis on it to see whether it is worth adding to your portfolio. Let us do this comparison on ROE for C.H. Robinson. If you go to about any financial website and look up C.H. Robinson, the site will probably list that C.H. Robinson is in a transportation sector. What we can do is look up several firms from this industry that seem likely they would be similar to C.H. Robinson and compare their ratios to C.H. Robinson's. One way to choose similar firms is to find a list of companies in the industry sorted by market capitalisation. According to companiesmarketcap.com, the top performing transportation companies globally by market capitalization are shown in Table 1.

Market capitalisation is a measure of market value equal to the current stock price times the number of shares outstanding. Most financial websites will list companies in order of market capitalisation which will also help you choose firms that are similar in size. This is useful, because none wants to compare C.H. Robinson either with a company that is many times larger or smaller.

3. Conclusion

It does not seem likely the transportation firms would have that much in common. Note that C.H. Robinson is a pretty big firm but by no means the biggest. There are several firms on the list that are about the same size as C.H. Robinson and also seem to be in about the same line of business. For example, Old Dominion

Table 1
World's top 10 transportation companies by market capitalization, 2021

Rank	Company Name	Market cap, bln $US	Share price, $US	Average daily change,%	Country of origin
1	United Parcel Service	150.42	173.02	0.62	USA
2	FedEx	75.47	284.44	1.91	USA
3	Maersk	57.65	2,254.00	–0.89	Denmark
4	Hapag-Lloyd	29.36	167.06	0.72	Germany
5	Old Dominion Fright	28.64	244.98	0.65	USA
6	Expeditors	18.30	108.49	0.82	USA
7	C.H. Robinson	12.62	96.51	0.25	USA
8	Brambles	11.99	8.22	0.95	Australia
9	Orient Overseas Line	11.18	17.56	–2.98	Hong Kong
10	Knight-Swift	8.19	49.47	–0.44	USA

Source: https://companiesmarketcap.com/transportation/largest-transportation-companies-by-market-cap/ (date of access: 10.04.2021).

Fright, Expeditors, and Knight-Swift — all deliver transportation services like C.H. Robinson does. We will compare C.H. Robinson to these companies. For ROE, we see that among the firms that are C.H. Robinson's peers there is certainly some healthy ROEs. But C.H. Robinson by far has a much higher ROE than these firms. Based on some experience looking at companies, C.H. Robinson's leverage ratio seems pretty high. It means C.H. Robinson uses so much debt. It is explained by the fact that the firm has been able to support that debt so far due to fiscal stimulus during the corona-crisis. The next step would be going on to doing more research to measure how C.H. Robinson is actually currently valued in the market. It could be that C.H. Robinson already has a price that reflects its relatively high ROE. It is worth to learn a lot more about the products that C.H. Robinson and the subsidiaries intend to roll out in the coming months and years. In other words, it is a good start on finding an interesting company, but nowhere near the point where everyone is confident enough in its future success to put money on the line.

Hopefully, this article helps investors feel more comfortable around the company's financial statements. We have learned the basic financial ratios that help us judge the performance of different companies and seen that the way to use ratios is to compare one firm to a group of its peers. Though there is no one single ratio that identifies good companies, ROE is a good starting point for noticing strong performers. Once you find the company that interests you, look over major ratios to really get a feel for its financial performance, and do not forget to look into the stories behind the numbers like why C.H. Robinson uses so much leverage, and what kinds of new products it will bring to market in the coming years. These stories are really where you will discover the information that will convince you to invest or not to invest.

REFERENCES

1. Alemany N., Arago V., Salvador E. Lead-lag relationship between spot and futures stock indexes: Intraday data and regime-switching models. *International Review of Economics & Finance*. 2020;68(7):269–280. DOI: 10.1016/j.iref.2020.03.009.
2. Cao J.S., Wang J.H. Exploration of stock index change prediction model based on the combination of principal component analysis and artificial neural network. *Soft Computing*. 2020;24(11):7851–7860. DOI: 10.1007/s00500–019–03918–3.

3. Cheng T. J. A Multifactor Fuzzy Time-Series Fitting Model for Forecasting the Stock Index. *Symmetry*. 2019;11(12):1474. DOI: 10.3390/sym11121474.
4. Dong X., Ma R., Li H. Stock index pegging and extreme markets. *International Review of Financial Analysis*. 2019;64(7):13–21. DOI: 10.1016/j.irfa.2019.04.012.
5. Fu Y., Su Z., Xu B., Zhou Y. Forecasting Stock Index Futures Intraday Returns: Functional Time Series Model. *Journal of Advances in Computer Intelligent Information*. 2020;24(3):265–271. DOI: 10.20965/jaciii.2020.p0265.
6. Gao P., Zhang R., Yang X. The Application of Stock Index Price Prediction with Neural Network. *Mathematical Computer Applications*. 2020;25:53. DOI: 10.3390/mca25030053.
7. Hou Y. (G.), Li S. Volatility and skewness spillover between stock index and stock index futures markets during a crash period: New evidence from China. *International Review of Economics & Finance*. 2020:66(3):166–188. DOI: 10.1016/j.iref.2019.11.003.
8. Hu J. Q., Wang T. X., Hu W. W., Tong J. The impact of trading restrictions and margin requirements on stock index futures. *Journal of Futures Markets*. 2020;40(7):1176–1191. DOI: 10.1002/fut.22111.
9. Jain T., Sehgal S., Agrawal R. Disruptive Innovations, Fundamental Strength and Stock Winners: Implications for Stock Index Revisions. *Vision — The Journal of Business Perspective*. 2020;24(3):356–370. DOI: 10.1177/0972262920928890.
10. Janková Z., Dostal P. Prediction of European Stock Indexes Using Neuro-Fuzzy Technique. *Trends Economics and Management*. 2020;35(1):45–57. DOI: 10.13164/trends.2020.35.45.
11. Khan K., Zhao H. W., Zhang H., Yang H. L., Haroon M., Jahanger A. The Impact of COVID-19 Pandemic on Stock Markets: An Empirical Analysis of World Major Stock Indices. *Journal of Asian Finance Economics and Business*. 2020;7(7):463–474. DOI: 10.13106/jafeb.2020.vol7.no7.463.
12. Salisu A. A., Akanni L. O. Constructing a Global Fear Index for the COVID-19 Pandemic. *Emerging Markets Finance and Trade*. 2020;56(10):2310–2331. DOI: 10.1080/1540496X.2020.1785424.
13. Sun P., Weng T., Yang H. (2019). Evolution of Scaling Behavior of Stock Index Volatility. *Journal of University of Shanghai for Science and Technology*. 2019;41(1):71–76. DOI: 10.13255/j.cnki.jusst.2019.01.011.

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Potential Effects of ESG (Environmental, Social, and Governance) Policies on the Returns of an Investment Portfolio

Galina Klimova

ABSTRACT

The objective of this work is the corporate ESG policies as they relate to the company's financial and the consequent stock performance. The subject of the work is the effects of such policies on stock returns and stock portfolio performance. In order, to tackle the problem, the author taken several steps, namely:
Study of history and underlying principles of the ESG policies
Gathered information concerning common investor approaches to the adoption of the ESG mandates to their investment strategies
Tracked the performance of the broader market indices that follow ESG mandates
Considered particular example of the financial performance of an ESG adhering company
Developed recommendations relating to the appropriate selection of positions to the portfolio with ESG mandate
Overview of the findings and the recommendations for portfolio construction using the ESG principals as a selection criteria are presented in conclusion.
Keywords: ESG policies; stock portfolio; market indices; financial performance; Global Financial Crisis

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Потенциальные эффекты политики ЭСУ (экология, социальная сфера, управление) на доходность инвестиционного портфеля

Галина Климова

АННОТАЦИЯ

Цель исследования — попытка определить влияние корпоративной политики ESG (ЭСУ — Экология, Социальная сфера, Управление) на доходность портфельных акций. Для решения поставленной проблемы автор применил несколько общенаучных методов: анализ истории и основополагающих принципов политики ESG; сбор и анализ информации об общих подходах инвесторов к внедрению требований ESG в их инвестиционные стратегии; анализ показателей более широких рыночных индексов, соответствующих требованиям ESG; анализ финансовых показателей компании, придерживающихся ESG. По **результатам** исследования автором разработаны рекомендации по правильному подбору позиций в портфеле с мандатом ESG и построению портфеля с использованием принципов ESG в качестве критериев отбора.
Ключевые слова: политика ESG; портфель акций; рыночные индексы; финансовые показатели; Глобальный финансовый кризис

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Introduction

Over the last several decades political and economic discourse has been dominated by the debates surrounding the question of which direction the global development should take next after the unprecedented scientific and industrial advances made over the 20th century. While many advocated for the prospects of continued fast paced progress fueled by the ever surging scientific discoveries and accelerate rates of information processing, there were those who warned against the untampered economic growth. The latter argued that natural resources required to support such rates of expansion were simply lacking and that their consumption was unsustainable in the long run.

Then came the seeming evidence of what first appeared to be the Global Cooling, then was reclassified as Global Warming, and eventually stapled as the Global Climate Change. As troubling as this may sound, the greater challenge for the humanity was the purported anthropogenic nature of the Earth temperature changes. Thus, argued the supporters of limited economic growth, instead of advancement, the humankind had to refocus its efforts on curbing and restoring the damage it has already caused the environment. By artificially hampering the industrial growth, the problem of limited natural resources would also automatically be addressed, as fewer would be consumed over an extended period of time. Having received the boost from scientific publications and considerable government support and armed with essentially Malthusian–based theories, groups of politicians, scientists, and social advocates began to form and promote ideas of the environmental agenda and sustainable development.

For businesses, those ideas became succinctly encapsulated into the abbreviation of ESG principles, where E stands for environmental, S for social, and G for governance. Following the ESG principals implies expanding the company's usual scope of business to incorporate the social and environmental outreach into its practices. In addition to following the governmental regulations that often fail to encompass the entirety of the corporate activity that may be connected to the use of natural resources or pollution, ESG acts as a somewhat formalized moral obligation of businesses to adopt the best possible practices in order to reduce the footprint of humanity on the environment and provide support for the broader society. That is at least the idea of it.

Out of the trio, the governance principal, perhaps deservers a separate discussion. While the set of criteria applied to governance is in flux the same way it is for the other two principals, at its core it is aimed at improving the compliance and transparency of the business practices. Indeed, fair and transparent conduct benefits the company and its stakeholders in the long run. To illustrate, one could recall the infamous case of Enron and Arthur Anderson. After finding itself in a difficult financial position, Enron elected not to address its problem head on, but instead pretend as though nothing ever happened, forge its operating results, and find an accomplice willing to cover up its misdeeds long enough for the company to find a way out of trouble. Arthur Anderson filled the place of such a willing accomplice all too easily, knowingly signing off on the forged reports and perpetuating the deceit to the investment communities and the government agencies. Going as far as fake furbishing a new office space and sitting actors as employees, for when an outsider would show up for a sight visit, the top management of Enron clearly disregarded any pretense at responsible business practices and drew righteous ire from all over the country after the scheme finally came undone. Both Enron and Arthur Anderson shut down and many of their executives were given prison time.

It would seem that a scandalous case as that of Enron and Arthur Anderson would deter anyone else from following in their footsteps. However, in the years leading up to the Global Financial Crisis, practically entire industries got entangled in pyramid like schemes involving subprime mortgages and their derivative products led by non–other than the pinnacles of the US and world financial system — the bulge bracket investment banks. More than ever before the unraveling of the Great Financial Crisis spurred legislative action to force increased transparency on the banks and the corporate sector in general. Independent industry associations strengthened their governance policy guidelines in the efforts to try and prevent such system distress from happening again. Given the collapse of the financial system during the 2008 crisis, it comes as no surprise that the investment community has become overly sensitive to policies of transparency, proper busi-

ness practices, and compliance in the years that followed. Collectively known under the umbrella term, Governance, those policies continue to be on the forefront of the investment decision making by any experienced professional irrespective of their view on the environmental and social principals.

1. ESG Definition and Background

In the past decade, social responsibility concerns have moved to the forefront of the investment decision making considerations in most developed economies and forced the developing world to adapt to the demands of the staunch supporters of the ESG (Environmental, Social and Governance) policies. Due to the widespread support for corporate social responsibility and the fight against anthropogenic climate change, ESG investment products continue enjoying increased popularity. In its latest report, The European Fund and Asset Management Association estimates that the net sales of ESG related UCITS funds grew from 19.5 billion euros to 235 billion euros in 2020 with the grand total Assets Under Management (AUM) reaching 1.2 trillion euros.

1.1. History

As recent as in 2019, investments into the sustainability related financial instruments amounted to 10.7 trillion euros, which represented nearly 43% of the total fund AUM in the European Union. Despite the strong trend and a large share of capital already invested in the ESG invested products, the untapped opportunities for the broader sustainable development related market indicate that the era of ESG investments is just beginning.

More and more investors seek to incorporate the ESG mandate into their portfolio strategy. By doing so they hope to strongarm businesses into adopting environmentally friendly practices and following the principles of corporate social responsibility. Ambitious as it is, the true challenge lies with the fact that there is not neither has there ever been a universal set of consistent and concrete rules or even guidelines with respect to the principles of ESG.

Depending on the provider the definitions and demands will differ. To demonstrate the problem using the simplest example, clean energy is at the top of the list when it comes to environmental considerations. Nuclear power is one of the cleanest ways to produce electricity. Yet the treatment of the nuclear power stations varies drastically with many denouncing them for their potential to harm millions.

Another example is electric vehicles. While it is evident that electric cars do not themselves emit carbon dioxide, mining and processing the nickel ore required to produce the electric car batteries can be quite a polluting endeavor. As a result, evaluating the full scope of potential impact on the ESG principals proves to be an arduous and ambiguous task even when considering a single company. That is why the investment community experiences a great urge for a unified, clear, and transparent set of ESG norms that could be readily applied by the portfolio managers.

Most reputable investment funds that purport to follow the ESG mandate, typically provide a somewhat comprehensive list of requirements that a company needs to pass in order to be included in the portfolio. While investment mandates themselves are generally written to allow the greatest flexibility to the investor, additional requirements and specifications can be adopted by individual portfolio managers with the consent from the Board of Directors to better suit the market demands. Since the variability between the standards and perceptions with respect to the ESG standards are so great, portfolio managers try to adopt the one size fits all model as much as possible. The requirements they release to their clients are more or less akin to a litmus test designed to determine if a company upholds any legitimate ESG standard.

Generally lacking a science background, clients in turn have a very vague understanding of what should be a part of the ESG criteria beyond the general words often repeated on the media. Having heard of the idea and being sold on the premise they rush to incorporate ESG principals into their investment practices. That, however, soon proves to be overly optimistic and ambivalent a task. Immediate questions arise in relation to how far and wide do investors and clients want to do due diligence in order to trace the full scale of the carbon footprint or other forms of pollution in order to assess the environmental friendliness of a company.

How much of that data is publicly available is a completely different matter. Far from every even public company chooses to publish open–

access environmental reports. Vendors of larger firms are frequently too small to even care about such reports. Thus, while larger corporations have started requiring their downstream suppliers to provide some forms of verification that the output they produce and sell to the company in question is "clean", it is often too expensive and resource intensive a task for the smaller market participant. Extensive requirements may go as far as suffocating the smaller businesses due to the sheer lack of resources on their end to ensure all standards are met and all the reporting is complete in line with the clients' expectations.

So why do investors and their clients concern themselves with ESG practices so extensively? For a long time, with the media being dominated by discussions of climate change, environment has been the central theme used to justify the move to sustainable practices. However, lately, the social responsibility side of the issue has also come under increased scrutiny. Here, not only sustainability business practices and supply chains are analyzed from a fair trade perspective, but also the rights of employees, anti–discrimination and inclusion policies, as well as community outreach programs are given considerable weight.

In the age of economic strain that the corona–virus engendered restrictions have put on the global markets, corporate social responsibility arguably gains greater significance, with emphasis on the word corporate. As the first wave of quarantine rampaged through the world, small and mid–sized businesses suffered the shock, from which many never recovered sending myriads of entrepreneurs into bankruptcy with the situation only intensifying as the lockdowns persisted. With business owners in arrears and fighting for survival, smaller businesses could do little to ease the pains of their employees, who were being laid off, furloughed, or deprived of the main source of income such as tips for restaurant workers. Not in a completely dissimilar way, larger corporations faced also challenges from the economic downturn and the consumer spending slump. They, however, generally had better footing to weather the economic crisis be it due to heftier safety cushions or stronger negotiating positions with banks and vendors. With that and even as the relief checks arrived from the government, a significant portion of the workforce simply became redundant during the times of the pandemic. With no operating cash inflows to fund the employee wages and benefits, multiple corporations were forced to also lay off or furlough many of their employees, airline, cruise, and hospitality industries being the primary examples.

Yet, unlike the smaller mom and pop shops, corporations on average possess higher liquidity and are better positioned to extend benefits and support to their employees in the times of dire need. And what a need did the pandemic present. As the private sector, and at this point most of the public sector as well even in the developed world, faced plunging demand, supply chain interruptions, and threats of surging inflation, the world population experienced a noticeable loss of income. Furthermore, overextended resources of the healthcare sector meant that those in need of medical attention were unlikely to receive adequate care and that more resources would be necessary to resolve medical problems. Therefore, many companies responded to the situation by reinforcing their social obligations and also implementing higher social standards within the company as well as with suppliers.

ESG investors often invest many clients' money in stable stocks and bonds. These often considerable sums, of course, provide some bargaining power and therefore influence. In addition, many asset managers and fund managers are now actively involved in the activities of companies with a view to sustainable transformation. For example, discussions with management that require stricter environmental protection, fair wages, or certain employee rights take place. If the company is not ready for negotiations and is not constructive, the investor as a shareholder can certainly bring it up at the general meeting. Or demand a change in investor voting behavior ("impact investing") there — these direct tools of influence have been used more and more often lately.

From an economic point of view, there are several reasons for investing in ESG stocks: Resilient companies often operate in dynamic emerging markets with good prospects. And sometimes they can have lower risks, for example in terms of reputation or future viability. This good risk and reward profile also appears to have a positive effect on returns: many studies now show that sustainable investments in the past did not lead to worse investment results than their classic counterparts — often even slightly better.

It is worth a note that past performance is not a reliable indicator of future result. Broad diversification across asset classes, regions, themes and industries is now possible thanks to strong growth in the market for "resilient" stocks or corporate bonds, green or social bonds. In addition, ESG investors are effectively promoting sustainable development that can protect our future and the world of our children.

The vast majority of 2,000 ESG ROI studies and analyzes paint a clear picture: On average, ESG portfolios are no worse than conventional products — often even better. The reasons for this are clear: sustainable investment is a shift from social awareness to more global responsibility and climate protection. In addition, due to its orientation, sustainable investments have fewer systemic or reputational risks in their business model. A prerequisite for this is proper risk management and careful selection of systems.

The growing popularity of ESG investments has contributed to the fact that, in the medium to long term, they can definitely improve the portfolio's risk and return profile. For example, a performance analysis commissioned by the Bundesverband Alternative Investments eV (BAI) shows that in the past, sustainable development funds have fluctuated less dramatically in value, that is, they posed less risk than conventional funds. One reason for this is that companies that are proactive and fair, practice responsible leadership and are not focused on short–term profit maximization are often in a stronger position.

Analyzing the multiple criteria that play a role in assessing sustainability, as well as continuously monitoring them, is complex, time consuming and costly. It is mainly undertaken by rating agencies that specialize in ESG or certain sub–regions of the ESG universe. For example, they assess the CO_2 emissions of countries or companies, check supply chains, or analyze whether a company is following good corporate governance rules.

Financial companies that create dedicated resilience funds or ESG funds often use multiple ratings at the same time to get as complete a picture as possible of the resilience of the security or the respective issuer.

In practice, three approaches have proven effective in recognizing the sustainability of companies:

Best-in-class approach. The best–in–class approach focuses on investing in those companies in the industry that are particularly resilient, that is, leaders in the implementation of ESG criteria. For this, issuers are evaluated by rating agencies based on specific ESG criteria and a rating is created. Investments are made only in securities whose issuers are doing well.

Exclusion criterion. The main criticism of the "best-in-class" approach is that, in principle, all industries can be considered, including arms, oil, tobacco and gambling. The extended approach filters out disputed companies or industries through an exclusion process. A more rigorous version of this approach allows you to invest only in companies that clearly meet certain ethical requirements. This could include, for example, adhering to the UN Global Compact, avoiding animal testing, or excluding relationships with countries that violate human rights.

ESG integration. Finally, the ESG integration approach intentionally incorporates non–financial information into financial analysis for investment decisions. This is based on the knowledge that aspects of sustainable development that are not reflected in the balance sheet, however, can have a large impact on the long–term development of the company.

1.2. The impact of ESG factors on corporate governance

As sustainable investing become more and more important, so do the demands of investors and their perspective. There is more and more talk about ESG, which stands for environmental, social, and governance, and makes it clear that social aspects of business and corporate governance are increasingly being considered in addition to the environment [1]. There is still a lot of talk about the environmental footprint, but increasingly there is a demand for fair terms for employees and suppliers or corporate governance issues.

In general, it can be said that investors now want more control over what happens to their money. However, there is still no single definition of what sustainable investing is. According to the fund company Invesco, five ESG strategies have now emerged and been implemented:

- Negative screening: Here certain industries or topics are excluded from the outset, such as arms or gambling

• Integration: in this paragraph, ESG factors such as the environment, human rights or corruption are consistently taken into account throughout the investment process — from financial analysis to implementation — and the quality of the company is assessed against them

• Active shareholder status: Investors attempt to influence companies through direct dialogue with company management and the purposeful use of their voting rights

• Norms-based screening uses criteria based on international standards and recommendations.

In essence, investors have to choose between two approaches: either using positive criteria, or identifying companies that specifically meet environmental and social requirements — be it climate efficiency, low water consumption or labor safety. Or, with negative criteria, they exclude from the outset companies, industries or countries that do not meet certain ESG requirements or violate international norms and standards. Such negative screening is one of the most common approaches.

In the next step, investors can use either an absolute or a relative approach. With positive screening, the absolute approach means that it is all about how well the company meets the ESG requirements, regardless of how it compares to other companies [2]. Similarly, companies that perform activities that do not qualify for ESG avoid negative screening. As a result, a very small number of stocks are excluded from one sector and a large number of stocks from another and individual sectors may even be excluded entirely. Thus, the absolute approach offers the advantage of setting certain minimum standards for different sectors, but because of the exclusion of certain stocks or sectors, it can lead to portfolio diversification.

With the relative approach, you first sort companies into groups, such as sectors or industries, and then filter out the best stocks from each individual group. In this way, the best–in–class principle applies. Here you select companies that are leaders in their industries in terms of environmental, social and corporate governance [3]. It is not limited to the classic sectors of sustainable development, such as renewable energy and environmental technology. Automobile manufacturers, oil companies, and chemical companies can also be considered if they do particularly well on ESG ratings and are best at implementing environmental and social standards in their industry.

One of the biggest criticisms of this approach is that companies do not have to be particularly sustainable; they only need to be among the best in their sector. On the other hand, it may exclude stocks that, while not the best in their peer group, are still better than most companies in another industry. Because many best–in–class indexes are weighted according to market capitalization, relatively small companies often have no chance of achieving significant weighting in the index.

More and more investors are beginning to use their voting power to influence companies. Rather than focusing solely on individual criteria, institutional investors and investment funds in particular are relying on direct dialogue with management to point out things that are important to them in terms of sustainability and to draw attention to complaints [4]. The confluence of several investors' interests, which is typical of active shareholders, often has a great impact on companies: after all, rejecting or ignoring proposed improvements can lead to disinvestment to the company's detriment.

Against this background, it is likely that sustainable investing and consideration of ESG factors should not necessarily result in lost profits. If investors prefer sustainable companies, it supports their stock price — and the link between sustainability and performance is automatically established, as many scientific studies have now proven.

On the other hand, the investment environment should not be so constrained by overly strict sustainability criteria that the portfolio can no longer be effectively diversified. Excluding entire industries can make it difficult to achieve an appropriate risk–return profile. Investors need to weigh carefully [5].

One of the biggest criticisms of best–in–class concepts is that companies do not have to be particularly resilient to be included in an investment fund. Rather, they are likely to be among the best in their sector. It can also mean excluding stocks that, while not among the best in their peer group, are still better than most companies in another industry.

Another weakness of this approach is that many best–in–class indexes are weighted according to market capitalization, and relatively small companies often have no chance of achieving significant

weight in the index. Accordingly, many best–in–class products select the best among large corporations, while the sustainability performance of medium or small companies is hardly considered, although interesting investment targets can be found here.

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On the other hand, large corporations usually have multiple lines of business, and so the problem is that they offer both ESG-compatible and ESG–incompatible products and services. In addition, their long supply chains also include countries where working conditions are unacceptable and the environment is damaged [6]. Even if the best-in-class concept results in a sustainable fund considering only those companies that do the least, they are nevertheless involved in the exploitation and destruction of the environment.

So-called "active shareholder status" is not about choosing or excluding companies to invest using criteria. Rather, more and more institutional investors, and investment funds are using their voting rights to directly influence companies in terms of sustainable investment.

In addition, in addition to the annual general meeting, they also engage in regular dialogue with management to point out things that are important to them in terms of sustainability and to call attention to shortcomings. The pooling of the interests of several investors, which is typical of active shareholders, often has a big impact on companies: after all, rejecting or ignoring proposed improvements can lead to disinvestment to the detriment of the company. [7]

Active ownership or participation, as this approach is also called, is particularly well developed in the Anglo-Saxon countries, Scandinavia, the Netherlands, Belgium, and France. In the U.S., the focus is on improving corporate governance as well as social issues — perhaps because, unlike in Europe, social systems are not very well developed. The Calpers pension fund, along with other big investors, has warned automakers General Motors and Ford to sell equity stakes if they do not disclose their greenhouse gas and climate strategies.

A pioneer among active shareholders is the Norwegian state pension fund. Not only was it one of the first investors to try to encourage companies to do business more sustainably, in direct dialogue, but with assets under management now exceeding $ 1 trillion, it is a real heavyweight. He is a real heavyweight whose voice no one can ignore [8]. He has made a name for himself in particular because he has sold stakes in companies for several years for environmental and social reasons on the advice of his ethics board and made it public. Financially, the pension fund's decisions are less painful than the snowball effect caused by the wannabes encouraged by this example.

The pension fund's commitment focuses not only on classic issues such as shareholder influence and the right to information, but also on certain eco–social issues such as climate protection, children's rights, and water. On the one hand, it actively uses its right to vote at general meetings; on the other hand, it directly addresses individual companies. Because of his influence, Norwegians find open ears and, as they say, can talk to any CEO they want. [9]

Major shareholders are increasingly pooling their strengths to get clear on specific company topics and minimize risk. Examples of this are the CDP investor initiative that emerged from the Carbon Disclosure Project, which was later merged with the Forest Footprint Disclosure (FFD) initiative. There are also the UN Principles for Responsible Investment, i.e., the UN Principles for Responsible Investment, under the auspices of the United Nations.

While ESG driven investment decisions, that is investment decisions that take into account environmental aspects, social issues and corporate governance criteria were previously mostly concerned with the equity markets, many investors today have turned their attention to gold and its full supply chain for proof of ESG compliance. In other words, the yellow precious metal must also now be green.

Therefore, the still fairly new concept of responsible exploration begs the question, under what conditions was the gold mined? Who benefited from it? How were the miners paid, how were the suppliers treated? Investors also want to eliminate the risk that gold was used to launder money, support terrorism, or finance wars [10]. Investors who want to act responsibly when it comes to gold must make sure that their shiny metal has no dark past.

Answering any of these questions can prove to be an arduous task because gold has an unlimited lifespan. Once produced, it does not disintegrate or change its qualities. Thus, it continues to circulate the market no matter the form. And in fact, there are gold bars in circulation that were mined and processed using methods and conditions that are no longer acceptable today. This is where the gold mining industry itself has been claimed and put.

Two of the most important organizations in the industry, the World Gold Council (WGC) and the London Bullion Market Association (LBMA), have developed guidelines for responsible gold mining and processing through which they set ESG–compliant environmental, social and corporate standards and want to prevent abuse. London Good Delivery ingots, which have been produced since 2012 based on the so–called LBMA Responsible Sourcing Program, meet these requirements. [11]

One gold ETF that meets these guidelines is the Royal Mint Physical Gold ETF from independent ETF specialist HANetf of London. It has been listed on the London Stock Exchange and Xetra since mid-February 2020, hedges 100% of its volume with physical gold and uses only bullion that fully meets the LBMA's strict requirements for responsible mining. In this way, investors can be assured that illegal activities or wars have not been financed and that human or other rights have not been violated. [12]

Gold ETCs that traded before LBMA standards went into effect also adhere to this, such as Invesco: because a fund company can only be assured that production is consistent with gold mined after 2012. The LBMA has instructed its depositary to minimize Invesco Physical Gold ETC investments in gold mined before then. On days when unit redemptions exceed new investments and more gold is sold by the fund, the custodian bank therefore tries to sell gold bullion mined before 2012, particularly to service redemptions.

ESGs have become a tough criterion for investment decisions and a strong trend that integrates environmental, social and governance considerations. Rather, the problem today is that there is still no single, universally applicable definition of sustainability.

In just a few years, the topic of "sustainable investing" has moved from the periphery to the center of investor interest. Gone are the days when the investment community was unwavering in its conviction that mandates outside of the direct financial concern that translated into company profitability were the only indicators of the success of the investment and that the do-gooders were wasting their potential returns on companies promoting ESG. Today, the idea of combining investment profitability with environmentally and socially conscious mandates has become pervasive. It tends to find great support in the annals of the high society and wealthy investors almost universally.

1.3. ESG and its effect on corporate profitability

Despite its immense popularity, many investors wonder what impact ESG has on profitability. This shows that it is not true that sustainable investment leads to lower returns, as is often claimed. According to various studies, sustainable funds often perform better than the corresponding traditional funds. They are even the real driving force behind portfolio returns. From 2009 to the end of 2020, almost 59% of ESG funds surpassed their average.

On the one hand, the good results can be attributed to the increased interest in sustainable investment. In particular, young investors are increasingly relying on ESG strategies. Companies that care about the environment, social issues and good corporate governance are increasingly the focus of this group of investors. Another reason for performance can also be found in industry

aspects. This year, for example, the fall of many traditional stocks, for example, in the energy sector, widened the difference in profitability.

When it comes to ESG ROI, the investment community seems to be split among the three domineering points of view:

- For a clear conscience, you have to pay with a lower rate of return compared to conventional investments
- Investing in ESG will lead to higher returns
- ESG criteria will not have a negative or positive impact on profitability.

Consider the arguments for lower returns. At the company level, incorporating sustainability criteria results in costs that are not borne by companies that ignore such criteria. In addition, investors with strict ESG mandates on sustainability choose their investments based on the criteria other than profitability. The investment universe becomes smaller due to additional selection restrictions, which reduces the expected return. Consequently, ESG criteria result in lower returns both at the company level and at the portfolio selection level.

In a similar fashion, arguments for higher returns can be made. ESG measures lead to more prudent management and better understanding of risks in a company, which reduces the risk of costly negative events (for example, litigation). This reduces funding costs. It is true that the implementation of ESG initially increases operating costs, but it often increases productivity at the same time, for example, through using less resources. One particularly stark example of this are the hotels that switched from changing the guest's towels on a daily basis, instead requiring the guests to leave the towels that need changing on the floor and putting the green use of water notices in the bathrooms. That practice alone saved hotel managers on the time that the room services spend making up the rooms and on the daily basis and the water and electricity that would otherwise, often unduly, be spent on the washing machines. As a result of these factors, sustainable companies tend to receive higher long-term profits than companies that do not take any or only the most essential ESG measures. At the portfolio level, choosing security based on ESG criteria means that well–managed companies are selected that are less risky than non-ESG companies.

There is also a third possibility that the effect is nil and ESG does not have any effect on corporate profitability whatsoever. Investments in ESG have grown significantly in recent years (annual growth since 2006 is 15 to 30%). This strong growth in the ESG sector means that an increasing number of market participants are considering sustainability issues and taking them into account in their considerations. In addition, since financial markets are highly efficient, especially in terms of relative prices and returns, it is unlikely that excess or insufficient returns can persist on ESG investments. Thus, the ESG factor is fully included in today's prices, the profitability does not differ from ordinary investments.

Anyone who has done sufficient research on sustainability and its effect on profitability should unfortunately find that the results, as is often the case in the social sciences, are not as straightforward as they would like. There are studies that find evidence that ESG investors should settle for lower returns, there are studies that show higher returns, and there are studies that cannot determine any impact on returns. So is the investor at the same point as before?

Not really, because it seems that some conclusions can be drawn from scientific research. First, ESG investors are less price sensitive than other investors. This is good news for suppliers of ESG products because it allows them to charge higher prices. However, for investors, higher prices usually mean lower returns. This is why price comparison is especially important when it comes to investing in ESG.

ESG profitability studies also in no way appear to be evenly distributed in terms of their results; there are relatively few studies that show the negative impact of ESG criteria. On the other hand, the vast majority see a positive impact on profitability. There seem to be niches in which the ESG approach is performing particularly well, for example in emerging markets.

There are also differences between the individual ESG factors. Management measures (G) have the most beneficial effect on profit, outpacing environmental measures (E) and the inclusion of social objectives (S).

In particular, the use ESG indices from reputable vendors such as MSCI or FTSE, on which numerous ESG products are based. MSCI, in particular, stands out for its wide range of ESG indices.

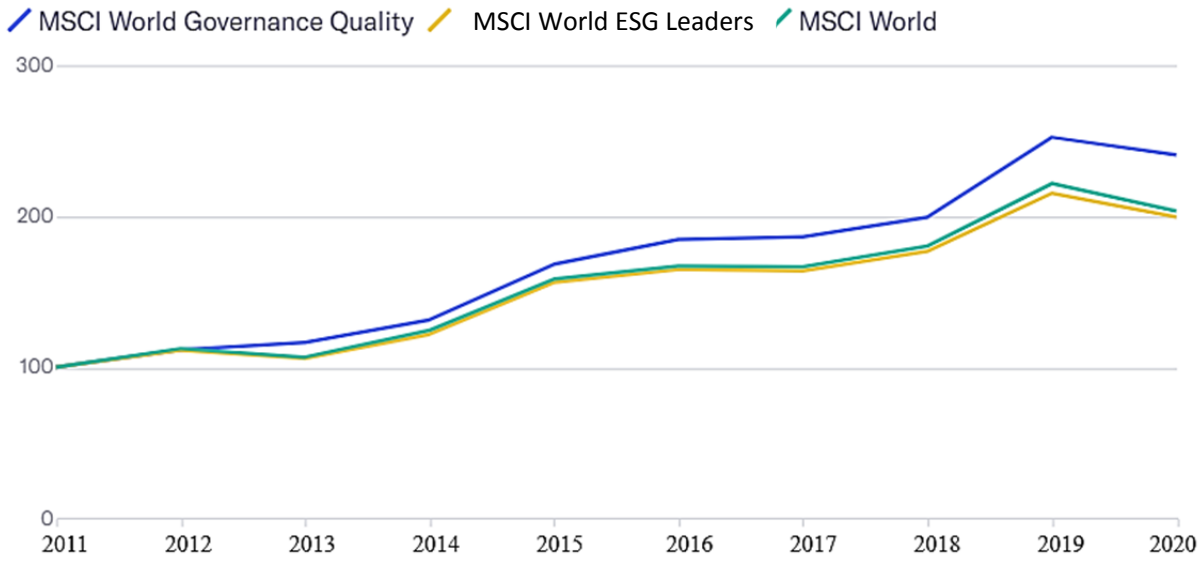

Fig. 1. **ESG Leadership Index, Governance Quality Index and MSCI World versus 100 Index**

Source: [8].

Governance part in ESG brings in higher profits.

ESG provides a performance advantage at the individual company level, but fund managers cannot necessarily translate this performance advantage into exceeding their fund's performance.

When the results of financial market research are so mixed, it might be a good idea to look at the results of real market instruments. The easiest option is to:

If you compare the performance of ESG indexes with the corresponding comparison indexes, you can see that in most cases the performance is almost the same. One example of this is the ACWI–ESG-Universal-Index from MSCI; its annual performance from 2009 to 2020 is 8.68%, benchmark performance is 8.58%.

In emerging markets, ESG products show a weak advantage. Both the FTSE Emerging ESG Index and similar Emerging Markets ESG products from MSCI performed slightly better than the corresponding benchmark index.

However, in one central point, the analysis of the index confirms the conclusion of the financial market research: the factor of governance is of great importance. The MSCI World Governance Quality Index significantly surpasses its MSCI World benchmark. The annual performance of the Governance Index since 2009 was 12.18% and the MSCI World Index was 9.83%. However, investors are disappointed that there is no product for private investors in this highly profitable ESG index.

In general, investors should state that while investing in ESG can provide a return advantage, existing products rarely, on average, significantly outperform after cost accounting.

In fact, taking into account the ESG criteria (environment, social, and governance) when selecting emerging market stocks for a portfolio can achieve an important superiority factor.

In terms of sustainability, emerging markets have some unique characteristics. Climate risks are greatest here, and in some developing countries, energy consumption will change significantly over the next twenty years. China is a classic example of this: the country currently still relies heavily on coal, but the share of renewables is likely to increase significantly by 2040.

Corporate governance is also one of the greatest challenges emerging markets face. Their standards in this area are sometimes very different from those of industrialized countries. There are also significant differences within emerging markets.

A recent study by Candriam Research Group examined how ESG stock selection affects the performance of an emerging market equity portfolio. Over the years, inadequate data sets and a narrow traditional approach to emerging markets have led to the belief that ESG strategies are not generating additional financial returns or may even reduce investment performance.

Research shows the opposite. Comparison of emerging market issuers that perform best in accordance with ESG criteria with companies included in the MSCI Emerging Markets Index shows that the set of stable emerging market stocks that meet ESG requirements outperformed on average 2 times a year over a period of 10 years, 4% according to the MSCI EM Equity Index. The volatility of the ESG portfolio was about the same as that of the traditional portfolio. Despite the better performance, the risk remains the same.

The excess returns across all regions analyzed (Asia, Latin America, the Middle East, and Africa) were particularly noticeable in Asia, where two-thirds of the MSCI EM index components are located (by quantity).

Excess returns versus market capitalization were also examined: ESG–compliant companies performed excess returns compared to the MSCI index in all three classes of market capitalization. However, this advantage is more pronounced for small and medium investments than for large ones.

The analysis also shows that all but two sectors benefit from the selection of an issuer based on ESG criteria. Interesting results were seen in the energy sector: 37 ESG stocks achieved an average performance of 3.7% and thus performed worse than equities in the MSCI Emerging Markets Index (4.2%). However, performance varied greatly depending on the ESG rating. The top–rated stocks achieved an average return of 7.3%, while the worst–rated stocks achieved just 1.1%.

Filtered asset allocation provides a performance advantage. Individual filters for the selection of the most sustainable companies are especially influential. This is the case, for example, with filters that exclude companies that are active in controversial areas (for example, weapons, gambling, alcohol and tobacco) or are the subject of controversy. By excluding such companies from emerging markets, investors can improve their averages by about 0.4%. If investors use regulatory filters (corruption risk, labor or human rights compliance, environmental risk) when selecting companies, the productivity gain is about 0.2%.

An ESG downgrade can be a useful leading indicator of future relative stock returns (over a period of six months to three years). As it turns out, the ESG rating downgrade is usually directly related to a serious lag.

Sustainable investing, such as in the form of an ESG ETF, has a promising future and makes sense. Member States of the United Nations want to achieve 17 Sustainable Development Goals by 2030. Thus, the ESG criteria will become more and more relevant.

2. Company's General Characteristics and Analysis of Chevron's Securities Portfolio

2.1. Brief description of Chevron Corporation

Chevron Corporation (Chevron), incorporated January 27, 1926, manages its investments in subsidiaries and affiliates and provides administrative, financial, managerial and technological support to the United States and international subsidiaries that conduct integrated energy and chemicals operations. The company operates in two business segments: Upstream and Downstream.

Upstream operations consist primarily of oil and natural gas exploration, development and production; liquefaction, transportation and regasification related to liquefied natural gas (LNG); oil transportation by international oil pipelines; natural gas processing, transportation, storage and marketing; and gas-to-liquids installation.

Refining operations consist primarily of refining crude oil into refined products; marketing crude oil and refined products; transporting crude oil and refined products through pipelines, marine vessels, motor equipment and railcars; and manufacturing and marketing commodity petrochemicals, plastics for industrial use and fuel and lubricant additives. The Company sells crude oil and natural gas from its production operations under various contractual obligations [13].

Exploration and production activities in the United States are primarily concentrated in the mid–continent region, the Gulf of Mexico, California and the Appalachian Basin. In California, the company produces in the San Joaquin Valley. Chevron is also engaged in various exploration, development and production activities in the deepwater Gulf of Mexico. The company has interests in the deepwater Jack and St. Malo fields. The company is interested in a production facility that is designed to accommodate production from the Jack/St. Malo development and third-party

tiebacks. Chevron is the operator of an exploration and appraisal and potential development program called Tigris, covering a number of jointly held offshore leases in northwest Keithley Canyon.

The Company's operations in the Mid-continent region relate primarily to Colorado, New Mexico, Oklahoma and Texas. As of December 31, 2020, the Company had approximately 500,000 and 1,000,000 net acres of shale and tight resources in the Midland and Delaware basins, respectively, in the Permian Basin of West Texas and southeastern New Mexico. As of December 31, 2020, the Company had approximately 472,000 net acres in the Marcellus Shale and 309,000 net acres in the Utica Shale, primarily located in southwestern Pennsylvania, eastern Ohio and West Virginia. the Company had approximately 500,000 and 1,000,000 net acres of shale and dense resources in the Midland and Delaware Basins in the Permian Basin of West Texas and southeast New Mexico, respectively.

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Other countries in the Americas include Argentina, Brazil, Canada, Colombia, Greenland, Mexico, Suriname, Trinidad and Tobago, and Venezuela. Exploration and production activities in Canada are concentrated in Alberta, British Columbia and the offshore Atlantic region. The company also has exploration interests in the Beaufort Sea region of the Northwest Territories. The company is interested in the Hibernia field, which consists of the Hibernia and Ben Nevis Avalon (BNA) reservoirs, as well as the unified Hibernia South Extension (HSE) areas in offshore Atlantic Canada. As of December 31, 2020.

The Company has a working interest in two exploration blocks in the Flemish Passage Basin offshore Newfoundland. As of December 31, 2020, the Company had approximately 228,000 net acres in the Duvernay Shale in Alberta and approximately 200, 000 above ground acres in the Montney Dense Rock. Chevron is interested in the proposed Kitimat LNG and Pacific Trail Pipeline projects. As of December 31, 2020, the Company was interested in 300,000 net acres in the Horn and Liard River basins in British Columbia. The company is interested in Aitken Creek and the Alberta Hub natural gas storage facilities.

In Greenland, the company is interested in Blocks 9 and 14, located in the Canumas area, off the northeast coast of Greenland. Chevron is interested in an exploration license for Block 3 in the deepwater Perdido region of the Gulf of Mexico. As of December 31, 2020, the Company was interested in two concessions covering about 73,000 net acres in the Vaca Muerta Shale formation in Argentina.

In Brazil, Chevron has interests in the Frade and Papa-Terra deepwater fields located in the Campos Basin. Chevron is also interested in the CE-M715 block located in the Ceará Basin offshore Brazil. Chevron operates the offshore Chuchupa and onshore Ballena fields. Chevron is interested in the deepwater Blocks 42 and 45 offshore Surinas. As of December 31, 2020, the Company was interested in three blocks in the East Coast offshore area on the Trinidad Coast, which includes the Dolphin, Dolphin and Sea Fish natural gas fields. Chevron's production activities in Venezuela are carried out by two branches in western Venezuela and a branch in the Orinoco belt.

In Africa, Chevron is engaged in exploration and production in Congo, Liberia, Morocco, Nigeria, and the Republic of Congo. In Angola, the Company operates and has interest in Block 0, a concession adjacent to the Cabinda Coast, and has interest in a production sharing contract (PSC) for Deepwater Block 14. The company is also interested in crossing the Congo River Canyon Pipeline Project.

Chevron is working on and has interest in the Lianzi Unitization Zone, located in an area equally shared by Angola and the Republic of Congo. Chevron is interested in an offshore concession in the Democratic Republic of Congo. Chevron is interested in the offshore high-trade permit areas (Nkossa, Nsoko and Moho-Bilondo) in the Republic of Congo. It is interested in Block LB-14 off the coast of Liberia. As of December 31, 2020,

the Company had three operated deepwater areas offshore Morocco. As of December 31, 2020, the Company was interested in eight managed concessions in the coastal and nearshore areas of the Niger Delta. Chevron has operations and interest in the Agbami field located in deepwater oil producing lease (OML) 127 and OML 128 [13].

In Asia, the Company has exploration and production activities in Azerbaijan, Bangladesh, China, Indonesia, Kazakhstan, Kurdistan Region of Iraq, Myanmar, Divided Zone located between Saudi Arabia and Kuwait, the Philippines, Russia and Thailand.

In Azerbaijan, Chevron is interested in the Azerbaijan International Operating Company (AIOC) and oil production from the Azeri-Chirag-Gunashli (ACG) fields. Chevron is also interested in joining the Baku-Tbilisi-Ceyhan (BTC) oil pipeline, which transports most ACG production from Baku, Azerbaijan, through Georgia to the Mediterranean deepwater port facilities at Ceyhan, Turkey.

In Kazakhstan, the Company has an interest in the Tengizchevroil (TCO) subsidiary and an idle working interest in the Karachaganak field. In Bangladesh, the Company operates and is interested in Block 12 (Bibiyan field) and Blocks 13 and 14 (Jalalabad and Mulawi Bazar fields). In China, Chevron has operating and non–operating interests in various areas of China.

In China, the company operates and has a working interest in the Chuandongbei project located onshore in the Sichuan Basin. The company also has non–operating working interests in the QHD 32–6 field, Block 11/19 in Bohai Bay and Block 16/19 in the Rust Belt.

In Indonesia, Chevron has working interests through various PSCs in Indonesia. Chevron has contractor interests in PSC Sarta and Qara Dagh. The company has operating and has an interest in the Chuandongbei project located onshore in the Sichuan Basin. The company also has idle working interests in the QHD 32–6 field, Block 11/19 in Bohai Bay and Block 16/19 in the Rust Belt.

In Australia/Oceania, the Company has exploration and production interests in Australia and New Zealand. In Australia, Chevron's exploration and production activities are concentrated in offshore Western Australia. As of December 31, 2020, the Company operated two LNG projects, Gorgon and Wheatston, and has a non–operating working interest in the North West Shelf (NWS) Venture and Exploration Area in the Review Basin and Carnarvon Basin. The company is also exploring in the South Australian Bay offshore area. Chevron is interested in the Gorgon project, which includes the Gorgon and Jansz-Io fields. The company is also managing the Wheatston project, which includes development of the Wheatston and Jago fields. Chevron has a non–operating working interest in the NWS venture in Western Australia. As of December 31, 2020, the Company was interested in three blocks in the Review Basin. As of December 31, 2020, the Company was interested in and was managing three deepwater exploration permits in the Pegasus and East Coast offshore basins.

In Europe, the Company has exploration and production interests in Denmark, Norway and the United Kingdom. As of December 31, 2020, it was interested in the Danish Underground Consortium (DUC), which produces crude oil and natural gas from 13 North Sea fields. It is interested in the Alder project, the Clair Ridge project and the Rosebank project in the UK. Chevron is interested in the PL 859 exploration block located in the Barents Sea. The company is involved in exploration and production in Denmark, Norway and the United Kingdom. As of December 31, 2020, it was interested in the Danish Underground Consortium (DUC), which produces crude oil and natural gas from 13 North Sea fields. It is interested in the Alder project, the Clair Ridge project and the Rosebank project in the UK. Chevron is interested in the PL 859 exploration block located in the Barents Sea.

The company sells petroleum products under its main brands Chevron, Texaco, and Caltex in various parts of the world. In the United States, the Company sells its products under the Chevron and Texaco brands. As of December 31, 2020, the Company provided approximately 7,800 Chevron and Texaco automotive service machines directly or through retailers and marketers, primarily in the southern and western states. As of December 31, 2020, approximately 325 of these locations were company-owned or descent stations. As of December 31, 2020, Chevron provided directly or through retailers and marketers about 6,000 branded service stations, including affiliates outside the United States. In British Columbia, Canada, the company operates under the Chevron brand. The company sells the Texaco brand in Latin America.

In Asia-Pacific, Southern Africa, and the Middle East, the company uses the Caltex brand. The company also operates through affiliates under various brand names. The company also sells a line of lubricant and cooling products under the product names Havoline, Delo, Ursa, Meropa, Rando, Clarity and Taro in the United States and worldwide under three brands: Chevron, Texaco and Caltex.

Chevron Oronite develops, manufactures and markets performance additives for lubricating oils and fuels and conducts research and development for additive components and blended packs. Chevron owns an interest in its subsidiary, Chevron Phillips Chemical Company LLC (CPChem). PChem produces olefins, polyolefins and alpha–olefins and is a supplier of aromatics and polyethylene pipes, in addition to participating in specialty chemicals and specialty plastics markets.

Chevron also has operations in the petrochemicals business through GS Caltex, a subsidiary of the Company. GS Caltex produces aromatic compounds, including benzene, toluene and xylene. These base chemicals are used to make a number of products, including adhesives, plastics and textile fibers. GS Caltex also produces polypropylene,

Chevron owns and operates a network of crude oil, natural gas and products pipelines, and other infrastructure assets in the United States. The Company's marine fleet includes both U.S. and foreign–flag vessels. U.S.-flag vessels are primarily engaged in the transportation of petroleum products in coastal waters of the United States. Foreign-flag vessels transport crude oil, liquefied natural gas, petroleum products and raw materials in support of global upstream and downstream operations. The Company's other businesses include research and technology and environmental protection. The Company's energy technology organization supports upstream and downstream activities. On November 14, 2006 a joint venture with Gazprom Neft, OOO Severnaya Taiga Neftegaz, was registered in Noyabrsk (Yamalo-Nenets Autonomous District) (exploratory drilling at a number of sites in the YNAO is underway).

2.2. Analysis of Chevron's financial situation

The bulk of the company's equity is estimated based on the Brent test. After the start of 2020, WTI's discount to Brent has widened due to rising U.S. production, a rebound in inventories and growing concern that infrastructure constraints would again limit flows at export points on the Gulf Coast.

Financial results improved significantly in 2020 (see Table 2.1), with a net income of $ 8.2 billion (see Table 2.1). Net income of $ 8.2 billion compared to a loss of $ 2.5 billion in 2019. USD 2.2 billion in 2019.

Production in 2020 was 2.728 million barrels of oil per day, which was 5% higher than in 2019. Upstream capital expenditures in 2020 were $ 16.4 billion. U.S. Portfolio management activities resulted in proceeds of $ 3.4 billion. This included the sale of geothermal assets in Indonesia and the Philippines and mature production assets in the United States [**7**].

In 2020, the capital and research budget totaled $ 15.8 billion. USD. Approximately $ 8.7 billion in planned capital expenditures are expected. The $ 8.7 billion will be used to maintain current assets, including $ 3.3 billion for the Permian Basin. The $ 8.7 billion is for the Permian Basin and $ 1.0 billion for the other shale and oil shale assets. The $ 1.0 billion will be for other shale and hard cap investments. Approximately $ 5.5 billion is planned for major capital expenditures. This includes $ 3.7 billion planned for major capital projects, including $ 3.7 billion related to projects related to the Permian Basin. The Company's investment in Tengizchevroil (TCO) in Kazakhstan is expected to be approximately US$ 3.7 billion related to projects related to the Future Growth and Well Pressure Management Project (FGP/WPMP). Exploration funding is expected to be $ 1.1 billion. USD 1.1BN. The remaining production costs are mainly related to early stage projects supporting potential future developments.

Dividends — Dividends of $ 8.1 billion were paid. The 2020 dividend is for the 30th consecutive year with a higher annual dividend payout. Capital and research spending. Invested $ 18.8 billion in the company's business. The company has invested $ 18.8 billion, including $ 4.7 billion (Chevron's share). The company's share (Chevron's share) of affiliate spending. The 2020 announcement projected spending of $ 18.3 billion. The 2020 announcement projected spending of $ 18.3 billion, including $ 5.5 billion.

Spending in 2020 is focused on short–term and high-yield investments, including the Permian

Table 1
Consolidated Balance Sheet

Millions of dollars	2020	2019	2018	2017	2016
Cash and cash equivalents	4,813	6,988	11,022	12,785	16,245
Time deposits	–	–	–	8	8
Marketable securities	9	13	310	422	263
Accounts and notes receivable, net	15,353	14,092	12,860	16,736	21,622
Inventories:					
Crude oil and petroleum products	3,142	2,720	3,535	3,854	3,879
Chemicals	476	455	490	467	491
Materials, supplies and other	1,967	2,244	2,309	2,184	2,010
Total inventories	5,585	5,419	6,334	6,505	6,380
Prepaid expenses and other current assets	2,800	3,107	3,904	4,705	4,391
Total current assets	28,560	29,619	34,430	41,161	48,909
Long–term receivables, net	2,849	2,485	2,412	2,817	2,833
Investments and advances	32,497	30,250	27,110	26,912	25,502
Properties, plant and equipment, at cost	344,485	336,077	340,277	327,289	296,433
Less: Accumulated depreciation, depletion and amortization	166,773	153,891	151,881	144,116	131,604
Properties, plant and equipment, net	177,712	182,186	188,396	183,173	164,829
Deferred charges and other assets	7,017	6,838	6,155	6,228	5,501
Goodwill	4,531	4,581	4,588	4,593	4,639
Assets held for sale	640	4,119	1,449	–	580
Total assets	253,806	260,078	264,540	264,884	252,793
Liabilities and equity					
Short–term debt	5,192	10,840	4,927	3,790	374
Accounts payable	14,565	13,986	13,516	19,000	22,815
Accrued liabilities	5,267	4,882	4,833	5,328	5,402
Federal and other taxes on income	1,600	1,050	1,073	1,761	2,509
Other taxes payable	1,113	1,027	1,118	1,233	1,335
Total current liabilities	27,737	31,785	25,467	31,112	32,435
Long–term debt	33,477	35,193	33,542	23,926	19,930
Capital lease obligations	94	93	80	68	97
Deferred credits and other noncurrent obligations	21,106	21,553	23,465	23,549	22,982
Noncurrent deferred income taxes	14,652	17,516	20,165	21,626	20,954
Noncurrent employee benefit plans	7,421	7,216	7,935	8,412	5,968
Total liabilities	104,487	113,356	110,654	108,693	102,366
Common stock	1,832	1,832	1,832	1,832	1,832
Capital in excess of par value	16,848	16,595	16,330	16,041	15,713
Retained earnings	174,106	173,046	181,578	184,987	173,677
Accumulated other comprehensive loss	(3,589)	(3,843)	(4,291)	(4,859)	(3,579)
Deferred compensation and benefit plan trust	(240)	(240)	(240)	(240)	(240)
Treasury stock, at cost	(40,833)	(41,834)	(42,493)	(42,733)	(38,290)
Total Chevron Corporation stockholders' equity	148,124	145,556	152,716	155,028	149,113
Noncontrolling interests	1,195	1,166	1,170	1,163	1,314
Total equity	149,319	146,722	153,886	156,191	150,427
Total liabilities and equity	253,806	260,078	264,540	264,884	252,793

Source: The author.

Basin and other shale and tight plays, as well as the completion of major projects and development of the Future Pressure Management Project and the Wellhead Management Project (FGP/WPMP) at Tengizchevroil (TCO) in Kazakhstan.

Portfolio management — realized $ 5.2 billion in proceeds from divestments. USD 5.2 billion in proceeds from the disposal of assets.

Revenue in the reporting period increased by 23.2% to $ 40.49 billion, compared to $ 32.87 billion a year earlier (Table 2.2). The analysts forecasted the indicator at the level of $ 40.78 billion.

In the U.S. Upstream segment, Chevron recorded a profit of $ 838 million, compared to a loss of $ 102 million in the same period a year earlier. The average realized price for U.S. crude oil in the first quarter rose to $ 59 a barrel from $ 41 a barrel. In the International Upstream segment, earnings rose from $ 955 million to $ 2.457 billion due to strong oil prices as well as higher natural gas sales volumes. The average realized oil price rose from $ 45 per barrel to $ 68 per barrel in the second quarter. Chevron's oil and gas production rose 1.7 percent to 2.826 million barrels of oil equivalent per day in the reporting period compared to the same period a year ago.

In addition, Chevron's costs in the second quarter rose 14.77% to $ 37.33 billion from $ 32.527 billion a year earlier. Chevron reported net income of $ 3.41 billion, or $ 1.78 per share, compared to $ 1.45 billion, or $ 0.77 per share, in the year–ago period, while analysts had projected earnings per share of $ 2.06.

Free cash flow from operations in the second quarter of 2020 was $ 6.855 billion, up from $ 4.971 billion, allowing the company to announce a $ 3 billion buyback program.

Capital expenditures for the period were $ 4,816 billion, up from $ 4,538 billion a year earlier.

2.3. Analysis of investment attractiveness of Chevron shares

Chevron (NYSE: CVX) shares rose to $ 105.25 and even surpassed it slightly, and certain technical conditions are now in place that are favorable for earnings growth.

On a daily price chart for the last year, several patterns are easily observable. First, the stock price has successfully pushed and established itself above the 200-day Exponential Moving Average (EMA) in November for the first time over the last year as demonstrated by the red line on the chart. Second, and perhaps even more telling, the orange line, which represents the 50-day EMA, crosses the 200-day EMA in February of 2021 creating one of the most bullish patterns, the Golden Cross. Since November the stock tested the 50-day EMA on at least 5 different occasions, but bounced back every time, which signals the strength of the stock on the market.

More recently, the stock price has been forming what seems to be the Cup and Handle pattern. Aided by the Relative Stochastic Index (RSI) is approaching the overbought territory, the pattern might indicate a short-term backdrop in the stock price, which presumably could be followed by a rapid breakout. The stock is approaching the second Fibonacci band indicating a bullish pattern, but also signaling of a potential for a short term reversal back to the third and fourth bands in the medium term.

Another aspect of the chart that might be giving an indication as to why the price is hanging around the 110 level is the local maximum on the chart back in late June, which formed a ceiling for future price moves. The stock price was able to break that upper bound back in March, however, it did not hold the level to long before falling back down to the pre-break out level. It retested the level in May, and it appears that the stock price is gathering strength to make a more substantial run up higher after a short period of drop and consolidation.

In the longer term, it is noteworthy that the price has hit its channel line — during the year it was pushing down from that line, and it is likely to do the same this time. In that case, the down-correction could reach as far down as the $ 65 level. However, it is more likely that the stock price would retest the 50-day EMA once again during a short-term correction and should it bounce back up, continue its upward trend bar any negative developments in the oil market. In a worst case scenario not precipitated by the events akin to the ones that triggered the April 2020 oil sell off, the share price might fall through the supporting 50–day EMA and retest the 200-day EMA still facing the third Fibonacci band on its way down. $ 98 per share, however, appears as another strong support level formed by the earlier three attempts at breaking out of the channel back in December 2020 and January of this year.

Table 2
Consolidated Statement of Income

Millions of dollars	2020	2019	2018	2017	2016
Revenues and other income					
Total sales and other operating revenues	134,674	110,215	129,925	200,494	220,156
Income from equity affiliates	4,438	2,661	4,684	7,098	7,527
Other income	2,610	1,596	3,868	4,378	1,165
Total revenues and other income	141,722	114,472	138,477	211,970	228,848
Purchased crude oil and products	75,765	59,321	69,751	119,671	134,696
Operating expenses	19,437	20,268	23,034	25,285	24,627
Selling, general and administrative expenses	4,448	4,684	4,443	4,494	4,510
Exploration expenses	864	1,033	3,340	1,985	1,861
Depreciation, depletion and amortization	19,349	19,457	21,037	16,793	14,186
Taxes other than on income	12,331	11,668	12,030	12,540	13,063
Interest and debt expense	307	201	–	–	–
Total costs and other deductions	132,501	116,632	133,635	180,768	192,943
Income (loss) before income tax expense	9,221	(2,160)	4,842	31,202	35,905
Income tax expense (benefit)	(48)	(1,729)	132	11,892	14,308
Net income (loss)	9,269	(431)	4,710	19,310	21,597
Less: Net income attributable to noncontrolling interests	74	66	123	69	174
Net income (loss) attributable to Chevron Corporation	9,195	(497)	4,587	19,241	21,423

Source: The author.

The cumulative effect of the characteristics of the shares by the issuer may be called management of the investment attractiveness of its own corporate shares. In this context, it is important to identify the macroeconomic factors affecting the Chevron corporate stock market.

The investment attractiveness of Chevron corporate stock is influenced by many factors that an investor considers when making an investment decision. The systematization of existing classifications of macroeconomic factors influencing the Chevron corporate stock market, analysis and synthesis of the factual material allowed the author of this work to propose generalized classification criteria.

In general, the key 2020 macroeconomic factor affecting the Chevron corporate stock market appears to be the price of purchased gas and oil.

According to the analysis shown in this work, purchased oil and gas costs increased by $ 235,407 million. The increase was $ 627,258 million for the six months ended June 30, 2020 and totaled $ 627,258 million for the six months ended June 30, 2020. The increase in purchased gas and oil expense for the six months ended June 30, 2020 was $ 627,258 million compared to $ 391,851 mil-

Fig. 2. **Chart of Chevron shares quotation for 1 year**

Source: TradingView.

lion for the same period last year. The company's natural gas purchases increased by $ 8.4 million in the same period last year. Gas purchases increased by $ 215,353 million, or 76 percent. Gas purchased for the six months ended 30 September 2011 was USD 499.486m, up 76% from USD 391.851m for the same period the previous year. Gas purchases for the six months ended June 30, 2020, compared to $ 284,133 million for the same period last year. The Company had a net loss of $ 11.8 billion for the same period last year.

Systematic risk, which is measured by the β–coefficient, which characterizes the response of an individual security's quotations to changes in external factors that respectively characterize the overall state of the economy.

The β–coefficient defines the change in the security's price relative to the whole market. It is considered as a coefficient of linear regression of security's yield relative to the yield of the market as a whole. This coefficient can be calculated using the formula [8]:

β_1= (Covariance of the asset with the market portfolio)/(Dispersion of the market portfolio) =σ_im/(σ_m^2) (2.1)

Or

β_i=(σ P/P)/(σ I/I) (2.2)

where σ P/P is the relative change of the market price of an asset for a certain time interval;

σ I/I — respectively, the relative change for the same period of the leading stock market index of the country.

In fact, β is the result of the variability of stock returns relative to market returns and the correlation between them. If the relationship between changes in stock returns and market returns is absolute (correlation equals 1), then the relative risk will be determined only by the volatility of the stock. Then the more substantial the volatility of a stock's return, the higher β and the higher the idiosyncratic risk of a return, all other things being equal.

When β > 1, the price of the stock changes faster than the market on average, and when β < 1–122 much slower.

Consequently, higher values of beta point to greater returns in a bullish market. Accordingly, higher beta also indicates a deeper dive of the stock price, when the bear stake over the market.

Let us calculate the β–coefficient of Chevron stocks.

Chevron's β coefficient in 2017 indicates that the stock is moving much higher than the market at a much faster speed. This claim is also evidenced by a significant increase in its market value (four times higher than in 2016). In 2018, the price declined by a factor of four. Such a sharp drop also dragged the value for the beta down to below 1

Table 3
Calculation of β–coefficient for Chevron in 2016–2020

Indicator	2016	2017	2018	2019	2020
Price per Share (P), USD	4.46	16.49	4.42	5.76	11.19
Equity Index (I)	498.86	1174.02	301.42	572.91	975.05
ΔP	–	269.73	–73.20	30.32	94.27
ΔI	41.33	135.34	–74.33	90.07	71.19
β	–	1.99	0.98	0.34	1.34

Source: The author.

to 0.98, bringing the overall price moves closer to the market rates. The 2019 β coefficient value indicates a much slower pace of stock movement relative to the market performance making it both a laggard in that year and a potential target for long–term investors looking for stocks in their latent phases. As the 2020 progressed and saw a massive global market crash across multiple asset classes, Chevron's stock declined more than did the broader S&P index. That particular move is most likely attributable to the oil glut in the first and second quarters of 2020 triggered by the slowed economic growth and the attempts by some members of the OPEC+ to curb the rise of shale producers. As storage facilities became replete with oil that had no prospects of being used any time soon producers started looking for space, in which to keep the overflow. Traders were in no better positions as they were faced with the dilemma of either taking the delivery of the barrels they owned futures on and finding storage or selling their positions at a loss. In its unprecedented move, the quagmire that ensued sent the WTI down to zero and from then on plummeting to the whooping negative $ 37.63 per barrel.

Chevron Corporation (Chevron), incorporated January 27, 1926, manages its investments in subsidiaries and affiliates and provides administrative, financial, managerial and technological support to the United States and international subsidiaries that conduct integrated energy and chemicals operations. The company operates in two business segments: Upstream and Downstream.

The majority of the company's equity is valued based on the Brent test. After the start of 2020, WTI's discount to Brent widened due to rising U.S. production, recovering inventories and growing concerns that infrastructure constraints would again restrict flows at export points on the Gulf Coast. Financial results improved significantly in 2020, with net income of $ 8.2 billion. Net income of $ 8.2 billion compared to a loss of $ 2.5 billion. USD 2.5 billion in 2019.

Production in 2020 was 2.728 million barrels of oil per day, which was 5% higher than in 2019. Upstream capital expenditures in 2020 were $ 16.4 billion. U.S. Portfolio management activities resulted in proceeds of $ 3.4 billion. The portfolio management activity generated $ 3.4 billion, including the sale of geothermal assets in Indonesia and the Philippines and mature production assets in the United States.

Chevron (NYSE: CVX) shares rose to and even slightly above $ 110. The investment appeal of Chevron corporate stock is influenced by many factors that an investor considers when making an investment decision. The systematization of existing classifications of macroeconomic factors influencing the Chevron corporate stock market, analysis and synthesis of the factual material allowed the author of this work to propose generalized classification criteria. In general, the key 2020 macroeconomic factor affecting the Chevron corporate stock market appears to be the price of purchased oil and gas.

3. Proposals for the Development of Investment Activity on the Stock Market with the Help of ESG-investment

3.1. Development of socially responsible innovations and socially responsible investing in the context of the stakeholder concept of value–oriented management of enterprise innovation activities

The activity of enterprises has always been accompanied by the creation of certain negative effects on society, which are manifested, for ex-

ample, in environmental pollution, deterioration of consumer health (during the production, and goods harmful to health or the use in the production of low-quality or hazardous substances), reduction of social well-being of society (when a lower level of compensation or reduction of jobs), etc.

Despite the constant existence of such externalities, they have not always been taken into account and not considered in the process of creating the added value of the enterprise, because they do not directly affect the key components of value creation (price, costs, income, risks). The concept of "enterprise value" and "public value" were absolutely separated.

However, in order to ensure long-term and sustainable development, modern conditions of economic management require enterprises to change their attitude to the creation of "social value" — positive effects beneficial to society, in particular environmental, ethical, social and others. This occurs, firstly, due to the fact that the generated negative effects in some cases reach a global scale and begin to affect the financial performance of the enterprises themselves, worsening the conditions for conducting business activities and leading to an increase in their costs or directly the formation of losses.

For example, for domestic enterprises the emergence of the main negative externalities is associated with significant energy and resource costs of production, in the chemical industry an additional significant factor is the negative impact on human health due to the capacity of harmful substances in products, as well as significant environmental pollution in the production and consumption process [15].

The second factor that induces enterprises to participate in the internalization of external effects, i.e. their transformation into internal ones on the basis of the convergence of marginal private and public costs, is the increase in public awareness of such effects, a more critical attitude to the nature of business activity, which is reflected in consumer demand and, consequently, in the financial results of enterprises.

It should be noted that enterprises and society are not completely separate from each other. Each of these entities has needs, the satisfaction of which depends on the other entity. Thus, it is important for enterprises to operate in a market where consumers are not only interested in its goods, but also financially able to purchase them. The conditions of the business environment also play a significant role, such as the regulatory environment, the permitting system, the availability and reliability of suppliers, and the development of infrastructure, which determine the ease and overall possibility of doing business.

On the other hand, for the society, the development of the industrial sector on their territory means jobs and employment, guaranteeing tax payments to local and national budgets, etc.

Thus, in the area of intersection of the interests of society and individual enterprises it is possible to define the formation of common value or value for them, which consists in the simultaneous provision of competitiveness of enterprises and their compliance with social, environmental, ethical, economic needs of society [12].

The basis for the management of the creation of such common value in modern economic and investment theory is the concept of "value-based investing" (VBI) — value-based investing. The essence of this concept lies in the choice of such areas of investment that provide the greatest increase in the total value, that is not only the creation of value for the enterprise (for example, in the form of an increase in market capitalization), but also public value in the form of positive environmental, social and economic effects [7]. The concept of value–based investment (VBI) is based on the ESG-criterion (E – "environmental", S — "social", G — "governance"), that is, taking into account the tasks of environmental, social development and corporate management in making investment decisions along with the analysis of financial indicators and achieving the desired level of return on investment.

It is necessary to note, that value–oriented investing is rather a criterion, a basis for creation of the corresponding methodology for making investment decisions when choosing directions of investments, and therefore only indirectly influences creation of the enterprise's common value for it and society.

Accordingly, the more developed the stock market and the stronger the influence of stakeholders (primarily, investors) on the activities of enterprises, the more actively the ESG criterion will be implemented in the design of development strategies of economic entities themselves.

Table 4
Types of investment strategies in VBI "values-based investing"

Strategy	Characteristics
Sustainability themed	Making investments in areas and assets that narrowly relate to the implementation of the ESG criterion, covering one or more specific areas (e.g., investments in «green» technology, the sustainable development of a particular industry).
ESG integration	Formation of an investment portfolio based on a systematic combination of traditional financial analysis and assessment of environmental, social and managerial impact factors.
Best–in–class/positive screening	Investing in industries, companies or projects that demonstrate a better or higher level of positive ESG effects than others in the field
Exclusionary/negative screening	Approach involving the exclusion from the investment portfolio of certain assets related to companies, industries, countries, demonstrating the presence of negative effects on the ESG criterion
norms–based screening	Inclusion in the investment portfolio of those assets that, according to ESG criteria, are consistent with existing international standards and requirements
Impact/ community investing	Investments in companies, organizations and funds that aim to achieve significant social and environmental benefits in addition to financial returns. Includes investments in both developed and emerging markets, and may provide for returns below the market average
Corporate engagement and shareholder action	Investing in order to participate as a shareholder in voting and influencing management decisions in companies with a focus on meeting the ESG criterion

Source: The author.

It is also necessary to take into account that if the stakeholder approach is applied, the main driving force for the enterprise to take into account environmental, social, ethical sustainable development objectives in the design of its own strategies will be the response of its stakeholders and the value for them of the principles of value-oriented investment. If the ESG criterion does not play a key role for shareholders (investors), then enterprises will mostly focus on the achievement of high performance of a purely financial nature.

In order to develop a socially responsible attitude of stock market participants to the management of their assets and ensure that they take into account social and environmental objectives, and not only focus on obtaining high financial results, a number of international institutions and organizations, as well as leading investment companies, conduct active explanatory and educational activities in this direction, develop appropriate methodological support, as well as promote the Principles of responsible investing.

Development and introduction into practice of value-based investing (VBI) principles, formation of appropriate methodology of investment assessment and making investment decisions based on the principles of environmental, social, ethical efficiency contributed to the emergence of a wide range of new research in the investment sphere, highlighting new approaches to the formation of investment portfolios and the choice of investment strategies.

For designation of all directions of the investment which realization is based on application of the VBI concept and ESG–criteria in foreign literature and practice of the financial companies several terms are used, namely: in publications of "KPMG" the concept of responsible investing (RI – responsible investing), in "GSIA" (Global Sustainable Investment Alliance) the term of socially — responsible investing (SRI — socially responsible investing), also applied term of investments in sustainable development (sustainable investing) is most generalized.

The implementation of the concept of VBI today covers a wide range of strategies by asset classes and various actors — from institutional participants, investment funds, to private investments. In accordance with this new models and strategies of investment are formed and developed, which allow taking into account both the desired level of return on investment, and the positive social, environmental or other effects provided by them.

In general, all types of strategies in VBI can be classified by the breadth of objectives (investments by thematic areas and cross-industry investments that integrate all components of the ESG criterion) and the degree of importance of the ESG criterion in making investment decisions (strategies with the minimum ESG criterion — selection based on regulatory requirements and investments with exclusion of negative effects; strategies with the maximum ESG criterion — socially influential investments). Chevron Corporation today identifies 7 main investment strategies that are subject to the ESG criterion. The characteristic of these strategies is presented in Table 3.1.

In recent years, there has been an increase in investor interest in the use of socially responsible strategies in the process of forming portfolios of shares of industrial enterprises.

The orientation of investors to achieve the goals of environmental, social development and corporate governance in the activities of the enterprise forces the enterprises themselves to revise their investment, production, financial policies and to design a development strategy taking into account these objectives.

In addition to the conscious choice of investors as the main stakeholder group, the factors that transform the priorities of enterprises' activities are the market environment (primarily changes in the values and priorities of consumers), as well as global factors of influence on sustainable development — climate change, increase in population, completeness of energy and fuel resources, water and material resources shortages, deforestation, urbanization, deterioration of ecosystems, increasing requirements for product safety and ensuring the welfare of the population.

The global factors of influence on sustainable development determine the formation of new risks and opportunities for the enterprises. Ignoring the challenges of the external environment can lead to non–compliance with new standards and regulatory requirements for product quality, used raw materials, materials, etc. (regulatory risks); increased costs due to outdated production technologies, energy inefficiency (resource risks); loss of market share due to reduced competitiveness of products, customer dissatisfaction with quality or harm (market, reputational, judicial risks); deterioration of reputation among society and the labor market, loss of qualifications of the enterprise (reputational risks).

At the same time the readiness of the enterprise to respond to the needs and challenges of the economic situation allows to implement new opportunities and ensure the creation of additional competitive advantages: to achieve a lower than the industry average level of costs; to strengthen the market position as a socially responsible brand; to ensure the sustainability of economic development by responding to the needs of consumers and society, creating innovative products; to increase the interest of investors in investing in the enterprise.

Thus, properly assessing the global challenges of influencing sustainable development, enterprises can form effective strategies for their activities to minimize risks and simultaneously take advantage of the emergence of new opportunities. At the same time the key place in providing sustainable and effective development of the enterprise should be occupied by innovations.

In order for the innovation activities carried out by the company to meet the modern requirements of the company's stakeholders, in particular investors (shareholders), in the development and evaluation of innovative projects it is also necessary to take into account the factors provided by the investment ESG-criterion, i.e., the possibility of obtaining a positive effect from the implementation of these innovations or minimizing the negative impact of environmental, social and ethical nature.

On this basis, there is a need to consider innovation as a tool to create social value and to allocate a separate class of "socially responsible" innovation.

Summarizing the theoretical foundations and practical aspects of the implementation of socially responsible investing, as well as scientific and theoretical approaches to understanding the es-

Table 5
Comparative analysis of annual returns of companies investing in sustainable development for 2013–2020, %

Asset	Year							
	2013	2014	2015	2016	2017	2018	2019	2020
Chevron Corporation	–39.02	31.58	17.99	–3.83	9.03	10.06	15.42	19.07
MSCI World	–42.08	26.98	9.55	–7.62	8.17	9.14	11.20	14.75
Deviation	3.06	4.60	8.44	3.78	0.86	0.92	4.22	4.32

Source: The author.

Table 6
Comparative analysis of key profitability indicators of companies investing in sustainable development over the period 2013–2020, %

Asset	Sales Profitability	Asset Profitability	Return on Equity
Chevron Corporation	12.72	6.16	16.42
MSCI World	6.27	3.16	5.51
MoRE World/ MSCI World	2.03	1.95	2.98

Source: The author.

sence of innovation and innovation activities of enterprises, under socially responsible innovations in the work it is proposed to understand new or significantly improved products, technological processes, organizational changes, marketing strategies, the implementation of which at the enterprise provides the creation of new value for the enterprise and public value.

This approach allows, firstly, to focus attention on the key role of innovation in providing sustainable development of enterprise and its response to new global risks and opportunities and, secondly, to transform the investment criterion of ESG and move from the level of stakeholders and the formation of investment strategies at the level of the enterprise.

Studying the peculiarities of functioning of enterprises in the sphere of socially responsible innovations, there is often an erroneous opinion about the formation of significantly lower financial performance of such enterprises, because part of the profit is redistributed in favor of society. In reality, the situation is reversed. The growth in world practice of requirements for transparency and disclosure of information by business entities on the direction and nature of their activities to ensure sustainable development has made it possible to form significant statistical databases, allowing making investment decisions more consciously and responsibly.

A study of statistical data (Tables 5, 6) regarding the profitability and profitability levels of businesses shows that companies that are more resource efficient (use less water, fuel and other energy resources, and have lower emissions into the environment) have significantly better results.

Thus, the data in Table 5 show that for companies that are among the top 10% of the real sector leaders in the global economy for resource efficiency, the formation of their annual profitability level indicators during 2013–2020 was characterized by the same trends as for all companies in general, but their actual values of these indicators were always higher.

Similar conclusions can be drawn with regard to the profitability indicators of the studied groups of enterprises (Table 6). Thus, the average values of the levels of return on sales, assets and equity for 2013–2020 indicate that the return on sales and assets of the most resource-efficient enterprises is approximately twice as high as similar indicators summarized for all real sector companies, and the return on equity of such enterprises is almost three times higher than the global indicator.

The obtained results indicate that innovation-active enterprises, which are focused on sustain-

able development, not only ensure the achievement of socially significant goals, but are also able to provide financial advantages to investors in the form of higher return on capital.

One more confirmation of economic expediency of development of socially responsible innovations is the forecast indicators of innovative technologies market growth, including, in particular, implementation of circular supply chains, energy-efficient innovations, renewable energy sources, "smart city" technology.

The development of these areas is not only an opportunity to reduce the level of costs of enterprises and their dependence on the cost and supply of exhaustive resources, including fuel and energy, but also the prospect of creating new innovative products and new markets.

Thus, modern conditions of economic management require enterprises to reorient from ensuring the increase exclusively of their market value to the additional creation of "social value", i.e. satisfaction of certain social, environmental, ethical needs of society in the form of formation of positive effects or minimization of negative impacts. Innovations are the key tool of creation of a social value and maintenance of steady and effective development of the enterprise.

To ensure their competitiveness not only in commodity markets, but also in resource markets and, above all, the capital market, manufacturing enterprises in the process of evaluation and selection of innovative projects must take into account changes in the priorities of shareholders, potential investors and other stakeholders [7]. The growing role of ESG–factors (environmental, social effects and corporate governance) in the construction of investment strategies and the formation of investment portfolios stimulates the introduction of appropriate criteria for the evaluation and comparison of innovative projects.

Today there are several types of investment strategies that can be used in the implementation of socially responsible investments. In turn, enterprises in the process of developing their own innovation policy can also be guided by these strategies in a certain way and give different degrees of importance to the creation of environmental and social external effects along with the formation of an increase in added corporate value and the achievement of the desired financial indicators [12]. For example, due to the traditional approach to doing business, innovative activity is carried out exclusively for the purpose of increasing profits, increasing profitability, entering new markets, that is, its effectiveness is evaluated exclusively by "internal" for the enterprise indicators mainly of financial character. Socially responsible innovations are actually not implemented or are very limited, and all the created surplus value is distributed for the needs of the enterprise itself.

Characterizing modern approaches to enterprise management and the formation of its innovation policy, it should be noted that despite the relevance of taking into account the interests of society in modern business, still the main goal of the business entity remains profit making. Thus, the approach based on the adaptation of the investment ESG-criterion in the innovative activity of the enterprise causes the formation of several basic approaches, which are a middle ground between traditional business and charitable, non-profit activities, depending on the degree of consideration and implementation of the ESG-criterion.

The minimum degree of consideration of ESG–criterion at socially — responsible innovations provides formation of such innovative strategies which put the primary goal of improvement of risk — management in the company, avoidance of corporate conflicts, and also minimization of legal, ecological, ethical risks connected with discrepancy of product policy or technological equipment of the enterprise to existing standard requirements or expected changes in normative–legal regulation [6].

The following strategy of implementation of innovations to ensure sustainable development of the enterprise involves not only a passive response to regulatory requirements and minimization of risks, but also the active use of new opportunities arising from changes in the social, environmental and ethical nature in the external environment. This approach implies the application of innovation selection strategies, which ensure the creation of positive externalities, as well as integrated ESG strategies, which allow combining the financial goals of the company and the needs of society.

Concentration of company efforts on achievement of essential positive effects in a certain direction of realization of socially responsible innovations (for example, on introduction of renewable

energy sources, creation of socially significant innovative products and the like) defines transition to thematic innovations with maintenance of essential growth of public value in the chosen direction [15]. If within the framework of realization of thematic innovations the enterprise carries out development and introduction of new products, it can provide growth of its financial indicators, creation of new markets and consolidation of competitive positions.

Maximum consideration in innovative activity of the enterprise of ESG-criterion leads to change of strategic reference points of conducting entrepreneurial activity and approaching to non–profitable organizations by certain features. This is due to the fact that to achieve a large-scale positive impact in the direction of environmental, social and other socially necessary innovations, part of the enterprise profit is redistributed in favor of creating new social value.

Thus, depending on the chosen strategy of innovative activity the enterprise can focus on the maximum scale of implementation of ESG-criterion, i.e. on creation of positive effects, implementation of socially influential innovations, or on its minimal consideration — ensuring compliance with regulatory requirements and elimination of negative effects.

3.2. Methodological basis of the influence of ESG factors on the stock returns depending on the value of the increase in the aggregate value of the enterprise

The spread of the approach to the combination of corporate and social values in the process of innovative activity of enterprises requires the development and improvement of appropriate methodological support to compare, evaluate and select innovative projects that would simultaneously meet the criteria of both financial efficiency and formation of corporate value, and satisfaction of social and environmental needs and creation of value for society. Classical theories, which reveal the essence and methods of transferring external negative effects, created by enterprises for society, into internal effects (internalization of external effects), are theories of A. Pigou and G. Coase.

A. Pigou regarded external externalities as "market failures", which arise as a result of enterprises focusing exclusively on their own benefits and overproduction of goods with negative externalities, or vice versa — underproduction of goods with positive externalities. On this basis, he considered government intervention in the form of an additional tax on negative effects or provision of subsidies for the creation of positive externalities as the main method of influence on the internalization of externalities. In R. Coase's approach, the method of overcoming negative externalities was not a direct state regulation, but a clear definition of property rights and creation of a free market for their purchase/sale, and thus transferring key resources (water, air) from the category of unlimited to the category of rare ones.

Thus, the considered theories of A. Pigou and G. Coase explain the mechanisms of possible redistribution of negative externalities between enterprises and society with the help of methods of state intervention — through direct establishment of subsidies and taxes, or at the expense of further development of private property — formation of the institution of ownership rights on resources (air, water and others).

However, modern enterprises do not always need incentives from the state, as they gradually become active participants in the process of managing external effects themselves. Therefore, there is an objective need not only for scientific and theoretical substantiation of the mechanism of internalization of external effects, but also for a comprehensive assessment of the total value obtained for society and enterprise from the implementation of socially — responsible innovation.

Significant interest of international organizations, associations and associations (Natural Capital Coalition, World Business Council for Sustainable Development), international financial and analytical centers and companies (PwC, KPMG), as well as the public, public movements and associations (B Lab, Shared Value Initiative, True Price) in the development of socially responsible investing and new standards of functioning of enterprises contributed to the development of a number of methods and recommendations for companies to adopt responsible investing principles and consider ESG factors in their activities [12, 16, 8, 2].

Let's analyze the most popular in the world practice methodologies for assessing the value created by the company for all stakeholders. One of such techniques is "B Impact Assessment" — a set of standards developed by a group of experts

of "B Lab" on various industries and directions of activity.

The work of "B Lab" is based on the belief that in the future the evaluation of the effectiveness of the enterprise will be based on the analysis of its impact on the environment as one of the key indicators along with profitability and other financial indicators of activity [9]. Thus it is necessary to estimate not only sales volume, profit and scales of business, but also the created value for consumers, employees, society and environment.

By its structure, the "B Impact Assessment" methodology includes three components:

Standards — Contains reliable, comprehensive, transparent and independent standards of social and environmental performance that allow businesses to assess the total value created

Indicators — the publicly available performance of other companies which can be used to compare the environmental and social impact of different enterprises and calculate the normative value

Tools — specific practical proposals that allow enterprises to improve their impact on the environment.

Direct development of standards and definition of norms in the group "B Lab" is engaged in about 20 experts who are members of the Advisory Council for the development of standards and are recognized experts in their field and have experience in applying the stakeholder approach in management. The methodology takes into account the interests of different stakeholder groups by, among other things, involving experts representing businesses, government and non–profit organizations.

The advantage of the methodology "B Impact Assessment" is the separation of two separate groups of regulations, standards and tools designed for developing countries and for developed countries. This allows taking into account the peculiarities of the functioning of the markets of each of them and the specifics of the assessment of the created value [12].

Another methodology, which involves a comprehensive assessment of the total value created by the enterprise, "Total Impact Measurement & Management" (TIMM), developed by PwC [2]. This approach applies the most multidimensional view of the sources of creation or reduction of value and takes into account the need to simultaneously meet the needs and requirements imposed on the business entity by consumers, regulators, employees, suppliers, shareholders.

The implementation of the Total Impact Measurement & Management methodology is based on the following basic principles:

A holistic view of value — PwC proposes a comprehensive assessment of the value created (or reduced) by a business in the process for its shareholders and other stakeholder groups relevant to the operation of the business. In particular, it is proposed to take into account social, environmental, economic and fiscal effects: the value created for the local society, the contribution to the economy and public finances through the payment of taxes, the impact on the environment and society, and the like

Understanding impact-using a holistic, integrated approach to value assessment promotes an understanding of the overall impact, outcomes and consequences of alternative strategies, including innovative strategies, and makes it easier to choose the best strategy for all stakeholders

Monetization of impact-one feature of Timm's methodology is to take a value-based approach and give monetary expression to both individual and aggregate indicators. This provides a more reliable and powerful basis for justification of management decisions

Optimization of management decisions — availability of conducted assessments of business options and implementation of alternative innovation and investment projects allows optimizing the decision–making process and ensuring maximum business efficiency [5].

The analysis of risks of internalization of negative external influences, arising as a result of activity of the enterprise, should be carried out taking into account the medium- and long-term perspective and the tendency to increase such risks with expansion of the time horizon of the analysis. According to the results of the second stage of the methodology of true value assessment with application of economic and mathematical modeling methods, forecasts of reflection of the highest identified risks on the financial results of the company are formed.

Taking into consideration that the purpose of functioning of any enterprise should be not only to gain profit in the current period, but also to maintain or increase its volume in the future, so investment and innovation activity of the enter-

prise will be aimed at minimization of the identified risks and formation of conditions for development of the enterprise. Thus, the third stage of the methodology "KPMG True Value" focuses on the choice of investment and innovation projects that can provide the maximum efficiency of the enterprise and include management of the creation of both corporate and public value.

The components of the implementation of the third stage of the methodology "KPMG True Value": identification of possible investment and innovation projects, the calculation of "true value" indicators for each of the projects, comparing the projects with each other and making a decision.

The first component on identification of possible projects may include development of new products, improvement of technological processes or separate operations, changes in sales policy and the like.

It should be noted that the selection of projects that meet the criterion of creating both corporate and public value includes two categories:

Investment (innovation) projects, the implementation of which is aimed at reducing the negative impacts on society and provides a reduction in the cost of the enterprise to pay taxes (for example, for pollution) or penalties, as well as losses associated with the activities of stakeholders and market dynamics

Investment (innovation) projects, the implementation of which is aimed at creating a positive impact on society and provides an increase in income due to the formation of additional competitive advantages, strengthening the brand, employee loyalty, providing tax benefits.

Both of the above investment directions are not mutually exclusive and can be implemented simultaneously.

After all possible investment projects have been formed, their evaluation is carried out, namely direct financial benefits from their implementation and the potential future income from internalization and the creation of additional value for society are calculated.

The final stage of the analysis is the construction of marginal aggregate cost (utility) curves for the projects and a comparison on their basis of the income generated by the implementation of each of the proposed projects. In doing so, depending on the ratio of corporate and societal value, all projects can be assigned to one of three categories:

Projects that are characterized by a positive net cash flow due to direct revenues from their implementation, independent of the creation of social value

Projects for which the positive value of net cash flow is formed only under the condition of taking into account revenues from the creation of public value

Projects, which are characterized by a negative value of net cash flow, but can be accepted for consideration, since they provide the creation of high value for society.

It should be noted that the methodology "KPMG True Value" does not give unambiguous recommendations for the choice of investment (innovation) projects, this choice depends on the priorities of the enterprise to create company profits and value for society [16].

One of the methodologies for assessing the environmental effects of a company's activities is the Environmental Profit & Loss Account, in which all indicators characterizing the company's impact on water, soil, air and the use of other resources are put into monetary terms. The development of this methodology was designed to eliminate the problem of incomparability of data and to provide a unified measurement of indicators, characterizing the level of environmental pollution, carried out by the enterprise at all stages of production and sales of products. Maintenance of the ecological account of profits and losses allows to estimate and compare according to the given characteristics both separate companies and separate kinds of the goods [17].

From the point of view of the subject of management, the cost estimate of its risks and opportunities associated with the level of environmental impact is determined by the amount of payments that are transferred as taxes or mandatory fees for the use of water resources, energy resources, waste management, land use, and the like. In contrast, the methodology attempts to determine the real impact of the enterprise on the environment and calculate the real cost of environmental pollution.

The implementation of the methodology includes several stages, namely:

Analysis of the financial indicators of the enterprise in accordance with the industry affiliation, sphere of activity

Processing of data on the enterprise, compiling its environmental profile, including the calcula-

tion of direct environmental losses and damage in the supply chain

Collection and processing of data about the enterprise from other sources of information (information from governmental and non-governmental organizations on pollution levels and so on)

Determination of priority spheres in which reduction of the negative environmental impact of the enterprise is of primary importance

Expression of environmental impact in cost indicators.

The advantages of forming the environmental profit and loss account of the enterprise are:

Assessment of financial risks associated with limited natural resources and regulatory regulation of this area

Comparing environmental costs of different types of raw materials, production processes, location of facilities, suppliers, and different stages of the life cycle of products

Identifying opportunities to optimize the company's operations, supply chains, and product mix based on resource availability and environmental cost levels

Ensuring transparency of environmental activities of business managers, consumers, investors and other stakeholders.

Among the complex methodologies of aggregate value assessment it is worth considering the approach of the World Business Council for Sustainable Development (WBCSD), which is called "Redefining Value", that is, "revaluation of value". The general basis of the concept of "Redefining Value" formation of true (true) value by determining the true income and real expenses of the enterprise and application of these indicators in the internal and external reporting [**9**].

In order to integrate the concept of creating total value in the process of making management decisions by business entities, it is necessary to make changes in the evaluation and measurement of value, as well as in the formation of financial statements, in particular the allocation of such components as social and natural capital. In order to achieve these objectives, the following priorities have been defined for the organization in the near future:

1) Formation of the conceptual framework — development and consolidation of the key elements of the "Redefining Value" program, definition of basic concepts and the role of integrated value management, identification of existing management tools and target benchmarks

2) Management of natural capital–harmonization of approaches to assessment and measurement of natural capital for the purposes of integrated management of enterprise value and performance, identification of leading methods of assessment and measurement of components of natural capital

3) Management of social capital-harmonization of approaches to the assessment and measurement of social capital for the purposes of integrated management of the enterprise's value and performance, identification of the leading methods for assessing and measuring the components of social capital

4) Improvement of reporting — ensuring interrelation between different systems of reporting and disclosure requirements of governments, non-governmental organizations, stock exchanges, investors; taking into account their focus on the long-term perspective as well as tracing and distribution of innovations in financial reporting that contribute to implementation of an integrated approach to value management;

5) Education, capacity building and exchange — increasing awareness and developing skills among employees of companies to assess, measure and report on the creation of financial value, non–financial influences and dependencies

6) Change of operating rules — advocacy and support to market participants (enterprises, investors, stock exchanges, regulators, etc.), which carry out complex value management according to proposed methodology.

Within the framework of realization of one of directions of the program "Redefining Value", namely concerning management of ecological effects and natural capital, the separate project under the direction of "Natural Capital Coalition" which has received the name "Natural Capital Protocol" was founded [1]. Its development was based on already existing documents in this area, in particular the protocol on greenhouse gas ("GHG Protocol") and the recommendations on corporate ecosystem valuation ("Guide to Corporate Ecosystem Valuation").

The primary goal of this program is to develop a methodological framework for assessing and improving the system of management of direct and indirect impact of business activities on the

state of ecology and natural capital. Taking into account the existence of other methodologies for assessing natural capital, developed both at the level of international organizations and individual enterprises, when applying the "Natural Capital Protocol" the following tasks are solved:

Developing clear and understandable recommendations on the quantitative, qualitative and monetary evaluation of natural capital, relevant influences and dependencies, as well as on the choice of the level of evaluation

To provide a possibility of using the methodology in various areas of business activity (risk management, innovative activity, in the study of new sources of income, etc.)

Creating recommendations for applying the methodology at various organizational levels of management and in various business structures, based on the formation of a value chain

Ensuring the possibility of applying the methodology in all industries and sectors of the economy, as well as in all geographical regions.

So, in general, the methodology of the "Natural Capital Protocol" is not new in the assessment of natural capital and the environmental effects created as a result of business activities. However, it is aimed at the development of existing leading approaches to the management of natural capital, neutralizing the shortcomings and deficiencies and ensuring consistency and comparability of approaches in different industries and geographical regions [18].

Just as the Natural Capital Protocol methodology is limited to the assessment of environmental effects, there are a number of approaches that focus on the management of social capital and solving social problems through entrepreneurial activities. The most popular among such approaches is the concept of Shared Value, which is being developed by the global community of business leaders. The idea of Shared Value is that businesses can benefit economically if they create value for society by meeting its needs.

Using this approach helps to redirect company funds from highly specialized and charitable programs, which have a limited range of impact, to more serious and large-scale projects that can make a tangible impact on improving the functioning of society as a whole. It has its advantages also for development foundations and other agencies on assistance on more effective use by them of opportunities of business sector for economic and social development [11].

The assessment of the social value created can be conducted not only by businesses to analyze the effectiveness of their activities, but also by other actors (investors, trade intermediaries, social protection agencies) for their own purposes. For example, for investors, this information is important in determining the social and environmental risks of investments and in forming an overall investment decision.

Among the most informative indicators that are used to measure and account for the value, which includes social, environmental and economic results of business activities, is the social return on investment — SROI ("Social Return on Investment"). SROI is a relative indicator that reflects the ratio of public benefits expressed in monetary form (social, environmental, economic effects) obtained as a result of the project (changes, innovations) to the amount of costs incurred.

There are two types of SROI — evaluation and forecast.

The first is used to determine the results of investment (implementation of activities) on the basis of actual indicators. Forecast SROI is calculated to estimate the potential social value that can be created by achieving the planned performance indicators or results of project implementation.

The calculation of SROI includes several stages. The first step is to determine the scope of the evaluation and the list of stakeholders in order to establish the boundaries of the analysis and include only the effects and indicators that are relevant to the study. The next step is to build models of the impact of the enterprise's activities on various stakeholders by mapping input, output and outcome parameters.

The third stage of SROI calculation includes statistical substantiation of the relationships identified during the preliminary stage and providing the initial parameters with a cost estimate. Taking into account the results of the third stage of SROI evaluation, those effects and changes are identified and excluded from the study, the occurrence of which is the result of the influence of other factors and parameters and occurs independently of the activities of the enterprise under study.

At the fifth stage, SROI is calculated directly by finding the sum of cost estimates of positive effects created as a result of the economic activ-

ity of the subject, reducing it by the cost value of negative effects, and comparing the obtained result with the volume of investment. This stage may also include an assessment of the sensitivity of the result indicator to the volume of investment. The final stage is reporting, dissemination of the obtained data among the stakeholders of the enterprise, realization of investments with positive SROI and verification of the results. The advantage of the social return on innovation analysis is, first, the possibility of applying this indicator both to the business entity as a whole and to individual types of works, technological processes, products. Secondly, SROI is a universal indicator, as its calculation and application of the results can be carried out by both internal and external stakeholders of the enterprise [8].

Let's summarize the considered documents and methodological developments in the sphere of assessment and management of creation of corporate and public value in table 7.

Taking into account established in international and domestic practice scientific and methodological bases of innovative projects assessment and approaches to enterprise value creation management taking into account external effects of its activity, in the work it is proposed to assess innovative projects taking into account ESG-criterion and the value of created total (corporate and public) value according to such scientific and methodological approach, which involves realization of 5 main stages:

The choice of the enterprise's goal in the implementation of ESG-criterion in innovation activities

Selection of innovation strategy type with consideration of ESG-criterion; identification of types of external effects of enterprise activity and evaluation of the probability of their positive or negative influence in the process of realization of the innovation project with the use of the method of scenarios

Calculation of the value of created social value and total net cash flow from innovation

Verification of compliance of the obtained indicators with the goal of implementing socially responsible innovation and making a decision on the innovation project.

The first stage of realization of the offered methodical approach provides establishment by the enterprise of a desirable degree of consideration of ESG-factors at formation of innovative policy: restriction by performance of only minimal requirements; active participation in creation of positive external effects or priority of consideration of ESG-factors over reception of financial benefits and maintenance of the maximum impact on social development.

Each chosen goal of implementation of socially responsible innovations corresponds to several possible strategies, within which the degree of consideration of ESG-factors is also differentiated. Determination of the strategy for the implementation of innovation activities of the enterprise is the second step in the implementation of the scientific and methodological approach to the assessment of socially responsible projects.

The next step is to identify the types of external effects of the enterprise's activities and assess the likelihood of their positive or negative impact using the method of scenarios. Depending on the industry, scale of production and other features of functioning of the enterprise the composition, types and directions of its influence of externalities (external effects) may be different.

In the most generalized form all the external effects of economic entities can be divided into spheres of influence — economic, social, environmental and others; and by the direction of influence — into positive and negative. The composition and characteristics of the main types of externalities of enterprises in each sphere and direction of impact are presented in Table 8.

It should be noted that in the process of implementation of innovations not all of the expected external effects can actually be achieved. So, if the indicator of corporate value is sufficiently predictable, the formation of public value is characterized by a high degree of uncertainty. This is caused, firstly, by the use of mainly qualitative indicators for its expression and by the complexity of their translation into monetary form. Secondly, the formation of social value is beyond the direct influence of the enterprise, is not controlled by it, and therefore, the planned results may not be achieved due to the action of various external factors, including the activities of competitors, government policies and the like.

The most appropriate method for assessing the possible results of the implementation of an innovative project, taking into account the created

Table 7
Current methodological developments in the assessment and management of corporate and public value creation

Documents and Methodologies	Developer	General Characteristics
B Impact Assessment	B Lab	Contains standards, regulations, and tools that allow companies to assess, compare, and improve the social and environmental effects they create over the long term
Environmental Profit & Loss (EP&L) Statement	IT company BSO/ Origin (Eckart Wintzen)	The first attempt to put a monetary value on the environmental impact created throughout the production process chain
Total Impact Measurement & Management (TIMM)	PwC	A new approach designed to help companies understand the overall impact of their operations
KPMG True Value	KPMG	A methodology that involves 3 steps and allows companies to 1) estimate their «present» profit taking into account externalities; 2) determine future risk–weighted revenues; 3) develop business approaches that create both corporate and public value
Social Return on Investment (SROI)	SROI Network	The methodology is based on generally accepted accounting principles to help manage and understand the social, economic and environmental consequences of an enterprise's activities
Redefining Value	World Business Council for Sustainable Development (WBCSD)	A work program to help WBCSD member companies standardize their tools for measuring and managing their impact on society and the environment
Natural Capital Protocol	Natural Capital Coalition (previously TEEB for Business)	Harmonized methodology for capital assessment in the investment decision–making process
Shared Value	Shared Value Initiative	Management strategy focused on creating business value by identifying and solving social
True Price	True Price	A non–profit socially oriented organization whose purpose is to help multinational corporations, small and medium–sized businesses, nongovernmental organizations, and governments quantify and qualify their economic, social, and environmental impact, particularly at the product creation level

Source: The author.

social value is the method of scenarios, because it allows you to consider different reactions of the market, stakeholders and regulators to innovation, as well as take into account the different degrees of achievement of the social, environmental and economic objectives [19].

Classically, this method involves the development of three basic scenarios: optimistic, realistic and pessimistic. To apply the scenario method, all the external effects created by the activities of the enterprise were divided into highly probable, probable and unlikely.

In this case, comparing the probability of achieving different in the direction of the impact of external effects, it can be noted that the minimization of negative externalities is more likely, because it includes such parameters controlled by the enterprise, as: refusal to produce certain types of products (for example, harmful or hazardous to health products, goods or services of

Table 8
Systematization of the main types of external effects of production enterprises

Scope and direction of externalities		Types of externalities	Characteristic Impact
Economic	Positive	Taxes	Proceeds to the economy from all types of taxes and fees
		Dividends	Securing public wealth by making payments to shareholders
		Interest on Loans	Ensuring the prosperity of the financial sector of the economy through the development of credit
		Wages	Ensuring a stable income and quality of life for employees
	Negative	Tax Evasion	Economic losses due to under–receipt of taxes and fees by budgets
		Corruption	The factor of economic inefficiency
Social	Positive	Infrastructure	Infrastructure development (e.g., roads, energy production and transmission) that improves the quality of life and creates new economic opportunities
		Health Care	Providing recreational wellness services, including to employees and the local community. Providing improved quality of life and overall health
		Education	Providing educational services, including employees and the local community. Providing for the enhancement of productivity and quality of life
	Negative	Low Wages	Not providing workers with enough money to live and maintain a normal quality of life due to a low cost of living, creating unsatisfactory working conditions. Use of child labor
		Health Care and Security	Damage to health, injury or death caused by insufficient funding for occupational safety measures
		Pollution	Damage to the health of workers and the public due to air, water, and noise pollution

Source: The author.

unethical nature); reduction of pollution due to the introduction of new technology and the like.

Positive externalities, on the contrary, can only be categorized as probable or unlikely, since their achievement requires a positive feedback from the market environment.

According to overestimation by the enterprise of possibilities to achieve all positive effects or underestimation of real value of negative effects, which remained, at an estimation of the innovative project will lead to artificial overestimation of an indicator of expected total

cost and acceptance of irrational innovative decisions.

The method of scenarios, which covers the construction of at least three alternative variants of events, allows avoiding the risk of incorrect assessment of the indicator of the expected total cost from the implementation of the project. As part of the proposed approach to assessing socially — responsible innovation, the formation of scenarios was similar to the division of all enterprise externalities on the probability of their occurrence, namely:

Pessimistic scenario of the implementation of the innovation project provides for the coverage of only a small proportion of external effects associated with the minimization of negative externalities, that is, it takes into account only highly probable external effects

The realistic scenario assumes partial achievement of the goals of minimizing negative effects and creating positive effects — when calculating, it covers externalities attributed to high probability and probability

The optimistic scenario assumes that all positive external effects will be achieved, and therefore the high-probability, probable and low-probability externalities are taken into account to determine the total cost indicator.

At the fourth stage of implementation of the scientific and methodological approach to the evaluation of innovative projects, taking into account the ESG-criterion, the key indicators characterizing the effectiveness and efficiency of innovation are calculated for each proposed scenario. For key indicators of evaluation of socially responsible innovations the value of created total value and net cash flow from innovations were chosen.

The algorithm for calculating the first of these indicators, which characterize the financial results of innovations implementation, involves:

1) Formation of corporate value — the amount of profit formed by the results of innovation activity as the difference between the income received and the total amount of costs incurred for the implementation of the innovation project

2) Formation of public value is carried out on the basis of finding the net financial result between positive and negative effects in the context of all spheres of external influence of the enterprise — economic, ecological, social and other

3) Evaluation of aggregate value indicator as a sum of corporate and public value.

The more the enterprise will be oriented to the maximum implementation of ESG-criterion, the greater will be the positive effect and the total value of the actually created public value. Conversely, the failure of an enterprise to ensure a sufficient level of environmental safety will lead to the loss of value of its innovations due to the formation of a significant amount of costs to society.

The traditional indicator of estimation of productivity of innovative projects is a net cash flow. The difference of its formation in the process of implementation of socially responsible innovations is the inclusion in the final indicator as a result of the project directly on the enterprise, and the estimated income in the social and environmental directions.

It should be noted that the assessment of the cost (value) of environmental and social effects is quite subjective and depends on the importance of these factors for the stakeholders of the enterprise.

The last step of the proposed scientific-methodological approach is to check the compliance of the innovation project with the goal of implementing socially responsible innovation. In case the calculated expected indicators of public value, net cash flow taking into account the internalization of external effects and total corporate and public value are consistent with the goal, the chosen innovation strategy and the degree of importance of ESG factors for the enterprise, this is the basis for a positive decision on the implementation of this innovation project.

Thus, the need for enterprises to take into account the social, environmental and economic effects arising in the course of their business activities forms new requirements for the process of selection and assessment of the effectiveness of innovative projects. To perform this task, the paper proposes a scientific and methodological approach to the evaluation of innovative projects, taking into account the ESG-criterion and the value of the created total (corporate and public) value. Its application will allow selecting innovative projects that would simultaneously meet the criteria of financial efficiency and value creation for society.

4. Conclusion

ESG principals have gained a firm ground in the investment decision making for many

modern allocators forcing portfolio managers and even companies themselves to adopt to their demands. Best described as Value Based Investments or VBI, such a strategy relies on the ideas of financing only those projects or companies that benefit the greater causes for humanity such as reduce pollution, promote social equality, or repair the damage done to the environment by toxic industrial production.

Despite their generally negative reputation, companies in the dirtiest industries such as petrochemical can still successfully adopt and implement relevant ESG policies and satisfy the criteria for some ESG mandates imposed by the environmentally conscious investor community. Notably, it is safe to say that the Environmental and Social principals in the ESG trio were originally primarily targeted at companies, whose production processes create the most pollution. It was done in order to incentivize them to limit the poisonous emissions and clean the pollution already caused. Even though, lately, this goal was seemingly replaced by a much more ambitious one of eradicating polluting production altogether, the current state of affairs and the level of scientific advancement prohibits any such radical transitions any time soon. However, the underlying aforementioned principals of still keeping corporations on their toes regarding the use of cleaner production technologies is still sound and can fit certain ESG investment mandates.

Significant uncertainty still remains in the domain of what investors consider as sufficient adherence to the ESG principals, however, numerous recognized protocols exist in order to aid companies and investors to navigate these dark waters more easily. Natural Capital Protocol is one example of such an assessment tool that allows companies to evaluate their dependence on the natural resources. Investors in turn can also utilize the program to gage their interest in a project or company depending on their level of commitment to the environmental agenda.

Overall, adopting ESG practices clearly comes with a set of positive and negative consequences. Thus, among the advantages of those policies are the social and environmental contribution to the planet and posterity inherent to the idea of ESG. Investor confidence generally tends to rise as the company improves its ESG standing and can expect greater institutional ownership from the larger investment houses servicing wealthy clients with the VBI agenda. On the other hand, the costs in the form of capital expenditures and forms of contribution to the social causes can cause the companies to bleed cash and reduce the Free Cash Flow to Firm.

With that in mind, financial and operational health of the companies remain paramount to the investment decision making with or without a high ESG rating of a specific investment target. Only a comprehensive and detailed business valuation coupled with the assessment of the implemented ESG practices can provide a valid glimpse into the potential success of the investment position regardless of its ESG rating. Detailed approach to ESG selection criteria were presented in Chapter 3 along with the recommendations on how to interpret and implement such criteria.

REFERENCES

1. Kozlova M.V., Varavin E.V., Pestunova G.B. Responsible investment as a condition for the development of "green" economy. In the collection: Sustainable development of digital economy, industry and innovation systems. Proceedings of the scientific-practical conference with foreign participation. Edited by D.G. Rodionov, A.V. Babkin, Eds.; 2020:374–376.
2. Knyazeva I.G., Shamsutdinova A.V. European experience of "green" economy functioning and its prospects in the Russian Federation. In the collection: Intercultural Dialogue and Cooperation between the EU and Russia: Experience of Implementing Jean Monnet Projects at Nizhnevartovsk State University. Materials of the International Scientific and Practical Conference; 2019:88–93.
3. Pashayeva S.S. "Green" economy: innovative environmental solutions. *Vector of economy*. 2020;3(45):45–49.
4. Kulikova E.I. Directions of transformation of financial products and services in pandemic conditions. *Entrepreneur's guidebook*. 2020;13(4):64–71.
5. Ashwin Kumar N.C., Smith C., Badis L., Wang N., Ambrosy P., Tavares R. (2016). ESG factors and risk–adjusted performance: a new quantitative model. *Journal of Sustainable Finance & Investment*. 2016;6(4):292–300. https://doi.org/10.1080/20430795.2016.1234909.

6. Hörter S., Mader W., Menzinger B.E.S.G. Risk Factors in a Portfolio Context Integrated Modeling of Environmental, Social and Governance Risk Factors An Innovative Study for Institutional Investors. Risklab; 2010. https://www.yumpu.com/en/document/view/25786699/esg–risk–factors–in–a–portfolio–context–allianz.
7. Nedorezkov V.V. ESG-principles in the activities of Russian credit institutions. In the collection: The development of "green" financing markets in Russia and the world. In: Collection of articles of the I International scientific-practical conference. Ufa; 2020:71–74.
8. Vostrikova E.O., Meshkova A.P. ESG-criteria in investing: foreign and domestic experience. *Financial Journal*. 2020;12(4):117–129.
9. Esaulkova T.S. Foreign experience of socially responsible investment of pension assets. *Problems of Economics and Legal Practice*. 2020;16(3):31–36.
10. Ivanitsky V.P., Petrenko L.D. Development of responsible investments according to the concept of sustainable finance. *Journal of New Economy*. 2020;21(4):63–78.
11. Kolesnikov N.P. Experience of securities market regulation in the USA. *Student's Herald*. 2020;17–5(115):10–11.
12. Henriksson R., Livnat J., Pfeifer P., Stumpp M. Integrating ESG in Portfolio Construction. *The Journal of Portfolio Management*. 2019;45(4):67–81. https://doi.org/10.3905/jpm.2019.45.4.067.
13. Soboleva O.V., Steshenko A.S. "ESG-factors" as a new mechanism for enhancing responsible investment and achieving sustainable development goals. In the collection: Sustainable development: challenges and opportunities. Collection of scientific articles. E.V. Viktorova, Ed. Saint — Petersburg; 2020:246–255.
14. Sergeev A.V. Trends of development of the securities and commodities market in Russia: the results of 2019. *Financial markets and banks*. 2020;2:72–76.
15. Kuznetsova K.A. Managing the implementation of ESG–principles. In the collection: I Open economic readings of students dedicated to the memory of Onishchenko Dmitrii Ivanovich. Materials of the First regional interuniversity scientific-practical conference of students and undergraduates, held as part of the celebration of the 55th anniversary of the Lipetsk branch of Financial University. T.D. Strelnikov, O.Y. Smyslovaya, Eds.; 2021:98–102.
16. Annenskaya N.E., Nazaryants A.A. Responsible investing is a growing trend on the Russian financial market. *Digest-Finance*. 2020;25(4(256)):462–479.
17. CFA Institute. GUIDANCE AND CASE STUDIES FOR ESG INTEGRATION: EQUITIES AND FIXED INCOME; 2018. https://www.cfainstitute.org/–/media/documents/survey/guidance–case–studies–esg–integration.ashx
18. Nochevkina E.A., Gutman S.S. Analysis of green finance markets in Russia and abroad. In the collection: Sustainable development of digital economy, industry and innovation systems. Proceedings of the scientific–practical conference with foreign participation. D.G. Rodionov, A.V. Babkin, Eds.; 2020:387–389.
19. Stotskaya D.R., Muratov R.R. ESG investing and how it is gaining popularity. *Science through the prism of time*. 2020;12(45):69–72.

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Financing of Large Infrastructure Projects: Chinese Experience and Russian Practice

Egor Kuropyatnik

ABSTRACT

The **purpose** of this work is to research the problems of financing large infrastructure projects in Russia and abroad (on the example of China) and suggest ways to improve and develop financing in Russia. The **tasks** of this work are as follows:
Consider the theoretical aspects of financing large infrastructure projects.
Make a solution of the problem distribution of project risks of infrastructure construction in Russia.
Identify the prospects for improving the Russian practice of financing infrastructure projects based on foreign experience.
Explore and find the best financing option for major infrastructure projects.
Find new features of financial instruments in the Russian financial market that may create new condition for infrastructure projects.
In this work **methods** of scientific knowledge have been used such as induction, deduction, analysis, synthesis, generalization, description. The **object** of the research was financing of large infrastructure projects. The subject — problems of financing large infrastructure projects in Russia and abroad (on the example of China).
Keywords: infrastructure projects; Chinese experience; Russian financial market; project risks; policy of sanctions

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Финансирование крупных инфраструктурных проектов: китайский опыт и российская практика

Егор Куропятник

АННОТАЦИЯ

Предмет исследования — комплекс вопросов, связанных с финансированием крупных инфраструктурных проектов в России и за рубежом (на примере Китая). Основная цель исследования: выявление перспектив совершенствования российской практики финансирования инфраструктурных проектов на основе зарубежного опыта; поиск лучшего варианта финансирования для крупных инфраструктурных проектов; выявление рисков проектов инфраструктурного строительства в России; разработка теоретических аспектов финансирования крупных инфраструктурных проектов; разработка рекомендаций по совершенствованию и развитию этого вида финансирования в России; поиск финансовых инструментов на российском финансовом рынке, которые могут создать новые условия для инфраструктурных проектов. В процессе исследования были использованы индукция, дедукция, анализ, синтез, обобщение, описание и другие общенаучные методы.
Ключевые слова: инфраструктурные проекты; китайский опыт; российский финансовый рынок; риски проекта; политика санкций

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Introduction

Infrastructure projects are beginning to become one of the most important elements in the development of the national economies of countries. Unfortunately, over the past decade, a slowdown in its growth rate has become a common feature for all world economies. The economies of developed countries often face the problem of "japanization" or "age-old stagnation" — when there is a situation of slowing down the pace of economic development in conditions of achieving results close to zero interest rates. The growth rates of developing economies show themselves in a similar way. They were also slowed down. The main factor that influences this phenomenon was the deficit of the aggregate demand of the world economy relative to the aggregate supply (according to the IMF, from 1.5% to 2% of world GDP). Consequently, the imbalance, through the imposition of sanctions, has become important for developing economies to fall in oil and commodity prices and a decrease in trade. China, which has been the most powerful driver of all economies over the past 10 years, is experiencing a slowdown in the growth rate of the national economy. As a result, today China is experiencing the formation of the planned reform of the model of economic development of the "Celestial Empire", where the main emphasis should be placed on the development of domestic infrastructure and the domestic consumer market. The construction of high-quality modern infrastructure is urgently needed, first of all, by countries with developing economies. According to the McKinsey Global Institute, the needs of the world economy in infrastructure investments in the period from 2020 to 2030 should amount to $ 57 trillion. According to OECD estimates, the annual demand for investment in infrastructure is $ 3.7 trillion, while about $ 2.7 trillion is invested. Thus, the investment deficit is $ 1 trillion. The problem of the deficit in global infrastructure investment is complex, which is due to relevance of the topic of work.

1. Theoretical Aspects of Financing Large Infrastructure Projects

1.1. The essence and methods of financing large investment projects

"Investment is the usage of financial resources for further profit. Accordingly, an investor is the current owner of funds (an individual or legal entity) who is interested in investing them in a particular object. The essence of investments is identifying the correct investment object, which in the future will be able to bring income and increase the invested capital" [1]. Investing allows for the following as shown on Fig. 1.

Investment projects allow you to make a profit, and for this it is rational to choose and invest in different investment platforms, which are studied in detail and analysed from different aspects: place of registration, term of work, financial conditions,— are selected based on reviews and those that actually pay.

"An investment project is the implementation of investments that contribute to the implementation of an investment idea. Such investments must be economically feasible and expedient, have a certain period and predetermined volumes" [ibid].

An analysis of the demand for products, which will be the result of the implementation of this project, is necessarily carried out. The staff of the enterprise are subject to mandatory assessment and analysis. Is he available in sufficient numbers and whether he has the necessary qualifications. The main point is the assessment of the financial stability of the enterprise.

Justifications are mandatory for state expertise.

The materials developed for the justification can also be used by the customer for conducting sociological research, polls, referendums. On their basis, business plans for credit institutions are developed. Justification is used when receiving subsidies and various benefits.

The larger the volume of investments financed in the project, the more detailed the justification should be. The analysis of financing terms must be thorough and comprehensive. The object of funding should also be critically analysed. The budget of the investment project is compiled and evaluated. It is necessary to clearly define the sources of financing for the investment and construction project and their structure. It is also necessary to draw up a schedule for the receipt of funds.

There is also the concept of a feasibility study for the implementation of a project, it is carried out when the project requires significant capital investments. This analysis is much deeper, it assumes the presence of a large technical part in the justifications, which provides the main technical characteristics of the object, its parameters.

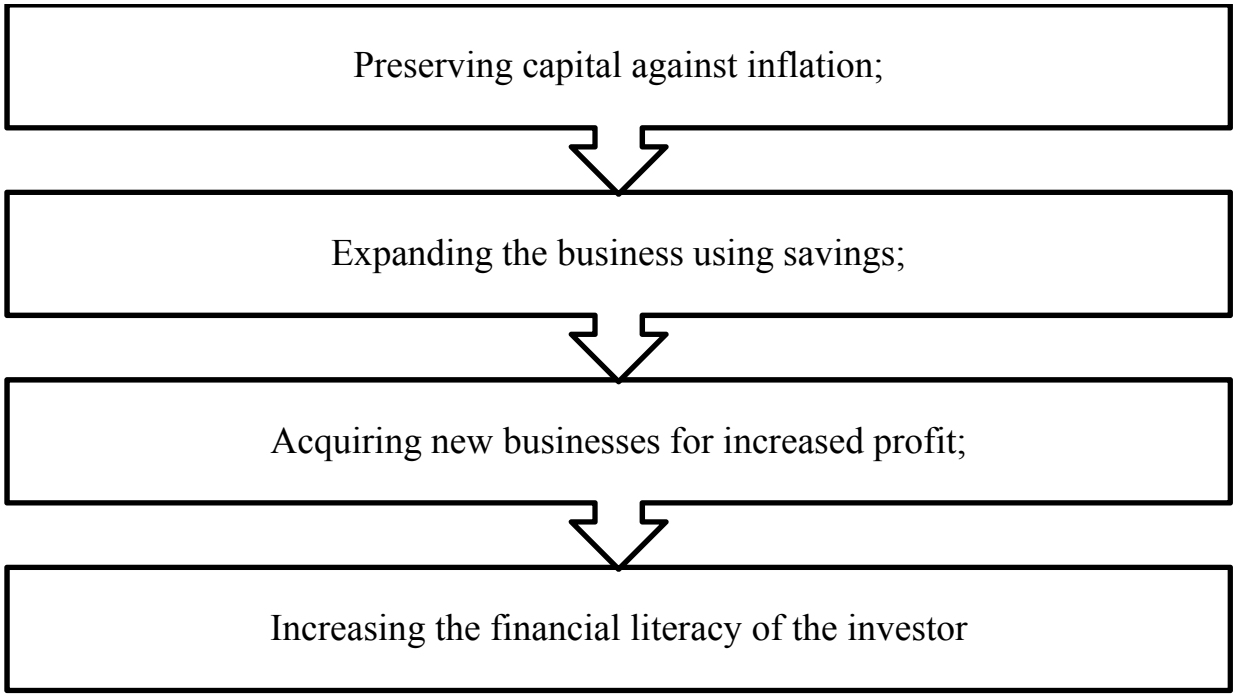

Fig. 1. **Scheme of financing large investment projects**

Source: The author.

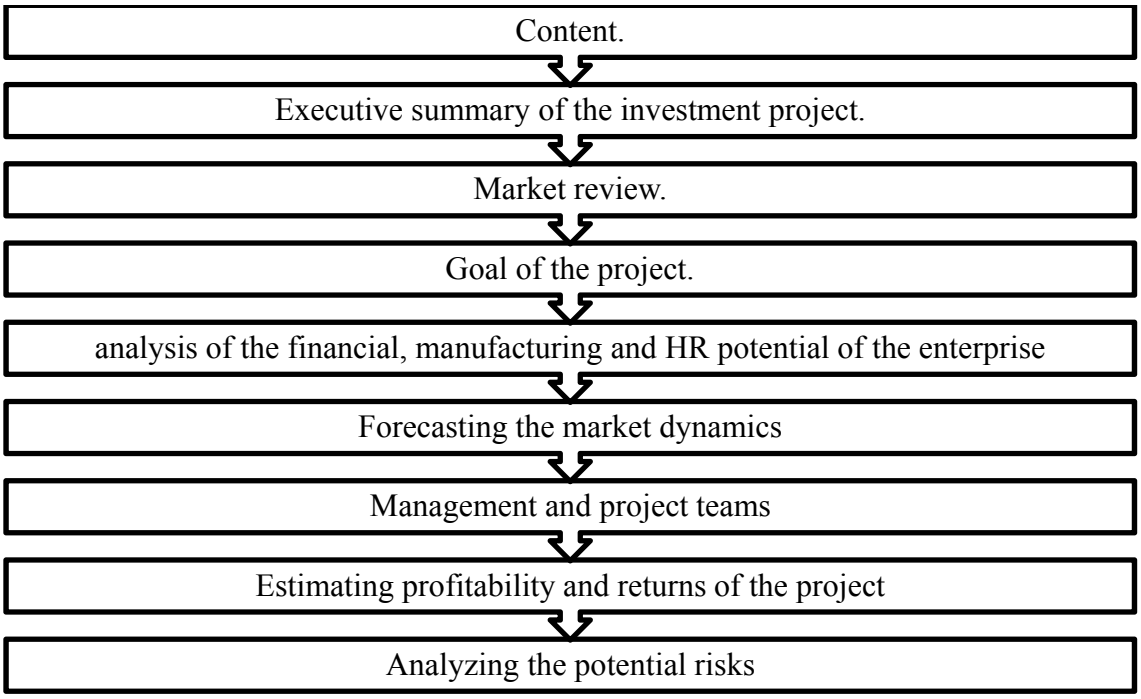

Fig. 2. **9 main stages of an investment project**

Source: Compiled by the author.

The costs that an investor needs to develop a feasibility study range from 5 to 10% of the cost of the entire project.

The resulting document should contain 9 main sections, their title may vary, we offer the following list, presented in Fig 2.

Of greatest interest from the point of view of justification is the stage where it is necessary to calculate the efficiency of investments for the project.

The methodology for assessing the effectiveness of investments contains the calculation of

four main indicators: net present value, profitability index, internal project efficiency and payback period of the project. This methodology makes it possible to assess the effectiveness of investments taking into account the time factor, that is, all cash flows received under the project are discounted, that is, their value is given as of the current date.

For projects that are less than a year old, simple performance indicators are provided: a simple rate of return on a project, a rate of return, and a payback period.

An important component of assessing the effectiveness of investments is the commercial efficiency of the project.

For these purposes, the following formula is used:

P=I/C, (1.1)

where P — is the level of profitability of the project;

I — income from project implementation;

C — project implementation costs.

The efficiency of the investment process is based on effective cooperation in investment, to substantiate such cooperation, the "Methodology for assessing the economic efficiency of investing in real estate" was created.

At the first stage, the cost per unit of housing area should be clearly defined.

It is assessed using the estimated standards that have been enacted in our country and are the basis for calculating the estimated cost of construction.

Based on the cost of one square meter of typical houses and having a conversion factor, the total estimated cost of construction is determined:

Ст=С*К*К1*К2 (1.2)

С — estimated cost of 1 m^2;

К — estimate conversion factor;

К1 — coefficient taking into account the material of the outer walls:

К1=1 — for panel houses;

К1=1,25 — for serial brick houses;

К1=1,3 — for brick houses for atypical projects;

К2 — coefficient taking into account the category of housing:

К2 = 1 — for ordinary housing;

К2 = 1,25 — for houses with improved layout, decoration.

Calculation of the construction cost for a potential investor plays a significant role.

Ci = Ст*Кз (1.3)

Кз — coefficient taking into account the costs of the investor

If the investor does not have enough own funds to implement the project, then the cost is calculated taking into account the loan:

Cik = Ci*(1 + (B*R)) (1.4)

B — a value that determines the share of credit resources from the total amount of capital investments. Practice shows that the share of credit resources should not exceed 30%;

R — average annual lending rate.

Further, if the investor is interested in assessing the level of standard income, the cost price is recalculated again. Construction costs are very high, so the investor is currently setting this level at 35%.

After the final determination of the profitability of the project, the shares of income are redistributed between the investor and the developer. The types of investment projects are described below in Table 1.

Investment projects are further divided into the following categories which is presented below in Figure 3.

It is strategically important to know what the investments in investment projects in terms of amounts are. These are small, medium, large. Small investments do not always bring small profits and too large ones more than those that are borrowed.

1.2. The concept of infrastructure projects and the specifics of their financing

"Infrastructure project — creation/operation of industrial/social infrastructure facilities necessary to ensure the activities of the state and the economy" [1].

The amount of funding for National Projects in Russia is estimated at 25.7 trillion roubles until 2024. Of these funds, about 20 trillion roubles should be directed to the development of infrastructure, including 7 trillion roubles — private investments, while there are no tools for delivering investments to infrastructure. In the world, one of the key mechanisms for the creation, reconstruction, and modernization of infrastructure facilities are infrastructure funds managed by private management companies.

Infrastructure funds can be categorized by type into Exchange-Traded Fund (ETF), Open Mutual Fund (OMF), and Private Equity Fund (PEF). Along with classical asset management companies —

Table 1
Types of investment projects

Type	Description
Short-term	"Experts clarify that the maximum term of work is 12 months, while the project can work for even less, the main thing is that it pays money profitably and stably. On average, such a project functions for 3–6 months" [2, p. 256].
Mid-term	"On average, this is a job for 1–2 years. Medium-term includes bank deposits, business investments, work with mutual funds" [2, p. 256].
Long-term	"These are investment projects that bring profit 5–7 years after the investment, and for Moscow this is a typical option for investing in real estate. Some experts argue that the maximum return on investment should not exceed 2 years. The basic principle of work: the client has a significant period of time for the situation to be corrected in the direction of his interests, or the main goal is gradually achieved" [2, p. 256].

Source: Compiled by the author.

money managers — a separate class of infrastructure management companies — Infrastructure Assets Manager — has emerged on the global market over the past 10 years. Green funds are the trend of the XXI century. According to experts, the number of green infrastructure funds in the world exceeds 500, the total amount of assets is more than $ 200 billion. The total amount of capital attracted to the infrastructure funds of the TOP-10 management companies is $ 175.5 billion, the TOP-30 — $ 303.8 billion. The volume of the 10 largest deals with the participation of infrastructure funds in 2019 exceeded $ 46 billion. The largest deal of 2019 was the purchase of assets in the US telecommunications sector by EQT Infrastructure IV and Digital Colony Partners in the amount of $ 14.3 billion [3].

The universe of infrastructure funds exists due to the fact that this ecosystem contains important institutions that monitor processes, collect information, and assess risks. Systems of external ratings, assessments, monitoring and measurements are the basis for the existence of the universe of infrastructure funds. There are a number of large players on the Russian market, but they are not enough to meet the current infrastructure financing needs. An institute for external evaluation of infrastructure projects is developing in Russia. The range of methodologies of Russian rating agencies is expanding.

The implementation of national projects in Russia is estimated at 25.7 trillion roubles from 2019 to 2024, of which 5.7 trillion roubles are in the field of human capital, 9.9 trillion roubles — a comfortable environment for life, 10.1 trillion — economic growth. Of these, about 20 trillion roubles should be directed to the development of infrastructure, of which, according to the expert assessment of NAKDI, it is necessary to attract 7.5 trillion roubles of private investment. At the same time, when speaking of a "private investor", it is important to clearly understand who it is about, because any money of a private investor, be it a retail investor, corporate or institutional, is regulated separately.

Each type of infrastructure investment requires its own pipeline and machinery to deliver. The expert community should take a proactive position, formulate an understanding of what money is waiting in the infrastructure. At the same time, as a result of comparing the estimates of the needs for investment in Russia's infrastructure in terms of national projects in Russia and the G20 analytical service for the Global Infrastructure Hub, reduced to a single format (period and currency), the difference between the estimates was about 1.5 times. The Global Infrastructure Hub estimates the need for infrastructure investments in Russia at $ 1.8 trillion from 2007 to 2040.

According to the Global Infrastructure Hub, the need for financing infrastructure in the world is estimated at $ 94 trillion by 2040. The analytical service assessed the role of the capital market in financing the infrastructure of 5 countries — the Russian Federation, the USA, the United Kingdom, Brazil, Korea and France. In particular, the availability of financial services is assessed as follows (on a scale from 1 to 7): Russia — 4.4, USA — 6.2, United Kingdom — 6.1, Brazil — 5.2, Korea — 4, France — 3. Domestic credit to the private sector

Aimed at creation, development and modernization of business
By type of participatio - direct; indirect. The investor (direct) defines the general trend, or a consultant, the fund manager (indirect).
By profitability - low, mid and high
By liquidity - low, mid, high, and illiquid
By payback period - 1 month. 2-6 months. 6-12 months. Over 5 years.
By nature of usage - primary; reinvestment; disinvestment.
Direct investment. Reinvesting capital and profit. Extracting part of the capital for further usage.
Investment territory - internal and external
Companies and projects registered in domestic jurisdiction or abroad
By forms of ownership - private; governmental; mixed; foreign; mixed.

Fig. 3. **Classification of investment projects**

Source: Compiled by author.

in% of GDP is estimated as follows: Russia — 56.4, USA — 190.4, United Kingdom — 134.5, Brazil — 67.9, Korea — 140.6, France — 95.7. Local equity financing on a scale of 1 to 7: Russia 3.1, US 5.5, United Kingdom 5.4, Brazil 3.4, Korea 3.9, France 4.7. Total value of shares in circulation in% of GDP: Russia — 7.9, USA — 224.7, United Kingdom — 78.8, Brazil — 26.7, Korea — 91, France — 41.3.

The cost of closed infrastructure transactions with foreign capital,% of GDP: Russia — 0.7, USA — 0.3, United Kingdom — 2.1, Brazil — 0.6, Korea — 0.1, France — 0.6. These countries have different strategies and scenarios, but there is a common feature in all these countries except Russia — a positive answer to the question "Do foreign or domestic institutional investors invest in infrastructure, such as pension funds or insurance companies?"

There are separate projects and cases in Russia, but no single market has been formed — the market must have common rules and attributes. In the world, the largest volume of investments in infrastructure among institutional investors falls on the sector of pension funds, in second place are insurance companies, in third — sovereign funds.

In Russia, one of the main mechanisms for the implementation of infrastructure projects with the involvement of a private partner is concession agreements. According to NAKDI [4], as of November 30, 2019, 268 concession projects are being implemented in Russia with a total volume of investment obligations of 1.87 trillion roubles. Of these, 19 concession projects are financed through bond issues with the attraction of funds from institutional investors. 11 issuers-concessionaires carried out 33 issues of concession bonds for the amount of 94.9 billion roubles.

The bulk of infrastructure financing occurs without the participation of institutional investors. In world practice, infrastructure funds are one of the main mechanisms for financing infrastructure. Infrastructure funds can be categorized by type into exchange-traded funds (ETFs), open-ended mutual funds (OMFs), and closed-end investment funds or private equity funds (PEFs). Infrastructure ETFs, with rare exceptions, are automated funds. Stock indices are used, which are created by several leading analytical services.

On their basis, the largest management companies in the world presented investors with hundreds of options for portfolios of securities, united by industry or regional principle, according to the level of capitalization or the generosity of the dividend policy. As a rule, OMFs are actively managed, and the index funds existing in this class do not have infrastructure specialization. The benchmarks are chosen as management benchmarks — either the yield on government bonds, the behaviour of indices, or the indicator specifically set by the organizers of the fund as a percentage per annum. PEF is, in fact, a project financing instrument that is actively developing in the world. The mechanism of closed infrastructure funds, which allows distributing risks among several participants and structuring a pool of projects for managing risk portfolios, made it possible for long-term conservative investors to enter the infrastructure at an early stage and claim higher profitability on projects compared to the operational stage. If you look at the investors in most large infrastructure projects, the list will include infrastructure funds. Also, consortia that organize financing of large infrastructure projects, as a rule, contain infrastructure funds inside.

As of the end of August 2019, according to NAKDI, there are: — 125 infrastructure ETF funds with assets of about $ 55 billion. Among them are funds founded by management companies BlackRock, First Trust, Invesco Investment Management, Lyxor, Asset Management, State Street Global Advisors,— 500 OMF funds with a volume of about $ 212 billion, including funds founded by management companies AMP Capital, Amundi, First State Investments, Macquarie Infrastructure and Real Assets, Valu, Trac Inv Management Limited, 1 All data on concession tenders and the implementation of concession projects have been prepared based on information from 1,500 private funds with assets over $ 1 trillion, including funds founded by management companies Macquarie Infrastructure and Real Assets, Global Infrastructure Partners, Brookfield Asset Management, AMP Capital, Allianz Group.

The constellation of private funds is actively growing: in the market for a decade of development of infrastructure investments through funds, a separate group has already been formed, a separate type of management companies, Infrastructure Managers, along with classic Money Managers. They stand out in a separate group with their TOP lists, ratings, and so on.

In particular, TOP-10 management companies in terms of capital raised to infrastructure funds over 10 years, according to Preqin, attracted $ 175.5 billion, and the TOP-30 largest management companies in the world — $ 303.8 billion. Information and analytical service IPE, which monitors the process the formation of a new type of managers, in 2018 for the first time presented the TOP-75 of the largest infrastructure management companies in the world. According to the results of the second rating, there was a trend towards a significant increase in the average volume of transactions and the consolidation of infrastructure funds. In the market, in particular, two giants of the industry are being formed with targeted fundraising of about $ 20 billion each. Asset managers Brookfield Asset Management and Global Infrastructure Partners expect to break both market records and their own accomplishments.

The FTSE Infrastructure Indexes are calculated by the British analytical company FTSE Russell, part of the FTSE Group, jointly owned by the Financial Times and the London Stock Exchange. The indices, based on stocks of companies in the basic infrastructure industries, include stocks of public companies in both developed and emerging markets, which generate 65% of their revenues from ownership of infrastructure assets.

The FTSE series consists of nine indices covering six infrastructure subsectors: telecommunications, energy, transportation, transportation, communications, materials and engineering. The indices track over 800 stocks from over 40 developed and emerging markets, including basic infrastructure and infrastructure-related sectors, allowing investors to tailor risk based on their investment goals and risk appetite. Infrastructure indexes MSCI are calculated by the international company Morgan Stanley Capital International (MSCI), which is owned by the American investment bank Morgan Stanley. All components of the index are classified in one of thirteen sub-sectors in accordance with the Global Industry Classification Standard, which are grouped into five key infrastructure sectors: telecommunications, utilities, energy, transport, and social infrastructure. Along with global and regional indices (Europe, Asia), the MSCI line includes infrastructural indices of individual countries — the USA, Japan, India, etc. [4].

S&P Infrastructure Indices are developed by one of the world's largest providers of indices and analytics — S&P Dow Jones Indices. The company has developed several real asset indices reflecting the value of stocks and fixed income companies in the energy, transportation, utilities and telecommunications industries. Dow Jones Brookfield Global Infrastructure Broad Market Corporate Bond Index, which tracks the exchange value of corporate bonds, is one of the largest indices in infrastructure with a portfolio of about 1.2 thousand companies. A distinctive feature of the infrastructure indices of the S&P family is the relatively high share of securities of the utilities sector — from 30% to 51%. The Morningstar Sustainability Rating allows investors to assess the extent to which the companies in the fund's portfolio are managing environmental, social and governance factors. The approach allows us to identify sustainable funds, even if they do not position themselves as products that support the ESG-investing approach.

For investors, the most valuable source for making decisions on projects is Databases, in which disparate information is unified and structured into formats that are convenient for analysis. The historical accumulation of information is especially valuable for rating agencies and analytical structures that develop and administer indices, benchmarks and other indicators. Among the information and analytical services on the infrastructure funds market, there are: ETF database, Preqin, Bloomberg, Infrastructure Investor, IPE (Investment & Pensions Europe), IJGlobal, Morningstar. They structure, bring together in a single database, translate the entire infrastructure market into the language of analytical products. Products and information collected in databases allow investors to assess the prospects and risks of investing in certain assets.

According to NAKDI estimates, NPFs in Russia will be ready to purchase shares of "infrastructure funds" (in the amount of no more than 5% of assets for each unit investment fund) using pension reserves and pension savings in the event that more than 80% of the mutual fund are bonds or financial liabilities (loans, deposits) having an acceptable rating level from an authorized rating agency. In addition, in order to attract NPF funds and increase the reliability of pension investments, it is necessary to organize the work of infrastructure funds on the principles of "capital call", which provide for the presence of the investor's obligations to make the next instalment on demand under the previously concluded agreement. Thanks to this scheme, the fund does not have a problem of what to do with unplaced funds, and the money is not frozen.

The most popular way of financing large infrastructure projects — public-private partnership (PPP) — is a form of cooperation between the state and business, based on pooling resources and distributing risks in order to create infrastructure or provide services to the population.

The relevance of PPP is the ability, even in tough conditions of budget financing, to implement important public projects in a short time, as well as to increase the efficiency of such projects through more mobile and innovative private business.

Indicators for the implementation of PPP in the Russian Federation in 2020:

At the beginning 2021, almost 3.1 thousand concession agreements in force of completed upon expiration

The total volume of investment liabilities is over 1.7 trillion roubles

Of which 1.2 trillion roubles (over 70%) — are off-budget investments

One third of concession agreements at the initial stage (design or construction), this is 61% of the total investment obligations

Investment liabilities account for only 1.6% of Russia''s GDP in 2019 (for comparison, in the UK 6.6%, in Australia and New Zealand — 6.9%, in Canada — 8.1% of GDP)

Concession agreements are used to attract investment in infrastructure in 81 out of 85 constituent entities of the Russian Federation

10 leading regions signed over 100 concession agreements

42% of investments within the framework of federal concessions, of which 96% — in transport infrastructure

94% of concessions are concluded at the municipal level, of which 93% are in housing and communal services

32 major agreements with investments over 10 billion roubles

93 agreements with an investment volume of 1–10 billion roubles

The average term of a concession agreement is 12 years, in the transport sector — 21 years, in the social sector — 22 years [5].

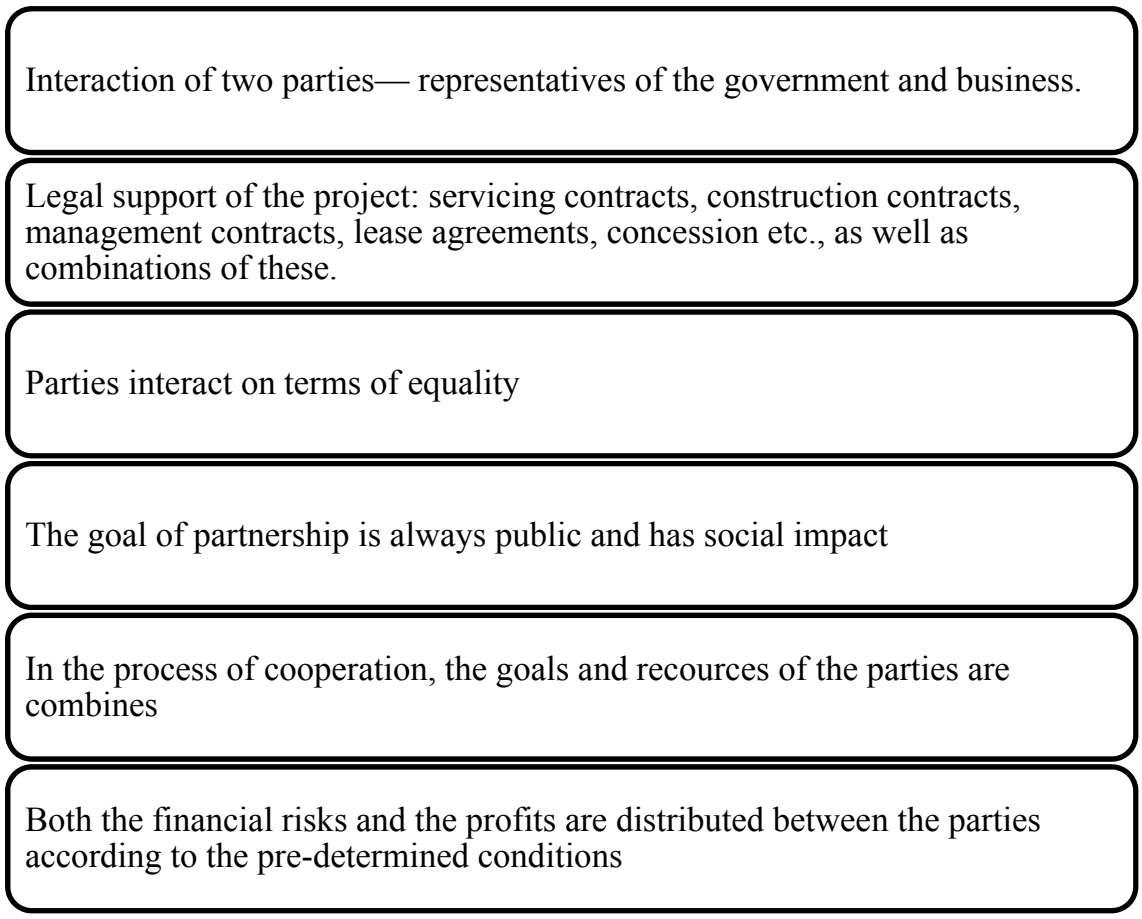

Fig. 4. **Economic indicators of public-private partnerships**

Source: Compiled by the author.

Economic indicators of public-private partnerships are presented in Fig. 4.

Problems of PPP Projects Implementation in Domestic Conditions are presented in Figure 5.

In Russia, 2769 projects worth 722 billion roubles are being implemented in the communal sector, and they are concentrated mainly in municipalities.

According to the level of development of the sphere of public-private partnership for 2020, in the top ten Samara region, Moscow, Moscow and Nizhny Novgorod regions, Perm Territory, Khanty-Mansi Autonomous Yugra Region, Sverdlovsk, Tambov, Irkutsk, Novosibirsk regions.

1.3. Problems of financing large investment projects at the present stage in the context of a pandemic

The Covid-19 crisis has significantly suppressed global economic activity. In 2020 alone, eurozone GDP dropped by 7.5%, while average global GDP showed a 4.5% contraction (OECD, 2020). Many governments have stepped in to cushion the impact on households and business. Much of the spending has been to ensure businesses are still viable once authorities can safely remove the restrictions imposed on social and economic activity to limit the spread of the virus. This will enable activity to bounce back but full economic recovery will require additional stimulus. Infrastructure investment is one path to achieve this and is widely regarded as an effective way to spur economic activity.

Infrastructure projects can become one of the economic victims of the pandemic — many of them can be rehabilitated. Reducing costs due to infrastructure looks logical: why start another megaproject, the payback of which will stretch for many years, if it can be postponed to a more favourable period, and the funds can be spent on patching holes in the budget? Moreover, not only the coronavirus, but also the strongest drop in oil prices has dealt a blow to government revenues.

"According to the forecast of the Ministry of Finance, the budget deficit in 2021 will be about 4% of GDP, experts say about 7%. The recession will

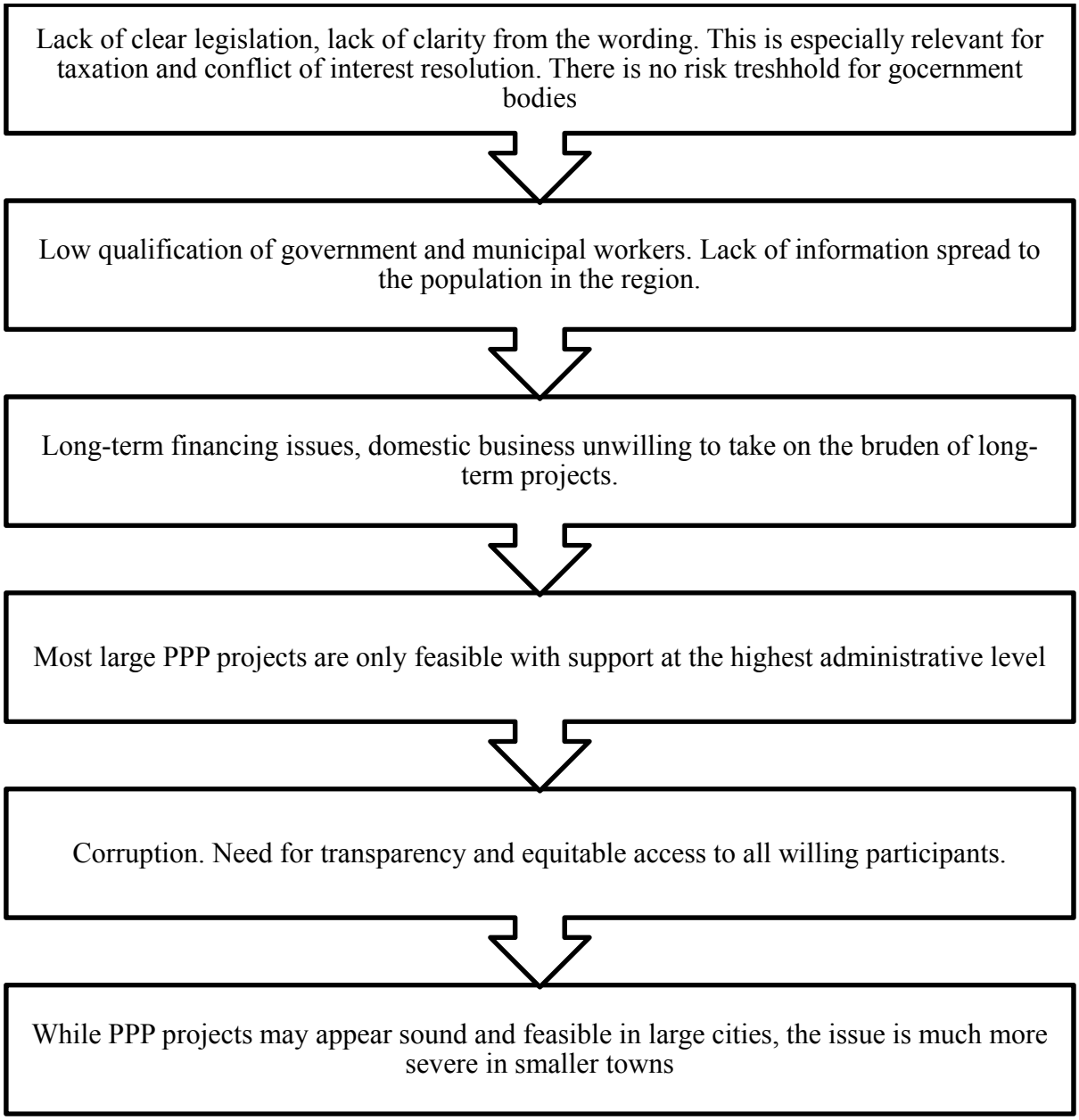

Fig. 5. **Problems of PPP Projects Implementation in Domestic Conditions**

Source: Compiled by the author.

be accompanied by an increase in unemployment, inflation and bankruptcies of small and medium-sized enterprises, a decrease in real incomes of the population. more effective methods than cutting infrastructure spending Large countries, both in the past and now, in the fight against the crisis, are betting on the accelerated development of public infrastructure — both at the expense of the budget and at the expense of private investment, reserves are unpacked, business funds are attracted on the principles of public-private partnership (PPP). And this, as practice shows, not only does not worsen the state of the economy, but, on the contrary, helps to move faster from recession to growth".

"In response to the global crisis of 2008, China allocated $ 586 billion (or 12% of GDP) for the development of transport infrastructure and projects in housing and communal services, ecology and energy. This allowed a return to GDP growth of almost 9% in 2009. In 2008, India attracted more than $ 13 billion through government bonds and loans from international financial institutions and used these funds to finance concessional lending for infrastructure projects and subsidize interest rates for loans for PPP. The measures taken allowed the Indian economy to achieve GDP growth of almost 9% as well" [5].

And now some countries have decided to overcome the consequences of the pandemic crisis in

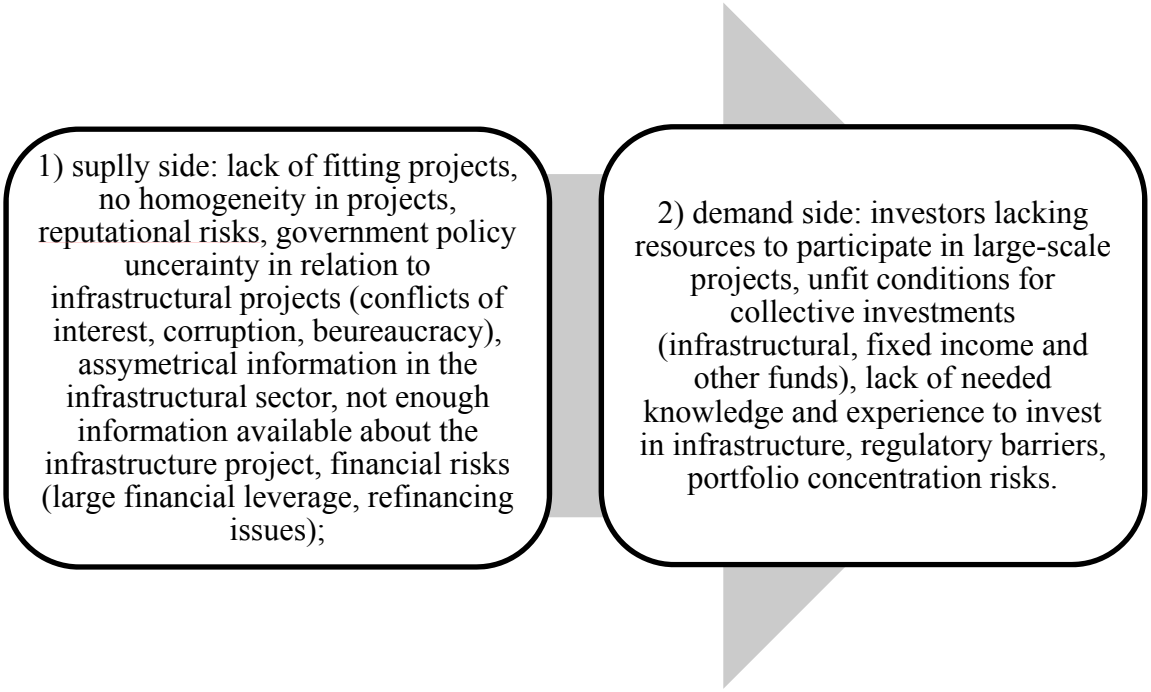

Fig. 6. **Barriers to Investment in Infrastructure Projects**

Source: Compiled by the author.

the same way. China will allocate 7.6 trillion yuan (or over $ 1 trillion) from the budget to support infrastructure projects by the end of the year; Brazil will support projects in the transport sector for more than $ 5 billion; The US is ready to inject an additional $ 2 trillion into infrastructure alone.

"Fundamental support measures are needed — co-financing from the state, load guarantees, long-term project financing. We also need systemic changes that would increase investor confidence in the state. Conceptual revision of the entire budget planning system and reorientation of part of national projects to attract private investment on a return basis, i.e., changing the rules of the game, taking into account the current realities. Now, in most national projects, expenses go through the classic state order, although it would be quite possible to organize a PPP" [6].

The barriers to investment in infrastructure projects can be divided into supply and demand barriers as shown in Figure 6.

The above barriers meaning an infrastructure investment are difficult to overcome, especially for investors in emerging markets with low liquidity and high financial risks.

Therefore, this chapter considers the various definitions of infrastructural project financing, as well as assesses the various specifics of large investment projects in general. A detailed reasoning for economic and financial cooperation in financing large investment projects is considered, and a detailed literature review of domestic and international experience in this regard is conducted.

The notion of Public-Private Partnership (PPP) is deeply discussed in various aspects, and special attention is payed to the problems of implementing such public-private cooperation initiatives in the domestic domain. It is noted that fundamental support measures are needed for the PPP sector to further develop in domestic and international. The proposed measures for such improvements are market co-financing from the state, load guarantees, long-term project financing.

Various barriers to large-scale investment and infrastructure projects both on the supply and demand sides are assessed, among which are ack of fitting projects, lack of homogeneity in projects, reputational risks, government policy uncertainty in relation to infrastructural projects, as well as investors lacking resources to participate in large-scale projects and unfit conditions for collective investments are pointed out.

The projects that are most likely to deliver the required economic stimulus are those already in the pipeline, with cleared planning and environmental approvals, awaiting only funding. Maintenance backlogs in particular are suitable targets. Attempts to bypass consultation and approval

processes for less advanced projects can be highly counterproductive, resulting in legal challenges and lengthy delays. New mega-projects cannot be expected to deliver anything in the timescale required. The necessary critical investment mass should be achieved by a large volume of smaller projects that can be initiated quickly, including maintenance projects. Distributing funds to local authorities for disbursement can enhance the speed of project delivery. The infrastructure stimulus should be publicly financed: making PPPs a major part of a stimulus package would be counterproductive. Finally, project selection should also take careful account of long-term policy priorities, especially addressing social equity, decarbonisation and the resilience of transport systems.

2. China's Experience in Financing Large Infrastructure Projects

2.1. Features of the financial and economic systems of China and the countries involved

Consider the model of the PRC's economic development under Deng Xiaoping.

"Deng Xiaoping died in China on February 19, 1997. The man who, in just a few years, turned China from a poor country that knew first hand about hunger, into one of the world's economic leaders. In terms of his historical significance, he is perhaps slightly inferior to his predecessor, Mao Zedong, nevertheless, he can confidently be called one of the main politicians in the history of the twentieth century" [7].

"Deng Wengming was born in 1904 in a small village in a fairly well-to-do family. His parents were strong middle peasants, and his father, moreover, had a university education. Therefore, from childhood, he strove to orient his son to study. Deng studied at one of the best schools in the province. he changed his surname Wengming to Xixian. The surname Xiaoping, by which he became known to the whole world, is actually a nickname that he adopted as an adult. Literally it translates as "small bottle". His height was indeed quite small, just above 150 centimeters)" [8].

After studying at school, he managed to get into the student study program in France. Together with a group of Chinese students, he left for Europe. Although Dan's parents were not poor people, they could not fully support him in Europe, and he had to earn money. The future Chinese leader had a chance to work as a worker at the Renault plant and as a waiter.

"At the same time, together with other students from Asian countries, he fell under the influence of leftist ideas. Many students from Asia studied in France, and many of them were infected with communist ideas. There he met with Zhou Enlai, one of the most influential Chinese communists in the future and the only person who had a lot of influence on Mao who did not like to listen to anyone. Under the influence of his comrades, Deng joined the newly formed Chinese Communist Party, which at that time had only a few hundred members. He spent seven years in France. The reasons for leaving the country have not yet been unequivocally established. According to one version, the French police became interested in him, according to the other, he was invited to study in Moscow" [9].

Let us present the main points of the success of the economic model laid down by Deng Xiaoping:

"Throughout his career, Deng Xiaoping has consistently and firmly insisted that the Chinese Communist Party should lead the policy of reform and opening up. This principle has been and remains a framework for reforming Chinese statehood today, guaranteeing Deng Xiaoping the position of one of the founding fathers." modern Chinese state. China is an extraordinary country in many respects. It combines such seemingly incongruous features as adherence to ancient traditions and communist ideology. Features of the Chinese economy allowed this country to break out among the states with great prospects" [10].

This country can be called one of the oldest states in the world. It occupies an area second only to the Russian Federation and Canada, equal to 9.572 million square meters. km. The Chinese are the largest nation on Earth, with a population of over 1 billion. In view of the shortage of fertile land, all even inconvenient areas are used for the needs of the population.

Since ancient times, the Chinese state has developed under the influence of Buddhist philosophy and Confucianism. Many principles laid down by Confucius himself are strictly observed today. It is safe to say that it was they who influenced the peculiarities of the development of the Chinese economy. This distinguishes this state from other Asian countries. The main differences include:

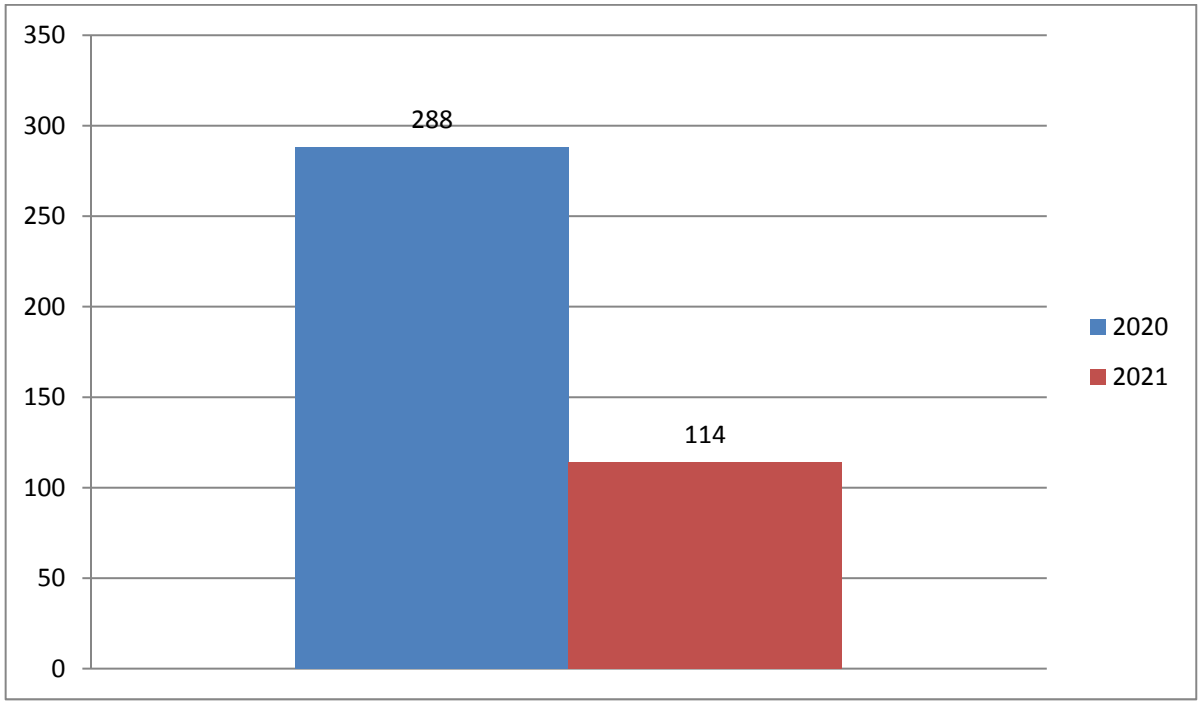

Fig. 7. **Railway investments in China, mln USD**

Source: Compiled by the author.

Ability to absorb the positive experience of other countries, adapt to new times

Simultaneously observance of religious and cultural traditions

Placement of the state at the head of the entire system, active participation of the people in its life

Using socialist norms to bring the country to the top

Strict control over the elements of power, constant checks to ensure compliance with the rules

Taking care of nature in order to protect and preserve it.

The peculiarities of China's economic development at the present stage have made it possible to achieve GDP equal to 1 trillion. dollars, which significantly exceeds Russia's GDP. At the same time, GDP per unit of population is much less than in our country. Thanks to its large reserves of minerals, China is a major industrial center.

In addition, agriculture is significantly developed in this country. China can be called one of the main producers of silk and other textile products. All these achievements took place under the sign of socialism, so the country's economy is somewhat different from similar ones in other countries. As a result of the combination of all of the above factors, the Chinese economy has acquired peculiar features. The peculiarities of China's mixed economy are such that the state actively participates in the economy, by about 60%. Apart from the state, private capital plays an important role in the economy. For China to play the role of world leader, it needs the internationalization of the yuan, and for that it needs deep financial markets.

2.2. Description of the main methods of financing infrastructure projects abroad

Beijing recently authorized large infrastructure projects to include special bonds issued by provincial governments as part of project capital, which can then be used to secure bank loans that will cover railways, highways, and energy and gas projects, among others.

China is shifting its focus to infrastructure investment, abandoning the corporate tax-cutting approach that the government has favored in previous years.

The country does not expect significant further tax cuts in 2021, although the effect of the tax cuts will continue this year. In 2021, infrastructure will be the "key beneficiary" of fiscal policy. This change is necessary because tax cuts have a weaker multiplier effect in stimulating economic growth than direct government spending.

China to invest $ 114 billion in railways in 2021. China approves a number of infrastructure projects to stimulate growth China will intensify local government bonds to support the economy The

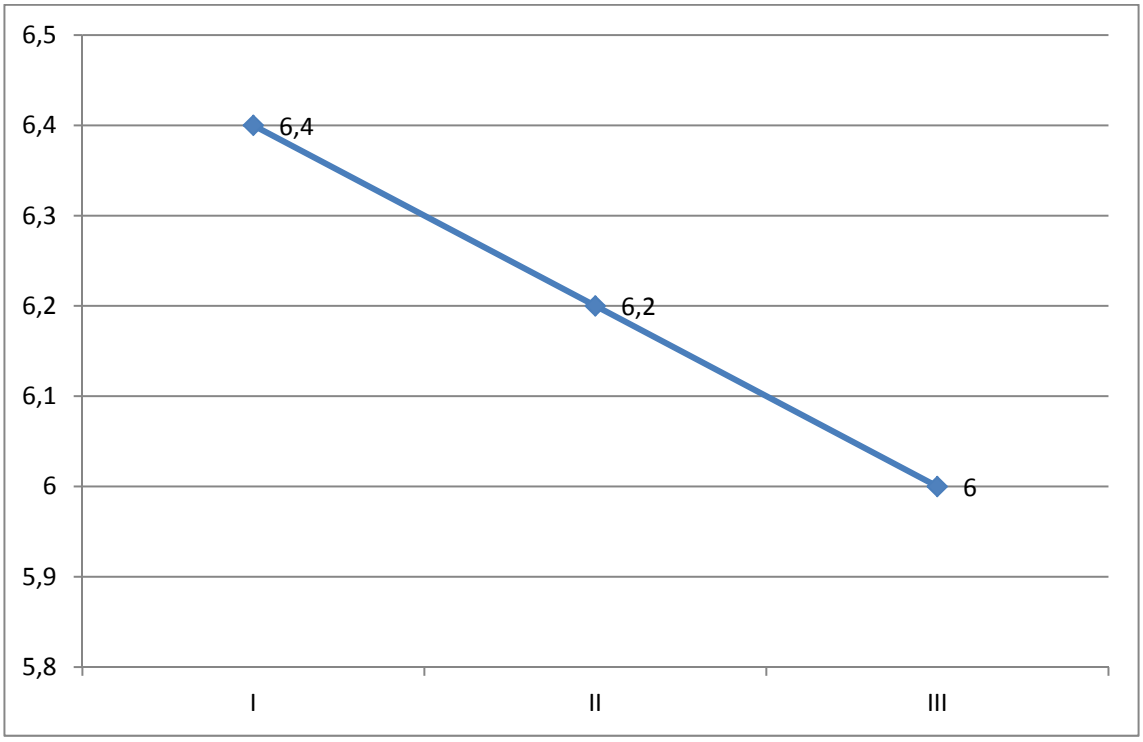

Fig. 8. **Change in China's 2020 GDP by quarters, %**

Source: Compiled by the author.

Chinese government announced this month that it has achieved its target of tax cuts for businesses and households by more than 2 trillion yuan ($ 288 billion) in 2020, boosting economic growth by about 0.8 percentage points. For instance, railway infrastructural investments in China for 2020–2021 are presented below in Figure 7.

However, growth in corporate profits and investment in manufacturing has not improved significantly, raising doubts about the effectiveness of the measures taken. The world's second largest economy has faced downward pressure amid weakening investment and consumption and a trade conflict with the United States.

In the first quarter of 2020, China's GDP grew by 6.4%, in the second quarter — by 6.2%, in the third quarter — by 6%, at the lowest rate since 1992. The Chinese GDP trend is presented below in Figure 8.

In November, the Chinese authorities moved 1 trillion yuan from the 2021 local government special bond quota to 2020 to stimulate the economy. The PRC Ministry of Finance said local governments should ensure that special purpose bonds used to finance infrastructure projects are issued and used as early as possible.

Meanwhile, China will take a focused approach to increasing investment and will not resort to massive incentives to develop infrastructure. China's investment in infrastructure projects in 2021 is likely to increase by 5% over the previous year.

The PRC expects more active financing of projects with the help of funds attracted by local authorities through the placement of special bonds, since part of the money raised last year will be used this year.

Investment in 2021 will focus on urbanization, environmental protection and transport infrastructure projects.

In 2021, China will increase investment in infrastructure.

China's investment in fixed assets in the transport sector skyrocketed in the first two months of 2021. According to the PRC Ministry of Transport, the total investment reached 271.7 billion yuan (about $ 40.44 billion), an increase of 8%.

RMB 191.1 billion was invested in road construction, up 4.9%. The fastest growth rates of investments — 27.2% — were recorded in the field of waterways.

During the next five-year plan, China is planning huge financial investments in the national technological infrastructure. Until 2025, about $ 1.6 trillion will be invested in infrastructure. The money will go to the development of 5G networks, charging stations for electric vehicles, AI and other

innovations that will help develop the economy, science and technology in China.

According to the Chinese Academy of Information and Communication Technology, technology infrastructure spending will account for approximately 10% of the country's total social infrastructure spending. In light of the global spending on IT infrastructure, Chinese investments also appear to be sub-record. So, according to Gartner forecasts, for example, this year alone, the entire world will spend $ 3.75 trillion on technological infrastructure, while China will divide $ 1.6 trillion over five years.

Nevertheless, a spurt in investment in China will still occur, as annual investment in IT infrastructure will double compared to the costs in the previous five-year period. And it will bear fruit. However, the Chinese authorities are aware that US sanctions may interfere in something and somewhere. To counter the threats, an import substitution program has been proposed, but whether it will help or not to say today is very premature.

Returning to the "new infrastructure initiative" that is starting to be implemented in China this year, we note that it is divided into seven main sectors: 5G communications, charging equipment for new energy vehicles, including hydrogen stations, data centers, AI, ultra-high voltage transmission lines to provide efficient energy supply with high capacity, high-speed long-distance rail networks and the development of industrial Internet for connected factories.

"China's new policy could add $ 13 billion to $ 19 billion in project capital from the issuance of special bonds, and while the country has pledged that the use of earmarked bond proceeds for project capital will be closely monitored, it remains a serious risk. This is because this debt is ultimately the responsibility of the government, even if it is classified as project capital. Engineering experts expect that, with the new stimulus measure, the leverage ratio of local governments will rise to 3% from 2018 levels, reaching 23% of GDP by 2020, and with that, it looks like China will again go on its old paths of accumulating debt and increasing its risk" [9].

From an econometric point of view, a panel regression with fixed effects is suitable for studying the dependence of the level of investment in PPPs in the fields of energy and transport.

Thus, the model is initially defined:

$$Inv\_T_{it} = \beta_0 + \beta_1 GNI_{it} + \beta_2 FDI_{it} + \\ + \beta_3 g\_debt_{it} + \beta_4 p\_debt_{it} + a_t + a_i + \varepsilon_{it} \quad (1)$$

$$Inv\_E_{it} = \beta_0 + \beta_1 GNI_{it} + \beta_2 FDI_{it} + \\ + \beta_3 g\_debt_{it} + \beta_4 p\_debt_{it} + a_t + a_i + \varepsilon_{it} \quad (2)$$

where,

β_0 — is a constant

GNI_{it} — is gross national income (current US$)

FDI_{it} — is foreign direct investment, net (BoP, current US$)

g_debt_{it} — is external debt stocks, public and publicly guaranteed (PPG) (DOD, current US$)

p_debt_{it} — is external debt stocks, private non-guaranteed (PNG) (DOD, current US$)

a_t — time fixed affect

a_i — country's fixed affect

ε_{it} — error

Regression was conducted on the 12 countries for which a sufficient number of values of the variable under study were presented in the database of World Bank: Turkey, Peru, Philippines, Russia, Malaysia, Mexico, India, Ecuador, Columbia, China, Brazil, Argentina.

All countries are correct comparisons to Russia and China, as they belong to the group of developing countries. In energy sector, which is presented in Table 2 the panel regression according to all countries results have shown that a higher level of PPP investment is associated with a higher level of private sector external debt.

In my opinion, this may be due to the fact that the private sector takes additional loans. If we take only China, no significant relationships were found in energy sector.

The transport sector analysis which is presented in Table 3 also has shown us that a higher level of PPP investment is associated with a higher level of private sector external debt. Moreover, we can consider here and only China's data, the panel regression showed that a higher level of PPP investment is associated with a higher level of public sector external debt.

As I can suggest, the state similarly takes out additional loans, as in the case above, or the state is so accredited that it prefers to invest in infrastructure projects in partnership with the private sector.

It all depends on the government's policy. Each year can be different. If the economy has to be

Table 2
PPP volume investments in energy

	All countries	All countries	All countries	All countries	All countries	China only
GNI	0.0003**	0.00002	−0.001***	−0.001***	−0.001***	−0.0001
	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.001)
FDI		−0.027**	−0.030***	−0.025**	−0.010	0.001
		(0.011)	(0.010)	(0.011)	(0.011)	(0.011)
g_debt			−0.007	−0.023**	−0.011	0.0001
			(0.006)	(0.009)	(0.011)	(0.016)
p_debt			0.035***	0.033***	0.032***	0.003
			(0.005)	(0.007)	(0.007)	(0.019)
Constant	2,032.788***	1,855.595***	1,160.549**	2,033.512**	−1,731.708	1,923.681
	(308.420)	(312.947)	(478.292)	(946.954)	(2,766.112)	(1,313.196)
Fixed effects – Country	No	No	No	Yes	Yes	Yes
Fixed effects – Year	No	No	No	No	Yes	Yes
Observations	239	239	219	219	219	26
R^2	0.024	0.050	0.254	0.366	0.489	0.028
Adjusted R^2	0.020	0.042	0.240	0.326	0.371	−0.157
Residual Std. Error	4,224.177 (df = 237)	4,177.056 (df = 236)	3,855.390 (df = 214)	3,631.423 (df = 205)	3,508.252 (df = 177)	1,404.879 (df = 21)
F Statistic	5.891** (df = 1; 237)	6.201*** (df = 2; 236)	18.228*** (df = 4; 214)	9.107*** (df = 13; 205)	4.134*** (df = 41; 177)	0.152 (df = 4; 21)

Note: *p<0.1; **p<0.05; ***p<0.01

Dependent variable: PPP investment in energy.

supported this year, the state will prefer to spend money on it and will then ask the private sector to invest in it. A similar analysis would have been made for Russia, but no significant results were found, due to the limitations of the Data set.

China is investing heavily in the development of education. In 2020, 178 billion yuan was invested in the development of the education sector, which is 15% more than in 2019. Basically, all projects are implemented through PPP. Private investments account for about 63% of expenditures, 47% are financed from public funds. This experience should be adopted in our country as well.

We can further extend our analysis and assess another rather curious relation. It is mostly accepted in economic literature that infrastructural investments lead to an increase in labor productivity. Hence, one would expect that this is the case for China as well.

For this hypothesis, we will use the OECD data on infrastructural investments in China, in EUR [11], as well as the labor productivity data provided by the ILO and measured as output per worker (GDP constant 2011 international $ in PPP) [12].

Granger causality is a rather convenient econometric tool for this hypothesis. Formally, it is set up as two equations of the following format:

$$Y(t) = a_0 + a_1 y_{t-1} + \ldots + a_p y_{t-p} + b_1 x_{t-1} + \ldots + b_p x_{t-p} + \varepsilon_t$$

$$X(t) = c_0 + c_1 x_{t-1} + \ldots + c_p x_{t-p} + d_1 y_{t-1} + \ldots + d_p y_{t-p} + u_t$$

Where p is the lag, which we assume to be 1 for the sake of simplicity. We then have to use an F-test to test the following hypotheses for the statistical significance of coefficient significance:

$$H_0^1 : b_1 = \ldots = b_p = 0$$

$$H_0^2 : d_1 = \ldots = d_p = 0$$

Within this econometric framework, we attempt to test the notion of whether the infrastructure investment has a statistically significant impact

Table 3
PPP volume investments in transport

	All countries	All countries	All countries	All countries	All countries	China only
GNI	0.001***	0.001***	−0.0002	−0.0003	−0.0004	−0.0001
	(0.0001)	(0.0002)	(0.0003)	(0.0004)	(0.0004)	(0.001)
FDI		0.002	−0.002	−0.003	0.009	0.005
		(0.013)	(0.012)	(0.014)	(0.016)	(0.022)
g_debt			−0.009	−0.013	−0.008	0.129***
			(0.007)	(0.011)	(0.015)	(0.030)
p_debt			0.035***	0.038***	0.040***	−0.010
			(0.006)	(0.009)	(0.011)	(0.039)
Constant	1,499.598***	1,514.554***	862.332	918.563	644.369	−9,187.167***
	(368.307)	(385.711)	(592.495)	(1,383.602)	(3,551.811)	(2,589.445)
Fixed effects – Country	No	No	No	Yes	Yes	Yes
Fixed effects – Year	No	No	No	No	Yes	Yes
Observations	215	215	196	196	196	27
R^2	0.165	0.166	0.301	0.311	0.378	0.787
Adjusted R^2	0.162	0.158	0.287	0.262	0.212	0.748
Residual Std. Error	4,798.309 (df = 213)	4,809.409 (df = 212)	4,612.236 (df = 191)	4,691.131 (df = 182)	4,847.132 (df = 154)	3,181.124 (df = 22)
F Statistic	42.226*** (df = 1; 213)	21.025*** (df = 2; 212)	20.601*** (df = 4; 191)	6.330*** (df = 13; 182)	2.282*** (df = 41; 154)	20.310*** (df = 4; 22)

Note: *p<0.1; **p<0.05; ***p<0.01

Dependent variable: PPP investments in transport.

on labour productivity, i.e., if infrastructure investments "Granger cause" increases in labour productivity.

Having completed the above procedure in R using the "lmtest" package, we obtain a probability value p=0.0419, which suggests acceptable statistical significance.

While the analysis is quite obviously superficial and lacks econometric depth, it can still be a hint of importance of infrastructural incentives in terms of macroeconomic growth and long-term stability, even in major economies such as China.

2.3. Impact of the pandemic on the implementation and financing of infrastructure projects in China

The COVID-19 pandemic has negatively affected the implementation of about 60% of the projects of China's Belt and Road Initiative.

The pandemic seriously affected 20% of projects, another 40% were affected in one way or another. The remaining 40% are carried out as usual and are practically not affected.

Beijing is making active efforts to preserve international supplies and maintain close contacts with all economic partners. The Chinese government is interested in long-term cross-border projects and will make active efforts to promote them. Some projects have slowed down, but none have been abandoned.

According to official statistics, China's direct investment abroad from January to May amounted to 296.2 billion yuan ($ 42.2 billion), down 1.6% year on year. At the same time, Chinese capital investment in the economies of the Belt and Road countries continued to show growth, having increased by 16% in five months on an annualized basis, to $ 6.53 billion.

The Belt and Road Initiative is a concept proposed in 2013 by Chinese President Xi Jinping with the aim of activating international multilateral trade and investment projects with the participation of as many countries as possible and the use of Chinese and foreign capital. More than 150 countries and international organizations have already joined it.

The general concept of the Belt and Road Initiative is presented below in Figure 9.

The unexpected coronavirus pandemic has driven the global economy into a deep recession.

Fig. 9. **The geographic outlay of Belt and Road initiative**

Source: https://en.wikipedia.org/wiki/Belt_and_Road_Initiative.

As an important part of business cooperation between Russia and China, trade and economic cooperation between the Far East and China also faces unprecedented difficulties.

"At present, the movement of people between the Far East and China is largely suspended. This has directly sent the tourism industry between the Far East and China into a state of shock. Vladivostok ranks third after Moscow and St. Petersburg in the tourist destination in Russia for Chinese tourists, the number of which last year amounted to almost 400 thousand. And today we do not see Chinese tourists, sightseeing, as in previous years during this period. Freight traffic through road crossings between the Far East and China is still working, but the throughput of freight transport through the checkpoints "Pogranichny-Suifenhe", "Poltavka-Dongning", "Kraskino-Hunchun" is only 30–40 cars per day in one direction, which is significantly less compared to the period before the pandemic" [13].

Strict anti-epidemic measures and a blow to the economy led to a decrease in demand in the markets of the Far East and China. Some companies with Chinese capital in the Far East have encountered difficulties in their activities.

"The serious impact of the pandemic on economic cooperation between the Far East and China is directly reflected in the decline in bilateral foreign trade. According to Russian customs data, the total foreign trade of the Far East in the first quarter of this year amounted to about 7.315 billion US dollars, which is compared to the same period last year. 13.23% lower; imports amounted to about USD 1.564 billion, up 3.23%, and exports amounted to about USD 5.751 billion, down 16.83%. China amounted to about US $ 1.898 billion, down 20.52%, the volume of imports from China was about US $ 693 million, down 20.16%, the volume of exports to China was about US $ 1.205 billion, which lower by 20.72%" [ibid.].

"During the same period, the total volume of imports and exports in the Primorsky Territory amounted to 1.778 billion US dollars, up 2.3%. Including the total volume of exports amounted to 771 million US dollars, down 1.15%; imports amounted to US $ 1.007 billion, up 5.51%. The total trade volume of Primorsky Krai with China amounted to US $ 896 million, down 11.02% year-on-year. exports to China amounted to USD 400 million, up 1.52%; imports from China amounted to USD 496 million, down 19.09%. China is a major trading partner of Primorsky Territory, accounting for 50.6% of the total foreign trade of Primorsky Territory for the same period".

However, the impact of the pandemic is a random external factor, and the main provisions of

economic cooperation between the Far East and China have not changed. As the pandemic softens and its possible completion, the economic cooperation of the Far East with China will quickly rebound from the bottom, make a V-shaped rebound and start a new life.

"China and Russia are the largest economies in the world and will resume production at the moment or in the near future, which will lay a solid foundation for the restoration and development of economic cooperation between the Far East and China. China was the first in the world to emerge from the pandemic and resume production at full speed. Recently, Russia also developed a plan for economic recovery. It is planned to spend about 5 trillion roubles on economic recovery in three stages over two years. Despite the serious consequences of the pandemic, China is still the second largest trading partner in the Far East, the largest source of foreign investment. and the largest place of origin of enterprises-residents of ASEZ and FPV" [4].

"A number of large investment cooperation projects planned for implementation in the Far East by Chinese and Russian companies, temporarily suspended due to the epidemic, will be gradually launched after the pandemic subsides. These include a project for the production of methanol with a volume of 1.8 million tons (totaling $ 1.5 billion) jointly with the Nakhodka Mineral Fertilizer Plant, a project for the production of liquefied natural gas (totaling more than $ 2 billion) in the city of Bolshoy Kamen and the project of a grain logistics center in the Mikhailovsky district (the total cost of the project is 20 million US dollars). Large Chinese companies are also interested in participating in the project to develop the Baimsky copper deposit in Chukotka. initial advantages, economic cooperation between the Far East and China is still gaining new opportunities" [14].

During the pandemic, people's lives and working regimes have undergone major changes, and many new areas are coming to the fore. The impact of the pandemic on economic cooperation between the Far East and China is temporary and limited. Cooperation in the post-epidemic era is fully prepared to open up new ways of development and bring new prosperity to the peoples of both countries.

Therefore, this chapter is mostly dedicated to the international experience in financing of large infrastructural projects, especially to that of the People's Republic of China, where it is found in abundance. A detailed analysis of the main methods of financing infrastructure projects abroad is conducted with a special emphasis on China's approach to conducting such PPP endeavours.

The unexpected coronavirus pandemic has driven the global economy into a deep recession in virtually all of its industries and sectors. As an important part of business cooperation between Russia and China, trade and economic cooperation between the Far East and China also faces unprecedented difficulties. Evidently, the COVID-19 pandemic has had vast effects on the implementation and financing of large infrastructural projects around the world and in China as well.

3. Prospects for Improving the Russian Practice of Financing Infrastructure Projects Based on the Use of Foreign Experience

3.1. Features of the present condition of the Russian economy and their influence on the financing of investment projects

The scale of economic contraction in Russia has become one of the largest over the past 20 years. In 2020, GDP declined by 3.1%, stronger only during the 2009 global financial crisis (–7.8%) and the Russian crisis in 1998 (–5.3%). In absolute terms, the most important proposal to the fall in GDP: mining, transport, trade and services to the population, and in relative terms — public catering (–24%), culture and sports (–11.4%).

This influenced the use and sources of GDP formation: the final consumption of households decreased by 8.6%, the gross profit of the economy by 9.3%, and exports and imports — by 5.1% and 13.7%, respectively.

The fall in economic activity and the downturn in the economy directly affected the real disposable income of the population, which fell by 3.5%. The cumulative decline in revenues since 2013 was 10.6%, which pushed revenues back a decade to the level of 2009–2010.

The worsening financial situation of Russian residents is confirmed by a decrease in household consumption, an increase in unemployment (+1.3 percentage points or +960 thousand unemployed in December 2020, yoy) and poverty (+1.2 million people with benefits below the subsistence level).

minimum in Q3 2020, *yoy*). The turnover of retail trade (–4.1%) and paid services to the population (–17.3%) also significantly decreased.

Industrial production in 2020 decreased by 2.9% due to a drop in activity in the extractive industry (–7%). The oil and gas industry suffered the most (–8.1%). The manufacturing industry practically did not change compared to 2019 (+ 0.3%), while individual industries had multidirectional dynamics — from a 23% increase in the production of drugs and medicines to a 13% decrease in the automotive and leather industries.

The physical volume of agricultural production in 2020 increased by 1.5%, this was due to a high grain harvest (+ 9.8%) and an increase in meat and dairy farming (+ 3.1% — livestock and poultry, + 2.7% — milk). The harvest of fruits and vegetables, potatoes, sunflowers and sugar beets, on the contrary, significantly decreased from 3% to 40%, which negatively affected the growth of retail prices in the second half of 2020.

The construction industry remained unchanged in 2020 (+ 0.1% — the volume of construction work in constant prices), although the commissioning of residential buildings (excluding houses for gardening) decreased by 5.9%, in part due to downtime in the spring months against the background of restrictions. The decline in housing construction and preferential mortgages provoked an increase in prices for new and secondary housing by 14%, which is several times higher than official inflation (3.4% on average for the year).

The construction of large infrastructure facilities (airports, ports), as a rule, is associated with direct government funding and investments by state corporations, and is perceived as an island of stability in a situation when the markets are stormy. More than half of the funds for the construction of all infrastructure projects in the south of Russia, according to our estimates, go to roads.

In the South and North Caucasus, we counted seven major road construction projects worth 342.9 billion roubles (51% of large infrastructure projects in the Southern and the Northern Caucasus Federal Districts). The largest of them is the Tavrida highway, the reconstruction of which will cost 166 billion roubles. This is a logical continuation of the Crimean bridge. Throughout its entire length until 2017, it was a two-lane road of inadequate quality, which simply could not cope with the traffic flow from the "mainland". Today this project is at the final stage of construction, work on it is in full swing.

The share of "airport projects" in the rating is small compared to other construction projects — only 63.8 billion roubles (about 9.4). Even less in logistics (0.4%) and hydraulic engineering (3.2%).

The largest infrastructural projects in the Southern Federal District (SFD) in 2020 are presented below in Table 4.

The Transport Strategy of Russia for the period up to 2035 takes into account the need to eliminate restrictions on the network of highways, inland waterways, and ensure transport accessibility, primarily in remote and hard-to-reach regions.

Infrastructure projects by themselves do not always have a significant effect on the regional economy. Often this is almost wasted "buried" money, a serious result from the development of which only external contractors have received.

The financing of infrastructural projects in the North Caucasus Federal District (NCFD) is described in Table 5.

For a more successful implementation of infrastructure projects, new objects of influence between the government and business are required. During the pandemic, the priorities of the construction industry shifted to social and medical facilities. It was at this time that a "project" format of effective interaction between government and business was formed, when a city or region becomes the main customers and developers, and business gets the opportunity to participate in large infrastructure projects.

Let's consider financing on the example of large projects.

1. Construction of the Crimean bridge.
2. Construction of the Tavrida highway.
3. Arctic zone development.

The Crimean Bridge is a grandiose structure, created in 2 years. The overpass is 19 km long — the longest in Russia and Europe. 227.9 billion roubles were spent on the "construction of the century". R. Is it a lot or a little? How much did the Crimean bridge cost every resident of Russia? Consider the features of the project.

The idea to connect the Krasnodar Territory and Crimea was born over 100 years ago, during the time of tsarist Russia. The first structure was built by Soviet engineers in 1944. In 1945, the bridge was destroyed by an ice drift.

Table 4
Largest infrastructural projects in the SFD in 2020

№	Project	Company	Industry	Investment, RUB thousand	Time horizon	Region	Source
1	Construction of the federal highway "Tavrida" along the route Kerch-Simferopol-Sevastopol	Rosavtodor	Road construction	166 000 000	2017–2020	Crimea and Sevastopol	"Expert Yug"
2	Development and renovation of railway infrastructure on the approaches to the ports of the Azov-Black Sea basin	JSC "Russian Railways"	Railway construction	160 000 000	2011–2020	Interregional	JSC "Russian Railways"
3	Construction of infrastructure facilities for the dry cargo area of the port of Taman	Russian Railways, Rosmorport	Railway construction, hydraulic engineering	81 000 000	2020–2024	Krasnodar region	"Expert Yug"
4	Construction of the Aksai automobile bypass	GC "Avtodor"	Road construction	77 400 000	2018–2022	Rostov region	"Expert Yug"
5	Construction of the far western bypass of Krasnodar with a length of 51 km	LLC "Far Western Bypass Krasnodar" (structure "Avtodor")	Road construction	39 000 000	2020–2023	Krasnodar region	GC "Avtodor"
6	Construction of a new terminal at Krasnodar International Airport	JSC "International Airport Krasnodar" (JV "Basel Aero")	Airports	25 000 000	2020–2023	Krasnodar region	Krasnodar International Airport
7	Development of the Simferopol International Airport	Simferopol International Airport LLC	Airports	22 761 696	2016–2022	Crimea	"Expert Yug"
8	Construction of the Bagaevsky hydroelectric complex	Rosmorrechflot	Hydraulic engineering	22 000 000	2016–2020	Rostov region	"Expert Yug"
9	Reconstruction of the A-135 highway (Southern entrance to Rostov)	FKU "Department of Federal Highways" Azov	Road construction	6 877 475	2016–2020	Rostov region	Ministry of Economic Development of the Rostov Region
10	Creation of the Rostov logistic postal center FSUE "Russian Post"	FSUE "Russian Post"	Logistics	3 957 900	2014–2021	Rostov region	Ministry of Economic Development of the Rostov Region
11	Modernization of the terminal of international airlines at Anapa airport	JSC Anapa International Airport (JV Basel Aero)	Airports	418 000	2020–2021	Krasnodar region	Anapa International Airport

Source: "Expert Yug".

Table 5
Financing of infrastructural projects in the NCFD

№	Project	Company	Industry	Investment, RUB thousand	Time horizon	Region	Source
1	Construction of bypass roads of the cities of Derbent, Dagestan Ogni and Khasavyurt	Uprdor "Kavkaz"	Road construction	50 000 000	2019–2024	The Republic of Dagestan	"Expert Yug"
2	Construction of an air terminal complex, a new runway, reconstruction of the airfield infrastructure of Grozny airport	FSUE "Administration of Civil Airports"	Railway construction	15 700 000	2020–2024	Chechen Republic	"Expert Yug"
3	Construction of a highway from the Arkhyz resort to Kislyi springs	Republican State Enterprise "Directorate of Capital Construction"	Railway construction, hydraulic engineering	2 600 000	2020–2021	Karachay-Cherkess Republic	"Expert Yug"
4	Reconstruction of the railway infrastructure at the Nazran-Sleptsovskaya section and construction of a railway station at the Sleptsovskaya station	JSC "Russian Railways"	Road construction	2 500 000	2021–2024	The Republic of Ingushetia	Committee for Transport, Energy, Communications and Informatization of the Republic of Ingushetia
5	Construction of a bypass road for the city of Gudermes	Uprdor "Kavkaz"	Road construction	1 100 000	2018–2020	Chechen Republic	"Expert Yug"

Source: "Expert Yug".

The leadership of Russia and Ukraine agreed on the construction of a ferry across the Kerch Strait in 2000, in 2010, and in 2013.

In 2014, in connection with the transition of Crimea to Russia, the economic and political situation required decisive measures. In the summer of 2014, the construction plan was approved. In 2016, the overpass project was approved by Glavgosexpertiza. The work started immediately, in 2016.

Before dwelling on the final version, the specialists reviewed 74 projects of the transport crossing. Including an underwater tunnel running along the bottom of the Kerch Strait.

The choice fell on the crossing, starting on the Taman Peninsula, crossing the strait, skirting Cape Ak-Buran, and reaching the coast of Crimea.

If the crossing was built in the area of the ferry crossing, it would be shorter and cheaper. The option was rejected due to the tectonic fault and the presence of active mud volcanoes.

At the preparatory stage, the project was estimated at an amount of up to 300 billion. R. It consisted of several components:

Construction — 150 billion RUB

Preparation for construction work — 86 billion RUB

Construction of access roads — 52 billion RUB.

The difficulty lay in the installation of piles, because the construction had to be carried out in a seismically active area. In addition, the construction of roads, the arrangement of the security zone was required.

During the construction, 5,500 piles and 595 supports were installed, ranging in length from 3 to 35 m. Up to 16,000 people worked at the gigantic construction site at the same time.

As a result, the experts settled on the final cost of the construction of the facility — 227,92 billion roubles. The work was carried out at the expense of the federal budget, without attracting additional investments.

The estimate includes:

- design, survey work
- preparation of the territory
- temporary structures for construction workers
- energy supply facilities
- installation of piles
- installation of the main structures of the railway and road sections
- unexpected expenses.

The contractor was the company of billionaire Arkady Rotenberg, Stroygazmontazh. The contractor was selected out of tender due to the absence of other bidders.

The main subcontractor is Mostotrest with a contract for 96.9 billion roubles, whose share also belongs to Rotenberg.

The Kerch Bridge of Russia consists of a 4-lane highway and a railway line in both directions. The crossing is 19 km long. stretches over the water for 7.5 km., over land — 11.5 km.

According to experts, the annual maintenance of the crossing will be about 480 million roubles.

The capacity of the railway section of the structure is about 100 trains per day in both directions. The highway is designed for a load of 40,000 vehicles per day.

Construction was carried out on several sites at the same time. First, in 2016, specialists and workers strengthened the piles. The difficulty was that up to solid ground it was necessary to overcome 90 m of silt located at the bottom of the bay. As a result, the pile supports were driven to a depth of 105 m.

The grandiose construction was not without incident. In 2016, a ship from Turkey crashed into the bridge pillars. One support sank, it was cut and taken out. Neighboring supports have shifted. The consequences were corrected promptly, the incident did not affect the completion date.

In 2017, the rail and road arches were completed. The central part of the structure was left for the passage of ships.

The inauguration of the bridge for light traffic took place on May 15, 2018, 6 months ahead of schedule. Freight transport has started over the overpasses since October 1, 2018.The railway section was launched in December 2019.

The Crimean Bridge in Russia has become the largest, most technically complex and expensive overpass in the country.

Among Russian projects, it took first place in terms of construction cost. The cost of the bridge in roubles — 227.9 billion. The cost of the bridge in dollars is about 5 billion.

For comparison:

A 44 km long overpass across the Ob. cost Russia 43 billion RUB

Departure from Ufa, including a bridge, a tunnel and a road — 34 billion RUB

Bridge over the river. Chusovaya in the Perm Territory — 14 billion RUB.

When compared with world projects, the Kerch overpass is in the top three most expensive:

The Qingdao Bridge in eastern China is 42.5 km long and about 8.8 billion dollars have been spent on its construction. At the crossing, cars move in three lanes.

Bay Bridge, connecting San Francisco with Oakland, cost the Americans 6.4 billion dollars. The structure is divided into 10 car lanes, bicycle and pedestrian zones.

Kerch building worth 5 billion dollars.

From the top three, the Russian project has replaced the Great Belt overpass, built in Denmark. It took 10 years and 3.14 billion dollars to build it. The structure consists of a road and rail section in the western half and an underwater railway tunnel, accompanied by a suspension bridge, in the eastern section.

A simple mathematical calculation allows us to determine whether the grandiose construction has hit the pocket of the Russians.

If the amount of 227.9 billion RUB round up to 228 bn RUB and divide by 109 million Russians over 18 years old, you get about 2000 roubles per person.

228 bn divided into 146,793,744 people (population of the country) turns out to be 1546 roubles per person.

It should be taken into account that the money spent on construction was taken from the federal budget, part of which comes from taxes. For example, in 2018 tax revenues to the treasury amounted to 521.3 billion RUB, which exceeds the amount required for construction, more than twice.

The result of the construction of the Kerch Bridge was the renewal of the infrastructure of

the Crimean coast and the Taman Peninsula, simplification of the delivery of goods to Crimea and back. And the inhabitants of Russia now more often rest on the picturesque coast. According to official data, the tourist flow increased by 40–50%, up to about 10 million people a year.

In the early morning of May 16, 2018, convoys of cars moved towards each other from the banks of Taman and Kerch. From that day on, the Crimean bridge began to work, which was very much awaited on both sides of the Kerch Strait. During the year, five million cars drove along the crossing, and statisticians collected a lot of interesting numbers and facts about this grandiose structure.

19 km is the length of the bridge. It is the longest in Russia and Europe.

Crimean bridge — 1 year.

Only 408 km separate it from the International Space Station, pictures from which the cosmonauts published.

The volume of design documentation was 570 volumes or 30 gigabytes of data.

More than 15,000 engineers and workers were at the height of construction. There are about the same number of inhabitants in Sudak.

And the most adult builder is 70 years old.

At the base of the Crimean Bridge there are almost 7,000 piles, sunk to a depth of 12 to 105 meters, which is the height of a 35-storey building.

The wall thickness of the tubular pile is 40 mm, which is comparable to the thickness of tank armor.

The first pile was immersed in 25 days, and after the technology was worked out, it took 24 hours.

816 days were spent on the construction of the road section of the bridge.

330 km — the thread that will turn out if you fold all the tubular piles of the bridge in a line. This is more than from Kerch to Sevastopol, if you go by car.

595 supports hold 260,000 tons of span steel structures. That is the weight of the 36 Eiffel Towers.

Each railway span weighs more than 500 tons, which is 1.4 times heavier than the ISS.

Out of 13,000 km of reinforcement bars, a 4-lane road is connected. Approximately this distance is flown by a plane from Moscow to Sydney.

250 meters of rebar knitted by one builder per work shift.

10 cm / min — the speed of the overspan over the water area. The snail moves at the same speed.

10,000 tons — the weight of the two arched spans. This is the weight of 400 empty KAMAZ dump trucks.

76 km — the thread that will turn out if you fold all the rails of the bridge in a line.

227 m is the length of each arch. This is the length of two football fields.

490 tons of high strength bolts are screwed on two arches.

One high strength bolt weighs 63 grams.

100,000 liters of paint was spent on two arches, which is two railway tanks.

A total of 120 hours (5 days) lasted a sea operation to transport and install two arches on the supports.

12 million tons of materials and structures are required in total for the construction of the bridge, which is twice the weight of the Egyptian pyramid of Cheops.

20,000 cars crossed the bridge in the first day of its operation, 200,000 — in 2 weeks, 5 million — in 12 months.

More than 30,000 vehicles in 24 hours — the bridge's daily record.

117 km of road marking lines on the bridge.

Only once during the construction period there was an ice drift and this did not affect the bridge and its supports.

2,700 storm hours were recorded over the three construction winters. This is almost 113 days, or about 4 months.

The Crimean authorities announced the construction of the Tavrida highway 4.5 years ago — and then they estimated its cost at 85 billion roubles. After a couple of months, apparently, having recounted, they named the amount one and a half times larger — 128 billion. But in the end the road cost about 150 billion roubles.

Construction began in 2017, dividing the construction into eight sections, launching them as soon as they are ready. And in general, the story resembles the Crimean bridge. Handed over earlier than planned. And the track that connected Kerch and Sevastopol really turned out to be good, says the Crimean blogger Alexander Gorny, who took a ride on Tavrida a month ago.

The contractor was chosen without competition. For this, the republic changed its legislation. There is logic in this, because otherwise you would have to choose the company that will offer the lowest price. And the risk of being faced with something

that does poorly. And with Crimea, apparently, they cannot afford it. And the decision, as one might assume, was made not in Simferopol, but in Moscow.

The general contractor was the VAD company. She had previously received large government contracts for the construction of roads. Not much is known about the company: it has been working since the mid-1990s, originally from St. Petersburg. True, she moved to Vologda three years ago. As Delovoy Petersburg wrote, due to the fact that at some point there were difficulties with the city authorities and the company stopped receiving government orders. In the Spark system, only two minority shareholders are listed among the owners, these are businessmen Viktor Perevalov and Valery Abramov. VAD is not as famous as some of our construction giants, but it has proven itself well in its industry.

Soon they will build another road, but not from the Crimean bridge, but, on the contrary, to it, that is, from Krasnodar. The contract was awarded to the structure of Arkady Rotenberg, who built the bridge itself. The Kuban highway will cost the budget almost 100 billion roubles.

The businessman's company was also the only contender for the state order. But not because it was appointed by the authorities — there were simply no others willing. Which is also easily explained, such contractors are immediately subject to Western sanctions. Rothenberg and so on under them. Against the company that built "Tavrida-VAD" — they were also introduced. But on the other hand — government orders for tens of billions of roubles.

The road with a length of 250.7 km was built for almost three years. About half of the track was built from scratch in hilly terrain, plains, mountains, through existing roads, branch lines and rivers.

On June 28, 2016, the head of Crimea, Sergei Aksenov, by his order appointed the VAD company as the contractor for the construction of the Tavrida highway. The cost of the contract for the republican section of the road was 137.3 billion roubles, for the Sevastopol section — 11.96 billion roubles.

Earlier, VAD distinguished itself by repairing Nevsky Prospekt, Palace Embankment, Vyborgskoye Highway in St. Petersburg, the construction of a VIP road to Pulkovo, the Sortavala highway, sections of the Scandinavia highway and other roads in North-West Russia.

The construction of the Tavrida highway is divided into seven stages, six of which pass through the territory of Crimea, one through the territory of Sevastopol. But before that there was a so-called "stage zero" — this is the construction of 8.6 kilometers of auto approaches to the Crimean bridge, which was also carried out by the VAD company.

The history of "Tavrida", however, will not end there. The VAD company will be engaged in the construction of the eighth stage of the highway in Sevastopol, which runs from the junction of the seventh stage to the President's road to the Yalta ring.

In addition, the construction of a branch of Tavrida to Evpatoria is underway — next year the first stage of the Simferopol-Evpatoria-Mirny highway will be commissioned, which bypasses the Simferopol airport and the village of Rodnikovoe to the village of Skvortsovo, and VAD is already designing the second stage of construction roads — from Skvortsovo to Evpatoria.

In 2018, the development of the Russian Arctic, which includes more than 3.5 million sq. km of the mainland, as well as many islands with a total permanent population of 2.5 million, was declared one of the priority areas of state domestic policy. The law "Fundamentals of the state policy of the Russian Federation in the Arctic zone for the period up to 2020 and beyond" was adopted on September 18, 20; later, the content of the act was significantly expanded in the "Strategy for the development of the Arctic zone of the Russian Federation and ensuring national security for the period until 2020", approved by the President of the Russian Federation on February 8, 2013.

Offshore development in the Arctic has slowed dramatically since the fall in oil prices at the end of 2014 due to the high cost of offshore and offshore production. Also, a significant role in this was played by the US and EU sanctions, which prohibit foreign companies from participating in exploration, oil production from the Arctic shelf in our country and transferring technology for this kind of work. However, interest in the region is growing every year. It is driven by a variety of factors, from the depletion of already used deposits and large explored deposits in the northern region to a warming climate and easier access and operation. The attractiveness of the region for the Russian Federation is not limited by the Northern Sea Route; significant energy resources are especially

important. The Arctic contains about a quarter of Russia's total oil reserves and more than 70% of gas, and the continental shelf has great potential for the growth of raw materials production.

In the context of the crisis caused by the pandemic and economic sanctions from the West, the fuel, mineral resources and oil remains one of the most stable sectors of the country's economy, which makes it one of the most privileged areas to invest in the economy of Russia. On the side of the dependence of the Russian economy on the export of hydrocarbon raw materials and the need for import substitution, the need to increase competitiveness in this market is becoming more acute, and active planning and further development of the north is also associated with this.

Thus, the priority task of the country's economic policy is not only to stimulate the development of the Arctic by easing conditions for companies-residents of the special economic zone, but also to attract foreign investment into the sector, since there is a need for additional financial investments. According to the assessment of the Ministry of Economic Development of the Russian Federation, the sanctions imposed on the country for the period 2014–2018 significantly influenced the possibility of attracting capital from abroad, which is reflected in Figures 10 and 11 [5].

Based on the data in the figures, it can be seen that the inflow of investments (liabilities) suffered from the sanctions much more than investments abroad (assets). Among the companies in the oil and gas sector that lost the most foreign capital were PJSC NK Rosneft, PJSC Transneft, PJSC Gazprom Neft.

One of the possible forms of attracting investments in the fuel and energy complex of Russia and in the economy as a whole is a production sharing agreement (PSA) — a type of agreement on the establishment of a joint venture. As a rule, such an agreement is concluded between a foreign mining company — a contractor and a government party that gives the contractor the right to conduct prospecting and exploration work and exploitation within the contract area in accordance with the terms of the agreement. As a rule, such an agreement is concluded for a long term (up to fifty years) or indefinitely. In Russia, PSA is regulated by the Federal Law "On Production Sharing Agreements" dated 30.12.1995 N 225-FZ. At the moment, there are three PSA projects in operation in the Russian Federation: Sakhalin-1; Sakhalin-2; Kharyaga oil field. Table 6 provides more details on these projects:

Consider the Sakhalin-1 PSA project. Exxon-Mobil, which has become a long-term partner of Rosneft, was forced to leave a number of joint projects due to the anti-Russian sanctions introduced in 2018. production, provision and sale of licenses, know-how, machinery, equipment. Shell also continues to operate in Russia. It should be noted that the PSA also has a number of disadvantages. First of all, this concerns high bureaucracy and the risk of corruption due to the involvement of the state side. Also, in two of the above projects, one way or another among the members there were legal claims in connection with the disagreement of the parties on the distribution of profits or products.

As for the sanctions, they are an obstacle for Western companies, preventing them from participating in the Arctic PSA. Thus, investment remains through the purchase of a share in the company, as happened in the case of the new Arctic LNG-2 LNG project established by PAO NOVATEK; in 2019, the French company Total bought out from PAO NOVATEK a 10% stake in project. Another 11.6% belongs to the company due to indirect ownership through a share in the share capital of PAO NOVATEK. Thus, Total directly owns 10%, PAO NOVATEK — 60%, CNOOC (China) — 10%, CNPC (China) — 10%, Japan Arctic LNG (Japan) — 10%.

Anti-Russian sanctions tie the hands of European partners in the field of investments in the development of the Arctic. For this reason, it is worth considering cooperation with the countries of the Persian Gulf, China, Japan, not limited by the politics of the West. China, in particular, is a long-term and reliable partner of Russia in the development of the Arctic. Chinese companies own 30% of Yamal LNG and, as noted above, 20% of Arctic LNG-2. Also, China has an interest in the development of the Northern Sea Route as part of the New Silk Road — an important transport artery that can serve not only as a way of delivering goods, but also as a significant political object. Close cooperation with China in the Arctic is undoubtedly beneficial for the fuel and energy complex of Russia, but it also has certain, mainly political and environmental risks.

Attraction of investments is possible both from the west and from the east, but in different forms. When choosing partners, it is necessary to weigh the pros and cons, assess the possible risks.

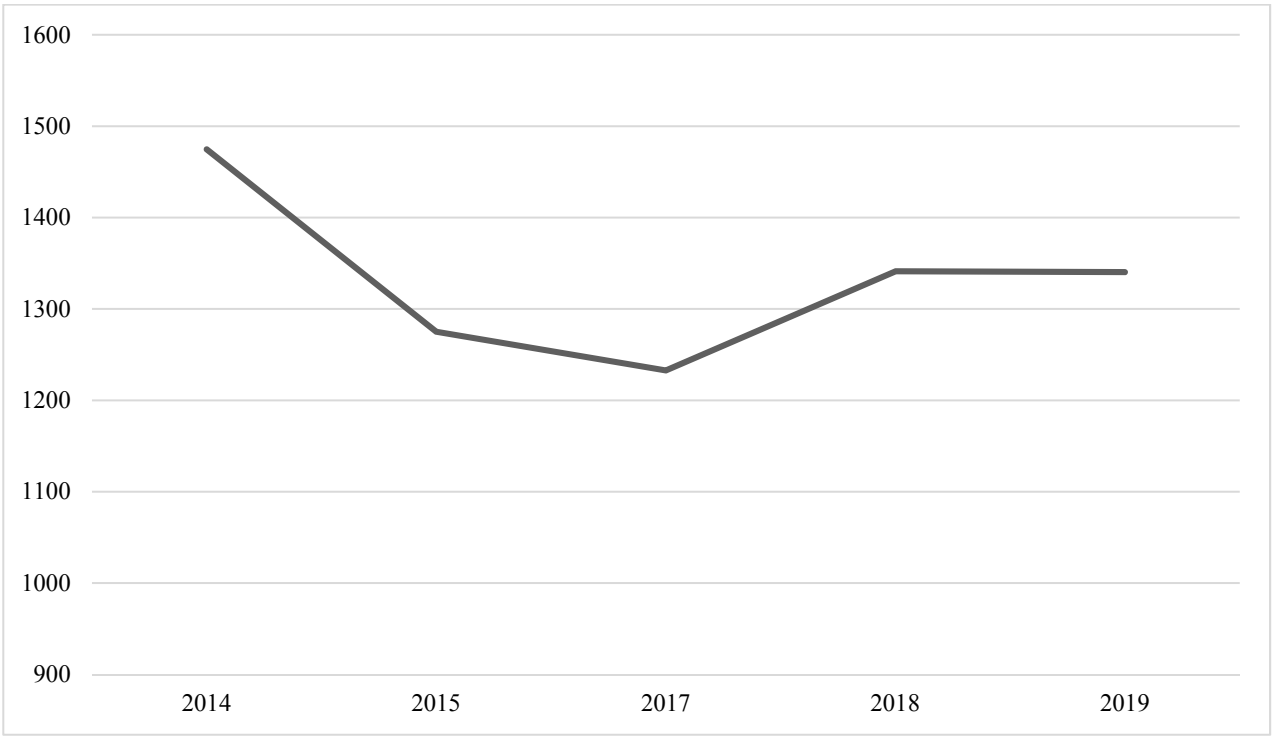

Fig. 10. **Russia's international investment position, assets in USD bln**

Source: [5].

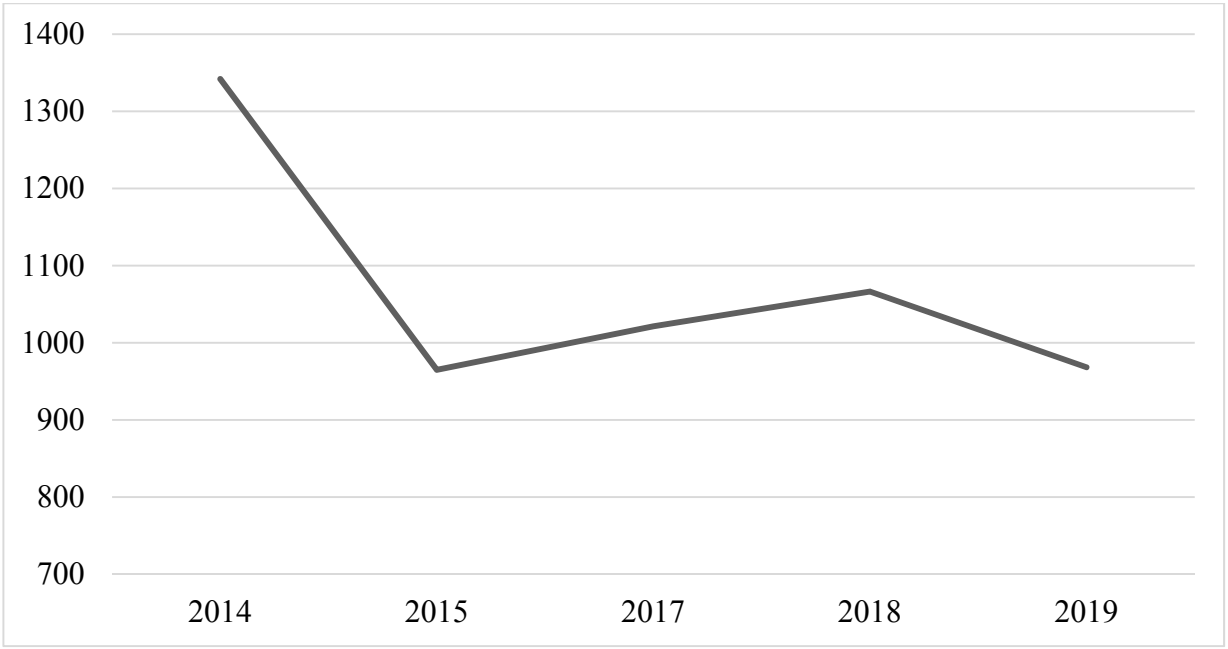

Fig. 11. **Russia's international investment position, liabilities in USD bln**

Source: [5].

3.2. The main directions of using foreign experience in financing large infrastructure projects in Russian practice

In the modern world, every country is focused on the effective management of its infrastructure facilities. PPP allows the government to involve private financial and intellectual resources and finally create profit from mutually beneficial cooperation between the public and private sectors. Some countries have accumulated a wealth of experience in implementing such projects, which would be useful for other countries, less developed in this industry. Some items can contribute to the development of the Russian PPP model.

Table 6
Structure of existing PSA agreement projects

Project	Operator	Owners
Sakhalin-1	Exxon Neftegas Limited	Exxon Neftegas Limited (USA) — 30%; ONGC (India) — 20%; SODECO (Japan) — 30%; Rosneft — 20%.
Sakhalin-2	Sakhalin Energy — established by the owners and operates on the basis of a PSA	Gazprom — 50% +1; Shell (UK, Netherlands) — 27,5% — 1; Mitsui (Japan) — 12,5%; Mitsubishi (Japan)– 10%.
Kharyaga oil field	OOO Zarubezhneft — Dobycha Kharyaga is a state-owned company	Zarubezhneft JSC — 20%; LLC Zarubezhneft — Dobycha Kharyaga — 20%; Statoil Sverige Kharyaga AB (Sweden) — 30%; Total E&P Russia (France) — 20%; Nenets Oil Company — 10%.

Source: Compiled by the author.

Thus, the subject of the article is a relationship between the partnership entities during the PPP. The object is PPP as a tool of cooperation between government and business. The process of implementing PPP projects is a particular issue in the modern economy. The problems include: the effectiveness of the PPP mechanism for improving infrastructure facilities, the selection of a suitable PPP model for project implementation, as well as the impact of factors that connected with the level of PPP development, such as the historical background and economic situation in the state, its goals, objectives and state policy that determines the priorities of PPP development in the country.

Most of the infrastructure projects in China are financed through PPPs.

In Russia, public-private partnerships have shown their application quite recently and today they are used in the construction of roads, airports, regional complexes, educational centres and water supply and sanitation systems. At a further stage, it is planned to introduce PPP projects in the field of culture, social infrastructure and many others. Today's unfavourable environment in the global capital and investment markets, as well as the constant tightening of legislation in banking in China, have significantly complicated and changed the structure of project financing.

For example, the pre-crisis growth of the public private partnership market occurred against the background of fairly cheap borrowed funds: in 2019–2020. their share reached 90% and more. And today it is forced to develop in conditions of constantly depleting financial resources).

In Figure 12 and Figure 13, which are presented below, we are able to see a number of infrastructure projects and expenditure amount on infrastructure projects in Russia compared to China.

We can see a significant difference as in the number of infrastructural projects as in the expenditure on it. China, as one of the most developed economies in the world, creates a large number of projects. Since 2004, and having made a sharp leap back then, Russia, as can be seen on the chart, was just beginning to attach importance to the financing of projects, namely PPP. It can be assumed that the huge costs and the high number of projects made in 2016 went to the construction of infrastructure facilities for the World Cup. An interesting fact is that in 2008, during the Beijing Olympics, the number of Chinese expenditures did not exceed the average value for the entire period from 2004–2019. The full explanation for this is the fact that China does take full advantage of the implementation of PPP investments. In the next step let us see the number of all PPP projects in Russia which is reflected Figure 14.

According to this schedule, starting only in 2014, the Ministry of Economic Development of the Russian Federation and the center for the development of state-owned private partnerships developed a set of methodological recommendations for the development of the PPP sector in the Russian regions. After that, there was an increase in the volume of investments and the number of projects themselves. At the moment, unfortunately, according to all known facts-pandemics, there is a decline.

The information that can be found in Chinese sources of use, especially the financing and organi-

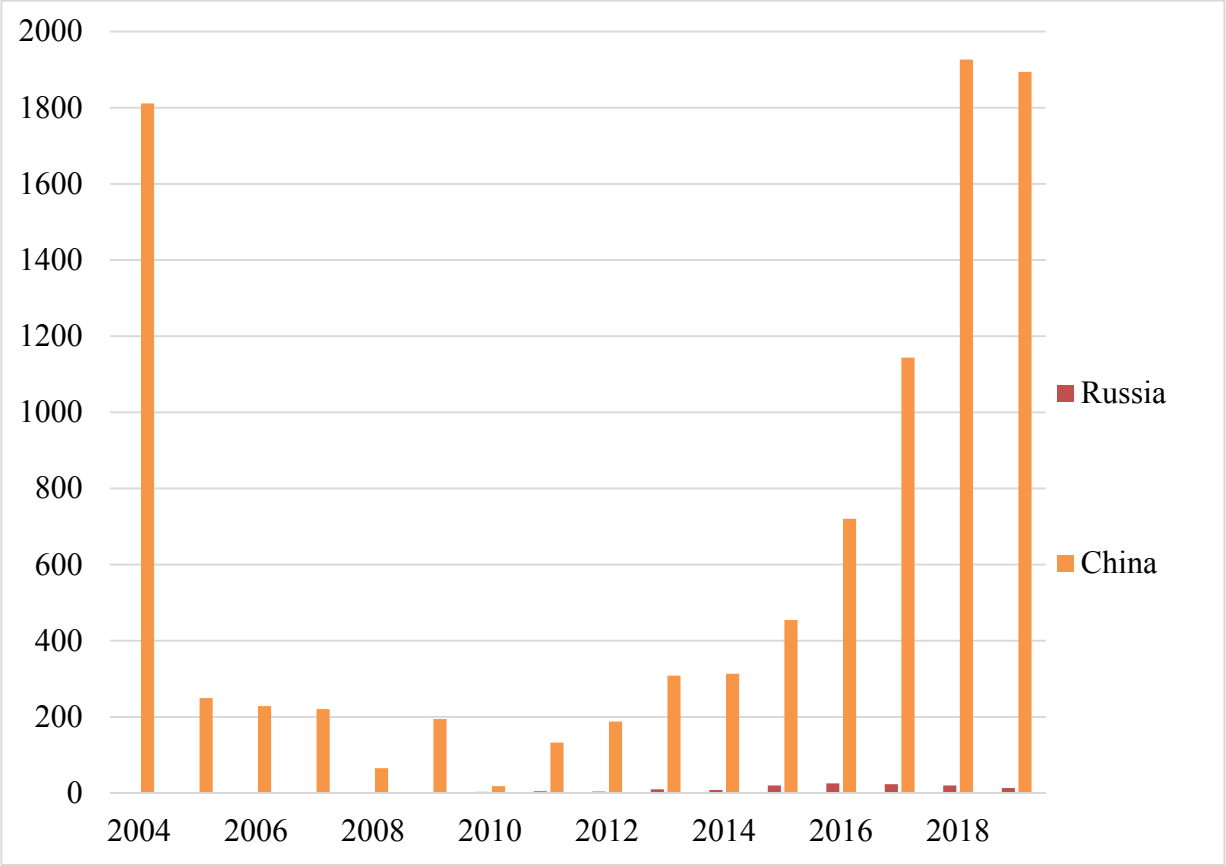

Fig. 12. **Number of infrastructure projects in Russia compared to China, 2004–2019**

Source: The author.

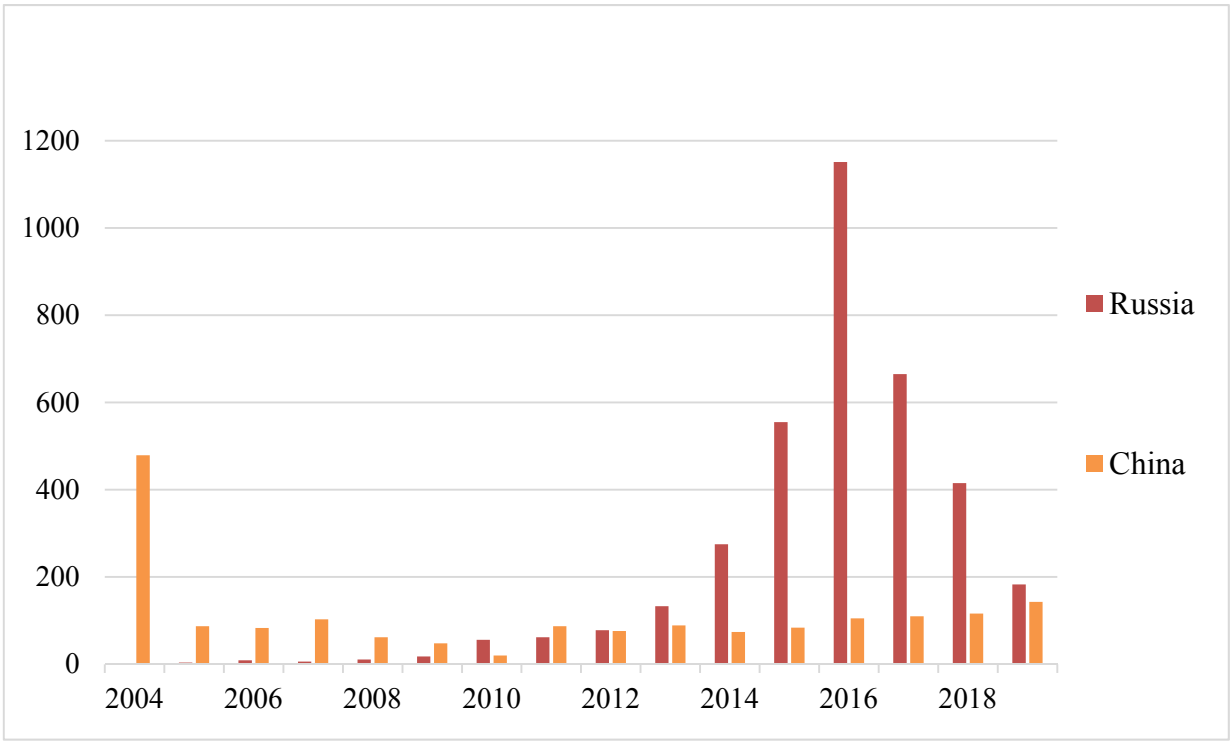

Fig. 13. **Expenditure on infrastructure projects in Russia compared to China, 2004–2019**

Source: The author.

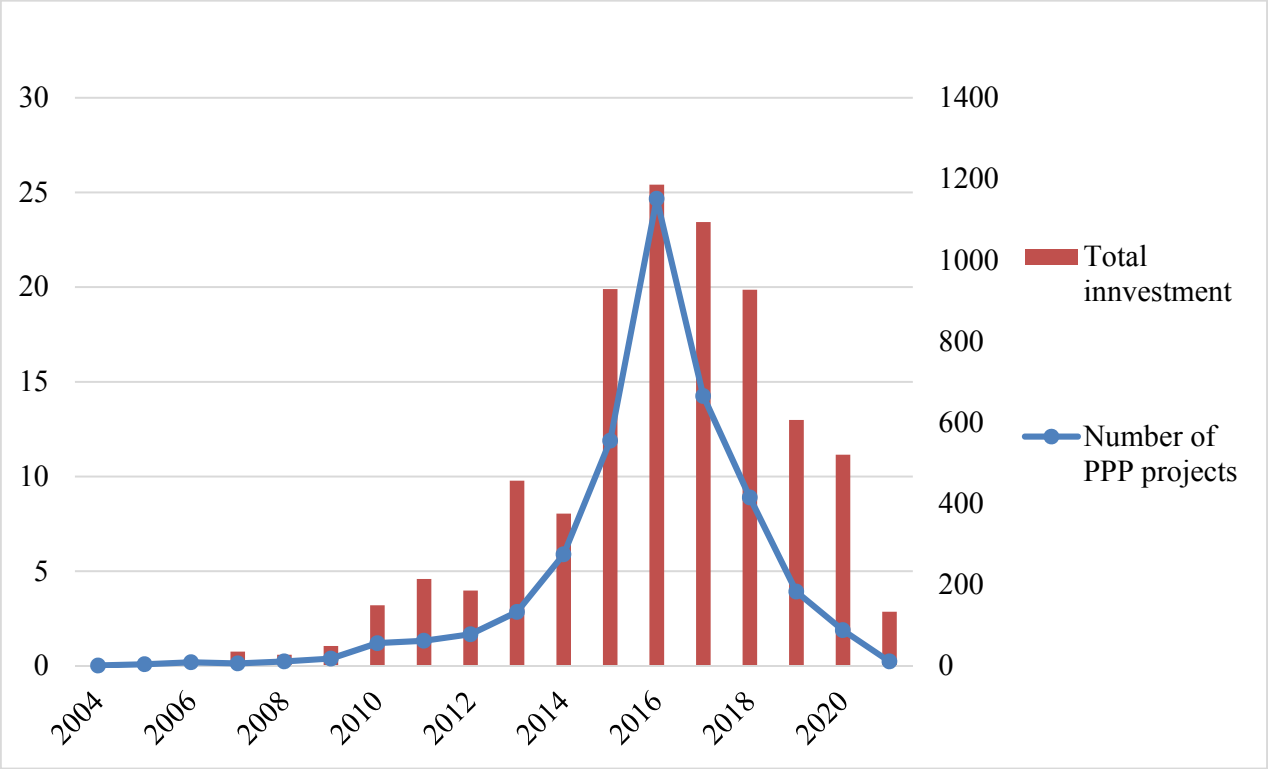

Fig. 14. **PPP projects in Russian Federation, 2004–2021**

Source: The author.

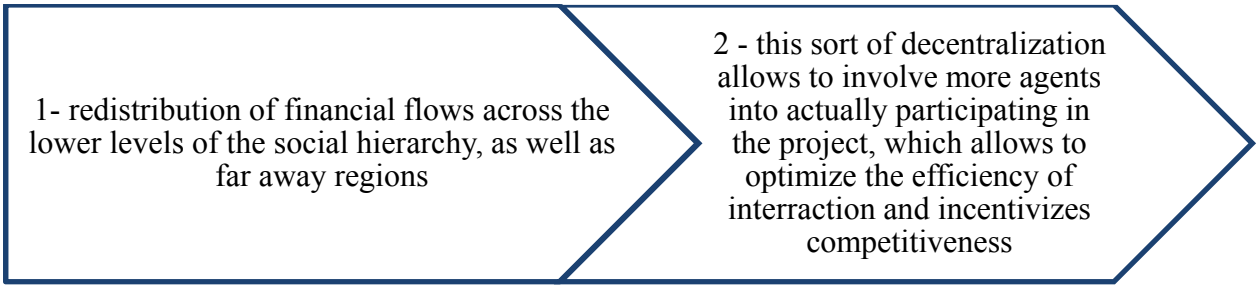

Fig. 15. **The specifics of Chinese and Russian PPP projects**

Source: The author.

zation of the state partnership of the PRC itself, they have a number of similarities with the Russian system, namely at the regional level. The specifics of Chinese PPP projects are outlined in Figure 15.

Consider, as an example of the application of the Chinese experience, the sphere of education. The extensive practice of using PPP mechanisms to modernize educational institutions in Russia has not yet developed, but more and more regions are showing interest in concluding PPP agreements in this area.

"Special attention is currently focused on schools — at the federal level, the program 'Assistance in the creation of new places in general education institutions in the constituent entities of the Russian Federation (based on the projected need)' has been approved, the purpose of which is to modernize the educational infrastructure, optimize the workload of schools and develop the non-state education sector. To achieve the goals of this program, such legally regulated PPP models as a concession agreement and a PPP agreement can be used. For example, Sberbank of Russia offers regions and investors a 'box' concession solution for the construction of schools. Its use will allow concessionaires to apply for project financing from Sberbank Russia. There are other projects that are gaining popularity" [15].

"Vnesheconombank and Prosveshchenie Group of Companies plan to launch the construction of 13 schools in the Nizhny Novgorod region, which will provide places for study for 14.9 thousand

students. This will speed up the implementation of the state program of the Nizhny Novgorod region in terms of creating a modern educational infrastructure, as well as help with solving the problem of second The project involves the creation of turnkey educational sites, envisaging not only the construction and staffing of schools with the necessary equipment, but also the development of a curriculum, where the emphasis will be on pre-professional orientation and training of schoolchildren" [4].

There are still few public-private partnership projects in the field of education in Russia. Federal Law No. 224 "On Public-Private Partnership" entered into force at the beginning of 2016, but not a single educational project has been implemented within the framework of federal funding. But in addition to 224-FZ, there is also Law 115-FZ "On Concession Agreements", within the framework of which a number of projects are already being implemented. At the same time, PPP projects are actively implemented in the regions within the framework of local regulations.

"At present, the official website of the Russian Federation for posting information on bidding has posted information on 5416 tenders for the right to conclude agreements on public-private and municipal-private partnerships, including 70 tenders in relation to educational, cultural and sports facilities. On the support platform infrastructure projects ROSINFRA contains information on 40 projects under Federal Law 224, 45 more projects are at the pre-investment stage.On a concession basis (Federal Law 115), projects for the construction of preschool institutions and several projects for the construction of schools are being implemented" [4, p. 639].

The federal law on PPP provides for a rather complicated procedure for initiating a project by a private partner: "The proposal for the implementation of a partnership project is actually a complete pre-project preparation for a potential object, which, according to current practice, amounts to approximately 5% to 10% of the total funding In addition, the private initiator of the project must have a bank guarantee in the amount of at least 5% of the total amount of financing, as well as all permits that give the entity the right to carry out the relevant type of activity (licenses, membership in SROs, etc.). Also, the private partner has the right to attract a contractor that has all the necessary licenses. All this is provided to the public partner, who at the same time has the right to decide on the impossibility of implementing the PPP project. If the public partner and the authorized state (municipal) body decide on implementation of the project, a competition is announced" [4, p. 640].

In addition, according to the law on PPP, the conclusion of an agreement is only possible in relation to real estate or movable property. "This hinders the implementation of PPP relations in the field of intellectual property, which in the digital economy also does not contribute to the stimulation of private initiative. There is also uncertainty in tax legislation in relation to PPP projects. For example, if a private partner is transferred to a private partner within the framework of a PPP project, this entails the need to pay the corresponding taxes, although the private partner has not yet received any income.With regard to the implementation of PPP projects in relation to social infrastructure facilities, in particular schools, the PPP law provides for the transfer of ownership of the partnership object to the private partner" [16].

If social infrastructure facilities are funded, this is more patronage than PPP. "In some regions of the country, 70% of the funds allocated to the regions for PPP projects are returned to the federal budget due to the poor quality of the preparation of PPP projects. there is an opportunity to take into account the specifics of the region and reflect it in regional legislation. In a number of regions over the past few years, PPP projects in the field of education have been implemented precisely thanks to regional amendments to the legislation: kindergartens or schools were built throughout Russia, in particular in St. Petersburg, Moscow, Tomsk regions, the Komi Republic, Khanty-Mansiysk Autonomous Okrug, YaNAO" [ibid.].

It is predicted that by 2025 it is necessary to build about 2 thousand schools in Russia (this will require about 2 trillion roubles) — such a number of educational institutions will make it possible to completely abandon the second shift, provide all school-age children with places in educational institutions, as well as to create a modern information and educational environment in schools.

At present, the implementation of social policy, but transferred without funding: And today there is a question for the regions, where to find resources, both internal and external, to fulfil these tasks and seriously update the material and technical base.

"An experiment to create an educational infrastructure within the framework of a public-private partnership mechanism will begin in the Nizhny Novgorod region — Prosveshchenie Group of Companies and the VER.RF state corporation will become its participants. The Nizhny Novgorod region is among the top ten in the rating of the development of Russian regions in terms of PPP, posted on the support platform infrastructure projects ROSINFRA The project to create new schools is not implemented within the framework of federal legislation There will be a regional agreement on PPP, but part of the money is allocated from the federal budget" [16].

"Within the framework of the project, which will be carried out in two stages, it is planned to create 14.9 thousand places for schoolchildren in the region by building 13 schools. During the first stage (2020–2022), six schools with 8.1 thousand places will be built. and three schools with 1.5 thousand places in Nizhny Novgorod, as well as 3.6 thousand places were created in the cities of Kstovo, Dzerzhinsk and Arzamas. During the second stage (2022–2024), it is planned to create 6.8 thousand places in the region. places in a number of settlements. In total, there are 896 educational organizations in the region, which are attended by more than 321 thousand people, while 26.6 thousand children study in the second shift. The need for places for students, according to the state program of the Nizhny Novgorod region, is estimated at more than in 36.3 thousand, there are not enough 62 educational institutions [4].

Within the framework of PPP, they begin to work with the idea of creating a meaningful infrastructure based on an analysis of the needs of the region. In order to form the pre-professional orientation of the school, the economic indicators of the region are taken into account, a profile of potential jobs is also developed and the needs of enterprises of the regional economy are analysed. As a result, the requirements for the appropriate infrastructure become the basis for the design of the school.

"The school project is being prepared on a turnkey basis: a pedagogical concept should be formed, a building design should be prepared or adjusted taking into account this concept, a pedagogical and managerial core should be formed. The pre-professional orientation of the school will be represented by the 'high school-regional university-employer' model, and this will help to solve the problem of training and retaining personnel in the region. It is assumed that the erected educational institutions will be full-time schools operating from 8:00 to 20:00. The total investment in the project is estimated at 18.4 billion roubles. The implementation of the project will allow the implementation of the state program for 35% from extrabudgetary funds" [ibid.].

This is not the first VEB project, which is planned in the Nizhny Novgorod region. In November 2018, the head of the regional ministry of property and land relations, Sergei Barinov, during a meeting at the Ministry of Education of the Russian Federation on the creation of an effective model of public-private partnership in the modernization of children's recreation and health infrastructure, announced plans to conclude an agreement between the regional government and Vnesheconombank on cooperation in the area of rehabilitation of children's camps in the region on the basis of PPP.

The Enlightenment Group came up with an initiative to create a network of camps on already existing land plots that are not used for one reason or another, but intended for the functioning of children's camps. There are about 700 such plots in the country, and the potential volume of investments with the involvement of private capital is about 140 billion roubles to recreate the system of children's summer recreation in the required volume. The main directions of the functioning of children's recreation camps will be educational, cultural-historical, patriotic and sports. As part of the development of children's recreation, a project of the largest children's year-round camp is now being considered. The idea of the project is unique in itself, according to preliminary calculations, it will be one of the largest camps in Russia, which will be able to combine the most advanced practices of organizing children's recreation at the same time with the implementation of additional education programs. and the Northwestern Federal Districts, the first should be projects in the Nizhny Novgorod and Kaliningrad regions. The problem of children's summer holidays during the vacation period is quite acute. Parents send a significant part of their children to day camps due to the psychological unpreparedness of the parents, fear for safety, quality food and child care, lack of understanding of the benefits of the child's stay

in the camp, and serious infrastructure problems.

It is crucial to consider the aspects that need to be paid attention to when preparing a PPP project in the field of education using the experience of the China.

Ownership of the object of education:

The concession agreement model provides for exclusively public ownership of the object. In contrast, the PPP agreement model obliges to transfer the object to private ownership — then it can be returned to the public partner both after a short time and by the time the project ends.

In some cases, the possibility of obtaining ownership of the educational object can significantly increase the attractiveness of the project for private investors, since it allows the object to be pledged in favour of the financing organization. Therefore, the choice of the legal model for launching the project should be carried out taking into account the given factor.

Allocation of operational obligations:

In addition to commitments to invest funds and modernize property, it is a basic element of a PPP project. Bringing a private party to target operation (implementation of educational activities) and/or maintenance of property.

Due to the absence of large operators of educational services on the market, the private party, as a rule, is assigned the obligation to maintain the property, and the involved educational institution (state or municipal) is responsible for the educational process.

The SHG agreement allows flexible distribution of operating obligations between the parties — the private operator is responsible only for maintenance, and the public partner is responsible for educational activities, that is, involves an educational institution. Within the framework of the concession model, those responsible for the target operation of the facility will always have a concessionary before the grantor, despite the fact that a municipal or state educational institution is involved for target operation. However, the correct design of the terms of the agreement will help to reduce the investor's risks associated with the targeted exploitation of the property, so the choice between a concession and a PPP agreement should be made in the context of all the advantages and disadvantages of legal models, as well as public interests.

Carrying out commercial activities:

The conditions of a PPP project may provide for the implementation by a private party of commercial activities using the facility — additional educational and sports programs, sections, catering, etc. In this case, it is important to consolidate a well-thought-out regulation of interaction between a private party (or a person involved to provide additional services) with an educational institution (distribution of hours, premises, etc.).

The implementation of commercial activities creates an additional financial flow for the private party, which allows to reduce the financial burden on the budget of the public party, at the expense of which such projects are funded. For example, this will allow using the concept of the minimum guaranteed income together with fixed budget payments — in this case, part of the payments will be paid by the public side only if the private partner does not reach a certain level of profitability.

Conclusion

Summing up the general conclusions, it can be noted with precision that in order to support the development of stable growth of investments in infrastructure projects, the first step is to solve the problem of reducing aggregate demand. Here, an increase in government spending is immediately seen, and the source of financing will be either accumulated financial assets, as in the case of China and countries — exporters of oil and minerals, or securing support from government loans, as in the case of the United States and other developed countries. economy.

As for attracting financing for the infrastructure construction of private capital, it is that states and interstate structures (the above-mentioned development banks) should take the leading positions. Their main task should be to introduce into the practice of infrastructure construction mechanisms for mitigating project risks and temporary mechanisms for accumulated savings.

A good example is the use of infrastructure bonds backed by the assets of a development bank. According to the conclusion of the World Economic Forum, which compiles an annual rating of the competitiveness of national economies, the quality of infrastructure in Russia ranks 35th in the rating, with a rating of 4.8 (scale from 1 to 7). The most problematic element of Russia's infrastructure today is the condition of highways.

The costs of the entire infrastructure, in comparison with Russia's GDP, have shown a downward trend in recent years. This is largely due to the general decline in investment demand in the country, the imposition of sanctions on our state and the situation with the coronavirus.

Naturally, not only the above-mentioned global problems have an impact on the development of infrastructure construction. In addition to them, more detailed ones can be distinguished, such as:

The presence of errors in the planning system of infrastructure construction projects and a low percentage of optimization of the existing infrastructure

Imperfection of the contracting scheme, which does not allow for effective management of project resources

It is always worth considering the human factor

Lack of personnel professionally trained for the implementation of high-tech projects

Difficulty in overcoming administrative barriers and a significant level of corruption, dragging down the development of infrastructure in Russia.

Taking into account the entire domestic history, it is necessary to note this kind of problem of infrastructure construction, as effective control over the financing of the project and the costs during its implementation. Here it would be appropriate to give an example of a megaproject from the times of the USSR, such as the Baikal-Amur Mainline, the implementation of which did not lead to the expected impetus for the economic development of our country. The reasons that have a negative impact on the multiplier effect of infrastructure projects are low quality of implementation and overstatement of projects.

The actual model of the economic development of our state involves the use of the multiplier effect from state investments in infrastructure projects. In general terms, this approach looks like correct and timely, especially in the context of such a good infrastructure in our country, its improvement will certainly increase the quality of life of the inhabitants of Russia. In this case, of course, it is worth paying attention to an important detail.

The studies carried out demonstrate that the effect of infrastructure projects, positive for the continuous development of the economy, occurs to the greatest extent during their implementation. Upon termination of the implementation, this effect begins to rapidly deteriorate.

Having studied and taken into account all the results of research aimed at providing infrastructure projects in Russia with investment resources, for the long term, first of all, it is necessary to reform the financial system.

Consequently, the reform of the financial system should be an important component of the new model of economic development in Russia. The reform should be aimed at increasing the level of competitiveness, and at strengthening the operation of market mechanisms, both in the economy as a whole and specifically in the financial sector.

1. More active use of public-private partnership mechanisms is required in order to solve the problem of distribution of project risks of infrastructure construction in Russia.

2. There is a proper need for specific regulation and control over new infrastructure PPP projects. It is logical to organize them in the form of a national public-private partnership management system. In this vein, they can actively use the innovation infrastructure model.

3. In the context of attracting private capital to infrastructure construction projects, it would be advisable to use the positive aspects of financial engineering, namely, the formation of a set of derivative financial instruments on the Russian financial market.

These instruments should be covered by infrastructure assets or the results of the implementation of infrastructure construction projects.

In general, we can once again say that public-private partnership is one of the most promising mechanisms for attracting long-term investment resources for the development of infrastructure, modernization of the national economy and ensuring the innovative development of the country. The advantages of using the resources of the state and business in the framework of PPP are determined by a number of factors:

Limited financial resources do not allow the state to successfully address the development of infrastructure and industrial sectors without the participation of private capital

More effective management and high adaptability to the changing conditions of private business compared to state structures

The instability of the economic situation, which orients private business to search for objects for stable guaranteed investment investments

High riskiness of investment projects, which makes it necessary to distribute risks between partners.

According to all mentioned above, we should pay more attention to the development of PPP and disclose real data from Russian statistics to make various assumptions for improvement.

China and Russia are quite similar in their ways of economic development. By drawing up a number of models, we have seen that the use of such a financing method as PPP has a positive impact on the Chinese economy. Therefore, it is safe to say that if the required measures and China's experience are followed, Russia will be able to use China's experience and step up infrastructure investments in PPPs.

REFERENCES

1. Nikitina T.I., Lysenko A.N. Formation of public-private partnership as a tool for the development of the region. *Vestnik AGTU. Series: Economics*. 2019. (2). URL: https://cyberleninka.ru/article/n/formirovanie-gosudarstvenno-chastnogo-partnerstva-kak-instrument-razvitiya-regiona (date of access: 03/02/2021).
2. Ryakhovskaya A.N., Schreiber A.K., Kirillova A.N. Development of financing in housing and communal services: Monograph. A.N. Ryakhovskoy, Ed. Moscow: INFRA-M; 2018.
3. Chekalin, V.S. Economy of the municipal economy. Textbook. SPb.: SPbGIEU; 2019.
4. Pikulkin A.V. System of public administration. A textbook. 4th ed. Moscow: UNITY-DANA; 2019.
5. Program "Twelfth Five-Year Plan for Economic and Social Development". [Electronic resource] URL: http://news.sina.com.cn/c/2011–03–17/055622129864.shtml.
6. Chieh-Hua Wen, Jun-Yuan H. A discrete choice model of ocean carrier choice. *Journal of the Eastern Asia Society for Transportation Studies*. 2017;7:795–807.
7. Zotov V.B.. Municipal government system. Textbook. 3rd ed. SPb.: Peter; 2017.
8. Mikheev V. Evolution of the socio-economic model of China's development. *Society and Economy*. 2019;(3–4):148–188.
9. Chin-Shan Lu. Market segment evaluation and international distribution centers. *Transportation Research*. 2019;9(E):49–60.
10. Green Paper on PPPs, Commission of the European Communities; 2018. URL: http://eur-lex.europa.eu/LexUriServ/site/en/com/2018/com2018_0327en01.pdf.
11. OECD. Infrastructure investment data, China. URL: https://data.oecd.org/transport/infrastructure-investment.htm (date of access: 17.05.2021).
12. ILO Statistics. Output per worker (GDP constant 2011 international $ in PPP). ILO modelled estimates, Nov. 2020. URL: https://www.ilo.org/shinyapps/bulkexplorer48/?lang=en&segment=ref_area&id=CHN_A (date of access: 17.05.2021)
13. Borisova V.V. Logistic management in interregional commodity exchange. Rostov-on-Don: Center RGEU "Rinh"; 2019.
14. Wumek J. Lean Manufacturing: How to get rid of losses and make your company prosper. 4th ed. Moscow; 2020. (In Russ.).
15. Kazarina L.A. Improving the efficiency of supply chain management. Izvestiya IGEA. 2019;(4):13–21.
16. Pogudaeva M. Yu., Orkusha M.A. The main forms of economic interaction between private business and the state. *Economic journal*. 2019;(25). URL: https://cyberleninka.ru/article/n/osnovnye-formy-ekonomicheskogo-vzaimodeystviya-chastnogo-biznesa-i-gosudarstva (date of access: 02/30/2021).

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