Vol. 17 | № 4 | 2023 cfjournal.hse.ru ISSN 2073-0438

JOURNAL OF CORPORATE FINANCE RESEARCH

New Research | Corporate Financial Analytics | Applied Financial Analytics | Methods | Reviews | Discussions

Journal of Corporate Finance Research

Vol. 17 | № 4 | 2023
e-journal

www.cfjournal.hse.ru
ISSN 2073-0438

Contacts:

Higher School
of Economics (HSE),

11 Pokrovsky Boulevard, Building S
Tel.: +7 (495) 621 9192*27188
E-mail: cf@hse.ru

Journal of Corporate Finance Research (JCFR) was established in 2007. It is founded by the National Research University Higher School of Economics (NRU HSE) and **Irina Ivashkovskaya** (chief editor). The journal is included in Web of Science Russian Science Citation Index (RSCI).

Journal of Corporate Finance Research aims to publish high quality and well-written papers that develop theoretical concepts, empirical tests and research by case studies in corporate finance.

The scope of topics that are most interesting to JCFR includes but is not limited to: corporate financial architecture, payout policies, corporate restructuring, mergers and takeovers, corporate governance, international financial management, behavioral finance, implications of asset pricing and microstructure analysis for corporate finance, private equity, venture capital, corporate risk-management, real options, applications of corporate finance concepts to family-owned business, financial intermediation and financial institutions.

JCFR targets scholars from both academia and business community all over the world.

Frequency: 4 times per year

The Journal of Corporate Finance Research is committed to upholding the standards of publication ethics and takes all possible measures against any publication malpractices. Editors of the journal reserve the right to reject the work from publication in case of revealing any such malpractices.

Guidelines for authors:
https://cfjournal.hse.ru/en/for%20authors.html.

Contents

Journal of Corporate Finance Research
Vol. 17 | № 4 | 2023
www.cfjournal.hse.ru

New Research

5 **Elena Rogova, Marina Kirichenko, Daria Lebedeva**
Do Mergers and Acquisitions Promote R&D? The Case of European Innovation and Technology sector

19 **Rufina Evgrafova, Irina Ivashkovskaya, Ekaterina Shorokhova**
Corporate Resilience in Cancel Culture Times

38 **Tatsiana Lashuk, Mark Vasilevskiy, Evgeniia Filatova**
Performance of M&A Deals in The Russian Market: Evidence from Oil & Gas and Power Industries

59 **Aleksandr Stepanov, Alexander Kayatkin**
Stakeholder Value Creation through Business Restructuring: Post Sanctions Evidence from Russian Airlines

78 **Evgeniia Naumova, Gleb Silkin**
How Do Inclusive Growth Practices Affect Financial Performance and the Value of Metallurgy Companies?

93 **Anastasia Strekalina, Renata Zakirova, Alena Shinkarenko, Evgenii Vatsaniuk**
The Impact of ESG Ratings on Financial Performance of the Companies: Evidence from BRICS Countries

114 **Maxim Belous**
Dividend Policy of Russian Companies: Cancel Culture Effect

Reviews

132 **Yanfei Wu**
ESG Transformation in the Largest Emerging Capital Market of China. A Literature Review

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.5-18
JEL classification: G34, O32

Do Mergers and Acquisitions Promote R&D? The Case of European Innovation and Technology sector

Elena Rogova ✉
Doctor of Science, Professor, Saint Petersburg State University, Saint Petersburg, Russia,
e.rogova@gsom.spbu.ru, ORCID

Marina Kirichenko
Economist, MKT LLC, Moscow, Russia,
kirichenko.m.o@gmail.com, ORCID

Daria Lebedeva
Economist, JTI Russia LLC, Moscow, Russia,
dlebedeva27@gmail.com, ORCID

Abstract

Innovation efforts and R&D play a foundational role for companies seeking to further develop their products and services and secure a sufficient market share. This is especially relevant for knowledge-intensive fields, particularly for the Innovation and Technology Sector, where players are constantly challenged with adapting to its multi-faceted nature, processing large amounts of data, and rapid innovation transfer. Thus, it is important to study the factors that contribute to R&D intensity and encourage innovations in detail. The study explores the impact of M&A activity on R&D intensity and R&D spending increase of both the acquiring companies and their targets in European Union. The final sample consists of 85 companies that had implemented M&A deals in the Innovation and Technology sector of the EU between 2007 and 2021, acting as acquirers or targets in these deals. The data is collected from Refinitiv Eikon database. Subgroups are determined based on categorization established by the European Commission. These include Business support service activities, Computer programming, Data processing, Manufacturing, and Telecommunications. In addition, financial data was collected on non-merging companies for forming a control group for the analysis. Difference-in-difference and probit model estimation methods are used to analyze the effect of M&A activity on the companies involved. The results show that the R&D intensity of both acquirers and targets decreases in the post-merger period. As for R&D expenditures, they increase for acquiring companies, while the effect is the opposite for their targets. The study contributes to the literature as it, unlike other similar studies that focus mostly on one group of actors, differentiates between the effect on the innovation activity of targets and the effect on the acquirers. The results could be used to increase the knowledge of the M&A effect on innovation efforts in the Innovation and Technology sector in European countries and understanding the possible problems it could lead to.

Keywords: Innovation, Research and Development, Merger and Acquisition, R&D growth, R&D intensity, technology sector, difference-in-difference, M&A deals

For citation: Rogova E., Kirichenko M., Lebedeva D. (2023) Do Mergers and Acquisitions Promote R&D? The Case of European Innovation and Technology sector. *Journal of Corporate Finance Research.* 17(4): 5-18. https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.5-18

Introduction

There has been a continuous debate in the scientific community as to the effect mergers and acquisitions have on the innovation efforts and R&D activity of the companies that participate in mergers and acquisitions (M&A). M&A activity peaked in Europe in 2021 to the highest level since 2009 (1893.3 bn USD) and declined in 2022 and 2023 due to the uncertainty in the business environment on the continent that led to tough monetary policies, but it remains high [1]. The discussion of mergers' impact on innovation efforts and market competition has resurfaced in the scientific community due to the recent abundance of mergers in the high-tech industries [2]. One of the illustrative examples was the merger between the drug company Pfizer and its rival, Hospira. The European Union's competition commissioner, Margrethe Vestager, said about this transaction: "We only approved the deal after Pfizer agreed to sell the European rights to an arthritis drug it was developing. One concern was that Hospira already had a competing drug on the market, and we thought Pfizer might stop work on its own drug if the deal went ahead as planned. Which would have meant less of the innovation that we depend on as patients" [2, p. 284]. Another example is the telecom merger of Telefónica Deutschland and E-Plus in Germany that also became the subject of a European Commission investigation. It was discovered that the parties were each other's 'close competitors', so the mergers would lead to the elimination of market competition between the merging parties and, therefore, to a significant price increase in all the segments including the pre-paid and the post-paid service segments. Moreover, the merger would lead to high entry barriers and limited buyer power [3]. The authors have especially started to voice their concerns since approximately 2015, when the wave of mergers associated with the largest US technological companies, namely Google, Amazon, Facebook, Apple, and Microsoft (GAFAM), was identified [4]. Later it was revealed that a significant percentage of these mergers turned to be killer acquisitions', meaning that the core product of the acquired startup was discontinued shortly after the acquisition.

The relevance of this research is determined by two main points. First, the companies in the Innovation and Technology Sector are constantly pressured to add increasingly more valuable assets, offer innovative products, and show astounding growth rates [5]. Secondly, as constant innovation and R&D spending is inherent for this sector, thorough research into how M&A activity affects innovation efforts is especially relevant [6].

Analysis of the previous research on the topic shows that the relationship between innovation efforts and M&A activity is not conclusively established. There are two polarizing opinions in the scientific community, the first one stating that M&A puts a strain on the innovation efforts of the merged entity, while the second one presents findings that in some cases suggest a positive effect on R&D of firms involved in a merger. Researchers advocating for a negative effect of M&A on innovation efforts argue that these deals seem to make managers more risk-averse, thus reducing their commitment to R&D projects, and their overall number [7], while resourses spent on the M&A itself also prevent companies from investing the expected amount of funds into the on-going R&D processes. However, the scholars who found a positive relationship between M&A and innovation speculate that the R&D intensity decreases only briefly and then picks back up, and the merged firms are also able to spread their R&D-related fixed costs across a wider variety of projects.

As for the models built using the data on M&A activity and innovation efforts indicators, J. Haucap et al. [2] built a complex model for not only measuring the effect innovation has on acquired firms and the acquirer, but also on the non-merging players that are considered to be in competition at the moment. A theoretical oligopoly model is built with heterogeneous firms as well as a patent race model based on the European Commission data on a sufficient sample of more than a hundred merger targets from 38 different product markets. The data spans almost twenty years, from 1990 to 2009. The results help establish that there is a powerful connection between mergers in the market and rivals' performance in R&D. In addition, since this connection is determined to be negative, it poses a concern to the responsible authorities, since research-intensive industries might experience holdbacks due to this fact. It is important to note that the theoretical model has shown that if the pre-merger innovation level was low, there is a chance that a merger will have a positive effect on the innovation in the industry. On the other hand, E. Cefis and O. Marsili [8] speculate that mergers promote innovation within the firm, and act as a starter in the process of becoming an active innovator. The dataset is then transferred to transition probability matrices, and a random effects discrete choice model is estimated with the purpose of determining whether innovation activity is dependent on involvement in M&A. Finally, the article by F. Szücs [9] is the first to look both at the acquirer and the target before and after the merger with an assumption that the effects on both are highly asymmetric. The author combines propensity-score matching techniques to find a similarity measure with the nearest-neighbor matching algorithm to build control groups. The effects on R&D performance of groups are later evaluated with the help of difference-in-difference estimation and with a probit model. F. Szücs [9] shows that firms acquired through a merger had lowered their R&D efforts substantially after the event took place. Interestingly, the picture is similar for acquiring firms, considering that the intensity of innovation efforts also decreases, albeit due to the sales increase and only slightly if compared to the acquired firms. This is likely because acquirers pick highly innovative firms where the main subject of their technological portfolio has not been fully exploited, which leads to an increase in marketing & sales, along with a temporary halt in R&D. Our study, thus, builds on the knowledge base collected during these studies and proposes altered and improved versions of models examining the relationship between M&A and innovation.

As most of the research performed on this topic considers only one side of the M&A deal or makes no distinction between the two, our study explores the difference between the effect on innovation activity of targets and the effect on the acquirers. In addition, the research is also centered around the Innovation and Technology Sector and its subcategories, including Business support service activities, Computer programming, Data processing, Manufacturing, and Telecommunications. Thus, the results could be used to improve the understanding of the M&A effect on R&D and innovation activities in the sector and understanding the possible costs and benefits that could arise.

The remainder of the paper is organized as follows. The first part is theoretical and is centered around the definition of key terminology and concepts used throughout the paper. Moreover, the study of the already-existing research on Innovation efforts and M&A activity in the Technology and Innovation field, its relationship, and other factors that influence R&D intensity and merger activity in the sector is performed in this section. The second part is methodological and consists of a detailed data description of data used and the empirical strategy chosen for its analysis. In the next part, the results are presented and discussed regarding hypotheses stated in the beginning. Finally, in the last part the conclusions are drawn, together with an outline of practical implications and future research opportunities.

Literature review

Mergers between companies in the Innovation and Technology market commonly cause concerns about the decline of competition on the market and the number of innovations being introduced in the market. The problem of competition and availability of technologies on the market is described in [4; 10] using the example of five largest technological companies in the market (Google, Amazon, Facebook, Apple, and Microsoft). The analysis of the past five years of these companies' general growth strategies revealed that they exhibited tremendous merger activity in the field, mostly purchasing promising technological startups. However, it is not yet completely clear whether all these mergers are carried out in line with the existing laws of antitrust authorities and, more importantly, if these regulations could even be fully applied to controversial merger cases in this new digital economy.

W. Park and R. Sonenshine [11] found that horizontal mergers lead to a decline in post-merger innovation in comparison with the level of innovation that would have prevailed had a merger not occurred, but only for the sample of mergers that were challenged by antitrust authorities. The authors claim that mergers may happen because challenged companies may cut back on duplicative R&D. At the same time, it was mentioned that the growth in both the R&D and patenting at challenged firms from the pre-merger to the post-merger period was lower than that of non-merged firms over the same period.

Hence, two dimensions of studying relationships between M&A and innovation incentives arise. First, it is the issue of how to measure innovation incentives considering the large number of studies that provide a very broad vision of innovation and its origins and results [12–14]. Second, it is important to study what motives for mergers are driven by the intention of companies to increase their competitiveness through innovation.

Measurement of innovation incentives

The existing literature can be classified into several groups based on the way of measurement of innovation efforts. The first group is comprised of patent-based studies that examine the number of patents (R&D outputs) obtained by a firm. The advantage of such methods is that patents are a direct reflection of innovation and are related only to non-standard improvements or solutions. They correlate well with other measures of innovative output, have economic significance and are comparable across industries. In [2], the number of patents per year serves as the main innovation indicator. The authors used data taken from the PATSTAT database that contains information about patent applications for the years 1978–2015 for all companies in the sample. Patent citations and technology class assigned to each patent have been extracted from the database application data. It was found that in the post-merger period the growth of patent applications decreased by approximately 46%. V. Rao et al. [15] uses a dataset that contains information about 4,444 firms from 1992 to 2008 across four high-technology industries in 45 countries. To proxy innovation activity the authors used a number of patents created by the merged firm for the first three years following the merger. According to the observed results, the number of new patents typically declines in the first year after the merger compared to the year before but increases during the next two years. The authors suppose that the reason lies in the process of adaptation to the new company structure, while expected synergy appears only in the next few years.

The second group of studies uses the company's R&D expenses (R&D inputs) to measure innovation incentives. In comparison with R&D outputs, R&D inputs are associated with the company's willingness to invest in innovation instead of their success in achieving it. G. Phillips and A. Zhdanov [16] used annual R&D expenditures scaled by sales as a measure of innovation activity of companies. They mentioned that the highest R&D activity as a percentage of sales is concentrated among firms with below-median size. F. Szücs [9] analyzes the effect of mergers on two measures of R&D inputs: the growth of R&D expenditures and R&D intensity, defined as the ratio of R&D expenditures over sales. The author states that M&A transactions entail negative R&D growth effects. It was found that R&D spending of the target firms decreased after the merger. Another key point, R&D intensity, demonstrates a similar effect. The author mentions that the ratio of research expenditures to sales steadily decreased over the period for both acquirers and target firms.

E. Cefis and O. Marsili [8] make notable contributions to the existing literature by combining two ways of measurement of innovation incentives: if the firm introduced a

technologically new or improved product, service or process, or invested in R&D, or incurred innovation expenses at any time in the three years prior to the survey. The choice to use such a broad proxy for innovation is motivated by the primary aim of the study to capture whether (in any possible way) M&A helps firms to become innovators.

Motives for mergers

Motives for innovative mergers are vast and are driven by various factors. However, it should be mentioned that they coincide with the motives of non-innovative transactions. For example, a company may be interested in improving its organizational structure, diversifying cash flows, etc. One of the driving factors is the expectation of demand growth that requires increased production capacity; hence, mergers can act as the means of such an increase [17]. The authors point out that one intention for a merger of innovative firms may be the willingness to internalize their innovation spillovers and to gain a competitive edge.

Mergers of innovative companies may allow companies to reduce costs because of the effect of scale, quickly enter new markets, redistribute resources, including those employed in R&D, increase the customer and supplier base, or increase market power. However, often the main reason for a merger in the Innovation and Technology sector is the attempt to absorb external technological capabilities to compete successfully in modern economic conditions and expand the existing knowledge base of the company.

Recent studies describe various theoretical and practical approaches that allow drawing empirical predictions about the relationship between acquisitions and R&D incentives. F. Szücs [9] provides an estimation of the probit model and difference-in-difference analysis. The results of this research support the idea that mergers have a negative effect on R&D spending during the post-merger period. Acquirers show R&D expenditure reduction as well. However, the reason for such changes could be the diversion of financial and managerial resources to restructuring after the acquisition of the company.

E. Cefis and O. Marsili [8] estimated the dynamic random effect probit model and transition probabilities for the two groups of firms: M&A active and M&A non-active to understand whether there is a difference in innovation patterns between the two main groups of firms. The results of the study suggest that if the firm has previously participated in M&A, then the probability of transition from a non-innovator to an innovator, and the probability of continuing to be an innovator significantly increases. As for the impact on firms of different sizes, in some cases small firms become innovators.

S. Chou and Y. Chu [18] measure M&A activity as one industry-level factor that is responsible for the knowledge spillovers, the variable that, in turn, encompasses the variations in the innovation activity of standalone firms in the industry. Authors show that an active M&A market positively affects idea exchange between the firms and, consequently, ensures their knowledge base growth.

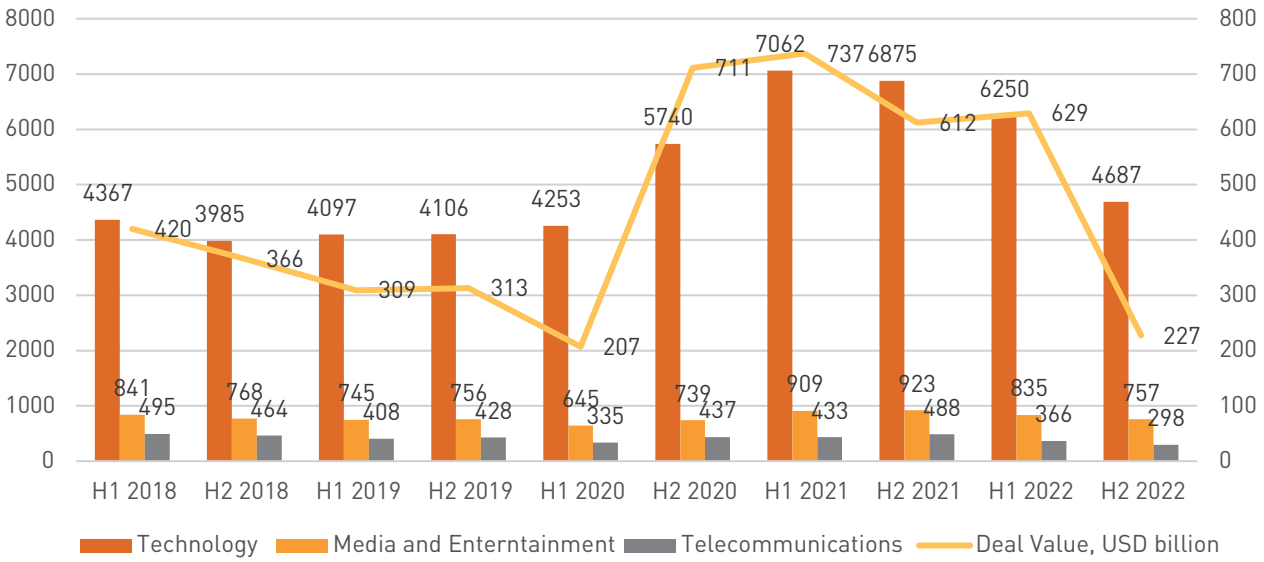
The model by K. Zhou et al. [19] considers both a down-stream firm and an up-stream firm in terms of the production chain. The model shows that a vertical merger reduces the risk premium of an innovation project. Interestingly, it is also found that the financial constraint-stock relationship is stronger in firms who pursued vertical merger integration.

G. Phillips and A. Zhdanov [16] investigate the impact of mergers and acquisitions on a firm's willingness to invest in research and development and innovations. In accordance with the theory set forth, large firms can outsource R&D investment to small ones. Later, those small firms that successfully innovate become attractive targets for acquisition, and an exit through strategic sales can be considered as the motivation to continue to spend on R&D. The paper also suggests that mergers can be a way to use innovation as a substitute strategy for the development of R&D.

Analysis of the current state and trends of the European Innovation and Technology sector

Looking at the latest overall statistics in the Innovation & Technology sector, it is apparent that M&A activity was bustling in the years leading up to the pandemic, and even certain limitations and a gap in economic activity during 2020 did not cause a major disruption to it. It can be seen from the graph at Figure 1 that the numbers have gone up in the last quarter of 2020, and the market overall seems to have rebounded. However, since the second half of 2022 M&A activities have shrunk, both in number of deals and deal value. Considering the trends in the sector, it is important to list the key points discussed in the recent publications on the topic. Firstly, as per the PwC report for 2023, abundance of new opportunities on the market led to firms exploring efficient ways to scale their operations and grow the business to compete for a significant part of the market share. Next, another characteristic of the market that is contributing to intensive M&A activity in the field is the regular disruption of other technologies, for instance, banking or healthcare, with suggestions of entirely new ways of operation and creating industries within industries, which has also led to intensive activity involving mergers and acquisitions. Finally, another key trend present in the sector is the fact that attracting funds for a new generation of companies offering lower costs and more scalable ideas is becoming increasingly easier, and models of using scaling prior to the initial public offering is thus becoming increasingly more popular [20].

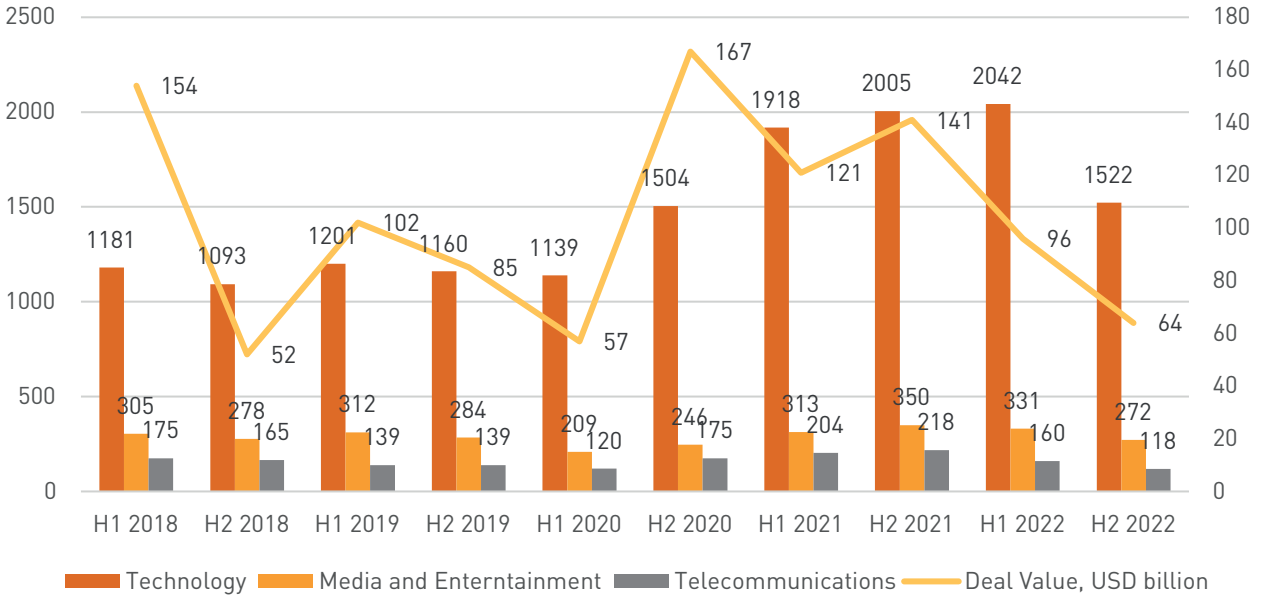
Figure 1. Number of deals and M&A deal value in the Innovation & Technology sector, 2018–2022



Source: [20].

Looking at M&A activity in the European IT sector (Figure 2), one may conclude that it mirrored global trends. Activity soared to record levels in 2021 and maintained momentum into the first half of 2022, followed by a slowdown in the latter half of 2022 that extended into early 2023 [21].

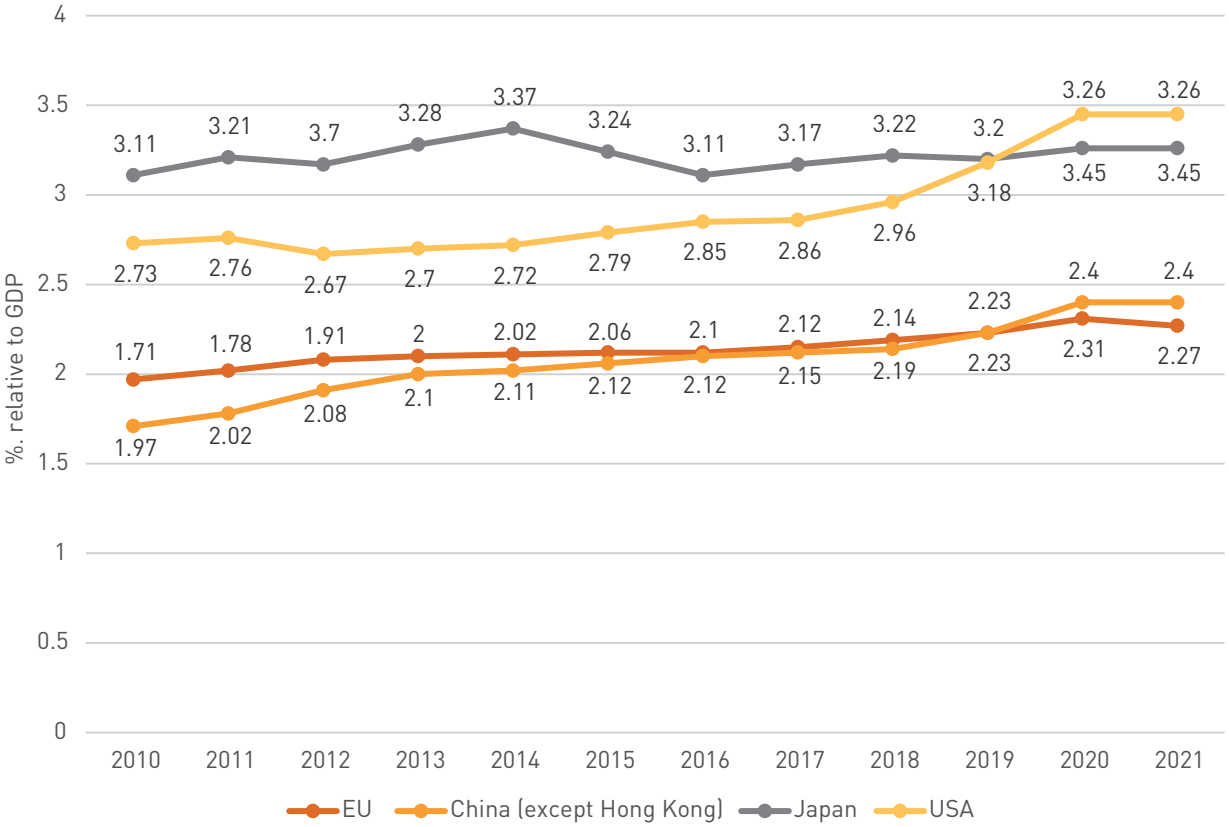
Figure 2. M&A deal value in European Innovation & Technology sector



Source: [20].

When comparing R&D expenditures in the European Union to those in other countries with developed economies, it is apparent that there is some room for growth available in the coming years. Although it is apparent that the percentage spent on R&D has been growing, there is still much to be done in terms of policies and instruments that ensure that sufficient attention is needed to this matter, so that a gap of about 2% is bridged and member states are in line with the leading developed countries (Figure 3).

Figure 3. R&D expenditures as % of country's GDP



Source: Eurostat. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=R%26D_expenditure

According to the Organization for Economic Co-operation and Development, as of 2021, the EU set the following as its two highest economic priorities needed for structural reform:

1) Boosting R&D and digitalization by increasing investment in R&D and promoting quicker diffusion of new tech developments.
2) Improving competition and its regulation in the sector by accounting for consumer lock-in, strong network effects, and enforcing proper big data maintenance.

Finally, looking at the percentage of people employed in the technology and knowledge-intensive sector, the percentage has remained on a rather high level for the past ten years. Throughout that time, it has also experienced a slight rise, but the overall number for the EU stayed at around 45% consistently. Therefore, it can be concluded from this graph that the sector offers many workplaces and plays a significant role in engagement of active workforce on the labor market [22].

Considering the statistics presented above, there is a significant number of M&A deals happening in the European Innovation & Technology sector, both in the amount and the deal value. It is interesting to note, however, that the percentage of R&D expenses relative to GDP has been stagnant for a few years now. Considering that the European Union has a negative trade balance in such highly innovative categories as Telecommunications, Electronics, and other high-tech goods, and the amount of M&A activity in these subcategories, it is especially vital to see whether the R&D expenses and their allocation are justified, and the value is delivered with potential sector and innovation growth considered. All in all, there is a need to determine whether intense M&A activity in the sector has any influence on R&D intensity and its growth patterns, to be able to implement the necessary regulations and initiatives to support innovation and competition in the sector in a timely manner.

Research framework and hypotheses

After analyzing the literature on the topic, a research gap for the study was identified. First, previous studies typically focused on only one side of an M&A deal (acquirers or targets), or did not differentiate between them in their analysis. In addition, several articles used short-term data available on the topic. Because it can take a longer period to restructure innovation efforts within a merged entity, this approach provides limited explanatory power. Finally, studies on the topic are focused on a vast array of industries, and the ones attracting the interest of the scientific community, and the most referenced ones, are mostly performed with data about non-R&D intensive sectors. A closer look into the innovation-driven industry is, therefore, required.

Based on the gap identified, we formulated the following hypotheses.

The first hypothesis is connected to the assumption proposed by F. Szücs [9], namely that a firm's sales would likely experience an increase after a successful acquisition, but R&D spending would not rise sufficiently, since some of expenses would be optimized through the merger of the two entities. Consequently, these assumptions would mean that as sales rise, R&D intensity decreases and R&D costs do not change. Still, after two companies merge, an increase in R&D expenses could naturally arise as their efforts and financial data for that would now be combined within the merged company. Therefore, this hypothesis should be thoroughly tested.

Hypothesis 1. The R&D intensity of the acquirer experiences a substantial decrease after the merger, but the growth of R&D spending is not negatively affected.

The second hypothesis considers the fact reported in [2], namely that the target is in a less beneficial position than the acquirer, and is thus its R&D spending and R&D intensity are likely top be negatively affected after the merger. For some time after the M&A deal, the emphasis is expected to be immediately put on integrating the target's processes into the acquirer's company both in the short and long-term, rather than on fostering new innovative outputs within the target company. The acquirer may choose to allocate dedicated R&D funds somewhere else or even dissolve intense innovation efforts of the acquired firm. However, in [23], it was found that some mergers, especially the ones that are close both sector-wise and in terms of technological processes, are likely to gain advantage in terms of R&D after merger. Since these features are also relevant for this study, the second hypothesis was formulated as follows.

Hypothesis 2. Growth of R&D spending and R&D intensity are negatively affected by the merger for target.

The third hypothesis was built based on [6]. Authors imply that innovation-centered sectors consistently show higher R&D intensity in the post-merger period. In addition, [24] reveals that knowledge-sharing and transfer of talent capabilities in terms of cybersecurity, Artificial Intelligence programming, and robotic process automation is crucial to push the sector forward. Transferring this to our data set with subcategories from the European Commission's Nomenclature of Economic Activities (NACE), it is hypothesized that out of all the categories considered during research, the Computer Programming subgroup would be the least affected due to having one the highest research intensity and innovation level compared to other subcategories. Thus, it could be considered most in need of high innovation intensity and efforts, and would be aiming to continue and preserve R&D activity even after a merger.

Hypothesis 3 R&D intensity and R&D growth of companies in the Computer Programming subgroup are influenced the least after the merger.

Methodology

Data collection and description

The data on deals evaluated in the study was collected from the European Commission (EC) database. To be selected for the research, mergers had to have value significant enough to be reported to the EC and issued a notification. The second criterion used was the sector they operated at the moment of the deal. EC database groups companies based on the European Commission's Nomenclature of Economic Activities (NACE) code [25]. Data sample is composed of companies that operate in the field of Scientific and Technical activities, Information and Telecommunication and are based in Europe. In addition, companies with more than one merger during the observed period were excluded from the sample to avoid possible bias when interpreting the results. We collected balance sheet data for these companies over the period from 2010 to 2021. In addition, the company's age was calculated, and two additional indicators were added.

1) R&D Intensity was measured as R&D expenses divided by company's revenue from business activities.
2) R&D growth is measured as a change in R&D expenses compared to the previous year. It is designed to see whether a company's spending on R&D decreased between two consecutive periods.

The data was collected using Refinitiv Eikon base and K-10 company reports. Companies without R&D data were dropped from the dataset.

The final sample consists of 85 companies. These companies were divided into subgroups determined based on categorization from the European Commission. These include Business support service activities, Computer programming, Data processing, Manufacturing, and Telecommunications (the detailed description of subgroups is provided in Appendix A). Finally, financial data was collected on non-merging companies that would later form a control group for the analysis using the same database and K-10 reports. As for the composition of the control group, it was required for the companies included to be based in the European Union, operate in the Innovation and Technology sector as per the specification used in the database, as well as report their R&D expenses and other financial information throughout the specified time. In addition, it was required for these companies not to be reported to the EU regulatory authorities (the European Commission) on the ground of participation in an M&A deal significant enough to be reported in 2007–2021. Finally, the companies that we were left with were examined to see if the parallel trend assumption would be held in each case. This assumption implies that in the absence of treatment, the difference between the test group and control group would hold constant over time.

Figure 4 and Figure 5 demonstrate the change in average R&D intensity and R&D growth for acquirers, targets, and control group approximately four years before and four years after the merger. Prior to the merger, both acquirers and targets demonstrated the same trend towards a slight decrease in the R&D intensity with small fluctuations.

Figure 4. Dynamics of R&D Intensity over a 4-year period before and after the deal

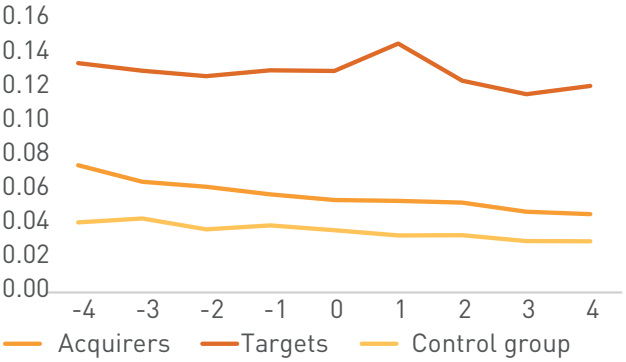
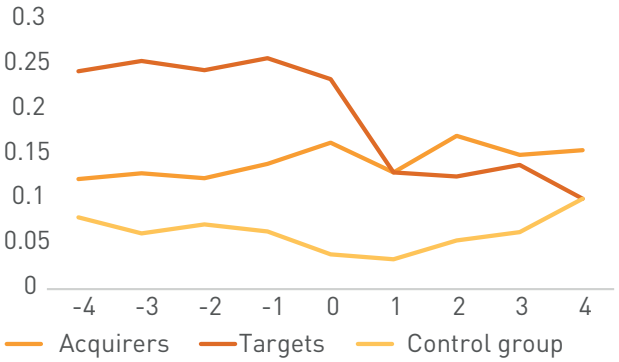


Figure 5. R&D growth over a 4-year period before and after the deal



After the merger (year 0), the dynamics of the two groups of companies remains the same: acquirers have been showing a steady decrease over the next 4 years, approximately 16% for the whole period, while the R&D intensity of targets has almost the same values. Compared to the test group, R&D intensity of the control group is much higher; the difference is approximately 50%. However, the graph does not demonstrate any significant fluctuations except for two years, when the value increased from 0.14 to 0.16.

As for the R&D growth trend, a sharp decrease in growth by 44% for targets in the first years after the mergers can be clearly seen, while later on growth became more stable. Acquirers demonstrate fluctuations over the whole period; however, a positive trend can be observed with a 26% average growth. The R&D growth of acquirers is caused by the transfer of R&D assets from the targets' to the acquirers' books after the merger. As for the control group, the graphic has a U-shaped form: after a sustained decline with the lowest point of 3.3%, the number began to grow.

Summary statistics for both pre-merger and post-merger periods are listed in Table 1.

Table 1. Average values of firm-level variables for control and treatment groups before and after the M&A deal

Variable	Acquirers		Targets		Control group	
	Before	After	Before	After	Before	After
R&D intensity	0.07	0.04	0.04	0.03	0.13	0.13
R&D growth	0.13	0.15	0.25	0.12	0.07	0.06
Total assets	68.31	93.13	26.23	29.28	51.69	72.92
Total debt	18.82	31.48	48.07	68.23	22.19	37.31
Revenues	40.04	49.12	25.45	26.64	26.66	33.91
Net income	6.25	7.31	1.61	1.59	1.68	2.91

Based on Table 1, it can be concluded that acquirers are characterized as firms with higher net income, which possess a greater number of assets, while targets show a negative debt-to-assets ratio and are less profitable. In addition, we can see that the control group's indicators of R&D intensity and R&D growth are much higher than those of the treatment group. It can be speculated, therefore, that the treatment group might use its merger activity as a means of acquiring that R&D and bridging the innovation gap.

To receive an additional insight into the data collected and its characteristics, probit models were constructed. We estimate the binary choice model where the dependent variable equals 1 if the firm was an acquirer, and 0 if the firm was a target. R&D intensity, R&D growth, total debt, net income, total assets, and age have been added as explanatory variables. For these variables we took pre-merger data, as it could potentially affect both the decision to merge and companies' future R&D efforts. We expected that the model may include a U-shaped or inverse U-shaped relationship with the role of the firm in a merger. To account for possible non-linearities in assets and age, we also include squared total assets and age. The model was estimated with random effects since the outcome does not vary over time for companies. The probit model was chosen based on the Akaike and Bayesian information criteria.

Table 2 presents the results after the calculation of margins for the estimated model. Acquirers on average are more R&D-intensive compared to non-acquiring companies. As was shown previously, targets were characterized by a staggering average R&D growth of more than 20% pre-merger. This could indicate that targets are usually striving to become innovation-intensive, and acquirers, seeing that they have a lower level of R&D intensity, might consider M&A as a new way of attaining new technology or know-how, as well as receiving a potential competitive advantage. A negative coefficient for the square of age shows that very young or very old companies are less likely to be acquirers than middle-aged companies. The positive coefficients of squares of total assets show that acquirers are usually companies with a very high or very small value of total assets.

Table 2. The results of probit model estimation

Variable	Coefficient
R&D intensity	.566*
	(.809)
R&D growth	–.130*
	(.003)
Total Debt	–.022*
	(.019)
Net income	.002
	(.046)
Total assets	1.292***
	(.342)
Total assets2	.044***
	(.023)
Age	.008***
	(.010)
Age2	–.00004***
	(.000)
Wald chi2	64.75

***, **, * denote the level of significance of 1%, 5% and 10%, respectively.

Research approach

Based on [9], the difference-in-difference approach was chosen to examine the effect of mergers on incentives of firms to innovate. The key idea is to compare changes in outcomes of the two groups over time: the first group is treated in a specific way; while the control group is not treated. The basic equation for the estimation of treatment effect presented is as follows:

$$y_{it} = \gamma + \gamma_i TREAT_i + \gamma_i POST_t + \beta TREAT_i \times POST_t + u_{it}, \quad (1)$$

where *TREATi* is a dummy variable of being treated or not; *POSTi* is a dummy variable for the post-treatment effect, and *TREATi* × *POSTi* is the treatment effect.

Therefore, the Difference-in-difference estimator can be defined in the following way:

$$\hat{\beta} = (\bar{Y}_2^T - \bar{Y}_2^C) - (\bar{Y}_1^T - \bar{Y}_1^C), \quad (2)$$

where $(\bar{Y}_2^T - \bar{Y}_2^C)$ is the difference in average outcomes between treated and untreated groups after the treatment, while $\bar{Y}_1^T - \bar{Y}_1^C$ is the difference in average outcomes between treated and untreated groups before the treatment.

The assumption of the basic model is that there are only two periods present. The first one takes place before the treatment, and the second one happens after. As the focus of the research is to find whether there is a change in R&D expenditures between these two periods, the dependent variable is constructed as the difference between the post-treatment and pre-treatment period [26]:

$$X_{post} - X_{pre} = \alpha + \beta_1 D_1 + \beta_2 D_2 + \beta_3 X + \varepsilon. \quad (3)$$

To attain the $X_{ù}$ indicator, the mean of either R&D growth or R&D intensity in the four years leading up to the year when the M&A deal was registered, was calculated. Similarly, the X_{post} is the mean of the four years after the year M&A took place. D_1 here is a categorical variable that equals 1 if the company did not participate in M&A at all during the observed period; 2 if the company was an acquirer in an M&A deal, and 3 if the company was a target. D_2 is a categorical variable indicating a company's subcategory from the EC categorization. X is the set of control variables including financial indicators such as Total Assets, Debt, and Net Income.

However, some bias needed to be eliminated, in particular, regression to the mean. Thus, an additional variable $X_{ù}$ was added to the model to account for the difference between the companies that was already present in the beginning of the observed period. The reason behind this addition is the assumption that the initial value of R&D intensity in the companies not involved in the M&A as opposed to the companies involved, was already substantially different from the beginning. A correlation between $X_{ù}$ and the $_1$ variable indicates if the company has participated in M&A, then the first regression built would produce a biased result. The regression with an added variable is presented below:

$$X_{post} - X_{pre} = \alpha + \beta_1 D_1 + \beta_2 D_2 + \beta_3 X_{pre} + \beta_4 X + \varepsilon. \quad (4)$$

The D_1 variable indicates if participating on either side of the M&A deal really affects the performance of the company comparing to its initial performance in the pre-deal period. Hence, the true effect of the M&A deal on R&D intensity and growth is apparent.

While the basic difference-in-difference model assumes that there are only two time periods, in practice situations may arise when treated and untreated groups have different trends in the average of the outcome variable. Additional challenges arise in the case of extended time periods when treatments occur at different times. The basic equation (1) cannot be estimated in this case because the post-period dummy is not defined for control observations. To solve the problem of time-varying treatment effects, researchers usually apply the two-way fixed-effect model [27] as follows:

$$\gamma_{it} = \alpha_i + \alpha_t + \beta D_{it} + \varepsilon_{it}, \quad (5)$$

where α_i is a dummy-variable for cross-sectional units, α_t stands for time periods, and D_{it} is a treatment dummy.

The estimated model is presented below:

$$\gamma_{it} = \alpha_i + \alpha_t + \beta_0 D_{it} A_i + \beta\ Ind_i + \beta\ X_{it} + \varepsilon_{it}. \quad (6)$$

Models were constructed based on the dependent variables (γ_{it}) discussed above: R&D intensity and growth of R&D spending. Control variables (X_{it}) included various financial indicators, such as Total debt, Total assets, Net income, EBIT, as well as company's age and its subcategory in the EC categorization ($ù_{\ i}$). Dummy variable D_{it} indicates the

treatment effect, but as treatments occur at different times, the variable was equal to 1 for the post-merger period and 0 for pre-merger period. A_i represents the dummy-variable that is equal 1 if company is an acquirer, and 0 if the company is a target. The interaction of these two variables helps to test our hypothesis about the impact both on acquirers and targets in the pre–merger and post–merger periods. In contrast to the basic model, the control group has not been included in the model because groups (before and after merger periods) serve as controls for each other during periods when their treatment status does not change.

The timeline within the data set was designed to track the evolution of innovation efforts through the years, before and after the merger. For this purpose, a set of dummy variables was created to indicate how far removed from the merger deal the currently examined year is.

Results and discussion

The first models estimated used the econometric specifications (3) and (4) discussed above. Table 3 presents the results of cross-section data models.

Table 3. Cross-section data model estimation results

Variable	Model 1		Model 2	
	R&D intensity	R&D growth	R&D intensity	R&D growth
Treated (Acquirer)	–0.375*** (0.011)	1.485** (0.069)	–0.437*** (0.009)	0.568*** (0.061)
Treated (Target)	–0.340*** (0.011)	–1.223** (0.069)	–0.437*** (0.011)	–1.382*** (0.059)
Initial value			–2.274*** (0.065)	–0.808*** (0.129)
Business support	–0.145** (0.013)	–0.465 (0.087)	0.012*** (.013)	–0.358 (0.074)
Computer programming	–.012* (.012)	–0.493* (0.080)	0.021** (0.011)	0.118** (0.069)
Data processing	–0.040 (.013)	0.461* (0.091)	–0.024 (0.013)	0.844** (0.078)
Manufacturing	0.109 (0.013)	–0.997** (0.084)	0.012** (0.012)	0.149 (0.074)
Revenue	0.081 (0.027)	–0.094 (0.018)	0.049* (0.025)	–0.049 (0.015)
Total Debt	0.535** (0.062)	0.025** (0.004)	0.265* (.058)	0.049* (0.003)
Total assets	–0.015 (0.027)	–0.022* (0.017)	–0.394 (0.025)	0.015** (0.015)
Adjusted R-squared	0.271	0.212	0.543	0.496

***, **, * denote the level of significance of 1%, 5% and 10% respectively.

Examining the coefficients for the first and second model in terms of R&D intensity, we can observe that the indicator for the acquirer and the target went up from –0.375 to –0.437 and from –0.340 to –0.437 respectively, which shows that controlling for the initial value helped in determining that the effect for M&A participants becomes more noticeable. As for the R&D growth of the acquirer, there is a noticeable decline from 1.485 to 0.568, however, the effect for target becomes even more pronounced with coefficient changing from –1.223 to –1.382. This could mean that M&A did not have a major effect on the R&D growth of the acquirer, but it is attributed to the decrease in the R&D activity of the target.

Based on the given outputs and considering the hypotheses formulated at the beginning, only some predictions were confirmed during the analysis. The first one stated that the R&D intensity of the acquirer experienced a substantial decrease after the merger, but growth of R&D spending is not negatively affected. It was confirmed, as R&D intensity is indeed negatively affected by a merger. On the other

hand, growth of R&D spending demonstrates positive dynamics over time. The second hypothesis about the growth of R&D spending and R&D intensity being negatively affected by the merger for the target, was partially confirmed. R&D spending has indeed declined after M&A, however, R&D intensity showed growth. The final hypothesis that stated that R&D intensity and R&D growth of companies in the Computer Programming group are least impacted after the merger was rejected. This was confirmed for the R&D growth model, however, the least affected group in terms of R&D intensity was Manufacturing.

Next, the two-way fixed effects model was estimated (Table 4). The dependent variable is the interaction between two dummies. It shows that a target's R&D intensity and R&D growth are negatively affected by mergers. The coefficients are negative and statistically significant, and the findings correspond to the models estimated with cross-sectional data. The effect on R&D spending is much more pronounced for targets, with a 0.336 average decrease compared to a 0.168 average increase for acquirers. At the same time, the positive coefficient for R&D growth for acquirers demonstrates that the incentive to sustain research activities continues to grow, while targets' innovative programs seem to diminish in the post-merger period. It was discovered that R&D intensity was the most affected in the Business support activities category, while the category least affected by M&A is Data processing. In terms of R&D growth, the least affected category is Computer programming, which corresponds to the previous model. Manufacturing demonstrates the greatest exposure to the impact of R&D growth changes.

Table 4. Panel data model estimation results

Variable	R&D intensity	R&D growth
Treated (Acquirer)	–0.016**	0.168**
	(0.016)	(0.073)
Treated (Target)	–0.005***	–0.336*
	(0.003)	(0.054)
Business support	0.118**	–0.077
	(0.049)	(0.188)
Computer programming	0.068*	0.045
	(0.021)	(0.085)
Data processing	0.048**	0.074
	(0.023)	(0.089)
Manufacturing	0.051*	0.101**
	(0.019)	(0.080)
Net income	–0.003*	0.005
	(0.001)	(0.024)
Total Debt	0.001	0.005**
	(0.001)	(0.014)
Total assets	0.005**	–0.016
	(0.003)	(0.035)
EBIT	0.002**	0.076**
	(0.001)	(0.033)
Age	0.004	–0.001*
	(0.001)	(0.000)
F-statistics	40.35	33.01

***, **, * denote the level of significance of 1%, 5% and 10%, respectively.

If we evaluate these results as compared to the previous studies on the topic, there are some noticeable differences. P. Desyllas and A. Hughes [23] find that R&D intensity of high technology companies only decreases in the first year after the merger, but then stabilizes and starts to steadily climb up over a three-year window after the merger, R&D productivity is also found to increase simultaneously. While our findings contradict these of the above-mentioned authors, our results are in line with other authors' research on the topic, namely [2], where a negative effect on R&D intensity in the post-merger periods was revealed, not only for firms participating in M&A activity but also for their competitors in possession of overlapping technologies. F. Szücs [9] also confirms that R&D intensity of both the acquirer and the target faces a decline post-merger. Finally, [4] discovered that M&A activity of large players in the Innovation and Technology Sector is destructive for innovation activity and R&D growth of target firms, and in some cases even contributes to the discontinuation of its core product. In conclusion, results seem to mainly agree with the latest research on the topic, however, there are several contradictions, perhaps due to a difference in measurement techniques and R&D metrics under evaluation that are chosen for each study.

Possible limitations of the study include its limited geographical scope as the study was performed only on the data from companies based in the European Union, and the R&D intensity and growth patterns could significantly differ from region to region. Cross-border deals, i.e., those that had been completed between companies in EU and companies from other regions also were not considered.

Another limitation is the relatively small number of firms that report R&D expenditures in their financial data. As with all the observations for which R&D expenditures are not recorded or must be dropped, the sample size had decreased by a significant percentage. This is especially relevant for target firms, as some of them were still considered small or medium-sized enterprises that do not publish their financial data as frequently as larger enterprises. We also dropped data companies that performed several acquisitions during the observed period; however, it could be interesting to investigate how serial acquisitions affect the acquirers' R&D efforts.

Finally, only the R&D costs were measured during the study, serving as a representation of the R&D input. It is not yet clear how it correlates with the R&D output of companies, and if there is, perhaps, a different trend will be revealed when comparing it with the input.

Conclusion

In this paper, the effects of M&A activity on R&D intensity and R&D growth of both companies acting as acquirers and targets were studied. It was found that R&D intensity is negatively impacted in the post-merger period for both the target and the acquirer. R&D growth experiences a decrease after the M&A for the target, but not the acquirer. Based on the analysis of other studies on the topic, the pattern here is somewhat compatible to innovation-related acquisitions, where the acquiring firm is looking for an acquisition of an already developed technology, instead of building one in-house. Since target firms are characterized by a much higher percentage of R&D growth pre-merger, which decreases by half after the deal, this could be interpreted as a threat to its potential of being a continuously innovative enterprise.

Considering the possible implications here, since most merger targets are firms with high R&D intensity, it is important to establish controls to ensure that these innovation efforts are not disrupted while these firms engage in M&A activity. Looking at the financial data, it is important to note that target firms had a considerable amount of debt in the pre-merger period, and after the merger, the debt has increased by about one third, while the assets increased only slightly, by approximately 15%. In the meantime, the acquirers showed a considerable growth in assets, net income, and revenue, with the latter increasing by more than 20%. The assumption here is that since R&D intensity is the ratio of R&D expenses to revenue from Business Activities, and that this ratio seems to be decreasing for both sides of the M&A activity, while R&D growth patterns differ between acquirers and targets, it is explained by a noticeable rise in revenue for the acquirers, and a decline in R&D spending for the target group. A negative R&D growth effect is a worrying sign that was present in cases related to targets, and, considering that these targets operate in a highly innovative field, this fact should be examined by competition authorities when designing methods of supporting the competitive significance of target firms. A growing amount of debt and stagnating or severely decreasing R&D activity can cause the target's core product or service to be dissolved into the acquirer's assets or be discontinued. This could in turn lead to the elimination of highly innovative market players, which is destructive to the competition within the sector, and as competition is one of the driving forces in sustaining stable growth in the sector and contributing to the customers' welfare, it is better to encourage careful supervision by competition authorities.

Considering future research opportunities, only the R&D input was measured during the study. Consequently, as a continuation of the study, it would be possible to now focus on the R&D output of firms (patents, innovative products, know-how technics, etc.) to determine if there is a correlation between input and output, as well as R&D intensity and growth. Another possible direction of research here is the observation of how related target and acquirer really are. The relatedness could be measured either by technology produced by both of them and the market in which they operate. This would provide a potential opportunity for discovering whether the relatedness of companies is a potential threat to innovation, or, on the contrary, conducive to knowledge transfer.

References

1. Pitchbook Global M&A Report Q3 2023. 2023. URL: https://pitchbook.com/news/reports/q32-2023-global-ma-report (accessed on 03.07.2023)
2. Haucap J., Rasch A., Stiebale J. How mergers affect innovation: Theory and evidence. *International Journal of Industrial Organization.* 2019;63:283-325. https://doi.org/10.1016/j.ijindorg.2018.10.003
3. Tyagi K. *Promoting Competition in Innovation Through Merger Control in the ICT Sector: A Comparative and Interdisciplinary Study*. Springer; 2019. 360 p.
4. Gautier A., Lamesch J. Mergers in the digital economy. *Information Economics and Policy*, 2021;54:100890. https://doi.org/10.1016/j.infoecopol.2020.100890
5. Argentesi E., Buccirossi P., Calvano E., et al. Merger policy in digital markets: An ex-post assessment. *Journal of Competition Law and Economics*. 2021;17(1):95-140. https://doi.org/10.1093/joclec/nhaa020
6. Christofi M., Vrontis D., Thrassou A., et al. Triggering technological innovation through cross-border mergers and acquisitions: A micro-foundational perspective. *Technological Forecasting and Social Change.* 2019;146:148-166. https://doi.org/10.1016/j.techfore.2019.05.026
7. Kern B. R., Dewenter R., Kerber, W. Empirical Analysis of the Assessment of Innovation Effects in U.S. Merger Cases. *Journal of Industry, Competition and Trade*. 2016;16:373-402. https://doi.org/10.1007/s10842-016-0225-0
8. Cefis E., Marsili O. Crossing the innovation threshold through mergers and acquisitions. *Research Policy*. 2015;44(3):698-710. https://doi.org/10.1016/j.respol.2014.10.010
9. Szücs F. M&A and R&D: Asymmetric Effects on acquirers and targets. *Research Policy.* 2014;43(7):1264-1273. https://doi.org/10.1016/j.respol.2014.03.007

10. Motta M., Peitz M. Big tech mergers. *Information Economics and Policy.* 2021;54:100868. https://doi.org/10.1016/j.infoecopol.2020.100868

11. Park W.G., Sonenshine R. Impact of Horizontal Mergers on Research & Development and Patenting: Evidence from Merger Challenges in the U.S. *Journal of Industry, Competition and Trade.* 2012;12(1):143-167. https://doi.org/10.1007/s10842-011-0119-0

12. Gopalakrishnan S., Damanpourb F. Patterns of generation and adoption of innovation in organizations: Contingency models of innovation attributes. *Journal of Engineering and technology management.* 1994;11:95-116. https://doi.org/10.1016/0923-4748(94)90001-9

13. Subramanian A., Nilakanta S. Organizational Innovativeness: Exploring the Relationship Between Organizational Determinants of Innovation, Types of Innovations, and Measures of Organizational Performance. *Omega.* 1996;24(6):631-647. https://doi.org/10.1016/S0305-0483(96)00031-X

14. Tushman M.L., Anderson P. Technological discontinuities and organizational environments. *Administrative Science Quarterly.* 1986;31(3):439-465. https://doi.org/10.2307/2392832

15. Rao V.R., Yu Y., Umashankar N. Anticipated vs. Actual Synergy in Merger Partner Selection and Post-Merger Innovation. *Marketing Science.* 2016;35(6):934–952. https://doi.org/10.1287/mksc.2016.0978

16. Phillips G.M., Zhdanov A. R&D and the Incentives from Merger and Acquisition Activity. *The Review of Financial Studies.* 2013;26(1):34–78. https://doi.org/10.1093/rfs/hhs109

17. Entezarkheir M., Moshiri S. Innovation spillover and merger decisions. *Empirical Economics.* 2021;61(5):2419–2448. https://doi.org/10.1007/s00181-020-01973-6

18. Chou S.C., Chu Y.F. Innovations and earnings non-synchronicity: evidence from industry M&A activities. *Accounting & Finance.* 2022;62(1):337–367. https://doi.org/10.1111/acfi.12792

19. Zhou K., Yan R., Liu Y. Vertical merger, R&D collaboration and innovation. *The European Journal of Finance.* 2019;25(14):1289–1308. https://doi.org/10.1080/1351847X.2019.1589551

20. *Global M&A Trends in Technology, Media & Telecommunications: 2023 Outlook.* PWC, 2023. URL: https://www.pwc.com/gx/en/services/deals/trends/2023/telecommunications-media-technology.html

21. The regional perspective. 2023 M&A report. BCG. October 26, 2023. URL: https://www.bcg.com/publications/2023/regional-perspective-on-m-and-a-market-trends

22. Science, technology and innovation – Overview. Eurostat Statistical, European Commission, Luxembourg. URL: https://ec.europa.eu/eurostat/web/science-technology-innovation

23. Desyllas P., Hughes A. Do high technology acquirers become more innovative? *Research Policy.* 2010; 39(8): 1105–1121. https://doi.org/10.1016/j.respol.2010.05.005

24. 2022 Technology Industry Outlook. Deloitte, 2022. URL: https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/technology-industry-outlook.html (accessed on 03.07.2023)

25. *NACE Rev. 2. Statistical classification of economic activities in the European Community.* Luxembourg: Office for Official Publications of the European Communities, 2013. URL: https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF (accessed on 03.07.2023)

26. Ball L., Sheridan N. Does inflation targeting matter? In: The Inflation-Targeting Debate. In: Bernanke B.S., Woodford M., eds. *The Inflation-Targeting Debate.* University of Chicago Press; 2005:249-276. URL: http://www.nber.org/chapters/c9561

27. Goodman-Bacon A. Difference-in-differences with variation in treatment timing. *Journal of Econometrics.* 2021; 225(2): 254-277. https://doi.org/10.1016/j.jeconom.2021.03.014

Appendix A

Definition of subgroups in the Innovation and Technology Sector

Subcategory	Definition
Computer programming	Managing local systems and operation of computer networks and/or customer data processing enterprises; providing expertise in the field of information technology: writing, modifying, testing and providing computer software support; planning and design of computer systems, various services related to computer equipment support, software and communication technologies; and other professional and technical computer activities
Business support service activities	Maintaining hardware and software on demand; provision of computer consultations and software for IT and business personnel, configurating specific business-tailored solutions; performing disaster recovery services and check-ups; installation of personal computers; software installation services
Data processing	Providing necessary infrastructure for hosting, data processing services, databases and related activities, as well as providing search engines and other outlets for the data maintenance on the Internet
Manufacturing	Production of equipment necessary for stable delivery of services in the information and communication technology (ICT) field, i.e., computers, telecommunication equipment, consumer electronics, non-individualized software
Telecommunications	Providing services related to telecommunications and related services (transmission of data, voice, recordings, text, sound, and video)

Source: [25].

Contribution of the authors: the authors contributed equally to this article.

The authors declare no conflicts of interests.

The article **was submitted** 06.10.2023; **approved after reviewing** 08.11.2023; **accepted for publication** 30.11.2023.

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.19-37
JEL classification: G30, G32

Corporate Resilience in Cancel Culture Times

Rufina Evgrafova
Junior Commercial Finance Manager, Planning, ITMS, Moscow, Russia,
rufina.evgrafova@gmail.com, ORCID

Irina Ivashkovskaya ✉
Doctor of Economics, Professor, Head of Corporate Finance Center, Head of School of Finance, National Research University Higher School of Economics, Moscow, Russia,
iivashkovskaya@hse.ru, ORCID

Ekaterina Shorokhova
Junior Corporate Finance Manager, ITMS (ex BAT Russia), Moscow, Russia,
ekaterina.shorokhova@gmail.com, ORCID

Abstract

Corporate resilience has emerged as a prominent focus in international studies, particularly in the context of the COVID-19 pandemic that unfolded in 2019. This attention has been amplified by the structural shifts in the business models of Russian companies, prompted by imposed sanctions, thereby accentuating the need for comprehensive academic exploration of resilience, its driving forces, and adaptive turnaround strategies, especially in the era of cancel culture. Despite the heightened significance of resilience, the drivers underlying it during structural crises remain insufficiently studied. This paper addresses this gap by employing a combination of quantitative methods applied to a sample of publicly traded Russian companies spanning the years 2012 to 2022 (first half), alongside case studies. Our contribution to the literature is manifold. Firstly, our application of Altman's Z-score model to publicly traded companies unveils the industries with the highest and lowest resilience across the Russian market from a historical perspective. Secondly, we assert that fluctuations in the degree of resilience during turbulent times, as captured by the Z-score, offer a more adequate evaluation compared to popular market-based metrics like total shareholder returns (TSR). Thirdly, our findings reveal that higher credit ratings and state ownership have no evident impact on the degree of resilience. Conversely, the professional background of CEOs is correlated with firm performance and plays a significant role in determining company resilience amid cancel culture challenges.

Keywords: Altman Z-score, CEO, cancel culture, corporate resilience, human capital, government ownership, total shareholder return, turnaround strategies

For citation: Evgrafova R., Ivashkovskaya I., Shorokhova E. (2023) Corporate Resilience in Cancel Culture Times. *Journal of Corporate Finance Research.* 17(4): 19-37. https://doi.org/10.17323/j. jcfr.2073-0438.17.4.2023.19-37

Introduction

The financial well-being of companies across various scales – small, medium, and large –is significantly influenced by external economic factors. The key differentiator between companies facing severe financial distress or bankruptcy and those leveraging turbulent times for restructuring lies in the efficacy of turnaround strategies implemented by visionary leaders. These strategies encompass organizational restructuring, cost reduction, asset redeployment, and market repositioning. The global market collapse induced by the COVID-19 pandemic, impacting businesses worldwide, serves as a pertinent example. The altered dynamics of corporate resilience drivers and adaptive turnaround strategies in the face of external shocks became especially pronounced during this period. While some companies navigated successfully, others grappled with severe distress. In Russia, external shocks manifested as sanctions imposed on numerous industries and companies in the early part of 2022, compounded by the effects of cancel culture. To maintain resilience, companies had to undergo extensive business process restructuring across different stages of the value chain.

Previous studies by Keenan et al., Angwin et al., Lin et al., Denis, Kruse, Kam et al., and Ashayeri et al. [1–6] have delved into turnaround strategies, while research by Cheema-Fox et al., Milano, Whately, Hidayat et al., Brand, Blaese, Lins et al., Levin et al., Markman, Venzin, Sajjad, Sarkar et al., Tarigan et al., and Rajesh [7–17] has explored factors influencing resilience. Yu, Pargendler, Tihanyi et al., and Abramov et al. [18–21] have specifically examined state ownership and its connection to firm performance. However, academic exploration of resilience in the context of external sanctions is largely lacking.

Our paper addresses this gap by investigating the factors influencing company resilience during cancel culture times in Russia, with a specific focus on the basic materials and consumer sector industries. Combining a quantitative approach for a sample of companies spanning 2021–2020 and case studies from 2022, we make several contributions to the literature. Firstly, by applying Altman's Z-score model [22] to publicly traded companies, we reveal the most and least resilient industries across the Russian market from a historical perspective based on the 2021–2020 sample. Secondly, we argue that fluctuations in the degree of resilience, as captured by the Z-score, offer a more insightful assessment compared to market-based metrics such as total shareholder returns (TSR). Thirdly, through case studies on companies in the consumer sector and basic materials industries (Nornickel, TMK, Rusolovo, M.Video, Magnit, and Pharmsynthez), we highlight successful practices for maintaining resilience in externally-driven economic turbulence. Our case analyses indicate that neither a close bank–company relationship nor state ownership or support has a direct impact on the degree of resilience. However, the professional background of CEOs is found to be correlated with firm performance during cancel culture times.

The remainder of the paper is structured as follows: Section 1 provides a literature review on turnaround strategies, factors affecting resilience, and hypothesis setting. Section 2 covers sample selection and data analysis, including Z-score metrics and variable descriptive statistics. Section 3 focuses on a summary of turnaround strategy cases in cancel culture times and the interpretation of results for the subsample. Finally, Section 4 presents and discusses the conclusions.

Theoretical Background for Turnaround and Resilience Strategies

The financial performance of companies, irrespective of size, is susceptible to economic shocks, and effective management during turbulent times is crucial to prevent financial distress. Visionary leaders can capitalize on these challenges to enhance market position and outperform competitors [1]. The turnaround strategy aims to reverse the corporate performance vector, necessitating innovative approaches to product and market development. The process typically involves restructuring leadership and organizational culture, followed by cost reduction, asset redeployment, and selective product/market strategies. The final stage focuses on repositioning, encompassing activities like product portfolio diversification and price adjustments.

A different classification of the steps in a turnaround is given by Angwin et al. [2]: traditional asset cost surgery, product-market pruning, and piecemeal strategies. Good management plays a key role in effectuating a sustained recovery.

Successful turnarounds involve complex processes influenced by environmental factors, internal resources, and corporate strategies. Operational restructuring, particularly changes in manufacturing processes, is identified as a crucial step towards recovery [3]. Cost control, including reductions in labor, research and development, and administrative expenses, is a common initial restructuring step [4]. Kam et al. [5] examined the market reaction to turnaround strategies by both state-owned and private firms in financial distress, emphasizing the impact of mergers and acquisitions, asset sales, managerial reorganization and debt restructuring. Their results showed that mergers and acquisitions involving operational restructuring elicit the greatest market reaction.

Discussing the factors for successful turnarounds, scholars have shown that downsizing can help a company faced by bankruptcy to overcome its liquidity crisis and regain confidence in its ability to repay debts [6]. However, downsizing as a tool to overcome distress also poses risks, especially when mass employee layoffs are involved. These risks grow when firms engage in multistage repetitive restructuring [3]. Striking a balance between long-term restructuring and immediate liquidity is critical for survival [6]. Firms that recover from distress tend to adopt growth-oriented

external-market focused strategies, while those that do not often resort to fire-fighting approaches [23]. Purpose-driven companies are found to be more resilient, emphasizing the importance of a clear corporate mission [8].

Factors Affecting Resilience

The COVID-19 pandemic serves as a pertinent example of a large-scale market collapse that necessitated companies to reassess their processes for resilience. Flexibility and strong stakeholder relationships emerged as crucial factors for resilience during the pandemic, according to Cheema-Fox et al. [7]. Entrepreneurial competences of the management team also played a significant role in mitigating crisis effects and surviving uncertainty [9].

The orientation towards stakeholders is central to crisis management. Purpose-driven companies exhibit more resilient financial results [8]. Lins et al. showed that social capital is linked to resilience, with firms possessing high social capital showing better profitability and growth during crises [11]. Corporate responsibility has been identified as a key factor for overcoming financial distress in a study of German and Swiss companies by Brand and Blaese [10]. Analyzing corporate resilience during banking crises, Levin et al. [12] highlighted the role of social trust in accessing finance. Markman and Venzin [13] assessed the influence of firm size, home market solidity, and product and market diversity on firm resilience.

Sajjad [14] and Sarkar et al. [15] investigated supply chain disruptions and relevant corporate responses in times of COVID-19. It has been shown that resiliency can be enhanced by establishing supply chain agility, supply chain partnerships and diversification [16]. Strategies focusing on sustainability should be implemented upstream in the supply network, while those focusing on resilience should be undertaken downstream [17]. Sajjad [14], Sarkar et al. [15] and Tarigan et al. [16] showed the importance of supply chain effectiveness in recovering from financial distress.

The role of government and banks in enhancing or impeding resilience varies across studies. Yu [18] found that government ownership enhances resilience due to the benefits of government support. Kam et al. [5] showed that the value added on mergers and acquisitions is enhanced when ownership is transferred from the state, while Abramov et al. [21] concluded that, if government has a dominant share, firm resilience is worse off due to increased debt burdens. Findings on the role of relationships with banks and their impact on company resilience are ambiguous. Levin et al. [12] showed that firms in countries with high levels of trust in business communications have better access to credits and therefore experience less profit loss in times of crisis.

Facing unprecedented restrictions, Russian companies had to rearrange business processes, including supply chain and distribution channels. A report by Kept (2023) on key trends and development areas for Russian industries during the geopolitical crisis [24] shows that Russian firms have succeeded in diversifying supply channels of finished products, raw materials and components and redirecting to alternative markets.

Different papers examine the role of state ownership [18–21], which is argued to have an adverse impact on company financial performance [20], while dominant state ownership affects firm results negatively by increasing the debt burden [21].

The factors driving the success of turnaround and resilience include top management team competences. Cheema-Fox et al. [7] show that companies with strong stakeholder relationships and greater flexibility are more resilient in times of distress. Hidayat et al. [9] corroborate that the entrepreneurial competences of management are key to surviving distress, while Keenan et al. [1] find that far-sighted leaders can use turbulent times to surpass competitors.

In summary, different aspects of turnaround strategies and their success in improving corporate resilience are explored in the literature. Many external factors can affect firm recovery, and researchers differ in their findings based on the sample period and country. However, the evidence regarding resilience during external shocks, particularly in a cancel culture period, is scarce. The concept of cancel culture is relatively new, and the effects of the 2022 sanctions on Russia are yet to be fully understood. However, previous work on global economic shocks and the recent COVID-19 pandemic allows us to formulate the following hypotheses:

H1: Human capital has a positive impact on company resilience during a cancel culture period.

As shown by Cheema-Fox et al. [7] and Milano and Whately [8], different factors can impact firm resilience, generally including human capital, supply networks, operation processes and corporate purpose. Notably, human capital as the non-financial and non-physical combination of skills, knowledge, education and other personal features of employees [25] positively affects organizational performance when properly managed [26], especially in the conditions of uncertainty.

H2: Companies with state ownership are more resilient during the current cancel culture period.

Scholars have shown that state-owned companies tend to grow slower and have shallower financial results than private companies [18–21], as government intervention can violate market conditions and make business less effective. However, for strategically important industries such as oil and gas or mining, government support adds to company resilience and financial performance [18]. The current structural crisis has different origins, being based on external shocks from imposed sanctions rather than the market situation. Under such conditions, firms with state ownership can hardly overcome all the problems without some sort of assistance. Hence, we posit that financial, legislative, and other means of state support strengthen firm resilience.

H3: Better relations with banks result in stronger resilience during a cancel culture period.

As debt restructuring is a proven turnaround strategy, a strong credit rating is expected to enhance transparency, risk evaluation, and negotiation leverage for favorable loan

conditions, contributing to the effectiveness of restructuring and overall company resilience [5].

Research Model and Variables

To evaluate company resilience, we have adopted Altman's Z-score model, a multiple discriminant analysis model employing five key ratios that is widely used in corporate finance, banking, and credit risk prediction. Distressed companies often employ this model as a guide for financial turnaround strategies. There are three variations of the classic Z-score model: the original 5-variable Z-score for public firms, the 5-variable Z'-score for private firms [27], and the 4-variable Z"-score for private firms [22], designed to minimize potential industry effects.

In the second variation tailored for private firms, one variable is modified – the book value of equity is used instead of market capitalization. The third version, designed for both manufacturing and non-manufacturing firms, omits the market-to-book value variable to minimize potential industry effects. An assessment of the predictive power of the different variations, including accounting-based, market-based, and hazard models, revealed minimal differences in predictive accuracy [28; 29]. Furthermore, Levy et al. [30] conducted a study on approximately 1,500 European and North American companies and concluded that Altman's Z-score provides a superior quality of distress assessment compared to stock market performance.

The Z-score model has been successfully applied to analyze companies in various emerging markets, including Pakistan [31], China [32], and Indonesia [33]. However, due to industry specifics and economic variations among countries, caution must be exercised in applying Altman's Z-score model. Bhatt [34] investigated the ability of the three versions of Altman's Z-score model to predict corporate distress in India and showed that these models have a remarkable degree of accuracy in predicting distress using financial ratios computed from the financial statements of the preceding year. Thus, the Z-score models also seem to have excellent potential for evaluating the risk of corporate distress in emerging markets.

Variables

In our research model, Hypothesis 1 focuses on the impact of human capital on resilience. To measure this, we analyzed methods commonly used for human capital valuation [35–37]. For Russian companies within the cancel culture period, it was impossible to use many human capital indicators such as turnover ratio, education expenses, and employee engagement. Instead, we utilized metrics for CEO human capital, which, given the significant role of CEOs in firm performance, especially during crises, was deemed acceptable.

For Hypothesis 2, examining the government ownership effect on corporate resilience, we analyzed the shareholder list to identify government involvement and the percentage of state ownership. Hypothesis 3, exploring the role of the bank–company relationship, utilized credit ratings as a proxy for measuring the impact of this relationship on resilience.

Description of the Selected Model

We adopted the following model for our analysis:

$$Z = 0.012 \cdot X_1 + 0.014 \cdot X_2 + 0.033 \cdot X_3 + 0.006 \cdot X_4 + + 0.999 \cdot X_5, \quad (1)$$

where X_1 is the Working Capital/Total Assets ratio;

X_2 is the Retained Earnings/Total Assets ratio;

X_3 is the Earnings before Interest and Taxes/Total Assets ratio;

X_4 is the Market Value of Equity/Book Value of Total Liabilities ratio;

X_5 is the Sales/Total Assets ratio;

Z is the overall score.

Sample Analysis

Financial data for Russian publicly traded companies for the years 2012–2020, sourced from Bloomberg, was used for our analysis. The industry profile is summarized in Table 1.

Table 1. Industry profile of companies in the sample

Industry	Number of Companies
Utilities	21
Basic Materials	19
Consumer, non-cyclical	13
Industrial	13
Energy	12
Communications	11
Consumer, cyclical	9
Financial	6
Total	104

Source: prepared by authors.

The financial metrics, including efficiency, profitability, and market value, were obtained from Bloomberg, with some adjustments made due to the absence of direct information on working capital and retained earnings. For working capital, we employed an alternative metric based on the difference between capital employed (total assets minus current liabilities) and disclosed intangibles. Working capital is important for analyzing operational liquidity to show whether a company can remain solvent. Theoretically, a business can go bankrupt even while being profitable, as it needs current assets (inventories, account receivable, and cash and equivalents) to repay current liabilities. We applied this adjustment based on capital employed net of disclosed intangibles to avoid omitting a variable that re-

flects company liquidity. The residual value after subtracting intangible assets (which should be considered illiquid) from capital employed and then dividing by total assets can serve as a proxy for the capacity to pay for liabilities. We believe that applying such an alternative metric is better than omitting the variable altogether.

For retained earnings, net income was used as a substitute in our model. The justification behind this choice for computing X_2 is that retained earnings originally come from net income (or loss). In the Z-score model, the retained earnings take cumulative profitability into account, and so the company's age is implicitly built in. Edward Altman himself warned that the use of retained earnings can discriminate against young firms, which stand a higher chance of being classified as bankrupt [38, p. 186]. The ratio of *EBIT to total assets* shows the true profitability of a firm's assets – it is commonly held that insolvency happens when total liabilities exceed a fair valuation of the company's assets calculated from the earning power of assets [38, p. 186]. The ratio of the *market value of equity to total liabilities* can be used to measure the decline in asset value, determined by the combined sum of market value of equity and debt, before total liabilities surpass the total assets. The latter case leads to insolvency. Finally, the *sales to assets ratio* shows the revenue generating power of assets and demonstrates the management's ability to deal with competition.

The resulting adjusted model is represented by:

$$Z' = 0.012 \cdot X_1 + 0.014 \cdot X_2 + 0.033 \cdot X_3 + 0.006 \cdot X_4 + 0.999 \cdot X_5, \quad (2)$$

where X_1 is (Capital employed – disclosed intangibles)/ Total assets;

X_2 is Net income/Total assets;

X_3 is Earnings before interest and taxes/Total assets;

X_4 is Market value of equity/Book value of total liabilities;

X_5 is Sales/Total assets;

Z' is the Overall adjusted score.

Descriptive Statistics

The descriptive statistics for each variable are presented in Table 2.

Table 2. Descriptive statistics of variables, 2012–2020

		2012	2013	2014	2015	2016	2017	2018	2019	2020
X_1 – (Capital employed – disclosed intangibles)/ Total assets	Maximum	0.93	0.93	0.91	0.91	0.90	0.94	0.93	0.92	0.92
	Minimum	–1.51	–1.03	–0.70	–1.06	–0.98	–0.85	–0.83	–1.79	–1.51
	Range	2.44	1.96	1.61	1.97	1.87	1.79	1.76	2.70	2.43
	Average	0.54	0.49	0.45	0.43	0.44	0.46	0.44	0.44	0.46
X_2 – Net income/Total assets	Maximum	0.20	0.18	0.27	0.32	0.65	0.27	0.32	0.70	0.22
	Minimum	–0.19	–2.47	–1.76	–3.48	–0.26	–1.62	–0.85	–20.48	–2.13
	Range	0.39	2.65	2.03	3.80	0.91	1.89	1.17	21.19	2.35
	Average	0.04	–0.01	–0.03	–0.04	0.07	0.02	0.02	–0.23	0.00
X_3 – Earnings before interest and taxes/Total assets	Maximum	0.25	0.24	0.24	0.41	0.44	0.33	0.42	0.43	0.42
	Minimum	–0.13	–0.71	–0.33	–2.97	–0.24	–1.56	–0.85	–18.90	–0.97
	Range	0.37	0.95	0.57	3.37	0.68	1.89	1.27	19.33	1.39
	Average	0.08	0.06	0.06	0.04	0.10	0.05	0.07	–0.19	0.05
X_4 – Market value of equity/ Book value of total liabilities	Maximum	15.38	13.08	10.49	12.03	12.41	13.01	21.87	25.36	15.19
	Minimum	0.09	0.06	0.02	0.04	0.06	0.06	0.05	0.05	0.07
	Range	15.29	13.02	10.47	11.99	12.35	12.95	21.81	25.32	15.13
	Average	1.36	1.23	1.01	1.03	1.43	1.53	1.41	1.56	1.48
X_5 – Sales/Total assets	Maximum	2.79	4.39	2.15	3.36	3.21	3.42	3.51	3.47	5.14
	Minimum	0.08	0.06	0.02	0.08	0.00	0.00	0.04	0.09	0.11
	Range	2.71	4.33	2.13	3.29	3.21	3.42	3.47	3.39	5.03
	Average	0.82	0.85	0.72	0.78	0.81	0.84	0.82	0.79	0.79

Source: calculated by authors.

For the period 2012–2020, no clear trend is observed in the average value of X_1, representing capital employed net of intangibles divided by total assets. This variable shows the share of liquid assets that can be used for debt repayment. The range (the difference between maximum and minimum) increased in 2019, coinciding with an increase in the number of companies with lower X_1. True profitability of assets (X_2) also lacked a clear trend during 2012–2020. Overall, the average values for all variables decreased from 2012 to 2015, followed by a slight increase until 2018–2019 and a subsequent fall in 2020, reflecting economic turbulence.

The calculated Z-scores for 65–75 companies (based on yearly data availability) for the period 2012–2020 are shown in Appendix 1. The aggregated results for each year are presented in Table 3, indicating no clear trend in Z-score values during the period. The average increased in 2012–2014, followed by a fall in 2015 and a new increase through 2016–2018. The first decrease in the Z-score in 2015 is associated with sanctions imposed in 2014. The second drop in 2019 may be partially explained by the fact that the two additional companies available for analysis in 2019 had scores of 0.5, driving down the annual average. The range, which indicates the difference of maximum and minimum annual scores, is greater for 2020 than for other periods. Such dynamics indicate the effect of the COVID-19 pandemic. The median, which corresponds to the point with an equal number of observations above and below, had no clear trend in 2012–2020.

Table 3. Aggregated results for the Z-score

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of analyzed companies	65	66	66	68	69	72	72	74	75
Maximum	2.79	4.40	2.19	3.36	3.20	3.42	3.51	3.47	5.14
Minimum	0.10	0.06	0.02	–0.07	–0.01	–0.07	0.03	–0.22	0.09
Range	2.69	4.35	2.17	3.43	3.21	3.49	3.48	3.68	5.05
Average	0.84	0.87	0.87	0.80	0.84	0.86	0.84	0.80	0.82
Median	0.71	0.68	0.64	0.69	0.78	0.72	0.73	0.72	0.64

Source: calculated by authors.

Table 4. Z'-score analysis by industry, 2012–2020

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Utilities	0.69	0.72	0.70	0.86	0.91	0.91	0.92	0.90	0.82
Basic materials	0.73	0.70	0.66	0.71	0.78	0.78	0.87	0.75	0.73
Consumer, non-Cyclical	1.08	1.28	0.71	0.79	0.85	0.93	0.77	0.76	0.73
Industrial	0.63	0.67	0.51	0.49	0.65	0.67	0.67	0.63	1.21
Communications	0.66	0.60	0.62	0.61	0.69	0.68	0.60	0.51	0.71
Energy	0.89	0.79	0.70	0.69	0.66	0.69	0.79	0.74	0.57
Consumer, cyclical	1.88	2.18	1.46	1.43	1.48	1.36	1.10	1.18	1.29
Financial	0.52	0.47	0.55	0.47	0.30	0.52	0.63	0.50	0.52

Source: calculated by authors.

The average scores for industries are presented in Table 4. The financial sector performs least favorably in terms of the altered Z-score, while the consumer cyclical sector is a top performer. The consumer non-cyclical sector could also be considered a top performer, showing a clear advance in 2012–2013, followed by a decline later on. In contrast, the industrial sector appears worse off in 2014, followed by a score comparable to the consumer cyclical sector in 2020.

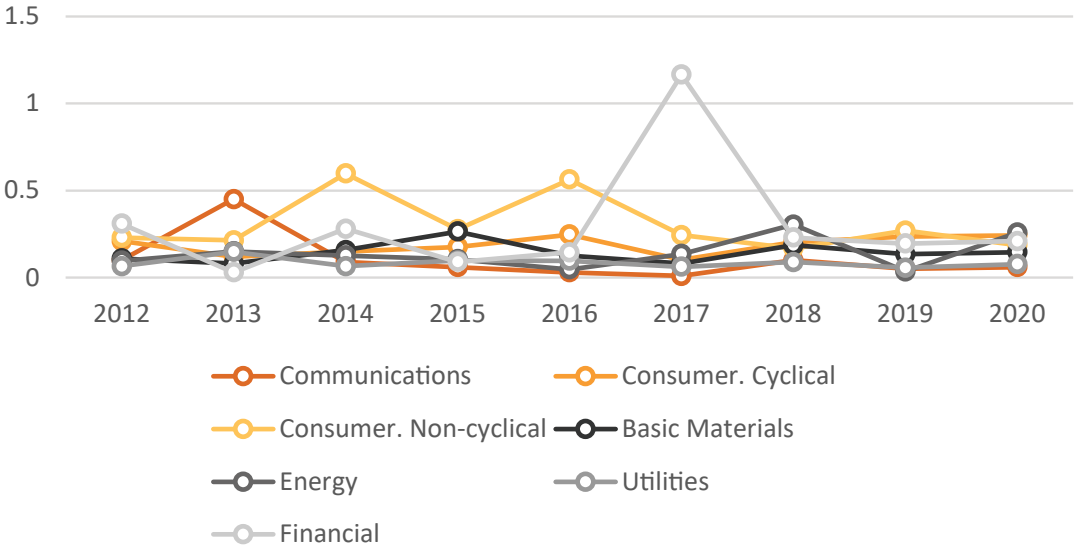
In our comprehensive analysis, we incorporated Total Shareholder Returns (TSR) into the model to assess industry trends alongside the Altman Z-score for the year 2020. TSR, considered a highly representative metric of a firm's financial performance from an investor's perspective, was intended for potential use in resilience measurement if rankings aligned with those derived from the Z-score. The study encompassed 69 companies from our Z-score sample, acknowledging data inconsistencies for some companies.

The complete TSR results for the period 2012–2020 are detailed in Appendix 2. A condensed representation of

industry average results for each year is graphically presented in Figure 1. Notably, TSR scores demonstrated considerable instability throughout the observation period, displaying significant fluctuations from year to year. An overarching decline was observed in the COVID-impacted year of 2020, serving as the baseline for comparison.

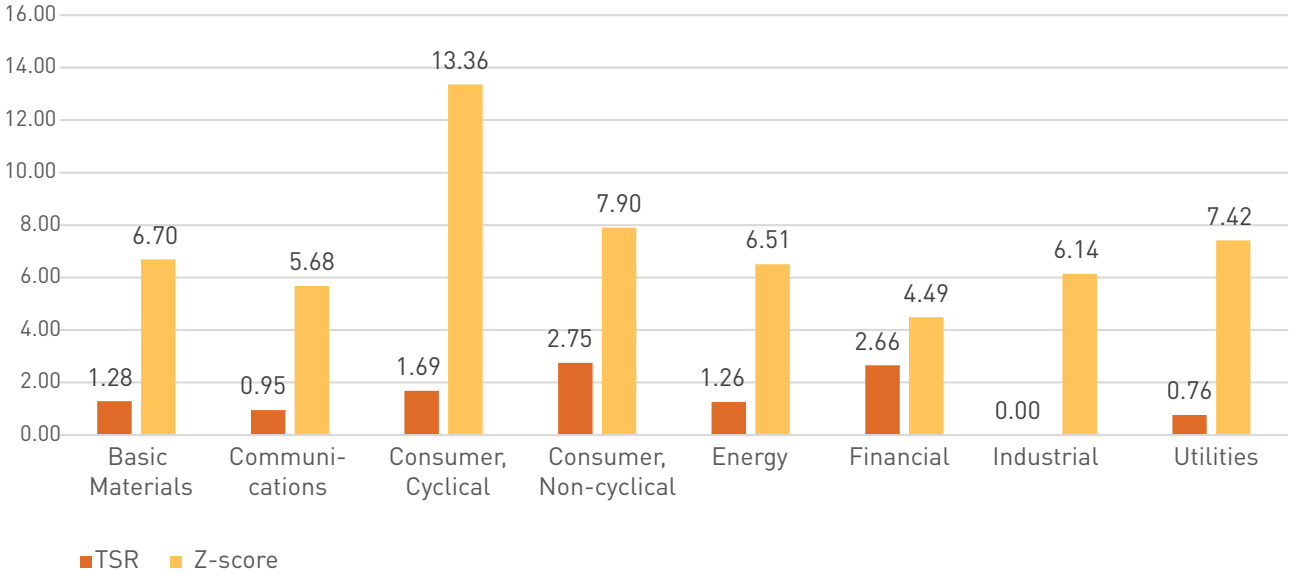
The top-performing sectors, as indicated by TSR, were the financial and consumer non-cyclical sectors, while utilities and energy emerged as the bottom performers.

Figure 1. TSR analysis by industry, 2012–2020



Source: prepared by authors.

Figure 2. TSR analysis and Z-score analysis by industry, 2012-2020



Source: prepared by authors.

The ranking of companies from our sample based on Z-score and TSR reveals notable disparities in industry positions, as depicted in Figure 2. The financial sector, a top performer in TSR, occupies the bottom-performer position when assessed by Z-score. Conversely, utilities exhibit the opposite trend. Interestingly, only the energy and communications industries share identical, albeit low, rankings. This suggests that TSR may not be a reliable metric for gauging resilience levels, particularly during times of crisis. This observation aligns with the findings of Levy et al. [31], who demonstrated, using data from developed markets, that the Z-score is a more effective indicator of company resilience than market performance.

Testing Hypotheses through a Case Approach

Sample Selection for a Case Approach

To scrutinize the impact of key drivers on resilience and evaluate performance under the influence of imposed sanctions, a case approach was employed. This involved selecting a few companies from the basic materials and consumer goods sectors to compare turnaround strategies under the pressure of imposed sanctions. We began by examining cases in the basic materials sector. This sector has a broad definition, usually being described as "an industry category made up of businesses engaged in the discovery, development, and processing of raw materials", e.g., firms operating with chemical products, metals, mining, and forestry. In response to sanctions targeting import and export processes in 2022, the basic materials sector experienced varied subsector performances. Metallurgy and chemicals maintained production levels, whereas forestry production significantly declined.

We then turned to the consumer sector. Subject to fewer damaging restrictions compared to basic materials and energy, the consumer goods sector demonstrated a slight decline in the first half of 2022 due to supply chain disruptions and financial limitations. However, a performance stabilization occurred in the second half as firms adapted to the new reality, creating new market opportunities for local producers after the exit of foreign companies.

For resilience analysis in 2022, case studies focusing on top-performers and bottom-performers in these industries were conducted based on Z'-score results from the most comparable period of 2020. Due to state-imposed limitations in financial data disclosure in 2022, the analysis concentrated on companies publishing results for at least the first six months of the previous year. Our decision to compute the Z'-score for six months is based on the assumption that most of the damage arising from sanctions had the worst impact on company performance during the first six months, after which companies in these industries launched adaptation policies and began to recover from the crisis [24]. New restrictions were mostly imposed at the end of the year, and their full effect was seen only in 2023, so we assume that the second half of 2022 was a time of stabilization for business. Moreover, resilience analysis at the peak of the structural crisis is more representative for the purposes of our study.

Case Study Companies

Six companies across the Russian market were selected for case studies, representing top and bottom performers:

1) Magnit: One of the largest food retail companies, owing 26,731 stores in 67 Russian regions[1].
2) M.Video-Eldorado (M-Video): E-commerce and consumer electronics retailer with over 1,200 stores in 370 Russian regions (business strategy is currently focused on online sales development)[2].
3) Pharmsynthez: Pharmaceutical company engaged in R&D and medical production.
4) Nornickel: Global metal and mining leader, specializing in nickel and palladium production as well as mining silver, gold, platinum and other metals and minerals[3].
5) TMK: Operates in steel piping, piping solutions, and supporting services for energy, chemical, construction and other sectors with 11 plants across Russia[4].
6) Rusolovo: Involved in tin, tungsten concentrates, and copper production[5]. Part of the Seligdar Holding Company since 2013.

Z'-Score Results

The computed Z'-score results for FY'2020 and HY1'2022 are presented in Table 5, indicating trends for the sample. Notable observations include:

- In HY1'2022, among consumer sector companies, Magnit and M.Video exhibited the best results, while Pharmsynthez displayed the lowest Z'-score, mirroring the same positions observed for FY'2020.
- In the basic materials sector, Nornickel was the leader in 2020 yet demonstrated the same Z'-score as TMK in HY1'2022, signaling potential changes in resilience (Nornickel's level of resiliency might have fallen or TMK may have improved its performance). Rusolovo has a better half-year Z'-score than its full-year result in 2020, which might be a sign of an increase in resilience. The average score was 0.82 in 2020 (see Table 4), and so both Magnit and M.Video can definitely be described as resilient companies, Nornickel and TMK as partially resilient, and Rusolovo and Pharmsynthez as non-resilient. For the first half of 2022, the resilience trend appears to be the same.

Table 5. Z '-score for case study companies, 2020, 2022

Industry/ Company name	Z'-score FY'20	Z'-score HY1'22
Basic Materials/Nornickel	0.77	0.48
Basic Materials/TMK	0.54	0.48

[1] Magnit at a glance – PJSC "Magnit".

[2] M.Video-Eldorado at a Glance (mvideoeldorado.ru).

[3] Meet Nornickel – Nornickel.

[4] Where we operate: TMK (tmk-group.com).

[5] Tin Mining Company JSC (rus-olovo.ru).

Industry/ Company name	Z'-score FY'20	Z'-score HY1'22
Basic Materials/Rusolovo	0.22	0.25
Consumer/M.Video	1.06	0.68
Consumer/Magnit	1.66	0.95
Consumer/Pharmsynthez	0.09	0.16

Source: calculated by authors.

Hypothesis Testing

To examine the influence of human capital on resilience and test Hypothesis 1, we focused on CEO data categorized into three groups:

- Personal information: age, gender, education (including major and level of education), and citizenship;
- External working experience: finance experience, other CEO experience, public service experience and same industry experience;
- Position in the company: ownership, tenure and board participation. Internal experience and motivation connected with firm ownership should also demonstrate the CEO's role in managing financial performance.

Research was conducted for five out of six companies, with Rusolovo excluded due to the unavailability of relevant data. Despite Rusolovo being considered non-resilient, the absence of analysis for this company does not hinder testing the impact of human capital on growing resilience.

Regarding personal characteristics, age variations were notable, with an average CEO age of 49 years, ranging from 34 to 63. The CEO of M.Video, the youngest among the sample, has a tenure of less than a year and is relatively less experienced, which is atypical for a CEO of such a large firm. All CEOs in the sample are male, and only the CEO of Magnit is a foreign citizen. Educational backgrounds vary, with two CEOs having an economic major and others specializing in law, management, and biology.

In terms of professional expertise, only one CEO has finance experience, while four CEOs previously worked in the same industry. Three CEOs have prior experience as CEOs, and one has a background in public service.

Only one CEO is a member of the board, and none in the sample have ownership in their respective companies. No data on ownership was available for Nornickel in 2022, but historical information indicates no ownership by the CEO.

Table 6. CEO human capital

	Nornickel	TMK	Rusolovo	M.Video	Magnit	Pharmsynthez
Age	61	48	No data	34	63	41
Gender	Male	Male	No data	Male	Male	Male
Level of education	2	2	No data	2	3	1
Major	Economy	Economy	No data	Law	Management	Biology
Citizenship	Russian	Russian	No data	Russian	Foreign	Russian
Work experience in finance	Yes	No	No data	No	No	No
Previous work experience in the industry	No	Yes	No data	Yes	Yes	Yes
Previous CEO experience	No	Yes	No data	No	Yes	Yes
Experience in public service	Yes	No	No data	No	No	No
Tenure	10	3	No data	Less one year	3	2
Board participation	No	No	No data	No	No	Yes
Ownership	No data	No	No data	No	No	No

Source: collected from Bloomberg.

Table 6 reveals that CEOs of resilient and partially resilient companies exhibit an age gap. However, age and personal maturity are not consistent drivers of resilience within the case sample.

If we compare education majors to the sector of the company's activity, Pharmsynthez's CEO stands out as the only one with a background directly relevant to the sector profile. Interestingly, Pharmsynthez, despite this relevance, registers low resilience. This suggests that a background-sector profile relationship is not a prerequisite for success in turnaround strategies during structural crises. Similar observations are made for M.Video, which belongs to the most resilient subgroup, and for the partially resilient subgroup, where CEOs in the basic materials sector have economic majors.

In terms of professional expertise, CEOs in the most resilient group (M.Video, Magnit) and TMK possess prior sector experience, indicating that industry knowledge may positively influence turnaround strategy results and resilience.

Analysis of CEO tenure demonstrates that CEOs of resilient and partially resilient firms have been in their positions for more than 3 years. This suggests that depth of working experience becomes a positive driver for companies during turbulent times, as demonstrated during the COVID pandemic. A 3-year tenure means that these CEOs have gone through COVID pandemic turbulence for their businesses. Thus, CEOs with relevant professional background and expertise add to their firms' ability to deal with cancel culture.

To test Hypothesis 2 on the role of state ownership and support types during cancel culture times, we examined the list of shareholders in our case sample, along with disclosed information on government subsidies and government relations (i.e., political donations, shared projects, etc.).

Nornickel's shareholder list does not include any government shares. Its major shareholder is Interros (37%), a private investment company[6]. The company did not receive significant government subsidizing in 2021, and no information on subsidies or legislative support has been disclosed for 2022. Nornickel has taken part in various government-related projects and, as of December 12, 2021, was a member of 25 government committees and expert groups. The company has not participated in political donations.

TMK's shareholder list lacks government shares, with the parent company TMK Steel Holding Limited (91%) being the major shareholder[7]. While there is no disclosed information on direct financial assistance, government support to the industry is mentioned as a boosting factor in a press release for H1 2021. TMK is involved in several projects with government and state-owned companies, including 15 projects with Rosatom according to an agreement of 2019[8]. In 2020, TMK organized a 100-million-rouble fundraising project with the non-profit organization Sinara, aimed at supporting hospitals during the pandemic.

Rusolovo's shareholder list excludes government shares. The 2021 annual report contains no information on financial support from the government. Rusolovo does not seem to be involved in government projects as much as TMK or Nornickel, yet it is actively engaged in community support through donations and programs, including relocation packages for employees and donations for local culture.

Thus, our subsample for the basic materials industry does not include companies with government ownership. One of the reasons is that such companies as Alrosa (state-owned company) and Mechel (one of whose shareholders, Gazprom, has government ownership) have not published annual reports since 2021, so it was impossible to calculate their Z-score for 2022 for the purposes of identifying a trend for hypothesis testing. As noted above, TMK and Nornickel are classified as partially resilient companies based on the altered Z'-score model (Table 8), while Rusolovo is classified as non-resilient, with its score increasing from 2020 to 2022. The score may stabilize in second half of 2022 for Nornickel and TMK, so further analysis is needed to fully comprehend the resilience of these companies to the 2022 sanctions. It is also important to note that Nornickel is not on the sanctions list, even though its CEO Vladimir Potanin is under sanctions. Rusolovo was not included on the sanctions list, either, while the director of Seligdar (owner of Rusolovo) was included. As for TMK, the company was not included on the sanctions list, while its ex-owner Dmitry Pumpyansky was.

In the consumer industry subsample, M.Video's shareholder list does not include government or state-owned companies. The major shareholder, Mr. Gutseriev, plans to dispose of his stake to a group of Russian businessmen[9]. M.Video received income from subsidized loan forgiveness from VTB in 2022[10]. Thus, M.Video is a company that has no stakes held directly or indirectly by the government yet receives state support through subsidies.

Magnit's shareholder list also lacks government ownership. However, major stakes are held by Marathon Group, owned by Aleksandr Vinokurov, who was included in the personal sanctions list in 2022 as a person affiliated with the government[11].

[6] Shares and ADRs – Nornickel (nornickel.ru).

[7] Share capital structure: TMK (tmk-group.ru).

[8] The TMK annual report 2020 https://report2020.tmk-group.ru/download/full-reports/ar_en_annual-report_pages_tmk-group_2020.pdf

[9] M.Video-Eldorado on changes in the composition of the Group's Board of Directors (mvideoeldorado.ru).

[10] The annual report of M.Video-Eldorado 2021 GQ2021 M.Video-EHldorado.pdf (mvideoeldorado.ru).

[11] Largest shareholder of Magnit came under EU sanctions. Kommersant Krasnodar (https://www.kommersant.ru/doc/5250512).

Table 7. Relationship of government participation and resilience levels

	Nornickel	TMK	Rusolovo	M.Video	Magnit	Pharmsynthez
Industry sector	Basic Materials			Consumer		
Resilience classification	Partially resilient		Non- resilient	Resilient		Non-resilient
Z'-score, FY'20	0.77	0.54	0.22	1.06	1.66	0.09
Z'-score, HY'22	0.48	0.48	0.25	0.68	0.95	0.16
Government or state-owned companies as shareholders	No	No	No	No	No	Yes
Government subsidies	No	No	No	Yes	Yes	No
Participation in state projects	Yes	Yes	Yes	N*	N*	No*

* Information not disclosed in annual reports.

Source: prepared by authors.

According to its annual reports, it has received subsidies from the government in the form of a subsidized loan (at a lower interest rate)[12], with a reported income of 123 million rubles over H1 2022[13]. Thus, Magnit is a company with indirect government affiliation, receiving support through subsidies.

Pharmsynthez has Rosnano (more than 25%) as a government-owned shareholder[14]. Its 2021 annual report shows that government procurement drove revenue growth by providing additional funding for national projects and allocating funds for the purchase of drugs for treating the coronavirus infection[15]. Therefore, Pharmsynthez is a company with government ownership.

The results are summed up in Table 7.

Table 7 shows that the only company in our subsample that has a state-owned corporation as a shareholder belongs to the least resilient subgroup. Several companies have direct or indirect owners included in the sanctions list as people affiliated with the government. Other companies have received different types of financial, legislative or other support from the state. Our results show that government ownership does not significantly affect company resilience in cancel culture times. In further analysis, it might be useful to expand the sample to include more state-owned corporations; however, there is limited data available at this point, as information has not been disclosed for most of these corporations for 2022.

Improving relations with banks is a key factor in enhancing resilience, as posited by Hypothesis 3. Previous research suggests that firms in high-trust countries tend to enjoy improved access to credit, resulting in decreased profit reduction during times of crisis [12]. To measure this driver, we utilized credit ratings, considering them crucial in negotiating favorable terms for debt financing. Given the absence of international rating agencies in Russia, we relied on RA Expert ratings.

Although Nornickel's credit rating for 2023 is undisclosed on the rating agency's website, it maintained a ruAAA rating with a stable prognosis from 2018 to 2022. This highest category signifies the company's very high ability to meet financial obligations. TMK, with a ruA rating, experienced a positive trend in 2021 (ruA+) but reverted to ruA in 2022 and 2023. This rating indicates a moderately high ability to fulfill obligations, albeit with increased sensitivity to external economic factors.

M.Video's credit rating, reviewed annually in March, was ruA- in 2018, remained ruA- in 2019–2020 with a positive prognosis, and rose to ruA+ in 2021–2022 before returning to ruA in 2023. This rating group likewise suggests a moderately high ability to meet obligations. Magnit's rating, disclosed in September–October, was assessed at ruAA– in 2018 with a positive prognosis before being changed to stable and then fully revoked in October 2018. For Rusolovo and Pharmsynthez, RA Expert did not assign credit ratings. Table 8 provides a summary of the data, comparing ratings and resilience across different groups.

[12] The annual report of Magnit https://www.magnit.com/ru/disclosure/annual-reports/.

[13] The financial statements of PJSC Magnit (magnit.com).

[14] PJSC PHARMSINTEZ, Vsevolozhsk district (TIN 7801075160), details, extract from the Unified State Register of Legal Entities, address, mail, website, telephone, financial indicators (spark-interfax.ru).

[15] The annual report of Pharmsintez 2021 2015 (pharmsynthez.com).

Table 8. Credit ratings and resilience groups

	Nornickel	TMK	Rusolovo	M.Video	Magnit	Pharmsynthez
Industry Sector	Basic materials		Basic materials		Consumer	
Resilience lassification	partially resilient		non-resilient	resilient	resilient	non-resilient
Z'-score, FY'20	0.77	0.54	0.22	1.06	1.66	0.09
Z'-score, HY'22	0.48	0.48	0.25	0.68	0.95	0.16
2023	–	ruA	–	ruA	–	–
2022	ruAAA	ruA	–	ruA+	–	–
2021	ruAAA	ruA+	–	ruA+	–	–
2020	ruAAA	ruA	–	ruA–	–	–
2019	ruAAA	ruA	–	ruA–	–	–

Source: credit ratings by RAexpert.

Thus, better credit rating does not necessarily mean better resilience. Notably, the revoked credit rating of Magnit in 2018 did not hinder its classification as resilient according to the altered Z'-score model. Similarly, M.Video, characterized by a moderately high ability to meet obligations, is also classified as resilient. On the other hand, TMK, despite sharing the same credit rating, is only deemed partially resilient. Intriguingly, Nornickel, holding the highest credit rating, is classified as partially resilient. Therefore, the hypothesis that better bank relations lead to stronger resilience cannot be confirmed.

Conclusions

Our study undertook an empirical assessment of resilience levels across various industry sectors during both the pre-sanctions and the cancel culture periods. By employing an adjusted 5-variable Altman Z-score model, we categorized companies into distinct classes based on resilience criteria. Interestingly, when juxtaposing these resilience metrics with market-based returns, specifically total shareholder returns (TSR), we observed an inconsistency in rankings during cancel culture times. TSR fails to accurately reflect resilience levels and does not align with the identified corporate classes.

To delve deeper into the drivers influencing firm resilience, we examined a subsample of six companies categorized as top-performers and bottom-performers across three resilience levels. While initially hypothesizing that human capital, particularly the combination of skills, knowledge, and education, would positively impact resilience during structural crises in line with previous research [7; 8; 25; 26], our analysis of CEO characteristics such as age, education, experience, and tenure did not yield strong evidence for this conjecture. However, we found that CEOs with relevant professional backgrounds contribute to their firms' ability to navigate crises.

For Hypothesis 2, which posited that financial, legislative, and other government support influences *resilience* in line with prior studies [18], our evidence challenges the notion that companies with government ownership or financial assistance are inherently stronger in terms of resilience. Additionally, we explored banks as potential drivers, expecting that better relations with them would provide financing flexibility and enhance resilience. However, our study reveals that a better credit rating does not necessarily correlate with better resilience. The limitations of this conclusion lie in the limited availability of credit rating data, assessed from a single agency due to the revocation and non-disclosure of ratings by international agencies for Russian companies.

Our findings hold significance for financial management and governance practices, particularly during turbulent times and structural crises. The paper lays a foundation for further research on trends in corporate resilience classes and their correlation with industry types.

References

1. Keenan P., Bixner R., Powell K., et al. Leading change in turbulent times. Boston Consulting Group; 2008. URL: https://www.bcg.com/publications/2008/leading-change-in-turbulent-times (accessed on 17.04.2023)
2. Angwin D., McGee J., Sammut-Bonnici T. Turnaround strategy. In: Wiley Encyclopedia of Management; 2015. https://doi.org/10.1002/9781118785317.weom120049
3. Lin B., Lee Z., Gibbs L.G. Operational restructuring: reviving an ailing business. *Management Decision*. 2008;46(4):539-552. https://doi.org/10.1108/00251740810865049
4. Denis D.J., Kruse T.A. Managerial discipline and corporate restructuring following performance declines. *Journal of financial economics*. 2000;55(3):391-424. https://doi.org/10.1016/S0304-405X(99)00055-0

5. Kam A., Citron D., Muradoglu G. Financial distress resolution in China-Two case studies. *Qualitative Research in Financial Markets*. 2010;2(2):46-79. https://doi.org/10.1108/17554171011053667
6. Ashayeri J., Ma N., Sotirov R Supply chain downsizing under bankruptcy: A robust optimization approach. *International Journal of Production Economics*. 2014;154:1-15. https://doi.org/10.1016/j.ijpe.2014.04.004
7. Cheema-Fox A., LaPerla B.R., Wang H., et al. Corporate Resilience and Response to COVID-19. *Journal of Applied Co rpor ate Finance*. 2021;33(2):24-41. https://doi.org/10.1111/jacf.12457
8. Milano G., Whately R., Tomlinson B., et al. A Deeper Look at the Return on Purpose: Before and During a Crisis. *Journal of Applied Corporate Finance*. 2021;33(2):41-50. https://doi.org/10.1111/jacf.12460
9. Hidayat M., Latief F., Widiawati A. et al. Factors Supporting Business and its Distrubution to Business Resilience In New Normal Era. *Journal of Distribution Science*. 2021;19(ll):5-15. https://doi.org/10.15722/JDS.19.11.202111.5
10. Brand F.S., Blaese R., Weber G., et al. Changes in Corporate Responsibility Management during COVID-19 Crisis and Their Effects on Business Resilience: An Empirical Study of Swiss and German Companies. *Sustainability*. 2022;14(7):4144. https://doi.org/10.3390/su14074144
11. Lins K.V., Servaes H., Tamayo A. Social capital, trust., and firm performance: The value of corporate social responsibility during the financial crisis. *The Journal of Finance*. 2017;72(4):1785-1824. https://doi.org/10.1111/jofi.12505
12. Levine R., Lin C., Xie W. Corporate resilience to banking crises: The roles of trust and trade credit. *Journal of Financial and Quantitative Analysis*. 2018;53(4):1441-1477. https://doi.org/10.1017/S0022109018000224
13. Markman G. M., Venzin M. Resilience: Lessons from banks that have braved the economic crisis — And from those that have not. *International Business Review*. 2014;23(6):1096-1107. https://doi.org/10.1016/j.ibusrev.2014.06.013
14. Sajjad A. The COVID-19 pandemic, social sustainability and global supply chain resilience: A review. *Corporate Governance*. 2021;21(6):1142-1154. https://doi.org/10.1108/CG-12-2020-0554
15. Sarkar P., Ismail M.W.M., Tkachev T. Bridging the supply chain resilience research and practice gaps: pre and post COYID-19 perspectives. *Journal of Global Operations and Strategic Sourcing*. 2022;15(4):599-627. https://doi.org/10.1108/JGOSS-09-2021-0082
16. Tarigan Z.J.H., Siagian H., Jie F. Impact of internal integration, supply chain partnership, supply chain agility, and supply chain resilience on sustainable advantage. *Sustainability*. 2021;13(10):5460. https://doi.org/10.3390/su13105460
17. Rajesh R. On sustainability, resilience, and the sustainable-resilient supply networks. *Sustainable Production and Consumption*. 2018;15:74-88. https://doi.org/10.1016/j.spc.2018.05.005
18. Yu M. State ownership and firm performance: Empirical evidence from Chinese listed companies. *China Journal of Accounting Research*. 2013;6(2):75-87. https://doi.org/10.1016/j.cjar.2013.03.003
19. Pargendler M. The unintended consequences of state ownership: the Brazilian experience. *Theoretical Inquiries in Law*. 2012;13(2):503-524. https://doi.org/10.1515/1565-3404.1303
20. Tihanyi L., Aguilera R.V., Heugens P., et al. State ownership and political connections. *Journal of Management*. 2019;45(6):2293-2321. https://doi.org/10.1177/0149206318822113
21. Abramov A., Radygin A., Entov R. et al. State ownership and efficiency characteristics. *Russian Journal of Economics*. 2017;3(2):129-157. https://doi.org/10.1016/j.ruje.2017.06.002
22. Altman E.I., Iwanicz-Drozdowska M., Laitinen E.K., et al. Distressed firm and bankruptcy prediction in an international context: A review and empirical analysis of Altman's Z-score model. *Journal of International Financial Management & Accounting*. 2014;28(2):131-171. https://doi.org/10.1111/jifm.12053
23. Sudarsanam S., Lai J. Corporate Financial Distress and Turnaround Strategies: An Empirical Analysis. *British Journal of Management*. 2001;12(3):183-199. https://doi.org/10.1111/1467-8551.00193
24. Klyuchevye trendy i perspektivy razvitiya otraslei rossiiskoi promyshlennosti v usloviyakh geopoliticheskoi turbulentnosti. 2023. (In Russ.) URL: https://assets.kept.ru/upload/pdf/2023/01/ru-trendi-perspektivi-razvitiya-otraslej-promyshlennosti-rossii-analiz-kept.pdf (accessed on 17.04.2023)
25. Pasban M., Nojedeh S.H. A Review of the Role of Human Capital in the Organization. *Procedia-social and behavioral sciences*. 2016;230:249-253. https://doi.org/10.1016/j.sbspro.2016.09.032
26. Wilson R.A., Briscoe G. The impact of human capital on economic growth: a review. Luxembourg: EUR-OP; 2004. URL: https://www.cedefop.europa.eu/files/BgR3_Wilson.pdf (accessed on 17.04.2023)
27. Altman E.I., Hotchkiss E. *Corporate financial Distress: o complete guide to predicting, avoiding, and dealing*

with bankruptcy. New York: Wiley, 1983. https://doi.org/10.1002/9781118267806

28. Agarwal V., Taffler R. Does Financial Distress Rbsk Drive the Momentum Anomale. *Economics. Financial Management*. 2008;September 1. DOI: 10.1111/J.1755-053X. 2008.00021X
29. Bauer J., Agarwal V. Are hazard models superior to traditional bankruptcy prediction approaches? A comprehensive test. *Journal of Banking and Finance.* 2014;40:432-442. https://doi.org/10.1016/j.jbankfin.2013.12.013
30. Levy C., Mysore M., Sneader K., et al. The Emerging Resilients: Achieving Escape Velocity. McKinsey & Company; 2020. URL: https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/the-emerging-resilients-achieving-escape-velocity (accessed on 17.04.2023)
31. Abbas Q., Rashid A. Modeling Bankruptcy Prediction for Non-Financial Firms: The Case of Pakistan. *MPRA Paper.* 2011:28161. https://doi.org/10.2139/ssrn.1917458
32. Wang Y., Campbell M. Business Failure Prediction for Publicly Listed Companies in China. *Joumal of Business & Management*. 2010;16(1):75-88. https://doi.org/10.6347/JBM.201001_16(1).0004
33. Prabowo S.C.B. Analysis on the prediction of bankruptcy of cigarette companies listed in the Indonesia Stock Exchange using altman (z-score) model and zmijewski (x-score) model. *Jumal Aplikasi Manajemen*. 2019;17(2):254260. https://doi.org/10.21776/ub.jam.2019.017.02.08
34. Bhatt S.N. Capital structure and turnaround strategies using altman's Z-score models. *Asian Journal of Research in Business Economics and Management*. 2012;2(7):102-113.
35. Lim L.L.K., Chan C.C.A., Dallimore P. Perceptions of human capital measures: from corporate executives and investors. *Journal of Business and Psychology*. 2010;25:673-688. https://doi.org/10.1007/s10869-009-9150-0
36. De Albuquerque N.R., Vellasco Marley M.M.R., Mun J., et al. Human capital valuation and return of investment on corporate education. *Expert Systems with Applications*. 2012;39(15):11934-11943. https://doi.org/10.1016/j.eswa.2012.03.002
37. Bukowitz W.R, Williams R.L., Mactas E.S. Human capital measurement. *Research-Technology Management*. 2004;47(3):43-49. https://doi.org/10.1080/08956308.2004.11671629
38. Altman E. *Corporate financial distress and bankruptcy*. 3rd ed. New York: Wiley; 1993.

Appendix 1.

Computation results of Z′-score for 2012–2020

Company	Industry	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFKS RM Equity	Communications	0.695	0.787	0.422	0.535	0.530	0.637	0.612	0.431	0.523	0.493
AFLT RM Equity	Consumer, Cyclical	0.931	1.332	1.396	1.154	1.323	1.672	0.665	0.640	0.736	0.300
AKRN rm Equity	Basic Materials	0.580	0.472	0.480	0.394	0.427	0.481	0.527			
ALRS RM Equity	Basic Materials	0.599	0.519	0.497	0.559	0.542	0.715	0.683	0.776	0.591	0.458
APTK RM Equity	Consumer, non-Cyclical	0.987	0.669	1.409	0.580	1.163	1.011	1.189	1.329	1.115	0.735
AQUA RM Equity	Consumer, non-Cyclical	2.787	2.794	3.415	0.230	0.096	0.456	0.983	0.514	0.721	0.475
BANERM Equity	Energy	1.139	1.172	1.284	1.235	1.197	1.041	0.940	1.166	1.074	0.604
BELU RM Equity	Consumer, non-Cyclical	0.910	0.878	0.781	0.822	0.870	0.954	0.919	0.906	0.898	1.004
CHMF RM Equity	Basic Materials	0.827	0.931	0.646	0.748	0.943	1.038	1.142	1.370	1.071	0.942
DIOD RM Equity	Consumer, non-Cyclical	0.438	0.374	0.417	0.512	0.481	0.612	0.572	0.559	0.474	0.398
DSKY RM Equity	Consumer, Cyclical							2.234	1.287	1.402	1.488
ENRU RM Equity	Utilities	0.526	0.539	0.543	0.541	0.803	0.952	0.940	0.893	0.955	0.591
FEES RM Equity	Utilities	0.141	0.127	0.171	0.195	0.202	0.250	0.231	0.227	0.211	0.193
FLOT RM Equity	Industrial										0.188
GAZA RM Equity	Energy	2.303		1.577	1.185	1.268	1.391	1.478	1.478	1.478	1.478
	(blank)		1.766								
GAZP RM Equity	Energy	0.447	0.418	0.410	0.384	0.371	0.376	0.372	0.411	0.366	0.284
GEMA RM Equity	Financial									0.452	0.395
GMKN RM Equity	Basic Materials	0.726	0.627	0.624	0.633	0.564	0.576	0.589	0.730	0.770	0.770
HYDR RM Equity	Utilities	0.463	0.362	0.382	0.388	0.389	0.473	0.416	0.401	0.410	0.424
IRAO RM Equity	Utilities	1.028	1.064	1.300	1.275	1.473	1.508	1.380	1.340	1.399	1.161
irgz rx Equity	Utilities	0.956	0.978	0.997	0.939	1.016	0.893	0.893	0.647	0.600	0.370
IRKT RM Equity	Industrial	0.581	0.590	0.795	0.428	0.442	0.467	0.467	0.249	0.445	
ISKJ RM Equity	Consumer, non-Cyclical	0.295	0.451	0.600	0.457	0.378	0.381	0.474	0.579	0.607	0.736
KMAZ RM Equity	Consumer, Cyclical	1.389	1.550	1.419	1.154	0.887	1.008	0.981	0.961	0.930	0.939
KUBE RM Equity	Utilities		0.718	0.575	0.548	0.712	0.712	0.670	0.688	0.741	0.665
KZOS RX Equity	Basic Materials	0.844	1.094	1.195	1.160	1.226	1.253	1.195	1.199	1.170	0.945
LIFE RM Equity	Cyclical	0.274	0.345	0.142	0.201	0.124	0.119	0.187	0.085	0.062	0.091
LKOH RM Equity	Energy	1.142	1.222	1.076	1.009	1.048	0.965	1.068	1.331	1.273	0.888
LNTA RM Equity	Consumer, Cyclical				1.392	1.439	1.373	1.495	1.499	1.292	1.614

Company	Industry	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
LSRG RM Equity	Financial	0.424	0.454	0.407	0.461	0.447	0.434	0.564	0.577	0.429	0.431
MAGN RM Equity	Basic Materials	0.535	0.594	0.662	0.685	0.816	0.987	1.002	1.070	0.984	0.863
MFON RM Equity	Communications		0.797	0.710	0.707	0.686	0.698	0.580	0.668	0.514	0.440
MGNTRM Equity	Consumer, non-Cyclical	1.947	2.055	2.202	2.189	2.402	2.399	2.197	1.413	1.453	1.657
MRKCRM Equity	Utilities	0.917	0.797	0.983	0.939	0.817	0.828	0.889	0.880	0.815	0.811
MRKK RM Equity	Utilities	0.703	0.627	0.530	0.559	0.661	0.691	0.727	0.707	0.950	0.962
MRKPRM Equity	Utilities	0.951	0.834	1.021	0.903	0.892	0.997	1.034	0.927	0.897	0.832
MRKSRM Equity	Utilities	1.080	0.984	1.166	1.240	0.863	0.844	0.888	0.874	0.826	0.789
MRKU RM Equity	Utilities	0.982	0.904	0.939	0.910	0.912	1.002	1.077	1.240	1.178	0.955
MRKV RM Equity	Utilities	1.214	1.040	0.991	0.895	0.952	1.061	1.154	1.212	1.090	0.994
MRKZ RM Equity	Utilities	0.900	0.806	0.877	0.862	0.795	0.872	0.994	1.277	1.006	0.997
MSNGRM Equity	Utilities	0.632	0.609	0.474	0.475	0.529		0.608	0.629	0.477	0.462
MSRS RM Equity	Utilities	0.534	0.482	0.467	0.425	0.420	0.427	0.465	0.484	0.478	0.472
MSTT RM Equity	Industrial						1.204	1.312	1.300	0.847	5.142
MTLR RM Equity	Basic Materials	0.600	0.612	0.594	0.647	0.724	0.842	0.933	0.952	0.913	1.356
MTSS RX Equity	Communications	0.723	0.852	0.847	0.701	0.667	0.816	0.820	0.497	0.582	0.549
MVID RM Equity	Consumer, Cyclical	2.107	2.313	2.301	1.892	1.851	1.833	1.637	1.129	1.047	1.056
NFAZ RM Equity	Consumer, Cyclical	2.010	2.753	4.403	1.985	1.981	2.133	2.458	1.966	2.672	3.552
NKNC RM Equity	Basic Materials		1.712	1.525	1.539	1.441	1.236	1.157	0.950	0.861	0.593
NLMK RM Equity	Basic Materials	0.644	0.690	0.669	0.685	0.776	0.847	0.964	1.136	1.084	0.949
NVTK RM Equity	Energy			0.546	0.549	0.574	0.620	0.616	0.760	0.520	0.407
ODVA RM Equity	Communications	0.369	0.101	0.056	0.020	0.067	-0.010	0.067	0.033	0.216	1.131
OGKB RM Equity	Utilities	0.810	0.712	0.684	0.595	0.532	0.634	0.670	0.686	0.612	0.557
ORUP RM Equity	Consumer, cyclical							0.576	0.522	0.504	0.356
PHOR RM Equity	Basic Materials	0.950	0.945	0.852	0.705	0.911	0.854	0.747	0.842	0.846	0.818
PIKK RM Equity	Financial	0.365	0.584	0.543	0.646	0.501	0.173	0.471	0.684	0.609	0.603
PLZL RM Equity	Basic Materials									0.535	0.735
RBCM RM Equity	Communications	1.136	0.891	1.050	1.221	1.304	1.446	1.551	1.467	1.125	1.078
RNFT RX Equity	Energy						0.503	0.588	0.716	0.682	0.682
ROLO RM Equity	Basic Materials			0.775	0.314	0.127	0.632	0.605	0.798	0.202	0.224
ROSN RM Equity	Energy	0.807	0.774	0.618	0.627	0.535	0.458	0.496	0.634	0.677	0.383
RSTI RM Equity	Utilities	0.734	0.339	0.395	0.392	0.369	0.410	0.417	0.418	0.401	0.379

Company	Industry	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
RTKM RM	Communications	0.599	0.535	0.532	0.557	0.551	0.546	0.556	0.504	0.547	0.557
SELG RM Equity	Basic Materials	0.365	0.244	0.274	0.226	0.313	0.391	0.270	0.319	0.397	0.460
SIBN RM Equity	Energy	1.127	0.951	0.832	0.687	0.605	0.624	0.678	0.727	0.670	0.483
SMLT RM Equity	Financial										0.637
SNGS RM Equity	Energy	0.522	0.445	0.382	0.294	0.273	0.282	0.296	0.321	0.320	0.203
SVAV RM Equity	Consumer, Cyclical	1.424	1.432	1.387	1.167	1.125	0.872	0.823	0.783	0.894	0.979
TGKA RM Equity	Utilities		0.438	0.479	0.473	0.462	0.513	0.554	0.568	0.551	0.483
TGKN RM Equity	Utilities					1.143	1.091	1.073	1.124	1.081	1.058
TNSE RM Equity	Utilities					3.362	3.203	3.419	3.508	3.467	3.361
TRMK RM Equity	Industrial	0.877	0.905	0.851	0.712	0.793	0.782	0.814	0.686	0.720	0.540
TRNFP RX Equity	Energy	0.378	0.385	0.374	0.330	0.326	0.327	0.326	0.325	0.338	0.306
UNAC RM Equity	Industrial	0.289	0.363	0.405	0.381	0.386	0.429	0.429	0.420	0.345	0.436
UPRO RM Equity	Utilities	0.635	0.672	0.697	0.688	0.693	0.802	0.709	0.677	0.672	0.645
URKA RM Equity	Basic Materials	0.283	0.309	0.265	0.252	0.368	0.293	0.316	0.310	0.322	0.312
UTAR RM Equity	Industrial	0.752	0.829	0.733					1.064	1.125	0.681
VSMO RM Equity	Industrial		0.557	0.565	0.513	0.341	0.381	0.318	0.326	0.329	0.272

Source: prepared by authors.

Appendix 2.

Detailed computation of Z '-score for the first half of 2022 and forecast for the full year of 2022

Company	Capital Employed/Total Assets	NI/Total Assets	EBIT/Total Assets	Market Cap/Total Liabilities	Sales/Total Assets	Z'- score HY1'22	Z'- score FY'22
Rusolovo	0.78	0.06	0.07	2.24	0.23	0.25	0.48
TMK	0.46	0.03	0.07	0.18	0.47	0.48	0.96
Nornickel	0.70	0.24	0.33	2.34	0.44	0.48	0.93
Magnit	0.58	0.02	0.06	0.43	0.94	0.95	1.89
Pharmsynthez	0.01	-0.05	-0.02	1.29	0.15	0.16	0.31
M Video	0.21	-0.01	0.2	0.11	0.68	0.68	1.35

Source: prepared by authors.

Appendix 3.

TSR 2012–2020

Company	Industry	2012	2013	2014	2015	2016	2017	2018	2019	2020
AFKSRM Equity	Communications	0.10	0.45	0.09	0.06	0.03	0.01	0.10	0.05	0.06
AFLT RM Equity	Consumer. Cyclical	0.60	0.15	0.10	0.30	0.19	0.07	0.15	0.11	0.55
AKRN rm Equity	Basic Materials	0.09	0.05	0.10	0.23	0.03	0.06	0.15	0.06	0.04
ALRS RM Equity	Basic Materials	0.10	0.12	0.23	0.08	0.41	0.13	0.09	0.21	0.07
APTK RM Equity	Consumer. Non-cyclical	0.31	0.58	2.06	0.67	0.44	0.05	0.07	0.18	0.08
AQUA RM Equity	Consumer. Non-cyclical	0.14	0.13	0.92	0.43	1.86	1.11	0.01	0.80	0.07
BANERM Equity	Energy	0.09	0.06	0.13	0.04	0.03	0.13	0.28	0.01	0.46
BELU RM Equity	Consumer. Non-cyclical	0.06	0.01	0.07	0.09	0.17	0.04	0.16	0.18	0.23
CHMF RM Equity	Basic Materials	0.06	0.31	0.07	0.22	0.01	0.16	0.18	0.02	0.06
DIOD RM Equity	Consumer. Non-cyclical	0.26	0.01	0.13	0.25	0.08	0.09	0.03	0.15	0.21
DSKY RM Equity	Consumer. Cyclical	0.20	0.30	0.26	0.33	0.31	0.22	0.14	0.16	0.11
ENRU RM Equity	Utilities	0.11	0.05	0.07	0.05	0.02	0.03	0.02	0.10	0.33
FEES RM Equity	Utilities	0.01	0.13	0.10	0.08	0.37	0.05	0.05	0.02	0.05
FLOT RM Equity	Industrial	0.02	0.04	0.45	0.88	0.01	0.19	0.09	0.21	0.19
GAZPRM Equity	Energy	0.03	0.10	0.06	0.09	0.01	0.07	0.26	0.07	0.17
GMKN RM Equity	Basic Materials	0.10	0.02	0.25	0.14	0.06	0.04	0.37	0.20	0.28
HYDR RM Equity	Utilities	0.18	0.05	0.05	0.05	0.08	0.07	0.03	0.02	0.04
IRAO RM Equity	Utilities	0.04	0.19	0.12	0.12	0.04	0.00	0.11	0.07	0.04
irgz rx Equity	Utilities	0.19	0.13	0.07	0.17	0.07	-	0.10	0.03	0.02
IRKT RM Equity	Industrial	0.01	0.28	0.09	0.29	0.28	0.24	0.29	0.10	0.81
ISKJ RM Equity	Consumer, non-cyclical	0.14	0.40	0.14	0.14	0.26	0.27	0.30	0.30	0.30
KMAZ RM Equity	Consumer, cyclical	0.11	0.04	0.03	0.12	0.37	0.17	0.19	0.02	0.12
KUBE RM Equity	Utilities	–	0.22	0.13	0.33	0.06	0.01	0.10	0.10	0.03
KZOS RX Equity	Basic Materials	0.24	0.02	0.18	0.26	0.10	0.05	0.10	0.08	0.13
LIFE RM Equity	Consumer, non-cyclical	0.36	0.08	0.54	0.12	1.00	0.09	0.52	0.17	0.28
LKOH RM Equity	Energy	0.10	0.05	0.24	0.10	0.08	0.15	0.37	0.01	0.30
LSRG RM Equity	Financial	0.18	0.01	0.54	0.01	0.16	0.30	0.06	0.25	0.07
MAGNRM Equity	Basic Materials	0.06	0.10	0.18	0.16	0.05	0.17	0.17	0.05	0.06
MFON RM Equity	Communications	–	–	–	–	–	–	–	–	–
MGNTRM Equity	Consumer, non-cyclical	0.33	0.29	0.32	0.24	0.13	0.06	0.08	0.11	0.14
MRKC RM Equity	Utilities	0.01	0.33	0.07	0.07	0.07	0.06	0.03	0.01	0.03
MRKK RM Equity	Utilities	0.12	0.00	0.01	0.09	0.11	0.03	0.07	0.08	0.30
MRKPRM Equity	Utilities	0.07	0.29	0.10	0.01	0.13	0.16	0.04	0.02	0.00
MRKS RM Equity	Utilities	0.05	0.29	0.05	0.26	0.08	0.11	0.06	0.04	0.02
MRKU RM Equity	Utilities	0.04	0.10	0.05	0.01	0.07	0.09	0.24	0.06	0.17
MRKV RM Equity	Utilities	0.04	0.07	0.06	0.04	0.11	0.11	0.07	0.01	0.04

Company	Industry	2012	2013	2014	2015	2016	2017	2018	2019	2020
MRKZ RM Equity	Utilities	0.00	0.34	0.05	0.10	0.07	0.05	0.35	0.24	0.02
MSNG RM Equity	Utilities	0.02	0.01	0.04	0.06	0.11	0.03	0.01	0.05	0.05
MSRS RM Equity	Utilities	0.03	0.03	0.01	0.03	0.06	0.07	0.06	0.01	0.02
MSTT RM Equity	Industrial	0.25	0.06	0.29	0.05	0.22	0.19	0.01	0.31	0.31
MTLR RM Equity	Basic Materials	0.10	0.18	0.10	0.04	0.09	0.08	0.02	0.05	0.08
MTSS RX Equity	Communications	–	–	–	–	–	–	–	–	–
MVID RM Equity	Consumer, cyclical	0.19	0.11	0.17	0.06	0.13	0.08	0.62	0.14	0.14
NFAZ RM Equity	Consumer, cyclical	0.11	0.06	0.12	0.05	0.41	0.07	0.02	0.51	0.40
NKNC RM Equity	Basic Materials	0.04	0.03	0.09	0.14	0.02	0.06	0.16	0.08	0.14
NLMK RM Equity	Basic Materials	0.10	0.08	0.16	0.22	0.04	0.15	0.29	0.10	0.02
NVTK RM Equity	Energy	0.20	0.41	0.20	0.33	0.13	0.09	0.43	0.04	0.18
ODVA RM Equity	Communications	–	–	–	–	–	–	–	–	–
OGKB RM Equity	Utilities	0.01	0.07	0.04	0.03	0.20	0.05	0.01	0.06	0.10
PHOR RM Equity	Basic Materials	0.05	0.01	0.18	0.54	0.01	0.03	0.29	0.06	0.02
PIKK RM Equity	Financial	0.44	0.05	0.02	0.17	0.13	2.03	0.40	0.14	0.35
PLZL RM Equity	Basic Materials	0.22	0.11	0.16	0.55	0.22	0.03	0.16	0.40	0.41
RBCM RM Equity	Communications	–	–	–	–	–	–	–	–	–
ROSN RM Equity	Energy	0.13	0.52	0.18	0.06	0.02	0.20	0.37	0.05	0.33
RSTI RM Equity	Utilities	0.03	0.16	0.01	0.01	0.18	0.05	0.08	0.01	0.03
RTKM RM Equity	Communications	–	–	–	–	–	–	–	–	–
SELG RM Equity	Basic Materials	0.08	0.15	0.05	0.47	0.39	0.03	0.37	0.39	0.51
SIBN RM Equity	Energy	0.05	0.03	0.11	0.04	0.05	0.25	0.29	0.00	0.20
SNGS RM Equity	Energy	0.08	0.01	0.06	0.13	0.02	0.15	0.32	0.01	0.32
SVAV RM Equity	Consumer, cyclical	0.06	0.06	0.22	0.20	0.07	0.00	0.10	0.47	0.14
TGKA RM Equity	Utilities	0.04	0.12	0.01	0.01	0.14	0.11	0.05	0.05	0.09
TGKN RM Equity	Utilities	–	0.25	0.06	0.03	0.06	0.02	0.04	0.02	0.00
TRMK RM Equity	Industrial	0.05	0.01	0.13	0.09	0.12	0.15	0.08	0.07	0.11
TRNFP RX Equity	Energy	0.09	0.02	0.03	0.05	0.04	0.04	0.11	0.09	0.10
UNACRM Equity	Industrial	0.06	0.29	0.34	0.18	0.20	0.08	0.09	0.15	0.23
UPRO RM Equity	Utilities	0.14	0.05	0.01	0.01	0.02	0.02	0.02	0.03	0.06
URKA RM Equity	Basic Materials	0.19	0.14	0.30	0.39	0.20	0.06	0.07	0.04	0.08
UTAR RM Equity	Industrial	0.44	0.04	0.08	0.08	0.07	0.01	0.10	0.03	0.33
VSMO RM Equity	Industrial	–	0.17	0.23	0.26	0.13	0.02	0.15	0.04	0.14

Source: Refinitiv, prepared by authors.

Contribution of the authors: the authors contributed equally to this article.

The authors declare no conflicts of interests.

The article **was submitted** 09.10.2023; **approved after reviewing** 12.11.2023; **accepted for publication** 10.12.2023.

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.38-58
JEL classification: C61, G30, G34

Performance of M&A Deals in The Russian Market: Evidence from Oil & Gas and Power Industries

Tatsiana Lashuk ✉
Specialist of financial department, CRCC RUS LLC, Moscow, Russia,
lashuktatsian@gmail.com, ORCID

Mark Vasilevskiy
External Solutions Team Lead, Lamoda, Moscow, Russia,
mivasilevskiy@gmail.com, ORCID

Evgeniia Filatova
Financial analyst, Allianz Partners, Munich, Germany,
eugfilatova@gmail.com, ORCID

Abstract

The paper provides a comprehensive investigation of M&A deals on the Russian market, particularly in the Oil and Gas and Power sectors. This research fills the gap in literature by scrutinizing key M&A trends, reviewing M&A activities, and evaluating M&A performance through a combined application of Data Envelopment Analysis (DEA) and case study analysis. A critical part of this study involves exploring the influence of geopolitical factors on these transactions. The article presents a novel academic contribution by offering focused insights on M&A activities in two under-researched yet critical sectors of the Russian economy. Furthermore, the innovative use of DEA and case study analysis enhances our understanding of industry trends over a span of 22 years, including the M&A transactions of 2022. Our sample includes 23 deals made by 17 Russian companies in the Energy and Power industries. We selected deals as a result of which the acquirer companies obtained more than 50% of the target company, so the acquirer company gained control over the operations and performance of the acquired company. The study traces the effects of geopolitical influences on M&A outcomes, a critical consideration given Russia's unique geopolitical context. This research is of practical significance for domestic and international businesses contemplating M&A decisions within Russia's Oil & Gas and Power industries, offering valuable insights to guide future strategies. While this study uncovers promising positive trends, further exploration and long-term data are necessary for a complete assessment of the impact of these M&A activities on company performance.

Keywords: Mergers and Acquisitions, Data Envelopment Analysis, Case study, Russian Market, Oil & Gas sector, Power Sector

For citation: Lashuk T., Vasilevskiy M., Filatova E. (2023) Performance of M&A Deals in The Russian Market: Evidence from Oil & Gas and Power Industries. *Journal of Corporate Finance Research.* 17(4): 38-58. https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.38-58

Introduction

The issue of Mergers and Acquisitions (M&A) has drawn increased attention from business executives and academic researchers alike in recent decades. They present one of the most significant avenues for business growth, diversification, and strategic repositioning. This research delves into the realm of M&A in the context of the Russian market, an environment marked by unique socio-economic, political, and regulatory conditions. Specifically, it narrows down the scope to examine M&A activities within two critical sectors of the Russian economy – the Oil & Gas industry and the Power sector, two very dynamic sectors of global strategic importance.

The existing literature, which we deeply analyze in the literature review part, offers a substantial body of knowledge on M&A transactions, including their driving forces, transaction processes, and impacts on stakeholders. However, there remains a lack of specialized studies focusing on the Russian market and, in particular, the Oil & Gas and Power industries. The present work intends to address this gap, providing a novel contribution to the academic discourse.

The scientific novelty of this work lies in:

1) A focused examination of M&A activities in two under-studied sectors of the Russian market: Oil & Gas and Power. These two industries are important for Russia because they can influence Russia's GDP.
2) An innovative use of both DEA and case study analysis for the evaluation of M&A performance in these industries can help us dive deeply into the understanding of these two industries' trends over more than 20 years, up to and including 2022.
3) An integrated approach that incorporates the analysis of geopolitical dynamics and their impact on M&A strategies and outcomes. Russia is affected not only by global crises, but also by political sanctions, which is an interesting field of study.

The practical significance of this work is its potential to guide future M&A strategies in Russia's Oil & Gas and Power industries. Its findings could assist both domestic and international businesses in making more informed M&A decisions. Such an investigation is pivotal for understanding the dynamics of these industries and has significant implications for strategic business decision-making in the future.

Mergers & Acquisitions in the Russian market over the years. Overview of market dynamics

Our study is dedicated to the exploration of the mergers and acquisitions (M&A) market activity within the Russian economic landscape. In this introductory section, we aim to trace the historical progression of the M&A market in Russia. We have chosen to divide this development into distinct periods, reflecting the various economic fluctuations in the country. Importantly, our study places particular emphasis on the Oil & Gas and Power sectors, underscoring their role in the M&A activity as a whole.

The historical development of the Russian M&A market can be divided into a few critical stages [1]. The first stage (1993–1998) was primarily marked by the mass privatization of state property, characterized by "takeovers through privatization". This period saw the formation of the primary financial and industrial groups (FIGs), many of which originated from informal banking. Privatization led to the creation of the largest Russian FIGs. Various financial groups and portfolio investment funds carried out company takeovers across industries, often with the aim of subsequent resale to non-residents or strategic investors.

The second stage, the "post-crisis boom" of 1999–2002 during the period of recovery growth, was characterized by an upsurge in hostile takeovers and a high proportion of speculative M&As. The primary driver behind this wave of M&As was the subsequent consolidation of shareholder capital.

The third period (2003–2008) aligns with the inception of the M&A phenomenon, which is aligned with the active development of the Russian economy. During this phase, M&A transactions were not limited to state-owned enterprises, but also spread extensively among private companies. The market exhibited a unique situation characterized by a predominantly high consolidation of shares under single ownership, a relatively high number of M&As carried out through offshore ventures, and the fact that the dominant shareholder tended to lead the company as an executive leader. In this stage, approximately 6.3% of all transactions surpassed the $500 million threshold, and total acquisition strategies were predominantly favored.

The period from 2008 to 2014 was marked by two considerable economic crises that substantially impacted the Russian economy and the corresponding M&A activities. These crises unfolded amidst weak regulatory frameworks, the limited influence of minority shareholders, and a lack of transparency in ownership structures. The effects of these crises were notable in the M&A domain, with a significant proportion of transactions involving foreign actors.

The subsequent phase from 2015 to 2018 represented an era of economic recovery in Russia. Despite this revival, the M&A market persisted with a substantial percentage of transactions being conducted through offshore entities and a dominant preference towards full acquisition of target companies. Transitioning to the recent period between 2019 and 2021, the year prior to the COVID-19 pandemic was comparatively stable, followed by the unsettling year of the global health crisis and its economic fallout, and eventually a year of economic recuperation. The M&A deals in this period mirrored the period's instability, with the crisis leading to an increase in debt-financed and management buy-out transactions.

Finally, our attention is drawn to the year 2022, characterized by political instability in Russia and the breakdown of relations with Western countries. The implications of these events on M&A activity within Russia constitute an essen-

tial focus of this study. Our objective is to comprehend the effects of these external disruptions on deal configurations, valuations, and regulatory responses.

Literature review and hypotheses development

Value creation of M&As in emerging countries: review of the results of empirical research

There are numerous different empirical studies of the performance of M&A transactions in developed markets, and fewer papers devoted to emerging markets. We decided to group previous academic papers that devoted their studies to evaluating M&A performance in Russia, BRICS and other emerging markets, according to the results of their research. Some researchers prove that an M&A deal can have a negative value creation effect on the acquirer company, while other researchers find positive effects of M&A deals on the acquirer company.

Academic papers that show a negative effect on acquirer company after M&A deal

H. Kinateder, M. Fabich, and N. Wagner [2] set out to bridge a crucial gap in the extant literature of mergers and acquisitions within BRICS, which is comprised of Brazil, Russia, India, China, and South Africa. To tackle their research question, the authors applied an event study methodology, analyzing a manually collated dataset of 50 domestic M&A deals announced by publicly listed companies in BRICS nations between June 2006 and December 2015. The empirical results from the study offer some intriguing insights. The results indicate that target firms experience a statistically significant positive AR around the announcement date. On the other hand, the acquirer firms' AR is slightly negative, indicating that the market does not significantly revalue these firms upon the M&A announcement. This outcome was found to be consistent with the results of previous studies in developed markets (e.g., R. Yaghoubi et al. [3]), but contradicted the research that examined cross-border deals with emerging market acquirers (e.g., S. Bhagat et al. [4]; B. Aybar and T. Thanakijsombat [5]).

O. Bertrand and M.-A. Betschinger [6] investigated the performance of more than 600 domestic and cross-border acquisitions by Russian acquirers in 1999–2008, preliminary in Commodity, Manufacturing and Service industries. They proved a significantly negative impact of M&A transaction on the acquirer company's performance. They state that emerging market firms suffer from the inability to gain value from M&A deals due to a lack of experience, especially in international deals.

M&A performance of Russian steel companies was investigated in an academic paper by E. Chirkova, and E. Chuvstvina [7]. They studied 56 M&A transactions carried out in 2005–2012 by Russian steel companies, including 33 cross-border and 23 domestic ones. This study revealed that cross-border transactions of Russian steel companies show negative excess returns. Additionally, they showed that the market negatively evaluates the acquisition of companies with financial difficulties, as well as targets from non-European countries.

S. Grigorieva, and T. Kalmykova [8] investigated the impact of payment with stocks on M&A performance of companies from USA and BRIC countries in 2002–2017. Their sample included 713 deals conducted by the USA and 468 deals in BRIC countries. The results of the paper were negative: on average, payment with stocks has a negative impact on M&A efficiency. However, this effect is adjusted if the target company belongs to a high-tech industry and depends on the degree of cultural differences between the countries participating in the transactions. Additionally, for companies from BRIC countries, political stability also influences M&A deals performance in a positive way.

Academic papers that prove a positive effect on acquirer company after M&A deal

A. Dell'Acqua et al. [9] investigated value creation in cross-border M&As in BRICS countries in 1997–2012. They proved that companies registered in BRICS countries obtained positive abnormal average cumulative returns from cross-border M&A deals with target companies registered in developed countries.

S. Bhagata, S. Malhotrab, and P.C. Zhuc [4] investigated the performance of 698 cross-border M&A deals in different emerging countries in 1991–2008. They found out that stock market reacts positively to emerging country acquirers, and acquirer returns are positively correlated with better corporate governance measures in the target country.

I.I. Rodionov, and V.B. Mihalchuk [10] investigated M&A transactions on the Russian market in 2006–2015. They used econometrical models to prove a positive M&A effect on the acquirer company under following conditions: positive macroeconomic factors (GDP growth), acquirer company's effective CAPEX expenditures before the M&A deal, type of ownership (the publicity of the target company has a positive effect, and the publicity of the acquiring company has a negative effect). Moreover, transactions that are large in monetary terms have a significant impact on the reporting of the acquiring company in general and on the value of the tax shield in particular.

The performance of over 360 M&A deals in companies from BRICS countries and their influence on the fundamental value of the acquirer company were investigated by E. Rogova, and D. Luzina [11] in their paper. They proved that M&A deals lead to an increase in the fundamental value per share of the acquiring companies from the BRICS countries. Also, they listed the factors influencing the creation or destruction of the fundamental value of acquiring companies: company size, transaction financing method, the company's industry affiliation and transaction payment method.

P.-H. Hsu et al. [12] in their paper investigated worldwide cross-border M&A deals in 1990–2010 for innovation. Us-

ing a sample that includes 85,591 M&A deals, they proved that innovation-driven cross-border M&As strengthen the acquirers' technology positions, which generates a positive impact of M&A. Innovative acquirers in low-innovation countries generate significantly higher stock returns from cross-border deals than from domestic deals. This result shows that innovation-driven cross-border deals can generate value-creating growth opportunities for the acquirer company.

According to our literature review, results of academic papers contradict each other: some researchers show a positive synergy effect from the M&A deal, others demonstrate a negative effect. In our paper we also want to perform an investigation in regard to M&A deals and find out whether it has a positive or negative effect on the acquirer company.

Academic papers according to resяearch methodology

Most papers we found about M&A performance in the Russian, BRICS and other emerging markets use the classical event study methodology to calculate the cumulative abnormal return of the acquirer company stock price to evaluate performance. This method is very popular among researchers, because in theory the stock price incorporates all the available information and expectations about the company's future development, and the M&A deal announcement should influence the stock price of the parties to the M&A deal. However, the stock price is not the only way to evaluate the performance of M&A deals.

In recent years, Data Envelopment Analysis has become increasingly popular in the field of Mergers and Acquisitions, where it is used to assess the efficiency and performance of merging entities. In addition to providing a benchmark for pre- and post-M&A performance, DEA can be employed to reveal the efficiency frontier, which represents the optimal combination of inputs and outputs for the merged firms. Through this process, DEA identifies best practices and pinpoints potential areas for improvement, which can guide the newly merged firms in achieving superior performance.

Data Envelopment Analysis (DEA) in assessing the performance of M&A deals

Data Envelopment Analysis (DEA) is a non-parametric linear programming technique used to measure the relative efficiency of decision-making units with multiple inputs and outputs (T. Nepomuceno [13]). Initially introduced by A. Charnes, W. Cooper, and E. Rhodes in 1978 [14], DEA has evolved into a widely used tool for assessing the performance of various entities, including firms engaged in mergers and acquisitions. In the context of M&A, DEA can be employed to evaluate efficiency gains or losses resulting from the integration of merging firms. Comparing the efficiency scores of the target and acquirer before and after the M&A, DEA can help identify potential synergies, areas for improvement, or inefficiencies arising from the transaction. Additionally, DEA can be used to benchmark the performance of M&A transactions against a set of peers or within an industry, offering valuable insights for investors and policymakers.

Recently, researchers have started using DEA more often to study mergers and acquisitions. Most of these studies examined businesses joining together within the same industry. As pointed out by S. Lozano, and B. Adenso-Díaz in 2021 [15], these studies usually have one of two goals: either to estimate the potential benefits of a merger, or to figure out the best partner for a merger.

In contrast, our study concentrates on scrutinizing the outcomes of a transaction that has already been finalized. Instead of predicting the potential benefits or identifying optimal partners for a merger, we evaluate the actual impact of a merger that has been fully executed, using data envelopment analysis to measure this effect. Our aim is to provide a comprehensive understanding of the real-world outcomes of these transactions.

The article "The Impact of R&D Expenditure upon the Efficiency of M&A Deals with Hi-Tech Companies" by E. Ochirova, and Y. Dranev [16] explores the dynamics of mergers and acquisitions within the ICT sector, with particular emphasis on the role of research and development (R&D) expenditures.

E. Ochirova, and Y. Dranev highlight the increasing relevance of M&A in the ICT sector, which is primarily driven by the potential for acquiring advanced digital technologies and knowledge. However, they argue that the effectiveness of these deals is often low, raising questions about the implementation of digitalization strategies.

The authors utilize the Data Envelopment Analysis method to assess the efficiency of M&A deals in the ICT sector, a model that allows them to take into account both the technological characteristics of the target companies and the financial performance metrics of the acquirer companies. Interestingly, the study uncovers that higher R&D expenditures on the part of the acquirer can negatively impact the efficiency of the M&A deal.

The study also takes into account capital expenditures (CAPEX) as an indirect measure of technological development and finds that a higher investment intensity on the part of the buyer negatively affects post-M&A performance.

The use of DEA in this manner is an interesting approach as it provides a nuanced way to assess the efficiency of M&A deals. By evaluating target companies' metrics for inputs, the analysis can capture key technological characteristics that are integral to the high-tech industry, including R&D expenditure, intangible assets, and capital investments.

Conversely, examining buyer companies for outputs enables the reflection of the financial performance following the M&A deal. This can include factors such as revenue growth and return on assets, providing a comprehensive picture of the deal's impact on the acquirer's financial performance.

The research article "Pre-evaluating efficiency gains from potential mergers and acquisitions based on the resampling DEA approach: Evidence from China's railway sector" [17] provides an exhaustive and well-founded exploration of the M&A schemes in the railway sector, with a particular

focus on China. The study has presented a comprehensive empirical analysis using three unique M&A schemes, seeking to identify the most efficient arrangement for enhancing the performance of China's railway sector.

The study meticulously utilizes the Data Envelopment Analysis approach, merging it with the merger potential gains model. The authors used data from 18 railway bureaus in China, spanning the period from 2011 to 2015. The authors were able to gather a comprehensive dataset that includes inputs such as the length of the route, number of employees, locomotive power, and outputs such as passenger turnover, freight turnover, and operational income.

The analysis focuses on the efficiency and potential gains resulting from M&A schemes, with the three proposed schemes being regional M&As, megamergers, and combinations of strong and weak railway bureaus. The study demonstrates empirically that a megamerger does not bring efficiency gains in the railway sector. This finding contradicts the popular belief held in other economic sectors and adds a unique perspective to the body of literature.

Another key insight from this research is the "stimulant effect" produced by regional M&As. It explains that a well-executed M&A can boost efficiency in the short term, but as this "stimulant's efficacy" wears off over time, the efficiency gains may diminish or even disappear.

Moreover, the paper emphasizes the critical role of geographical considerations in shaping the efficiencies of railway bureaus. It points out the variations in efficiency levels between bureaus in different regions, indicating that the location factor can strongly affect the efficiencies of railway bureaus. It reinforces the argument that M&A strategies should factor in the geographic proximity of the involved entities, a notion supported by M. Walter, and A. Cullmann [18].

However, the authors acknowledge the limitations of their work, including their inability to consider long-term efficiency gains after a potential M&A and the "chemical reactions" following a merger, such as integration of railway networks, adjustment of train routes, and ticket price fluctuations.

The paper provides significant insights into the impacts of different M&A schemes on the efficiency of the railway sector in China. The comprehensive methodological approach and empirical findings contribute substantially to the understanding of M&As in this context. The paper's findings also have broader implications for other countries with characteristics similar to those of China, like India and Russia.

The study by P. Wankea, A. Maredza, and R. Gupta [19] studies the strategic assessment of mergers and acquisitions in South African banks. There is a network DEA model to measure the influence of various factors on different types of efficiency scores, namely global (merger), technical (learning), harmony (scope), and scale (size) efficiencies. In their paper they test the impact of contextual variables such as bank type and origin through several robust regressions.

The analysis shows that most M&As in South African banking are beneficial in terms of the overall merger effect and technical efficiency effects. Additionally, it indicates that potential gains from M&As are higher in the production stage than in the intermediation stage. The results from the regressions indicate that the gains from mergers tend to be higher when both banks are local and lower when both are commercial. Local banks are more attuned to South African banking regulations than their foreign counterparts. The empirical findings also discover a decreasing trend in merger gains over the years, the reason for that can be the adoption of similar managerial practices and information technologies across different institutions. That means that the potential to learn from M&A is decreasing over time.

This study provides an in-depth look into the impact and efficiencies of M&A in South African banks, revealing the effects of bank type, origin, and trends. However, the oligopolistic nature of the industry may limit the opportunities for learning from such mergers. The authors suggest that the focus should be on merging commercial banks with investment ones and vice versa, specifically focusing on their local origin. The overall stability and soundness of the banking sector should also be considered when evaluating the benefits of a merger.

The next article by T.-S. Chang, J.-G. Lin, and J. Ouenniche [20] explores the use of data envelopment analysis in determining the ideal targets for mergers and acquisitions. The authors propose a new DEA-based Nash bargaining approach to select the most beneficial target for a merger, both in horizontal and vertical integration scenarios.

The research approach in this study combines theoretical modelling with empirical validation. The authors develop mathematical models based on DEA and Nash bargaining concepts, and then apply these models to real-world data in order to test their effectiveness. In terms of sample size, the authors use data from 22 electricity distribution districts of the Taiwan Power Company and 16 Taiwan securities firms.

However, the research also acknowledges that existing models aren't applicable to scenarios where a merged company can show significant growth, particularly in stable and mature industries, suggesting the need for future research to develop new models to handle such cases.

The authors effectively used a multi-method approach combining DEA and Nash bargaining solution to analyze a large dataset of M&A cases. The empirical results supported their hypothesis that the proposed DEA-based performance evaluation framework and Nash bargaining solution could serve as effective tools for M&A decision-making. However, the authors acknowledged that their research was limited by the existing DEA models' inability to effectively capture significant growth scenarios, signaling an avenue for future research.

In M. Rahman, and M. Lambkin's study [21], they employ a Data Envelopment Analysis, to effectively compare marketing efficiency in the years before and after a merger or acquisition. The DEA methodology is unique in that it al-

lows for the simultaneous consideration of multiple inputs and outputs, thereby presenting a comprehensive view of marketing efficiency. In contrast, prior studies have often used single measure methods, focusing on either sales revenue or market share, which do not fully encapsulate the complexity of marketing efficiency.

The empirical results of the study indicated that merging firms, on average, improved their marketing efficiency by 7.52% under the Constant Returns to Scale (CRS) model, and by 3.08% under the Variable Returns to Scale (VRS) model. Interestingly, the authors found a statistically significant difference in the marketing efficiency scores before and after the merger under the CRS model, but not under the VRS model. Even so, the authors argue that mergers and acquisitions still have a considerable influence on the marketing efficiency of the merged firms, as indicated by effect size calculations.

M. Rahman, and M. Lambkin's study, with its innovative use of DEA to measure post-merger marketing efficiency, significantly contributes to the M&A literature by providing a more comprehensive view of marketing efficiency, which has not been deeply investigated in prior studies. Despite its focus on the US banking sector and lack of attention to financial performance and the Russian market, it offers a valuable framework for future research exploring the marketing implications of M&As across different industries and markets.

In summary, Data Envelopment Analysis is a valuable tool for analyzing the performance of merging firms in M&A transactions. By measuring the relative efficiency of the involved entities, DEA can help identify synergies, potential areas of improvement, and inefficiencies arising from the M&A process. The practical application of DEA in various industries and contexts has demonstrated its relevance and effectiveness in evaluating the performance of merged firms, ultimately providing critical insights for decision-makers and stakeholders.

We found that most papers that research M&A performance use Financial sector firms, prominently banks, to apply the DEA approach. Our study focuses on the most developed industries in Russia, the Oil & Gas and Power industries, and we use the DEA approach to find impacts that can influence the performance of Oil & Gas companies that are involved in M&A deals.

Hypotheses development

Since the turn of the century, the global economy has experienced both ups and downs, e.g., the 2008 global financial crisis or the 2020 COVID-19 pandemic. In the same period, Russian history has been filled with even more turning points for the economy, among them the 2014 currency crisis and the geopolitical instability of 2022.

Also, as we have written before, for Russia the situation is complicated by a relatively young market economy. In such a turbulent environment, drawing conclusions about the success and reasons for M&A deals is both important and challenging.

On the one hand, mergers and acquisitions should yield positive results for the acquiring company, as such can be seen as an investment and, according to the corporate financial institute, should yield positive results in one of the following forms[1]:

1) Value creation.
2) Diversification.
3) Acquisition of assets.
4) Increase in financial capacity.
5) Tax purposes.
6) Incentives for managers.

Also, recent research shows that, on average, mergers and acquisitions have a positive effect on a company's performance in the long term (E. Vinocur et al. [22]). Also, some studies of transactions within a particular country suggest that transactions may not statistically significantly improve a company's performance, although they do not worsen it (M. Pervan et al. [23]).

However, in order for a deal to be successful, it is important to assess many factors beforehand, Deloitte states that "a Sustainably Advantaged Portfolio of businesses – one that is strategically sound, value-generating, resilient and sustainable – is at the heart of every successful company" [24].

In conditions of economic uncertainty, such criteria in transactions become even more difficult to assess. And if we're talking about the Russian market, due to the possible inexperience of the economy, many deals can have a negative impact on a company's performance.

Also, the areas under study were the most exposed to the crises experienced by the economy, as almost all of them created difficulties for the efficient operation of both the Oil and Power industries due to sanctions and product price volatility.

Moreover, it is important to pay attention to the volume and number of mergers and acquisitions in Russia. Studies argue that the size of the company directly affects the success of the deal in terms of the further results of the company, but both in Russia and worldwide there are fewer so-called hyper deals and the market has shifted to more pinpointed transactions.

On this basis, we can put forward two basic hypotheses:

H1: Mergers and acquisitions in Russia's Power and Oil & Gas industries on average had a positive effect or no effect at all on the performance of acquiring companies between 2000 and today, thus following the general trends of mergers and acquisitions deals

H2: Mergers and acquisitions in Russian Power and Oil & Gas industries on average had a negative effect on the performance of acquiring companies between 2000 and today, which may have been caused by the unstable external environment or inexperience of acquiring companies.

[1] CFI Team [Website] URL: https://corporatefinanceinstitute.com/resources/valuation/motives-for-mergers

Data and Methodology

Measuring the performance of M&A deals: DEA application for Russian transactions

The most important step in the DEA methodology is the selection of the parameters of the input and output vectors. As we said earlier, these vectors should reflect what companies use as a means of production and the final result of their activities.

In this paper we will conduct our analysis on the basis of companies' publicly available financial statements, since not all of them publish information about the volume of input and output. Also, the use of financial indicators is advantageous in that it allows to assess the performance of the operation taking indirect revenues into account.

We also separated the analysis of companies by industry to make the assessment more accurate. By analyzing companies from different industries, we might have violated the basic premise of DEA analysis – if at least one company in the sample can create a certain level of output at a given cost level, then other companies can do it as well.

Many works by other authors use specific metrics for evaluating mergers and acquisitions, which assess only a particular industry indicator, rather than the performance of enterprises as a whole.

We, on the other hand, want to evaluate the company's overall performance, so to determine the vector of input, we will turn to T. Coelli et al. [25], in which the authors tries to establish the indicators that allow to assess a firm's performance. The authors write that «a commonly-used classification of inputs involves five categories: capital (K) labour (L); energy (E); material inputs (M); and purchased services (S). The construction and use of data according to these categories in productivity measurement is sometimes referred to as the KLEMS approach. Often, the last three categories of inputs are aggregated to form a single "other input" category».

In our model, in the cost vector we use total assets to describe "capital", since we believe that this reporting line best reflects the essence of "capital" referred to by the authors, as production companies generate profits from available assets.

Later, in order to most accurately reflect the costs of production and sales (indicators of energy and material inputs), we use the cost of goods sold. According to the accounts under RAS, this indicator reflects both the cost of sales and the cost of production of goods. Also, to estimate the indirect costs of production, for companies in the Oil & Gas segment, management costs are used, reflecting what Coelli and other authors call "Labor" in their work. This reporting line is not used in the Power segment analysis, as not all companies use it due to RAS requirements.

Next, we need to define the variables in the output vector. For this purpose, we will use revenue growth and return on asset indicators, as these indicators are primarily associated with changes in the company's value (E. Ochirova, Yu. Dranev [14]).

Moreover, it is these indicators that seem to most clearly reflect the results of the companies, since any company seeks to maximize revenue. The return on assets indicator, which reflects the efficiency of their use, is most suitable for assessing the performance of companies that primarily use assets to generate revenue.

In this paper, we use two methods of assessing DEA – input-oriented and output-oriented. An input-oriented model shows by how much a company can increase output while keeping the input level unchanged, while an output-oriented model shows by how much a company can reduce the input level without changing the output level.

For each industry and each year, companies were evaluated separately, making it possible to assess changes in the performance of companies before and after deals, without being tied to a specific year.

Sample selection criteria and sample description

An important part of working with Data Envelopment Analysis is the creation of a representative sample of data. To determine which industry to analyze, we analyzed all mergers and acquisitions of Russian companies from 2000 to the present. Only deals with the "completed" status and deals in which the buyer was a public company were selected. We selected only publicly traded companies to easier search of their financial statements. Further data was collected in two stages.

The first phase involved identifying the sectors of economy in Russia with the most M&A deals – Energy (832 deals), Financial Services (613 deals) and Materials (557 deals). Thus, our choice fell on the Energy sector.

At the second stage, we analyzed industries inside Energy sector and M&A deals within this sector. As a result, we selected two with the highest number of deals, namely Oil & Gas (391 deals) and Power (331 deals). Within the taken industries, we selected deals in which the acquirer companies obtained more than 50% of the target company, gaining control and becoming able to manage the operations and performance of the acquired company.

The selected deals were ranked by amount and the largest deals were selected. As a result, 23 deals made by 17 companies in the Oil & Gas and Power industries were selected with the value ranging from 120 million dollars to 13,098 billion dollars, and 17 deals made by 16 companies with the value ranging from 6 million dollars to 1,861 billion dollars.

To assess deal performance, we examine the acquirer company's performance two years before and two years after the deal. A similar methodology is used by R. Mahabur in 2016, but in this paper, we focus on the analysis of the acquiring companies' performance, as we believe that the key goal of mergers is precisely the improvement of such companies.

Also, the data was collected and all financial indicators are calculated according to RAS.

Not all deals were sampled because not all companies have publicly available reports. We also tried to minimize the overlap of collected data by year during data collection. The final data tables can be found in the Appendices 1–4.

Table 1. Average indicators of the analyzed companies in Oil & Gas industry (in thousand rubles)

Type of variable	Variable	Pre-merger year (t–2)	Pre-merger year (t–1)	Post-merger year (t+1)	Post-merger year (t+2)
Input	Administrative expenses, rub.	20 661 468	24 108 439	32 686 174	36 839 964
	Cost of goods sold, rub.	780 122 958	908 283 912	1 333 588 346	1 557 607 875
	Total assets, rub.	2 947 010 172	3 374 041 933	4 790 216 661	5 484 149 795
Output	Revenue growth, rub.	206 848 219	232 066 482	370 731 789	316 839 891
	ROA	0.09	0.11	0.08	0.08
Descriptive	Current ratio	2.87	2.8	2.85	2.65
	Quick ratio	2.62	2.53	2.59	2.42
	Leverage	2.32	2.45	2.74	2.87
	Debt-to-Equity ratio	1.39	1.47	1.75	1.87
	ROE	0.18	0.22	0.16	0.17
	EBIT to Total revenue	0.24	0.26	0.21	0.23
	COGS to inventory	14.56	15.65	17.29	19.77

Source: compiled by the authors.

Table 2. Average indicators of the analyzed companies in Power industry (in thousand rubles)

Type of variable	Variable	Pre-merger year (t–2)	Pre-merger year (t–1)	Post-merger year (t+1)	Post-merger year (t+2)
Input	Cost of goods sold, rub.	81 730 558	87 861 253	99 465 080	104 486 626
	Total assets, rub.	449 896 733	499 892 675	577 654 651	613 353 535
Output	Revenue growth, rub.	12 357 518	7 704 203	7 699 218	8 143 593
	ROA	0.04	0.04	0.04	0.04
Descriptive	Current ratio	6.21	3.95	4.40	4.32
	Quick ratio	6.07	3.77	4.26	4.14
	Leverage	1.36	1.42	1.46	1.45
	Debt-to-Equity ratio	0.36	0.41	0.46	0.45
	ROE	0.05	0.04	0.05	0.06
	EBIT to Total revenue	0.24	0.21	0.24	0.24
	COGS to inventory	46.74	28.69	31.55	28.92

Source: compiled by the authors.

Tables 1 and 2 show the average financial performance of the analyzed companies. The tables include both input and output measures, which we will describe in more detail later in the paper, and financial performance indicators, which are considered by Harvard Business School to be the primary indicators for the preliminary evaluation of companies' economic efficiency (T. Stobierski [26]).

We see that in the Oil & Gas industry, leverage, debt-to-equity ratio and cogs to inventory (inventory turnover) change the most. The growth of leverage shows that companies began to finance capital increasingly more at the expense of debt, and the growth of debt-to-equity ratio shows that companies began to finance their operations increasingly more at the expense of debt, which certainly carries more risk for the company. This can lead us to conclude that companies are reviewing their capital structures, either by increasing debt to make a transaction or by acquiring the debt of companies as a result of the deal.

Nevertheless, we see that after the merger the companies show more efficient inventory management, strengthening sales. Such a conclusion can be drawn from the growing inventory turnover.

At the same time, an Energy sector company reveals the Current ratio and Quick ratio. Both indicators denote the liquidity of the company. From the growth of the indicators, we can conclude that, companies in this sector typically improve their ability to pay their obligations as a result of the M&A deals.

We also see an increase in revenue and sales for companies in both sectors, but we cannot make a definite conclusion about the performance of companies, as revenue and sales growth cannot unequivocally indicate an improvement in business performance. In order to understand how efficiently companies use their resources, we will use data envelopment analysis.

Empirical results

Hypotheses testing and results

In order to test the proposed hypotheses, we have utilized the insights obtained from the DEA analysis. The hypotheses posited at the beginning of the study were:

Mergers and acquisitions in Russia since the beginning of the XXI century have on average had a positive effect on the performance of companies.

Table 3. The result of a company's performance assessment on input (x) and output (y) in Oil & Gas industry

	t–2		t–1		t+1		t+2	
Comp_name	x	y	x	y	x	y	x	y
Slavneft 2009	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Tatneft 2017	1.00	1.00	0.39	1.71	1.00	1.00	1.00	1.00
Gazprom 2005	0.32	2.70	0.68	1.55	0.98	1.01	0.34	2.50
Gazprom 2007	0.60	1.39	0.66	1.41	1.00	1.00	0.13	3.26
Rosneft 2016	0.04	3.87	0.38	1.28	0.56	1.67	1.00	1.00
Bashneft 2019	1.00	1.00	0.35	1.70	0.21	–Inf	1.00	1.00
Rosneft 2013	0.58	1.02	1.00	1.00	0.51	1.47	0.03	11.58
Gazprom 2009	1.00	1.00	0.19	5.00	0.39	1.82	0.87	1.10
Gazprom 2004	0.52	1.94	0.66	1.63	1.00	1.00	1.00	1.00
Bashneft 2014	0.43	1.88	0.63	1.22	0.22	2.11	0.40	2.43
Gazprom 2011	0.20	1.44	0.03	6.11	0.10	3.78	0.21	2.89
Rosneft 2007	0.90	1.13	1.00	1.00	0.60	1.50	0.48	1.91
Rosneft 2017	0.03	5.24	0.02	28.55	1.00	1.00	0.02	9.11
Novatek 2018	1.00	1.00	0.72	1.15	1.00	1.00	1.00	1.00
Rosneft 2015	1.00	1.00	0.52	1.02	0.08	12.05	0.58	1.60
Tatneft 2019	0.82	1.23	0.70	1.21	0.14	2.61	1.00	1.00
Rosneft 2011	0.32	1.75	0.09	2.85	0.85	1.09	1.00	1.00
Mean	0.63	1.74	0.53	3.49	0.63	2.19	0.65	2.61
Stnd. Deviation	0.36	1.18	0.33	6.62	0.38	2.74	0.39	3.04
Num of efficient DMU	6	6	3	3	6	6	7	7

Source: compiled by the authors.

Table 4. The result of a company's performance assessment on input (x) and output (y) for the Power industry

	t–2		t–1		t+1		t+2	
Acquirer name (Deal Year)	X	y	x	y	x	y	x	y
OGK-2 2011	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01
Rushydro 2012	1.00	1.00	0.92	1.34	0.80	1.31	0.63	1.82
FSK Rosseti 2019	0.19	4.06	0.46	1.14	0.24	2.86	0.40	1.75
Lenenergo 2015	0.76	9.85	0.83	2.61	1.00	1.00	1.00	1.00
Mosenergo 2013	0.38	1.58	0.29	2.83	0.36	7.41	0.50	2.95
MOEK 2015	0.28	3.28	0.36	7.39	0.57	1.94	0.69	2.07
OGK-2 2016	0.31	2.28	0.39	5.96	0.46	1.85	0.89	1.10
Rushydro 2009	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Rushydro 2016	0.46	2.20	0.58	2.29	0.85	1.11	0.83	1.16
Rosseti Center 2010	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fortum 2013	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Rushydro 2011	0.76	2.19	1.00	1.00	0.74	3.55	1.00	1.00
Inter PAO 2019	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Rushydro 2018	0.61	1.58	1.00	1.00	0.44	2.01	1.00	1.00
MOEK 2018	0.28	1.65	0.33	2.25	0.39	1.39	0.50	1.54
FSK Rosseti 2018	1.00	1.00	0.24	3.86	0.24	1.79	0.23	3.84
Mean	0.69	2.23	0.71	2.29	0.69	1.95	0.79	1.51
Stnd. Deviation	0.32	2.23	0.32	1.93	0.30	1.63	0.26	0.83
Num of efficient DMU	7	7	7	7	6	6	7	7

Source: compiled by the authors.

The results of this analysis are presented in Tables 3 and 4[2].

We can see that in the case of Oil & Gas companies, average efficiency falls before the deal and rises afterwards, as does the number of efficient companies (DMU). This decline can be explained by two factors: companies losing efficiency decide to pursue a merger, or companies spend a significant amount of resources to prepare for the deal. It is also interesting to note that in terms of entry efficiencies, one year after the deal, companies are typically at the same level as two years before the deal, suggesting that most deals were driven by inefficiencies.

At the same time, we see a different situation with Power sector transactions. Here we see that, over time, the number of effective DMUs remains virtually unchanged over the time horizon studied, but the set of effective companies changes. At the same time, we see a different pattern of change for the input and output efficiency measures. Input efficiency decreases slightly in the first year after the deal but then increases, while output efficiency begins to increase immediately afterwards.

This pattern of change may tell us that companies in the Power industry are less flexible, i.e., it takes them longer to absorb new resources, they cannot achieve efficiency immediately by cutting costs, but they manage to effectively increase output along with the increase in assets acquired as a result of the deal.

What we can conclude from the above is that while some deals reduce company efficiency and companies show mixed levels of efficiency in the year after the deal, on average all companies improve their performance significantly compared to the period prior to the deal.

A more unstable external environment will not create new business opportunities, but will have a negative impact on the performance of acquirer companies after the deal.

[2] The closer the result is to one, the higher the efficiency.

Analyzing the DEA results, we find evidence supporting the first hypothesis. On average, there is an observed improvement in the performance of companies in both the Oil & Gas and Power industries after participating in mergers and acquisitions. This is evidenced by the increase in DEA efficiency scores for the companies' post-deal.

In the Oil & Gas industry, there was a notable rise in the average efficiency scores after the deal. Moreover, there was also an increase in the number of efficient DMUs. A similar pattern was observed in the Power industry, where the average efficiency remained consistent, and the output efficiency started increasing immediately after the deal.

This clearly suggests that M&As have generally had a positive effect on the efficiency of companies in the Energy and Power sector in Russia.

Regarding the second hypothesis, we observed that despite an unstable external environment, companies have been able to improve their performance post-merger or acquisition. There's no clear evidence to suggest that an unstable external environment has a negative impact on the performance of buying companies after the deals.

In fact, our results indicate that companies have been able to effectively utilize the assets they acquire in M&A deals to boost their efficiency and performance. This is seen by the positive changes in revenue and return on asset indicators post-deal.

Thus, based on the evidence, we reject the second hypothesis. An unstable external environment has not necessarily resulted in a negative impact on the performance of acquiring companies after M&A deals.

In conclusion, our analysis has revealed the overall positive effect of M&As on the performance of companies within the Energy and Power sectors in Russia since the beginning of the XXI century. Despite the challenges of an unstable external environment, companies have demonstrated their ability to effectively manage and leverage the assets acquired through M&As to improve their operational efficiency and performance.

These findings contribute to a broader understanding of M&A performance in emerging economies, particularly within the Energy sector. They also provide valuable insights for business strategists and policymakers who are grappling with decisions in a challenging and dynamic global economy.

Case study

Exploring information about completed M&A deals in Oil & Gas in 2022 in Russia, we decided to divide them into 3 groups.

The first group comprises the withdrawal of foreign companies from Russia's Oil & Gas sector and Russian companies buying out the remaining assets. 45 percent of all the deals by quantity entailed foreign companies leaving their shares of joint ventures with Russian companies or even their whole business. These deals were highly concealed, with most deal prices still unknown to the public and detailed information about deal performance hidden.

The second group is made up of classic M&A deals within the Russian market between Russian companies. These kinds of deals took up 52 percent by quantity of the entire number of deals. The information regarding this type of deals is more transparent and deal prices and other details are mostly open to the public.

The third group includes Russian companies buying foreign assets. There was only one import M&A deal, and it comprised 3 percent by quantity accordingly.

We decided to concentrate on the withdrawal of foreign companies from the Russian market, even the number of internal deals is higher, since it is one of the main trends of 2022 in Russian M&A market. This type of behavior, when numerous foreign companies close down their Russian business within a short period of time, can be called cancel culture.

Russian M&A deals in 2022 are characterized by non-transparency, with most of the information about deal prices being hidden from the public. However, we attempted to analyze all the existing information from companies' financial statements, press releases and local and foreign news. We are evaluating the Russian market, as well as Russian companies' performance and the influence of the current political risks on them, but can also say some words about foreign companies.

Case study of Oil & Gas industry on Russian M&A market in 2022 year: Lukoil and Shell

One of the most interesting M&A deals on the Russian market in 2022 was the deal between Lukoil and Shell.

Shell Plc. or Shell is a British company founded in 1907. Shell is one of the biggest global energy and petrochemical group of companies that operates in more than 70 countries. According to Global Forbes Rating 2022, which published its results on May 12, 2022, Shell is in the 16th place on the list of 2000 best world companies [27].

Shell Neft was a retail network consisting of 411 gasoline stations located in Central and Northwestern Federal Districts of the Russian Federation. Moreover, Shell Neft owned a lubricant blending plant in the town of Torzhok. Shell Neft was a 100% subsidiary owned by Shell Plc. According to Forbes, Shell Neft took the 20th place on the list of 50 biggest foreign companies operating in Russia in 2022, with revenue reaching 134,6 billion Russian rubles in 2021[3]. Shell Neft operated in Russia since 1992.

Lukoil was founded in 1991 in USSR. Lukoil is one of the biggest Oil & Gas companies in Russia. It operates in more than 30 foreign countries.

Shell is one of the foreign companies that made a decision to withdraw from its Russian business almost immediately

[3] Forbes: [website]. URL: https://www.forbes.ru/biznes/472203-50-krupnejsih-inostrannyh-kompanij-v-rossii-2022-rejting-forbes

after the start of the political conflict in February 2022. On March 8, 2022 Shell Plc announced its decision to leave its Oil & Gas business in Russia on its official website[4].

The main reasons for Shell's withdrawal from the Russian market were described in the annual report of Shell Plc. for 2022. Shell initiated its withdrawal from Russia because of two reasons. The first proclaimed reason was the safety concerns for company employees. The second reason entailed the numerous sanctions imposed on Russia, which caused wide-ranging challenges to company operations. "These risks and future events could impact our supply chain, commodity prices, credit, commodity trading, treasury and legal risks. In addition, there is potential reputational risk associated with how Shell's decisions in response to evolving challenges are perceived. The tensions also create heightened cyber-security threats to our information technology infrastructure. The geopolitical situation may influence our future investment and financial decisions" stated Shell's consolidated annual report[5]. Shell predicts that these sanctions can continue in the medium to longer terms.

Shell started its withdrawal from the Russian market by selling 100% shares of Shell Neft to Lukoil. On May 12, 2022 Lukoil announced on its official website the signing of a M&A deal contract that entailed buying 100% of shares of Shell Neft[6]. The deal included 411 gasoline stations (excluding 19 gas stations that operated under trademark licensing agreements), lubricant blending plant in Torzhok and all the employees of Shell Neft.

Russian Federation's Federal Antimonopoly Service (FAS) on May 19, 2022 approved the M&A deal that involved Lukoil's purchase of Shell Neft, with the following conditions[7]. Lukoil was allowed to buy 99.9% of total shares of Shell Neft, while Shell Neft retained the remaining 0.01%. Another condition was for Lukoil to trade petroleum product on the stock exchange on a regular basis. Additionally, Lukoil was not allowed to buy petroleum products on the stock exchange during the main trading session. FAS listed these conditions as necessary measures to develop competition in the Oil & Gas products market.

FAS may not have approved a 100% sale of Shell Neft business to provide Shell with an opportunity to return to the Russian market in future. Meanwhile, Shell reports that the company wants to leave the Russian market completely.

The board of Shell prioritizes the well-being of Shell's employees and signed the M&A contract with a condition to transfer all of over 350 employees working in Russia to the new business owner in full compliance with applicable Russian laws and regulations. Lukoil keeps all the employees and will develop the former Shell Neft business under a separate Finnish brand Teboil, which Lukoil company consolidated in 2005. Shell Neft assets, including all the employees, become a subsidiary of Lukoil under the name Teboil. The former CEO of Shell Neft Vitaliy Maslov becomes the head of the new company – Teboil[8].

The price of the deal was not announced by either party to the M&A deal. However, Shell company announced the relevant losses of USD 350 mln[9].

Unfortunately, there is still not enough information to evaluate this M&A deal properly, because its price is hidden from public, Moscow Stock Exchange was in flux, Lukoil's annual report and financial statement for 2022 have not been published yet, and the details of the deal also remain concealed. However, from our point of view, according to the information we obtained from Shell's 2022 annual report, Shell and Lukoil official websites, and Forbes website, the purchase of 99.9% of a well-structured retail business with a 20-year history in Russia, a business that follows Lukoil's operation strategy, is a good deal for Lukoil. This deal gives Lukoil an opportunity to expand its retail business in Russia and develop it with a new plant in Torzhok with the purchase of a high quality and well-operating business with all employees who can continue to work for Lukoil.

Case study of the Power industry on the Russian M&A market in 2022: the Enel, Lukoil and Gazprombank deal

In the course of 2022, the Power industry was characterized by a limited number of transactions, with only four deals reaching completion throughout the entire year. Interestingly, the distribution of these transactions was skewed towards two distinct periods, with two deals finalized in January and the remaining two in October. In our research, we are interested in the transactions that occurred following the inception of the Russia-Ukraine conflict in February 2022. We particularly focus on analyzing the potential impact of this geopolitical event on business operations within the Power industry. Consequently, we have chosen to closely examine the two deals pertaining to the Italian energy company, Enel Group. These two separate deals, executed with Russian companies LUKOIL and GPB-Fresia, can be conceptually unified as a single operation representing the Italian energy giant's strategic withdrawal from Russia. This selective approach allows us to investigate the implications of the conflict in a specific and timely case, offering insights into how such a geopolitical event may influence strategic decision-making and transactional outcomes within the Power industry.

[4] Shell: [website]. URL: https://www.shell.com/

[5] Shell company annual report 2022: [website]. URL: https://reports.shell.com/annual-report/2022/

[6] Lukoil official website. [website] URL: https://lukoil.ru/PressCenter/Pressreleases/Pressrelease/lukoil-dogovorilsia-o-priobretenii-rossiiskikh

[7] Federal Antimonopoly Service: [website]. URL: https://fas.gov.ru/news/31950

[8] RBK: [website]. URL: https://www.rbc.ru/business/07/06/2022/629efe9f9a7947f6fb11b5d6

[9] Shell company annual report 2022: [website]. URL: https://reports.shell.com/annual-report/2022/

The case study introduces the key companies involved, Italian energy firm Enel Group and its Russian subsidiary Enel Russia, LUKOIL (you can see the company's history in the previous paragraph), and the Closed Combined Mutual Investment Fund "Gazprombank-Fresia". It also outlines the key events leading up to the deal, including Enel's decision to sell its stake and the responses of potential buyers.

Founded in 1962, Enel, which is an acronym for Ente nazionale per l'energia elettrica (National Electricity Board) emerged from over a thousand energy producers in Italy, modernizing and expanding the national grid and pioneering renewable energy plants. Transitioning into a private company with the liberalization of the Italian electricity market, Enel introduced the world's first smart meters in 2001 and expanded globally through strategic acquisitions. Now, as one of the world's largest companies by revenue and the second-largest power company globally, Enel operates in 29 countries, with the Italian state as the main shareholder.

Enel Russia was established in Yekaterinburg on October 27, 2004 and named OJSC OGK-5 (EL5-Energo). Enel Group's involvement with the company started in June 2007 when it acquired 29.99% of the shares previously owned by RAO UES. Enel increased its stake to 37.15% in October 2007, and later to 56.43%. On August 8, 2014 the company was registered as Enel Russia. The most recent name change occurred on December 6, 2022 when PJSC Enel Russia officially became PJSC EL5-Energo. Enel Russia has an expansive operation that includes Konakovskaya GRES, Nevinnomysskaya GRES, Sredneuralskaya GRES, and several wind farm projects. Currently, the company's total installed capacity in electricity generation is 5941.9 MW, and in heat generation, it stands at 1.927 Gcal/h.

In the course of our research, we encountered a significant challenge in uncovering information related to the Closed Combined Mutual Investment Fund "Gazprombank-Fresia". Information regarding this entity's operations, financial health, and strategic initiatives remains largely elusive. Despite this, an observable pattern emerged, revealing another transaction wherein both Lukoil and Gazprombank-Fresia acquired controlling interest[10]. This suggests a possible strategic alliance or a concerted investment approach between the two entities.

The decision of Enel to sell its entire stake in PJSC Enel Russia, amounting to 56.43%[11] of the share capital, was finalized on October 12, 2022. The sale, completed by PJSC Lukoil and the "Gazprombank-Frezia" fund, totaled approximately €137 million. By the end of 2022, information emerged, indicating that LUKOIL had consolidated ownership of the entirety of the initially sold shares (56.43%) (EL5-Energo), although there was no official announcement or commentary on the sale of GPB-Fresia's portion of the stake [12]. This intriguing development suggests that the dual-transaction approach may have been more than a straightforward business decision. Rather, the involvement of GPB-Fresia could have been a tactical maneuver designed to facilitate a smoother transaction process and enable LUKOIL to ultimately secure a controlling interest in the shares.

The background of the deal itself and deal announcement were the following: in June 2022, Enel announced its decision to sell its 56.43% stake in Enel Russia, a business that generated just over 1 percent of the company's total gross operating profit[13]. The transaction, however, was not straightforward due to the specificities of the Russian regulatory environment. The deal was temporarily put on hold due to Presidential Decree № 520, enacted by the Russian government on August 5, 2022, which prohibited the sale of stakes in companies deemed strategic to the nation's economy until December 31, 2022. It was stipulated that these transactions could only be carried out with the explicit approval of the President; in absence of such approval, they would be rendered null and void. This presented an unexpected challenge in the M&A process, underscoring the importance of understanding and navigating the regulatory landscape in cross-border M&A.

In spite of the regulatory hurdle, the deal was given a green light when the Russian President approved the transaction in September 2022. This approval was crucial for the deal's progress and highlighted the necessity of executive endorsement in the Russian context for transactions involving strategic industries. Subsequent to this, the transaction was required to receive endorsement from the government commission for monitoring foreign investment and approval from the Federal Antimonopoly Service of Russia. Finally, in October 2022, all necessary approvals were successfully acquired, and Enel Group completed the sale of its stake in Enel Russia. The deal involved a transfer of all of Enel Group's generating capacities in Russia to LUKOIL and the Gazprombank-Fresia fund.

The sale of Enel's stake in PJSC Enel Russia was a strategic move in response to significant geopolitical shifts and risks in the region. The transaction, valued at approximately €137 million, resulted in the disposal of all of Enel's power generation assets in Russia, which had a combined capacity of around 5.6 GW from conventional sources and about 300 MW from wind sources at various stages of development[14].

The impacts of this sale were multifaceted and notably substantial in terms of financial implications. The Group

[10] Mergers.ru: News: [website]. URL: http://mergers.ru/news/LUKOJL-i-GPB-Freziya-poluchili-kontrol-nad-byvshej-rossijskoj-dochkoj-strahovschika-AIG-81040

[11] EL5-Energo official website: Share capital structure: [website]. URL: https://www.el5-energo.ru/en/investors/share-capital/structure/

[12] Vedomosti: [website]. URL: https://www.vedomosti.ru/business/news/2023/01/09/958384-lukoil-poluchil-el5-energo

[13] Enel Group official website: News: [website]. URL: https://www.enel.com/media/explore/search-press-releases/press/2022/06/enel-sells-its-entire-5643-stake-in-pjsc-enel-russia-

[14] Enel Group's Integrated Annual Report 2022: [website]. URL: https://www.enel.com/content/dam/enel-com/documenti/investitori/informazioni-

reported a considerable negative impact on its profit, approximately €1551 million, as a consequence of this transaction. The most substantial contributors to this loss were the release of the currency translation reserve (€1054 million) and a value adjustment of about €497 million.

The decision to sell was likely driven by a combination of factors, including geopolitical instability and the company's strategic aim to align its operations with the broader shifts in global energy markets. The significant financial impact underscores the potential risks associated with operating in geopolitically unstable regions.

Despite selling its stake in PJSC Enel Russia, the Enel Group continues to hold equity investments in Russia through Enel Green Power Rus LLC, Enel X Rus LLC, and a 49.5% investment in a joint venture, Rusenergosbyt LLC, which operates in the End-user Markets Business Line.

The post-deal analysis revealed significant developments and changes within the participating companies. Notable among them were shifts in leadership, share price fluctuations, and changes in dividend policies.

First, it was reported on December 9, 2022, that Enel Russia underwent a significant shift in leadership. Alibek Aibekovich Tnalin, a seasoned executive who had served at PJSC LUKOIL for the past 13 years, was announced as the new CEO[15]. This change of leadership marked a substantial strategic shift, likely as part of the adaptation process following the deal.

Subsequently, in the same month, Lukoil extended an offer to minority shareholders of EL5-Energo. The offer, proposing a buyout of the company's shares at a price of 0.48 rubles per share, elicited notable market reactions. Specifically, the shares of EL5-Energo suffered a significant downturn, depreciating by almost 6%[16]. Analysts attributed this slump to the offer price being lower than the prevailing market quotations.

Further into April 2023, EL5-Energo made an announcement concerning its dividend policy. The company declared that it would not be issuing dividends, opting instead to channel all funds towards covering the Company's loss[17]. The last dividends were paid by the company in 2020.

It needs to be mentioned also that from the available information there is no evidence suggesting any mass layoffs or employee transfers within the company following the transaction.

During the review of EL5-Energo's financial statements for 2022, we found noteworthy changes in the company's profitability compared to the previous year. In 2021, the company reported robust performance, with a total combined income of 2.3 billion rubles. However, the financial landscape of 2022 painted a starkly different picture. The company reported a substantial loss, amounting to nearly 20 billion rubles. This significant discrepancy, amounting to a fiscal shift of over 22 billion rubles, is primarily attributable to the impairment of fixed assets.

In the initial months of 2023, an asset evaluation revealed the necessity to acknowledge an impairment in the financial statements. This impairment, of a remarkable 29.4 billion rubles, was a leading factor in the pronounced losses of 2022.

Despite the overall financial downturn, EL5-Energo managed to increase its revenue by 2 billion rubles compared to 2021. This rise in revenue, amidst the significant financial losses, underscores a complex and nuanced financial landscape for the company.

We also examined the share price dynamics of EL5-Energo and Enel Group in response to key events that transpired throughout the year. It is essential to note, however, that attributing the fluctuations in Lukoil's share price to specific incidents is a challenging task, given the multitude of deals the company engaged in over the year. Consequently, establishing a direct correlation between particular events and the share price becomes a complex endeavor.

Our detailed investigation encompassed the dynamics of EL5-Energo's stock price, a valuable exercise that illuminated the stock's reaction to seminal events that unfolded over the course of the year. We observed a similar pattern of fluctuation in Enel Group share prices. Two marked declines can be traced back to specific episodes. The first drop occurred at the onset of military aggression in February 2022, an event that sent shockwaves through global markets. The second slump took place shortly before the announcement of the deal closure in October, another high-stakes event that investors monitored closely.

The announcement of sale of Enel's Russian business in June was a crucial moment. It triggered a sharp downturn in the share prices of the Enel Group, and contrarily, Enel Russia's stock experienced an uptick during the same period, indicating market approval of the proposed transaction.

Nevertheless, despite the various ups and downs, by the time the transaction was finalized, the shares of both companies had dipped to their lowest points. Enel Russia shares were valued at RUR 0.349 each, while Enel Group shares dropped to EUR 4 each. These values represented a stark contrast to their January 2022 prices, which were approximately RUR 0.8 per Enel Russia share and EUR 7 per Enel Group share.

Fast forward to the present day, the shares of Enel Group have shown resilience and rebounded almost to their Janu-

finanziarie/2022/annuali/en/integrated-annual-report_2022.pdf

[15] EL5-Energo official website: News: [website]. URL: https://www.el5-energo.ru/media/press/2022/09122022/

[16] RBK: [website]. URL: https://quote.rbc.ru/news/article/63bc0b639a79474c4a1805ac

[17] EL5-Energo official website: News: [website]. URL: https://www.el5-energo.ru/upload/iblock/26d/kkvvpt4j2rfs83oergyxaz2f31lc7esh/PRESS_RELEASE_EL5_ENERGO_BOARD_OF_DIRECTORS_RECOMMENDED_NOT_TO_PAY_DIVIDENDS.pdf

ary 2022 level, at EUR 6 per share. However, the share price of EL5-Energo, which currently hovers around RUR 0.56 per share, shows no sign of returning to its pre-conflict level in the foreseeable future. This analysis underscores the significant and lasting impact of geopolitical events on market dynamics and the fortunes of energy companies.

In drawing conclusions from this case study, it is important to note the complexity inherent in assessing the impact of the transaction on Lukoil. Unfortunately, due to the absence of 2022 financial information and the numerous other transactions the company has been engaged in throughout the year, determining the specific consequences of this deal becomes a challenging task. This multitude of corporate activities muddies the water when it comes to evaluating the transaction's overall success.

However, it is necessary to highlight that these observations are based on relatively short-term developments. The full impact of this transaction and the subsequent internal changes, such as in the company's management, may take longer to manifest. Therefore, a long-term perspective is crucial for a complete and robust understanding of this corporate maneuver's implications. While our analysis provides insights into the initial effects of the transaction, further study would be needed to explore the enduring consequences of this significant shift in ownership.

Conclusion and discussion

The exploration of Mergers and Acquisitions (M&A) transactions in the Oil & Gas and Power industries, has revealed a complex landscape marked by geopolitical shifts and risks.

Studying the market for Russian deals, we saw a correlation between the political and economic environment and the transaction volume. Thus, in 2006–2007, the years that are favorable for the economy, the number of deals and their volume exceeded that of the post-crisis 2009–2010 twofold.

The tipping point for deals was 2014, when sanctions and the reduction of foreign capital in the Russian economy led to a steady decline in the number of transactions until 2022. The global crisis due to the 2020 pandemic also contributed negatively to the number of M&A deals, but after that there was hope for a recuperation of the economy. It was in 2021 that the number of deals in the market showed significant growth for the first time in a long time.

The effect of the geopolitical turmoil in 2022 remains mixed; on the one hand we see a positive trend in the growth of the number of deals, but on the other hand it is accompanied by a decline in their volume.

This situation makes the issue of assessing Russian transactions even more urgent.

Overall, the impact of M&A efficiency on the performance of companies has a significant place in the literature. However, it has been observed that researchers have not reached a consensus on methodologies for evaluating such deals. One of the methods used by the authors is data envelopment analysis. This method is a strong statistical method based on linear programming methods and allows for a comparative assessment in the performance of companies within a sample.

However, the topic of the research of transactions on the Russian market in Oil & Gas and Power sectors has not been widely spread in scientific works, as the majority are focused on the research of developed economies or other market sectors.

Our assessment up to 2022, which utilized Data Envelopment Analysis (DEA), has indicated a positive trend in M&A activity. This provides evidence supporting the first hypothesis, namely that M&A activities have generally had a positive effect on the performance of companies involved.

The two case studies of M&A deals, one between LUKOIL and Shell Neft in the Oil & Gas sector, and the other involving Enel Russia and LUKOIL in the Power sector, have been instrumental in illustrating the challenges inherent in such transactions. However, for these case studies, we are unable to make definitive conclusions due to the lack of long-term performance data following the M&A transactions. Anyway, based on the information we have, it seems that the M&A between LUKOIL and Shell Neft may have the potential for a positive effect on LUKOIL's performance. The acquisition allows LUKOIL to expand its retail business in Russia and benefits from the well-structured operations and experienced personnel from Shell Neft.

On the other hand, the deal between Enel Russia and LUKOIL seems more complicated, as power is LUKOIL's secondary line of business. LUKOIL's ability to achieve efficiency and demonstrate positive performance from this acquisition may depend on other factors, but nevertheless, diversification of business and expansion of influence are more likely to have a positive impact on the company's results.

Case studies also revealed that an unstable external environment does not necessarily have a negative impact on the performance of acquiring companies. Shell's exit from the Russian market and Enel's sale of its stake in Enel Russia were both significantly influenced by an unstable external environment, mainly in the form of geopolitical shifts and risks.

Shell's withdrawal was prompted by concerns over safety and the potential impact of sanctions on its operations. Similarly, Enel's decision to sell appears to have been largely driven by the desire to mitigate the risks associated with operating in a geopolitically unstable region.

LUKOIL, as the buyer in both deals, faced both immediate and longer-term challenges as a result of this unstable environment. In the short term, the company had to navigate the complex regulatory landscape in Russia, including the presidential approval requirement for the Enel Russia deal.

In the longer term, it remains to be seen whether LUKOIL will be able to capitalize on these acquisitions and improve its performance in an environment characterized by political and economic instability. Both M&A deals were met with a mixed reaction from the market, and LUKOIL's shares experienced significant fluctuations in the aftermath of the deals.

It is also worth noting that an unstable external environment can sometimes present opportunities for companies that are well-positioned to take advantage of them. In this case, LUKOIL has been able to significantly expand its business through these acquisitions, despite the challenges posed by the external environment. The company's success in realizing the potential benefits of these deals will depend in large part on its ability to manage the risks and challenges associated with operating in this unstable environment.

It is important to note that the long-term consequences of these deals are yet to be fully understood, as the case studies provide insights into short-term developments. The full impact of these transactions, including changes in management, operational strategies, and financial performance, will require further study and analysis.

References

1. Radygin A. Russia's Market of Mergers and Acquisitions: Stages, Features and Prospects. *Voprosy Ekonomiki*. 2009;(10):23-45. (In Russ.) https://doi.org/10.32609/0042-8736-2009-10-23-45
2. Kinateder H., Fabich M., Wagner N. Domestic mergers and acquisitions in BRICS countries: Acquirers and targets. *SSRN Electronic Journal*. 2017:2896703. https://doi.org/10.2139/ssrn.2896703
3. Yaghoubi R., Yaghoubi M., Locke S., et al. Mergers and acquisitions: a review. Part 1. *Studies in Economics and Finance*. 2016;33(1):147-188. https://doi.org/10.1108/SEF-03-2015-0078
4. Bhagat S., Malhotra S., Zhu P.C. Emerging country cross-border acquisitions: Characteristics, acquirer returns and cross-sectional determinants. *SSRN Electronic Journal*. 2011:1813202. https://doi.org/10.2139/ssrn.1813202
5. Aybar B., Thanakijsombat T. Financing decisions and gains from cross-border acquisitions by emerging-market acquirers. *Emerging Markets Review*. 2015;24:69-80. https://doi.org/10.1016/j.ememar.2015.05.008
6. Bertrand O., Betschinger M.-A. Performance of domestic and cross-border acquisitions: Empirical evidence from Russian acquirers. *Journal of Comparative Economics*. 2011;40(3):413–437. https://doi.org/10.1016/j.jce.2011.11.003
7. Chirkova E., Chuvstvina E. Market reaction to the announcement of the acquisition of public and private companies. *Journal of Corporate Finance Research*. 2012;5(3):30–43. (In Russ.) https://doi.org/10.17323/j.jcfr.2073-0438.5.3.2011.30-43
8. Grigorieva S., Kolmykova T. Impact of Stock Payment on M&A Performance in High Information Asymmetry. *Vestnik Moskovskogo universiteta. Seriya 6. Ekonomika. = Moscow University Economics Bulletin* 2020;(3):58-77. (In Russ.)
9. Dell'Acqua A., Etro L., Piva M., et al. Investor protection and value creation in cross-border m&as by emerging economies. *Journal of International Financial Management & Accounting*. 2017;29(1):83–100. https://doi.org/10.1111/jifm.12069
10. Rodionov I.I., Mikhalchuk V.B. M&A Synergies in Domestic M&A Deals in Russia in 2006–2014. *Rossiiskii zhurnal menedzhmenta = Russian Journal of Management*. 2016;14(2):3–28. (In Russ.) https://doi.org/10.21638/11701/spbu18.2016.201
11. Rogova E., Lusina D. The effect of mergers and acquisitions on companies' fundamental values in emerging capital markets (the case of BRICS). *Journal of Corporate Finance Research*. 2015;9(3):27–50. (In Russ.) https://doi.org/10.17323/j.jcfr.2073-0438.9.3.2015.27-50
12. Hsu P.-H., Huang P., Humphery-Jenner M., et al. Cross-border mergers and acquisitions for innovation. *Journal of International Money and Finance. Elsevier*. 2021;112(C):102320. https://doi.org/10.1016/j.jimonfin.2020.102320
13. Nepomuceno T. Data envelopment analysis (DEA). *Scholarly Community Encyclopedia*. 2022.URL: https://encyclopedia.pub/entry/7783 (accessed on 16.07.2023)
14. Charnes A., Cooper W.W. and Rhodes E. Measuring the Efficiency of Decision-Making Units. *European Journal of Operational Research*, 1978;2, 429-444. http://dx.doi.org/10.1016/0377-2217(78)90: 138-8.
15. Lozano S., Adenso-Díaz B. A DEA approach for merging dairy farms. *Agricultural Economics – Czech*, 2021;67(6): 209–219.
16. 16. Ochirova E., Dranev Yu. The Impact of R&D Expenditure upon the Efficiency of M&A Deals with Hi-Tech Companies. *Foresight and STI Governance*. 2021;15(1):31–38. https://doi.org/10.17323/2500-2597.2021.1.31.38
17. Bai X., Zeng J., Chiu Y.-H. Pre-evaluating efficiency gains from potential mergers and acquisitions based on the resampling DEA approach: Evidence from China's railway sector. *Transport Policy, Elsevier*. 2019;76:46-56. https://doi.org/10.1016/j.tranpol.2019.01.012
18. Walter M., Cullmann A. Potential Gains from Mergers in Local Public Transport: An Efficiency Analysis Applied to Germany. *Discussion Papers of DIW Berlin*. 2018;832. https://doi.org/10.2139/ssrn.1426091
19. Wankea P., Maredza A., Gupta R. Merger and acquisitions in South African banking: A network DEA model. *Research in International Business and Finance*. 2017;(41):362-376. https://doi.org/10.1016/j.ribaf.2017.04.055

20. Chang T.-S., Lin J.-G., Ouenniche J. DEA-based Nash bargaining approach to merger target selection. *European Journal of Operational Research.* 2023;305(2):930-945. https://doi.org/10.1016/j.ejor.2022.06.017

21. Rahman M., Lambkin M. Creating or destroying value through mergers and acquisitions: A marketing perspective. *Industrial Marketing Management.* 2015;46:24-35. https://doi.org/10.1016/j.indmarman.2015.01.003

22. Vinocur E., Kiymaz H., Loughry M.L. M&A capability and long-term firm performance: a strategic management perspective. *Journal of Strategy and Management.* 2023;16(2):211-234. https://doi.org/10.1108/JSMA-10-2021-0204

23. Pervan M., Višić J., Barnjak K. The Impact of M&A on Company Performance: Evidence from Croatia. *Procedia Economics and Finance*. 2015;23:1451-1456. https://doi.org/10.1016/S2212-5671(15)00351-2

24. Deloitte (2017) M&A Making the deal work // Website deloitte.com. (https://www2.deloitte.com/content/dam/Deloitte/us/Documents/mergers-acqisitions/us-ma-making-the-deal-work-strategy.pdf)

25. Coelli T., Prasada Rao D., O'Donnel C., et al. *An introduction to efficiency and productivity analysis.* N.Y.: Springer Science + Business Media; 2005. 341 p.

26. Stobierski T. 13 Financial Performance Measures Managers Should Monitor. 2020. URL: https://online.hbs.edu/blog/post/financial-performance-measures (accessed on 16.07.2023)

27. Murphy A., Tucker H., eds. The Global 2000. URL: https://www.forbes.com/lists/global2000/?sh=3c76bc6c5ac0 (accessed on 16.07.2023)

Appendices

Appendix 1. Oil & Gas Completed M&A Deals in Russia 2022

#	Date	Seller	Country	Buyer	Object	Share, %	Deal Amount
1	Dec-22	Mercantile & Maritime Energy/Vitol	UK, Singapore/Netherlands, Switzerland	Fossil Trading FZCO	Vostok Oil	5.00	3.5 bln euro
2	Oct-22	ExxonMobil	USA	Sakhalinmorneftegaz-Shelf	Sakhalin-1 project	30.00	4 bln $ loss in assets
3	Sep-22	Totalenergies (Total)/Equinor (Statoil)	France/Norway	ZarubezhNeft	Kharyaginskoye field	50.00	No info
4	Aug-22	Totalenergies (Total)	France	NOVATEK	Terneftegaz	49.00	No info
5	Aug-22	Rosgeologia/Dmitry Chepurny	Russia	Elgaugol (Elga coal deposit)	Undytkan	67.00	No info
6	Jul-22	Trafigura Beheer BV	Netherlands, Switzerland	Nord Axis Limited	Vostok Oil	10.00	7 billion $
7	Jun-22	Gazprom	Russia	Lukoil	LayaVozhnegaz	49.00	11,436 billion rubles, 223.8 mln $
8	Jun-22	Rostec (Rostec)	Russia	A-Property	Elgaugol (Elga coal deposit)	5.00	40.80–95.20 mln $
9	May-22	Equinor (Statoil)	Norway	Rosneft	Sevkomneftegaz	33.30	No info
10	May-22	Equinor (Statoil)	Norway	Rosneft	Joint venture for Domanic deposits in Samara region	49.00	No info
11	May-22	Equinor (Statoil)	Norway	Rosneft	Krasgeonats	49.00	No info
12	May-22	Shell	USA	Gazprom Neft	Gydani Energy	50.00	No info
13	May-22	Gazprom Neft	Russia	Lukoil	Meretoyakhaneftgaz	50.00	52 billion rubles, 710.4 mln $
14	Feb-22	Damir Tuktarov / Stanislav Kotov	Russia	AO Aurora	Investgeoservice	44.60	78 mln $
15	Feb-22	Petronas	Malaysia	Lukoil	Shah-Deniz	10.00	1.45 billion $
16	Feb-22	Repsol YPF	Spain	Gazprom Neft	Karabashsky 10 oil and gas area	50.00	No info
17	Jan-22	Repsol YPF	Spain	Gazprom Neft	Evrotek-Yugra	68.00	No info
18	Nov-22	Baker Hughes Inc	USA	Management	Russian business of Baker Hughes	100.00	365 mln $
19	Sep-22	Halliburton	USA	Burservice	Russian business of Halliburton	100.00	344 mln $
20	Aug-22	Eni	Italy	Lukoil	Eni-Nefto	100.00	No info
21	May-22	Shell	USA	Lukoil	Shell Oil	100.00	No info
22	May-22	Eurasia Drilling Company (EDC)	Russia	Burovaya Kompaniya Razvitie	Eurasia Drilling Company	100.00	No info
23	May-22	Rosneft	Russia	UK Komaks	RN-Vostoknefteprodukt	100.00	No info
24	Apr-22	Tagras	Russia	Tatneft	UK Tatburneft	100.00	No info
25	Apr-22	Tagras	Russia	Tatneft	Tatintek	100.00	No info
26	Apr-22	Tagras	Russia	Tatneft	UK Tatspetstransport	100.00	No info
27	Apr-22	Tagras	Russia	Tatneft	KRS-Service	100.00	No info
28	Apr-22	Tagras	Russia	Tatneft	TMS-Logistics	100.00	No info
29	Apr-22	Tagras	Russia	Tatneft	NKT-Service	100.00	No info
30	Apr-22	Tagras	Russia	Tatneft	Mehservice-NPO	100.00	No info
31	Jan-22	Severstal	Italy, Russia (NWFO, CFD, PFO), USA, Ukraine, France, Switzerland	Russkaya Energiya	Vorkutaugol	100.00	15 billion rubles, 202.4 mln $
32	Mar-22	Ekaterina Borodina	Russia	Lukoil	Toplivnaya Kompaniya EKA	100.00	61.3 mln $
33	Feb-22	Standard-Oil	Russia	Evolution Holding Company	VPK-Oil	100.00	2.7 billion rubles, 35.9 mln $
34	Jan-22	Tagras	Russia	Tatneft	Tagras-Khimservice	100.00	No info

Source: Mergers.ru.

Appendix 2. List of Oil & Gas companies and deals

Year Completed	Target Full Name	Acquiror Full Name
2005	Sibirskaia Neftianaia Co	OAO "Gazprom"
2007	Sakhalin 2 Project	OAO "Gazprom"
2016	Aktsionernaia Neftianaia Kompaniia Bashneft' PAO	Rosneft Oil Co
2009	Gazprom Neft' OAO	OAO "Gazprom"
2013	OOO "Neftegazovaya Kompaniya Itera"	Rosneft Oil Co
2004	Shtokman Offshore Gasfield Development	OAO "Gazprom"
2009	OOO SeverEnergia	OAO "Gazprom"
2014	OOO Burneftegaz	OAO Aktsionernaya Neftyanaya Kompaniya Bashneft
2017	Aktsionernaia Neftianaia Kompaniia Bashneft' PAO	Rosneft Oil Co
2011	Kovykta Gas Condensate Field	OAO "Gazprom"
2007	Salavatnefteorgsintez JSC	OAO "Gazprom"
2007	Yukos Oil Co-Transport Assets	Rosneft Oil Co
2017	Nezavisimaia Neftegazovaia Kompaniia AO-Kodaneft' Project	Rosneft Oil Co
2018	Maretiom Investments Ltd	Novatek PAO
2007	OAO Mosenergo	OAO "Gazprom"
2017	Bank ZENIT PAO	TATNEFT named after V D Shashin PJSC
2015	OOO Natsional'nyi neftyanoy konsortsium	Rosneft Oil Co
2007	Yukos Oil Co-Oil Deposit Asset	Rosneft Oil Co
2009	OAO Daltransgaz	OAO "Gazprom"
2019	Sibur Tolyatti OOO	TATNEFT named after V D Shashin PJSC
2010	Slavneft'-Megionneftegaz OAO	Neftegazovaya Kompaniya Slavneft' OAO
2012	ZAO "Sintezneftegaz"	Rosneft Oil Co
2004	ZAO "Stimul"	OAO "Gazprom"
2019	RN-Kat LLC	Aktsionernaia Neftianaia Kompaniia Bashneft' PAO
2007	Morion PAO	OAO "Gazprom"
2005	OAO Ob'edinennye mashinostroitel'nye zavody	OAO "Gazprom"

Source: composed by the authors.

Appendix 3. List of Power companies and deals

Year Completed	Target Full Name	Acquiror Full Name
2011	OAO "Shestaya generiruyushchaya kompaniya optovogo rynka elektroenergii"	OAO «Vtoraya generiruyushchaya kompaniya optovogo rynka elektroenergii»
2012	Russian Federation-Power Assets	RusHydro JSC
2019	Far East Energy Management Co JSC-Power Distribution Assets	Federal Grid Co of Unified Energy System PJSC
2015	Sankt-Peterburgskie Elektricheskie Seti OAO	Lenenergo PAO
2013	OOO Teploenergoremont	Mosenergo PAO
2015	Teplosnabzhaiushchaia Kompaniia Mosenergo OOO	Moskovskaia ob'edinennaia energeticheskaia kompaniia PAO
2016	OGK-Investproekt OOO	Vtoraia Generiruiushchaia Kompaniia Optovogo Rynka Elektroenergii PAO
2009	Energosbytovaia kompaniia RusGidro AO	RusHydro JSC
2016	RAO Energeticheskie Sistemy Vostoka PAO	RusHydro JSC
2010	OAO "Yaroslavskaya gorodskaya elektroset"	MRSK Tsentra PAO
2015	Petrodvortsova Elektroset' OAO	Lenenergo PAO
2013	OOO "Tobolskaya TETs"	Fortum PJSC
2011	ZAO "Mezhdunarodnaya energeticheskaya korporatsiya" {MEK}	RusHydro JSC
2019	Rus Gas Turbines Holdings BV	Inter RAO UES JSC
2018	Gidroinvest AO	RusHydro JSC
2018	TSK Novaia Moskva OOO	Moskovskaia ob'edinennaia energeticheskaia kompaniia PAO
2018	Tomskie magistral'nye seti OAO	Federal Grid Co of Unified Energy System PJSC

Source: composed by the authors.

Appendix 4. Code in R for DEA Calculations

```
library(Benchmarking)
library(openxlsx)
library(readxl)

md <- "fin_eff"
s1 <- "eff" # "eff" - обычная, другое ("seff") - суперэффективность
s2 <- 2 # 1 - x, 2 - y, 3 - xy, 4 - graph
# X1. Операционные издержки - все издержки не связанные с производством.
          x1 <- Work_t_5_power$cogs
          x2 <- Work_t_5_power$ass_all

# Y1. Валовой доход
          y1 <- Work_t_5_power$ROA

# Y2. Валовая прибыль
          y2 <- Work_t_5_power$Revenue_growth
# Множество входов и выходов
      sx <- cbind(x1, x2)
      sy <- cbind(y1, y2)
    res <- list("x"=sx, "y"=sy)
```

```
calc_eff_year <- function(s1, s2, sx, sy){
# Расчет разных видов эффективности
# s1 - "eff" - обычная эффективность, иначе - суперэффективность
# s2 - 1,2,3,4 вид эффективности
# Возвращает вектор эффективности
    sxy <- cbind(sx, sy)
    if (s1 == "eff") {
        switch(s2,
# Эффективность по входу
               (res <- dea.direct(sx, sy, RTS = "vrs", ORIENTATION = "in", DIRECT = sx)
                z <- res$eff[,1]
                name <- "edx"),
# Эффективность по выходу
               (res <- dea.direct(sx, sy, ,RTS = "vrs", ORIENTATION = "out", DIRECT = sy)
                z <- res$eff[,1]
                name <- "edy"),
# Вход-выходная эффективность
               (res <- dea.direct(sx, sy, RTS = "vrs", ORIENTATION = "in-out", DIRECT = sxy)
                z <- (1 - res$eff[,1])
                name <- "edxy"),
# Гиперболическая эффективность
               (res <- dea(sx, sy, RTS = "vrs", ORIENTATION = "graph")
                z <- res$eff
                name <- "edgr")
               )
    }
```

```
    else {
# Calculation of super efficiency
        switch(s2,
# Эффективность по входу
          (res <- sdea(sx, sy, RTS = "vrs", ORIENTATION = "in", DIRECT = sx)
           z <- res$eff
           name <- "edxs"),
# Эффективность по выходу
          (res <- sdea(sx, sy, RTS = "vrs", ORIENTATION = "out", DIRECT = sy)
           z <- res$eff
           name <- "edys"),
# Вход-выходная эффективность
          (res <- sdea(sx, sy, RTS = "vrs", ORIENTATION = "in-out", DIRECT = sxy)
           z <- res$eff
           name <- "edxys"),
# Гиперболическая эффективность
          (res <- sdea(sx, sy, RTS = "vrs", ORIENTATION = "graph")
           z <- res$eff
           name <- "edgrs"))
    }
    return(list("eff"=z, "name"=name))
}

fin <- calc_eff_year(s1, s2, sx, sy)
WORK <- cbind(work_t_1_power$company, fin$eff)
```

Contribution of the authors: the authors contributed equally to this article.

The authors declare no conflicts of interests.

The article **was submitted** 06.10.2023; **approved after reviewing** 08.11.2023; **accepted for publication** 30.11.2023.

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.59-77
JEL classification: G30

Stakeholder Value Creation through Business Restructuring: Post Sanctions Evidence from Russian Airlines

Aleksandr Stepanov ✉
Chief Analyst, Rusnano, Moscow, Russia,
Alexanderstepanovst@yandex.ru, ORCID

Alexander Kayatkin
Foreign trade manager, EMIS CJSC, Moscow, Russia,
askayatkin@edu.hse.ru, ORCID

Abstract

The study is devoted to evaluating of turnaround strategies used by Russian airlines to overcome negative influence of 2022 crisis caused by sanctions pressure of West regulators in terms of ability to create value both for financial and non-financial stakeholders. To conduct a quantitative analysis of the effectiveness of turnaround strategies, evaluation methods based on traditional accounting indicators were used, as well as VBM indicators that take into account an opportunity cost. A qualitative analysis includes the estimation of management actions and decisions in terms of whether they violate interest of companies' major stakeholders. The study was carried out on the basis of such indicators as: PBITD/CE, PBITD/TD, ROA, Gross margin, EBITDA margin, Net Debt to EBITDA, EVA, Sustainable growth index and Interests harmonized index. As a result of the study, the features of turnaround strategies used by Russian airlines, namely PJSC Utair and LLC Pobeda were studied. The accounting ratios as well as the dynamic of economic profit were evaluated. The Growth sustainability matrix was constructed. The effectiveness of turnaround strategies in terms of value creation both for financial and non-financial stakeholders was assessed and the conclusions about prospects of companies' further development were made. The above results can be taken into account in the development of more sustainable turnaround strategies by other companies faced with challenges.

Keywords: stakeholders, economic value added, interests harmonized index sustainable growth index, sustainable growth matrix, turnaround strategies, Russian airlines

For citation: Stepanov A., Kayatkin A. (2023) Stakeholder Value Creation through Business Restructuring: Post Sanctions Evidence from Russian Airlines. *Journal of Corporate Finance Research.* 17(4): 59-77. https://doi.org/10.17323/j. jcfr.2073-0438.17.4.2023.59-77

Introduction

The problem of studying the concept of turnaround a company's business as a mechanism for overcoming financial instability was first seriously touched upon at the end of the 20th century. However, since then, the study of this problem is gaining more and more relevance, because the business environment is becoming more complex and dynamic, and the consequences of its abrupt changes can affect entire economic sectors.

Studying the problem of business turnaround, it can be noted that, despite the similarity of the directions of restructuring measures, each company is characterized by its own individual features. The choice of turnaround strategy is influenced by various factors, including the initial prerequisites of the company's financial distress and existing challenges. The task of the company's management is to provide measures to overcome financial instability, taking into account the interests of all stakeholders.

Many researchers over the past decades have contributed to the study of the problem of financial instability, strategies to overcome it, as well as the effectiveness of the implementation of such strategies. Among foreign authors who have studied problems related to business turnaround issues, E. Hotchkiss, M. Hopkins, S. Gilson, P. Asquith, R. Gertner, D. Scharfstein, J. Lee, J. Cunney can be distinguished, and among domestic researchers, I.V. Ivashkovskaya and others should be noted.

Despite the existence of a large number of papers that have investigated the theoretical issues of the causes of financial distress and subsequent business turnaround, there are a lack of papers investigating turnaround processes caused by foreign policy sanctions that restrict the work of companies and disrupt its business processes. In addition, during the analysis of the thematic literature, no works were found that would investigate the relationship between business turnaround and the value creation process simultaneously for both financial and non-financial stakeholders of the company.

Also, researchers have not yet paid attention to the consideration of individual post sanctions of 2022 cases of airline restructuring in the developing Russian market, which would make it possible to understand the nature of the problems caused by the sanctions pressure of Western countries, identify key measures implemented by management to stabilize the situation, as well as evaluate the effectiveness of such business turnaround strategies in terms of creating value for stakeholders.

The goal of the study is to solve the applied problem of identifying the key challenges faced by Russian airlines after the introduction of sanctions in 2022, and evaluating the effectiveness of turnaround strategies implemented by Russian airlines in terms of creating value both for financial and non-financial stakeholders.

The objects of the study are Russian airlines – Pobeda LLC, Utair PJSC while the subject of the study is the assessment of turnaround strategies.

The main sources for data search are the Bloomberg and Thomson Reuters terminals, financial and non-financial reports of companies, as well as other public data provided by the target companies including media publications and press releases.

The paper is based on the case study method. The choice of the case study method is motivated by the desire to provide empirical research of concrete actions and management decisions as well as conduct a quantitative and qualitative analysis of the effectiveness of entire turnaround strategies used by companies to cope with new challenges.

The academic importance of the study lies in the fact that present research can fill the gap in the study of problems of the relationship between business turnaround effectiveness and value creation simultaneously for both financial and non-financial stakeholders of the company.

The practical importance of this paper is that the case studies will be of interest to other Russian companies faced with challenges caused by sanctions pressure, since the study of business turnaround strategies of PJSC Utair and LLC Pobeda and evaluation of their effectiveness can contribute to the development of more effective turnaround strategies of other companies, as well as draw attention to a possible list of measures necessary to overcome crisis situations caused by external shocks more successfully.

Theoretical Aspects of Financial Distress and Company's Turnaround Process

Financial distress and its root causes

One of the key objectives of the strategic financial management is to create the necessary conditions for the economic security of the company, to establish and follow the principles of sustainable development. An organization is a socio-economic system that operates through different stages of its life cycle, and interacts with the external environment.

Depending on a company's life cycle stage, it sets the necessary standards and norms due to which it can operate with minimal costs, achieving the desired result. The external environment is definitely variable, that leads to deviations from the established guidelines. In turn, a significant deviation from the norm can lead to a loss of stability. One of the most important aspects that set the basic vector of the company's development is the process of maintaining financial stability. It is not necessary that a distressed firm will eventually fail but continuing decline in financial performance may ultimately lead to a company's bankruptcy and create significant financial loss to equity and debt investors.

According to E. Hotchkiss [1], a company is financially distressed if its liquid assets are not sufficient to meet the current requirements under the company's contracts for which the company has clear deadlines and obligations to

fulfill them. For example, such contracts might be the company's obligation to repay coupon payments on bonds on time. In case of violation of this obligation, bondholders have the right to apply to the court to ensure compliance with the agreement.

Similarly, in M. Hopkins [2] authors define troubled businesses as those that are overleveraged with excessive debt and are not able to meet covenants of loan agreements. However, debt overhang is not usually the base cause of a deteriorating financial performance of the firm. There are other factors that result in financial distress, but an excessive debt may exacerbate the problem.

The financial distress takes its origin from the broad diversity of financial difficulties the company can face during the life cycle. According to financial theory such difficulties can be caused by endogenous and exogenous risk factors. In general, endogenous risk factors refer to internal company's problems, so they have negative influence on a particular firm, while exogenous risk factors are pervasive and can affect many firms in the industry or the whole market.

In [3] there is a description of the proportion of every risk factor in each group. Author reveals a number of important sources of external risk such as macroeconomic changes, competitive changes, changes in regulation, social and technological shifts. According to the author's survey, around 41% of companies suffer from deterioration of financial performance due to bad macroeconomic conditions, 31% of firms face difficulties because of changing competitive environment, 13% suffer from regulatory limitations and 15% suffer from social and technological changes. Despite the confirmed importance of external risk factors and their influence on the firm's operating activity, the overall survey states that practically 80% of financial distress cases are caused by internal risk factors, particularly poor management and incompetence.

The importance of external factors in causing financial distress in the 21st century may be due to several reasons. First of all, it is the influence of globalization. In the 21st century, the world economy has become increasingly interconnected and globalized. This means that companies are more exposed to external factors such as economic downturns, changes in exchange rates, and political instability in different parts of the world that may result in imposition of sanctions. E. Hatipoglu and D. Peksen found that sanctions are likely to raise the probability of banking crises [4]. The results also indicate that financial sanctions have a more negative impact on the stability of banking systems compared to trade sanctions. Furthermore, the effect of sanctions is influenced by the level of economic damage inflicted on the targeted economies. These results have significant implications, suggesting that sanctions, as external shocks, not only have well-known adverse effects on economic growth, political stability, and humanitarian conditions but also have the potential to destabilize the financial stability of the targeted countries.

Secondly, the increased technological competition makes sense [5]. With the rise of the internet and the development of WEB 3.0, competition has become more intense in many industries. This means that companies need to be more responsive to changes in the competitive environment, such as new entrants, changing consumer preferences, and technological innovations. Companies that fail to adapt to these external factors may experience financial distress.

Why turnaround is better than bankruptcy

It is commonly believed that out-of-court restructuring generally incurs lower direct and indirect costs than court proceedings. This is because negotiations with a smaller number of interested parties can help to avoid serious conflicts of interest. Moreover, companies with a large amount of intangible assets are also more likely to opt for private restructuring, as these assets are more likely to decrease in value during restructuring. The relatively high costs of restructuring through the courts for such companies creates an increased incentive to preserve the value of intangible assets through private restructuring.

During the restructuring process, actions such as extending loan terms, providing additional funding, or converting debt into equity were undertaken [1]. According to S. Gilson [6], the challenge with private restructuring is that it does not substantially decrease the debt level compared to court-mediated restructuring.

Studies conducted by E. Hotchkiss, M. Alderson and B. Betker, S. Forte and J. Peña [7–9], whichanalyzed the key performance indicators of companies before and after restructuring, indicated that restructuring does not guarantee improved company performance. Many companies are compelled to undergo repeated restructuring efforts.

Turnaround and bankruptcy are two strategies that companies may use when they are facing financial distress. Turnaround involves making significant changes to the company's operations, management, and financial structure in order to improve its financial performance and return it to profitability. Bankruptcy, on the other hand, involves a legal process that allows a company to restructure its debts and operations in order to reduce its financial obligations and emerge as a viable business.

Restructuring is generally considered to be a better option than bankruptcy because it allows the company to continue operating while addressing its financial difficulties. This means that employees can keep their jobs, and the company can continue to provide goods or services to its customers. At the same time, restructuring is designed to maximize the value of the company by improving its financial position and addressing any underlying problems. Turnaround can be a more flexible process than bankruptcy, allowing stakeholders to tailor the plan to the specific needs of the company which can result in a more effective solution. This can help to protect the interests of stakeholders, including shareholders, creditors, and employees. Turnaround strategies can include cost-cutting measures, restructuring debt, divesting non-core assets, and improving operational efficiency. Turnaround can be a difficult process, and it requires strong leadership and a willingness to make difficult decisions in order to turn the business around.

When a company declares bankruptcy, the court takes over control of the process. In contrast, during a restructuring, the company's management team retains control of the process and can work to implement a plan that is in the best interests of all stakeholders. Bankruptcy can be stigmatizing for a company, potentially causing damage to its reputation and relationships with suppliers, customers, and employees making it harder to do business in the future. Bankruptcy can be a complex and costly process, and it may involve restructuring debt, selling assets, and renegotiating contracts with suppliers and other stakeholders. Restructuring, on the other hand, is generally viewed as a positive step toward improving the company's financial position and ensuring its long-term viability.

The decision to restructure or declare bankruptcy will depend on the specific circumstances of the company and its stakeholders. Stakeholders often decide to restructure or go bankrupt based on economic feasibility. Decisions need to be made with an eye to which option will create the most value. There were cases when the liquidation value of the company greatly exceeded the company's subsequent revenue for several years, so decisions were made on bankruptcy. Ultimately, the decision to pursue turnaround or bankruptcy will depend on the specific circumstances facing a company, including the severity of its financial distress, the availability of financing and other resources, and the willingness of key stakeholders to support a turnaround plan.

Key components of a successful company's turnaround

The subject of corporate turnaround has gained significant interest in both the strategy and finance fields. The concept of portfolio restructuring refers to a significant shift in a company's asset structure, accomplished by either investing in or divesting from various divisions, plants, and business units [10]. Although certain categories of corporate restructuring research are crucial during times of organizational distress, such as avoiding default, they require extensive transformation. Managerial restructuring might entail exchange of CEOs and top managers, as well as altering the board of directors [3; 11].

Organizational restructuring

First of all, before taking any actions, it's important to conduct a thorough assessment of the company's current situation, including its financial position, market position, and operational capabilities. This will help to identify the root causes of the problems and guide the development of an effective turnaround plan. Once the assessment is complete, the company needs to develop a clear vision and strategy for the future. This should include a clear understanding of the target market, the products and services that will be offered, and the unique value proposition that the company will bring to the market.

Operational restructuring involves a range of strategies aimed at enhancing efficiency and profit margins by reducing direct costs and streamlining overhead expenses in line with business volume. These strategies typically encompass cost reduction, revenue generation, and the optimization of operating assets. When dealing with financially distressed companies, operational restructuring is often the initial turnaround approach employed, as evaluating the firm's strategic position becomes irrelevant if there is a risk going bankrupt in the near future [11]. For businesses facing operational weaknesses, cost reduction measures may suffice, while revenue-generating strategies can be pursued by implementing price adjustments, such as price cuts or increases, depending on product sensitivity, and bolstering marketing efforts to stimulate demand [11]. A company turnaround refers to the process of revitalizing a struggling or underperforming company to restore its financial health and competitiveness.

The problem of organizational architecture is very important, as said J. Brickley, C. Smith, and J. Zimmerman [12]. The company should be well structured, employees should understand the decision-makers. Before undertaking major organizational changes, top managers should thus have a good understanding of how the firm arrived at its existing architecture and, more generally, of why particular types of organizations work well in particular settings. Such an understanding is important if only because the costs of organizational change can be so large. Employees should as well execute instructions of the management and not have much freedom of action.

According to H. Kraemer, Jr., M. Mauboussin, and A. Rappaport management in order to increase the company's value should establish long-term value creation as the company's governing objective, conduct a premortem before making large capital allocation decisions, allocate capital to its highest-value use, prioritize strategies rather than projects, considering applying some best practices of private equity to public companies, the CEO should work closely with the board of directors to establish the role each will play in creating long-term value [13].

Moreover, analysis of J. Brickley, C. Smith, and J. Zimmerman states innovation and product development can help to create new revenue streams and differentiate the company from its competitors [12]. Their work suggests cost reduction is also crucial. Companies undergoing a turnaround often need to reduce costs to improve profitability. This can be achieved through various means such as operational efficiencies, renegotiating contracts, and reducing headcount.

Empirical studies have linked operational efficiency strategies with successful turnarounds, as demonstrated by research conducted by K. John, L. Lang and J. Netter [14]. Nevertheless, it remains to be empirically proven whether operational restructuring can lead to recovery from the brink of bankruptcy.

Financial restructuring

Companies undergoing a turnaround often need to restructure their debt or obtain new financing. This can involve renegotiating terms with lenders or investors, issuing new debt or equity, or selling assets.

Debt restructuring allows a company to decrease its debt burden by reducing interest payments and payments on the body of the debt, rolling over the debt, or exchanging debt for company shares [6]. Another mechanism for debt restructuring is to attract additional financing to the company's capital. Although the company's debt obligations remain unchanged, the company receives additional liquidity, which it can use to pay off current debt. One example of this strategy is the attraction of direct investments in the capital of the company during the restructuring.

In addition to debt reduction and reorganization, regaining sufficient liquidity is crucial for turnaround efforts, as noted by K. John [15]. Moreover, dividend cuts have been used as a means to improve liquidity during distress. However, there is no clear consensus on the conceptual and empirical impact of such measures. While dividend reductions may lead to immediate liquidity improvements, they may also have negative signaling effects on capital markets.

Portfolio restructuring

Focusing on the core business is important in a turnaround as per, as said J. Dial, K. Murphy [16], and it can involve divesting non-core businesses, streamlining operations, and improving customer service and relationships. Downsizing and focusing on value creation areas is also a way of restructuring, while the unprofitable assets and business activities should be sold or formed to a new company, not affiliated with business. These helps companies in the industries that shrinks to perform better, effective and be valued higher. Studies conducted by D.J. Denis and T. Kruse [17], D.K. Denis and D. Shome [18], K. Hakkala [19], and C. Markides [20] have attributed the positive effect of divestitures on firm performance to factors such as decreased leverage, a greater emphasis on core competencies, and productivity growth resulting from divesting less productive plants.

In order to achieve a turnaround, firms may consider acquiring businesses that align with their core competencies and have the potential for long-term profitability. This step is particularly important for firms that have an inappropriate corporate strategy, operate in mature or declining product/markets, or require a new strategic direction [11]. Acquisitions can also be a growth acceleration strategy for firms experiencing poor financial performance but not yet in severe distress.

Managerial restructuring

Replacement of top management is often considered a necessary step towards successfully turning a company around. G. Milano et al. analyzed that a strong leadership team is crucial for a successful turnaround [21]. The team should have a clear understanding of the challenges facing the company, and the skills and experience needed to execute the turnaround plan.

According to J. Dial, K. Murphy employees are critical to the success of a turnaround, and it's important to keep them engaged and motivated during the process [16]. This can involve regular communication, training and development, and recognizing and rewarding performance. Several studies have shown that there is a positive correlation between the number of independent directors on a board and the likelihood of a company's survival [22; 23]. However, other studies have found no significant difference in the number of independent directors between bankrupt firms and those that survive F. Elloumi and J. Gueyié [24].

From the above studies it remains uncertain whether management changes in financially distressed companies actually contribute to their recovery. If we consider the stock market response as an indicator of the perceived effectiveness of such changes, the evidence from these studies does not provide a definitive conclusion.

Finally, a successful turnaround requires continuous improvement and monitoring. This involves regularly reviewing progress against the plan, making adjustments as needed, and ensuring that the company remains aligned with its strategic vision.

Overview of ways to assess the effectiveness of turnaround

Restructuring a business is a challenging process that demands significant effort from management. While continuing to function may be considered a sign of successful restructuring, this is not always the case. In fact, history is filled with examples of companies that continued to operate after restructuring, only to find themselves in financial distress again a few years later and teetering on the brink of bankruptcy. Therefore, it would be incorrect to assume that any completed restructuring is a success. Instead, a comprehensive approach that considers various metrics is necessary to evaluate its effectiveness.

There are several ways to evaluate a company's performance after restructuring. The simplest method is to assess whether the company was able to successfully restructure and remain independent.

The traditional approach to evaluating the effectiveness of business turnaround involves the use of an accounting approach, namely the analysis of accounting ratios and metrics at the time of financial distress and after restructuring. To evaluate the recovery strategies of financially distressed firms use various metrics such as PBIT/Sales, ROE, ROA, PBITD/CE, and PBITD/TD. The purpose is to evaluate their effectiveness in comparison to non-recovery firms. All the metrics used show a significant decline in performance from the pre-distress period of two years to the distress year. This decline is most prominent in PBITD/TD, which indicates a drop in profitability, as well as a sharp rise in debt for the sample firms. The profit margin, return on equity and assets, cash-flow return to capital employed, and cash-flow cover for debt all demonstrates a steep decrease. This suggests that the effectiveness of the recovery strategies should be evaluated using an integrated approach that considers various performance metrics.

Profitability is a commonly used metric to measure performance in many studies. Some studies [3] use nominal pre-tax profit, of which only Slatter adjusts it to real pre-tax profit. Meanwhile, other authors rely on profitability ratios

such as return on total assets (ROA) or return on investment (ROI) to indicate profitability.

Relying solely on current profitability to evaluate the success of a turnaround would be inaccurate. It is important to consider a range of indicators. To address this issue, several studies use multiple accounting-based indicators.

According to N. Pandit [25], relying solely on accounting measures is a common mistake in turnaround research, and there are significant differences in success measures between general management and finance research. The choice of accounting-based versus market-based measures is also critical when evaluating turnaround outcomes. However, E. Hotchkiss [7] provides contradictory results using accounting measures, which are typically used in general management research. While some researchers argue that market measures are less prone to manipulation, others claim that they are biased by expectations [26; 27].

The best practice is to use a combination of accounting-based and non-accounting-based indicators to assess performance. Some studies have incorporated human judgement to supplement accounting-based measures. B. Zimmerman [28] requires a consensus among stakeholders (investors, board members, and managers). This approach captures contextual variation, which is crucial given the heterogeneity of turnaround cases. However, relying solely on human judgement can be subjective.

To address the limitations of using accounting-based indicators alone, a more qualitative approach can be used to measure the effectiveness of turnaround strategies. Management research offers alternative concepts for measuring turnaround outcomes. For example, V. Acharya and K. Subramanian [29] use a firm's R&D investments and number of patents to indicate the success of turnaround strategies. E. Love and M. Kraatz [30] use changes in reputation as an additional measure of effectiveness. While these alternative measures provide valuable insights into the true effects of turnaround strategies, they may be less comparable than accounting-based indicators.

The academic literature recognizes the need to assess the effectiveness of business restructuring. There are two main areas of assessment: analysis of quantitative data on the example of studying accounting ratios, profitability indicators, etc. and market metrics abnormal return, MVA, etc. during financial distress and after business restructuring and using a qualitative approach. It is worth noting that the review of academic literature devoted to evaluating the effectiveness of business turnaround lacks information on the use of Value Based Management indicators that take into account opportunity costs / risks of investment and, accordingly, allow determining the possibility of creating real value for company shareholders through business restructuring. In addition, the existing layer of academic work practically does not consider the effectiveness of the restructuring process from the standpoint of non-financial stakeholders. All this creates the prerequisites for further research to study the issue of evaluating the effectiveness of business restructuring in terms of creating real value for both financial and non-financial stakeholders.

Turnaround and Financial Restructuring in Airlines

Practices and reaction of Russian airlines to financial distress caused by sanctions of 2014

In March 2014, Russia annexed Crimea from Ukraine, which led to economic sanctions being imposed by the European Union and other countries. These sanctions had a significant impact on the Russian economy, which was already facing challenges due to declining oil prices. As a result, the Russian ruble lost value rapidly, causing inflation and making it more difficult for Russian consumers and businesses to afford air travel. At the same time, devaluation of the ruble, led to increased costs of airlines, including aircraft leasing, payments for which are fixed in the currency. In addition to these challenges, the Russian airline industry was also impacted by a decline in international travel demand. Many Western airlines canceled or reduced their flights to Russia due to the economic sanctions and geopolitical tensions, which further limited travel options for Russian consumers.

As a result of these factors, the Russian airline industry experienced a significant decline in air travel demand in 2014–2015. According to data from the Federal Air Transport Agency, passenger traffic on Russian airlines declined by 4.4% in 2014 and 15.6% in 2015. This decline was particularly pronounced in the international market, where passenger traffic declined by 16.7% in 2014 and 27.6% in 2015.

To cope with these challenging market conditions, many Russian airlines implemented cost-cutting measures, such as reducing their route networks and fleet sizes. Some airlines also sought to diversify their revenue streams by offering additional services, such as cargo transportation and ground handling.

Despite these challenges, the Russian airline industry has demonstrated resilience and adaptability. Many airlines have sought to expand their presence in the domestic market, which has remained relatively stable in recent years. Additionally, the Russian government has taken steps to support the industry, such as providing financial support to struggling airlines and implementing measures to increase connectivity in remote parts of the country.

In response to these challenges, many Russian airlines have sought to reduce costs and improve efficiency. This has involved restructuring their operations, cutting back on unprofitable routes, and increasing their focus on more lucrative markets. Some airlines have also looked to diversify their revenue streams by offering additional services, such as cargo transportation and ground handling.

PJSC Utair is a member of the register of backbone enterprises of the Russian Federation and occupies a highly competitive position in the aviation industry market. Until 2020, the Airline was one of the five largest carriers in the country. The airline has a developed regional route network in the country, occupies an important place in the transport system of the Khanty-Mansiysk Autonomous Okrug and the Tyumen Region. The airline has a modern fleet of aircraft, numbering 63 aircraft and 337 helicopters.

Utair, a Russian airline, also underwent financial restructuring after facing financial difficulties in 2014 due to a debt burden of over 160 billion rubles. To solve this situation, the company engaged in negotiations with a syndicate of creditors consisting of 11 banks, resulting in a restructuring plan that was finalized on December 30, 2015. Under this plan, Utair secured two syndicated loans totaling RUB 42.6 billion, with repayment periods of 7 and 12 years, as well as issued two bond offerings amounting to 13.3 billion rubles, also repayable over 7 and 12 years. These loans were backed by assets and guarantees from Utair Group companies, along with a state guarantee covering 50% of the seven-year syndicated loan. As part of an initiative to enhance efficiency, Utair implemented measures such as optimizing its route network and reducing its aircraft fleet by one-third. These actions led to reduced personnel costs and generated savings of up to $100 million in lease payments.

Transaero Airlines, which was one of Russia's largest airlines, filed for bankruptcy in 2015 due to financial difficulties caused by the economic downturn and the devaluation of the ruble. The airline had accumulated significant debt, and its operations had been suspended by the Russian aviation authorities due to safety concerns. In 2015, the creditors of Transaero Airlines – VTB, Gazprombank, Novikombank, Promsvyazbank, Moscow Credit Bank, Sberbank, Rosselkhozbank opted for bankruptcy instead of debt restructuring. This decision was driven by the assessment that the liquidation value of the company was higher than its value if it were to continue operations after restructuring.

News broke on September 1, 2015, that Aeroflot was planning to acquire 75% plus one share of Transaero for a mere ruble. The acquisition was contingent on the restructuring of Transaero, full operational control and its integration into Aeroflot. However, the deadline for collecting the necessary stake in Transaero passed without success. Subsequently, on October 1, it was announced that Aeroflot had decided against acquiring Transaero.
Through asset restructuring, such as selling 35 aircraft, the company could reduce its debt burden by 22%. However, calculations of cash flows, taking into account the possible reduction, showed that it would not have a significant impact on Transaero's financial stability.

The losses incurred by creditors during the restructuring would be much greater than those resulting from liquidation in any scenario considered. Creditors would suffer losses ranging from 60 to 78% of the original amount of debt. Therefore, under any scenario of continued operation, the losses of creditors would be higher than in the case of liquidation. Secondly, the bankruptcy was initiated by protected creditors, whose liquidation losses are even smaller.

After filing for bankruptcy, Transaero Airlines went through a complex process of liquidation, which involved the sale of its assets and the settlement of its debts. The Russian government intervened in the process to support the affected employees and passengers of the airline, some of whom were left stranded when Transaero's operations were suspended. In 2016, Aeroflot, Russia's flag carrier, acquired some of Transaero's assets, including its aircraft and flight routes, as part of a plan to expand its operations and improve its market position. However, many of Transaero's debts remained unsettled, and the liquidation process continued for several years.

Overall, the bankruptcy of Transaero Airlines was a significant event in the history of the Russian aviation industry, highlighting the challenges faced by airlines during times of economic uncertainty and the need for effective restructuring and debt settlement processes.

Case Study of Business Turnaround in Russian Airlines after 2022 Sanctions

Methodology of value creation analysis for stakeholders

Traditionally, accounting metrics are used to analyze financial stability and evaluate business performance. As part of our study, the application of an approach based on ratios and metrics derived from financial statements, it is necessary not only for briefly analysis of the turnaround strategies effectiveness but also to compare the results of such approach with the results of more comprehensive one, namely VBM.

To assess the financial performance of the company, financial indicators were selected that were previously used by S. Sudarsanam and J. Lai [31] and reflect the profitability of the company in relation to the long-term capital attracted for the activities and the efficiency of the assets used:

$$\text{PBITD / CE} = \frac{\text{PBITD}}{\text{Capital Employed}}, \quad (1)$$

where PBITD – profit before interests, taxes, depreciation and amortization.

$$\text{PBITD / TD} = \frac{\text{PBITD}}{\text{Total Debt}}, \quad (2)$$

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}. \quad (3)$$

As well as operating profitability indicators previously used by E. Hotchkiss [7], M. Alderson and B. Betker [8], S. Gilson [6] to assess the effectiveness of current operations:

$$\text{Gross Margin} = \frac{\text{Total Revenue} - \text{Cost of Goods Sold}}{\text{Total Revenue}}, \quad (4)$$

$$\text{EBITDA Margin} = \frac{\text{EBITDA}}{\text{Total Revenue}}, \quad (5)$$

where EBITDA – earnings before interests, tax, depreciation and amortization.

Economic value added (EVA) is used most often when applying the VBM approach. The result of the formula shows whether the company generates additional income on the invested capital invested.

Depending on the result, we can draw a conclusion about the effectiveness of the company and its management (Table 1).

Table 1. Evaluation of efficiency depending on the values of EVA

EVA value	Description	Gain
EVA = 0	Return on invested capital is equal to the cost of capital	0
EVA > 0	There is an increase in the added value of the company, capital is used efficiently, there is an increase in real value	Yes
EVA < 0	The added value of the company decreases, the invested capital is used inefficiently, therefore, the real value is destroyed	No

Numerous domestic and foreign studies [32; 33] have extensively explored and debated the essential factors for creating long-term value, which go beyond financial aspects and encompass elements like competitive advantages, customer and employee loyalty, supply chain management, and others. Moreover, these non-financial factors have a significant impact on financial performance. Consequently, effective management of non-financial factors allows companies to achieve success, which can be measured through financial indicators. Therefore, the analysis of long-term value creation involves evaluating both financial and non-financial factors. The development of non-financial value drivers, crucial for sustaining long-term value, is influenced by a diverse range of stakeholders. According to I.V. Ivashkovskaya [34], establishing a network of stakeholders becomes a requirement for gaining competitive advantages, as both shareholders and non-financial stakeholders have the potential to greatly influence the company while also being influenced by it. The value of relationships with these parties is so significant that, alongside the shareholder value theory, the concept of stakeholder value (the stakeholder approach) is gaining popularity.

To evaluate strategic alternatives based on the interests of a company's stakeholders, the IHI (Interests Harmonization Index) is introduced, as noticed I.V. Ivashkovskaya [35]. This index measures changes that result from actions and decisions made within a strategic alternative to meet the interests of key stakeholders. The rating scale used for the index consists of three values: +1 indicates alignment between the strategic interests of the company and the interests of each stakeholder category, 0 represents no conflicts between strategic interests and stakeholder interests, and –1 denotes a contradiction between the strategic interests of the company and the interests of each stakeholder category.

The evaluations given pertain to the entire strategic period and are based on the potential impact of stakeholders on the company, with the weights being assigned based on expert judgment. The estimates are weighted based on the strength of the impact each stakeholder has on the company, with the maximum weight being 100%. Weights are the result of expert judgment. The weighted average must be calculated separately for positive and negative values.

The involvement of non-financial stakeholders plays a crucial role in generating internal value within a company. Harmonious relationships with stakeholders help to reduce the risk of capital costs. Furthermore, such a collaborative approach fosters the creation of opportunities for accumulating intellectual and social capital, facilitating the transformative function of knowledge, and ultimately enabling growth prospects. Conversely, a decline in the stakeholder harmonization index results in an escalation of stakeholder risk. In such cases, the potential for generating positive economic profit diminishes.

Motives for choosing PJSC Utair and LLC Pobeda for a case study

The 2022 sanctions, although focused on specific sectors, had a broad impact on various sectors of the economy due to the extensive range of sanctions restrictions imposed. The strength and direction of the industry's response to the sanctions pressure are influenced by several factors. These include how industry enterprises are integrated into global production, the nature of upward and downward links in global value chains (including the level of import dependence and its geographical distribution), the presence of foreign manufacturers in the Russian industry, the reliance of the domestic market on imports, the industry's experience in dealing with previous sanctions in 2014, and the ability of enterprises to adapt to these measures. The aviation sector has been facing its most severe crisis in history since 2020, both in the Russian Federation and internationally. This is due to the sharp spread of the COVID-19 virus and the restriction, as a consequence, air travel.

In 2022, the Russian aviation industry was subjected to even more extensive problems. The aviation industry has been severely affected by the sanctions imposed on Russia for its military operation in Ukraine.

The morning of February 24 for aviators began with the restriction of flights in the south of the Russian Federation. According to the decision of the Federal Air Transport Agency, the work of 11 airports was suspended: Anapa, Belgorod, Bryansk, Voronezh, Gelendzhik, Krasnodar, Kursk, Lipetsk, Rostov-on-Don, Simferopol and Elista. Initially, the restrictions were introduced until March 2, but were subsequently extended weekly and remain in effect to this day.

In response to Russia's special operation in Ukraine, Great Britain was the first country to close its airspace to Russian airlines. Over the next few days, the Czech Republic, Poland, Bulgaria, Latvia, Romania and a number of other European countries closed the skies for Russian carriers, after which European Commission President Ursula von der Leyen announced the closure of the entire European Union for them. A similar ban was introduced by Canada and the United States. The Russian Federation, in turn, announced the restriction of flights and overflights (such as those directed towards Southeast Asia) to airlines from 35 countries in Europe and Canada, which had a significant impact on the operations of such companies.

The EU has published an updated package of sanctions against the Russian Federation. Deliveries to Russia of civil aircraft and spare parts for them, as well as their maintenance and insurance, were banned. At the same time, foreign lessors were obliged to take the airliners already leased from Russian carriers. Against the background of mass arrests of foreign aircraft, Russian carriers, fearing for their fleet, began to cancel international flights even to countries open for flights.

The United States also imposed restrictions on the export of aviation industry goods to Russia and banned the maintenance of dozens of Boeing aircrafts. Experts note there is a significant dependence on the West equipment in this sector. In April 2022, Russian airlines had a fleet of 1,287 aircraft dedicated to commercial transportation. Out of these, 1,101 were passenger aircraft, 84 were cargo planes, and the remaining cluster of 42 business jets and 60 civil service aircraft. Approximately 67% of the aircraft in the fleet were manufactured by foreign companies, while these foreign-made planes accounted for about 95% of the total passenger turnover.

Passenger traffic of Russian airlines in 2022 decreased by 14%, to 95.2 million people, according to Rosstat, including 17 million people who were in international flights – 17.8% of total volume. However, this is not a significant blow, as the pandemic has significantly reduced international traffic from Russia. By the end of 2021, only 21% of the total volume of traffic consisted of international flights, of which only 1% were directed towards Europe, due to various factors such as vaccine non-acceptance.

In 2022, the Federal Air Transport Agency distributed 100 billion rubles among 32 airlines to subsidize domestic transportation, with Aeroflot Group receiving half of the funds. Additionally, carriers were compensated 19.4 billion rubles for canceled flights due to external restrictions, and 2.9 billion rubles were distributed among cargo airlines. In total, the domestic aviation industry received a record 172 billion rubles in subsidies from the budget in 2022, according to the Federal Air Transport Agency.

In 2023 the government has allocated 25.3 billion rubles to support air carriers. On January 12, Rosaviatsia initiated a selection process for companies to receive subsidies, which will be granted based on the number of completed passenger-kilometres on domestic routes. Airlines will receive 1.11 rubles per passenger-kilometre completed. To qualify, carriers must maintain an expected passenger turnover of at least 90% compared to the same period in 2022, resulting in a minimum of 22.2 billion passenger-kilometres of total passenger turnover.

Moreover, in response to the challenges the Russian government has endorsed a program aimed at fostering the growth of the aviation industry until 2030. Over 770 billion rubles have been allocated for the program's implementation.The funds will be used to subsidize domestic flights and support the aircraft industry. The objective is to achieve a modest yet significant annual rise in passenger traffic, following a relatively notable 10% decline compared to 2021. Additionally, the program aims to enhance the proportion of domestically manufactured aircraft in the fleets of Russian carriers from the existing 33 to 81%.

Russian airlines already faced with the necessity of making business restructuring to cope with financial distress caused by external factors, precisely sanctions of 2014 and COVID-19 pandemic in 2020. There is a new round of challenges that Russian airlines should deal with to continue its operations after sanctions of 2022. The study is focused on identifying key issues and major key actions and management decisions within turnaround strategies that companies develop and implement as well as analysis of the effectiveness of such strategies and their ability to create value for financial and non-financial stakeholders.

It is suggested to conduct a case study of two Russian airlines namely LLC Pobeda and PJSC Utair that have different business models and that's why it is interesting to look at which turnaround strategies these companies choose and evaluate their effectiveness. These ones are also the few of Russian large corporations, which continue sharing some information with media agencies and which still publish their financial statements despite the Resolution of the Government of the Russian Federation of March 18, 2022 No. 395 that allows to keep the financial statement non-public.

LLC Pobeda, which was established in 2014, is a part of the Aeroflot Group and was introduced to replace the low-cost carrier, Dobrolet, which stopped its operations due to the impact of Western sanctions in 2014. The airline has been consistently ranked among the top 100 low-cost carriers globally. The current fleet of Pobeda Airlines consists of 41 aircraft with an average age of 2.5 years, and the company has ordered two more planes as of January 15, 2023.

At the same time, PJSC Utair's origin dates back to February 1967 when the Tyumen Civil Aviation Administration

was established, in response to the high oil and gas production rates and underdeveloped railway and road networks. This led to the swift growth of the industrial and technical foundation of the Tyumen Civil Aviation Administration, with aviation becoming a crucial component of Western Siberia's natural resources development process. The airline obtained the global brand name Utair on May 30, 2002, recognized across Asia, Europe, America, and Africa. Currently, Utair's helicopters and airplanes operate practically in every corner of the world.

PJSC Utair currently engages in aircraft and helicopter operations, maintenance, personnel training, and flight services. Its fleet comprises over 300 helicopters and 80 aircraft. The airline's flight network covers more than 140 locations in Russia, with 75 exclusive routes solely accessible to PJSC Utair's customers. To enable direct flights between the country's regions, PJSC Utair has established an elaborate network of transfer hubs in Krasnodar, Surgut, Tyumen, Ufa, and Khanty-Mansiysk. The airline has a workforce of approximately 4,000 individuals, while Utair Group companies employ over 8,000.

Analysis of key turnaround initiatives

LLC Pobeda Case

The aviation industry, including LLC Pobeda, was severely affected by the geopolitical situation due to Russia's military operation in Ukraine, resulting in a significant decline in passenger traffic. LLC Pobeda experienced a significant reduction in passenger traffic in 2022, with a decrease of 19% to 11.69 million passengers. This drop was more substantial compared to other airlines, including Aeroflot (–4%), S7 Airlines (–10%), Ural Airlines (–8%), and Rossiya (also a part of the Aeroflot group) (–15%).

It is possible to identify the number of challenges that LLC Pobeda has faced and which has had negative impact on the company's operations.

Firstly, the suspension of work due to a special operation at 11 airports in southern Russia, including major ones such as Krasnodar, Rostov-on-Don, Anapa, and Gelendzhik. Close of airports result in the decrease of existing domestic routes and as a result decline of passenger traffic.

Secondly, the decision of Western countries to close their airspace to Russian airline flights, which resulted in significant limitations on international flights for LLC Pobeda. The airline ceased all international flights from March 8, and they only resumed by the end of 2022, leading to a 60% reduction in international flights and passengers, with only 1.9 thousand flights and 311 thousand people, respectively.

Thirdly, foreign companies are now banned from engaging in insurance and maintenance of Russian carriers' aircraft, leading Pobeda to perform maintenance based on Russian repair organizations. Moreover, the European Union has imposed sanctions aimed at preventing Russian airlines from using imported aircraft. These restrictions led to the seizure of three Boeing 737-800s that were intended for a low-cost airline overseas. Consequently, the airline's fleet was reduced from 44 to 41 aircraft. The reduction in the intensity of aircraft fleet utilization is a serious threat to the business of airlines. After all, every day of aircraft downtime means a loss for a company. A decrease in the number of flights and a lower volume of transportation reduces the revenue of the airline. In addition, a reduction in the number of flights and flight cancellations can lead to a loss of customers who will seek alternative means of transportation.

Moreover, there was a practically a 6 months LLC Pobeda was without its CEO and 9 months without flight director. Due to these challenges, CEO Andrey Kalmykov and flight director Andrey Tarasov resigned from Pobeda at the start of March of 2022. Andrey Kalmykov's contributions as CEO played a significant role in establishing Pobeda as one of the leading low-cost carriers in Russia. Under his leadership, Pobeda drastically increased its passenger numbers. He also prioritized the improvement of the airline's operational efficiency, customer service, and safety standards that allows the company to take a stable position on the market.

LLC Pobeda does not publish its own annual or semi-annual reports or does not have its own Investor relation department, so the analysis of key company's initiatives is primarily based on media publications and management statements. It is proposed to study company's turnaround initiatives in the context of 4 previously defined forms of restructuring: organizational, financial, managerial and portfolio ones.

The airline's management believes that LLC Pobeda will continue to operate uninterrupted, as a significant part of its operations is focused on the domestic market. In November 2022, LLC Pobeda made the decision to resume flights from Sheremetyevo Airport. Compared to its operations at Vnukovo Airport, the low-cost airline will offer a more extensive flight program with 25 routes instead of 14. The new routes from Sheremetyevo will include destinations such as Kirov, Cheboksary, Kazan, Vladikavkaz, Yekaterinburg, Nizhnekamsk, Perm, Irkutsk, Novosibirsk, Omsk, Ufa, Chelyabinsk, Krasnoyarsk, Tomsk, Barnaul, Astrakhan, Makhachkala, Nalchik, Stavropol, Nazran, Sochi, Kaliningrad, Murmansk, Volgograd, and Mineralnye Vody. Pobeda LLC has highlighted the advantage of Sheremetyevo Airport in facilitating quick turnarounds of flights, with a turnaround time of 25 minutes. This allows the low-cost airline to maintain efficient and timely flight operations, ensuring a high level of punctuality.

To minimize the negative impact of sanctions on its financial performance, the company is implementing measures such as optimizing its route network and increasing flight hours during peak traffic months. Additionally, LLC Pobeda has increased its volume of pro-mobile sales and further reduced its tariffs, even though this has resulted in lower revenue from its core business. It should be noted that LLC Pobeda is actively participate in subsidy program introduced by Russian government to make transportation more affordable and help airlines to cope with crisis. LLC Pobeda airline received 15.1 billion rubles in subsidies from the state budget in 2022 year. Thus, LLC Pobeda at-

tracts more people by selling cheap flight tickets, while the lost income is compensated by subsidies from the Russian government. According to government decree No. 761, the minimum flight time in the Russian region should be 72% of the level of April – October 2021. This requirement for obtaining a subsidy has also contributes to LLC Pobeda focus on the domestic market transportation.

The airline plans to increase the frequency of flights and add new destinations. Following the deregistration of some of its aircraft from the Bermuda registry, Pobeda has gained partial access to the international market. As part of the airline's strategy, it plans to expand its operations to Central Asia, specifically Uzbekistan. Recently the company has also launched the sale of air tickets to Armenia, the UAE and on the eve of the summer holiday season, the sale of air tickets to individual resorts in Turkey started.

On August 16, 2022, Dmitry Tyshchuk, who previously held the post of First Deputy CEO of PJSC Aurora Airlines, was appointed CEO of Pobeda Airlines. Since 2013, Dmitry Tyshchuk has held the position of the first deputy general director at Aurora Airlines. During his tenure, he played a pivotal role in expanding the regional airline's passenger volume and establishing new routes in the Far East. Furthermore, LLC Pobeda has successfully appointed a capable successor for the departed flight director. Konstantin Tarasov, who brings substantial experience in the aviation industry, has assumed the role of the new flight director. Prior to joining Pobeda, Tarasov held several senior positions at Ryanair, one of the largest low-cost airlines in Europe. To sum up, LLC Pobeda post sanctions turnaround strategy includes both operating and managerial initiatives that supposed to help the company cope with challenges it faced and helps to achieve ambitious goals in increasing its passenger traffic to 13 million in 2023, which is an 11% increase from its 2022 figure of 11.7 million passengers.

From operational restructuring point of view, LLC Pobeda concentrated on the domestic market and increased domestic number of flights despite the decrease in number of airplanes. Pobeda also has gained partial access to international market due to deregistration of its aircrafts form the Bermuda registry, optimized its route network, increased flight hours during peak traffic months, reduced tariffs, and boosted pro-mobile sales to mitigate the negative impact of sanctions.

There are no actions oriented to financial restructuring of the company, as long as LLC Pobeda is a part of Aeroflot group and according to its Balance sheet has no its own interest-bearing debt. It might be assumed that Aeroflot holding company accumulates debt on its balance and then distributes financing it among subsidiaries.

From managerial restructuring side of view, the new experienced team of top management including new CEO and Flight director that came to control the company and come up with new turnaround strategy to cope with existing operational challenges.

There was no portfolio restructuring because even though Pobeda is a very large company, it is a subsidiary of Aeroflot. Aeroflot Group at the same time does not plan to diversify its businesses, according to which Pobeda is a low-cost airline.

PJSC Utair case

With the beginning of special military operation, PJSC Utair as well as other Russian airlines has faced with a number of challenges. Based on data from the Federal Air Transport Agency, PJSC Utair's total passenger turnover on domestic routes, including subsidized flights, during April to September 2022 amounted to 57% of the same months in 2021, totaling 4.35 billion passenger-kilometers compared to 6.886 billion. In comparison, the small aviation segment, which is a subsidiary of PJSC Utair, only experienced a 13.5% reduction, but its passenger turnover was limited to 31.5 million passenger-kilometers. Although there is no data on the helicopter segment, it reportedly has insignificant traffic. The airline flew approximately 90 billion passenger-kilometers from April to October.

It should be stated PJSC Utair has faced practically with the same challenges as LLC Pobeda. In March 2022 the CEO of Utair Andrey Martirosov observed that Russian civil aviation is currently undergoing a unique phase of operation. He mentioned that the sanctions imposed on the industry have had a substantial impact on the flight geography, traffic volume, and the availability of aircraft and their components for flight, with a significant reduction already witnessed and expected to continue in the future. In 2022, Utair almost faced a situation similar to the reduced air traffic crisis that plagued air transportation during the first wave of the COVID-19 pandemic in 2020. Nevertheless, despite the challenging circumstances, the management of the Utair reassured its employees that they would not be subjected to reduced working hours. Additionally, they pledged to maintain all payments specified by the collective agreement and labor contracts and ensure that they are disbursed punctually. Moreover, during a meeting with the governor of Yugra, Natalia Komarova, the CEO of PJSC Utair stated that the airline aims to increase its employees and attain a consistent operational performance in 2023.

PJSC Utair also develops it route network. In contrast to LLC Pobeda the company actively develop both new domestic and international routes. PJSC Utair was among the first companies to increase the number of international flights after the sanctions, buying 27 aircraft from lessors and removing them from Bermuda registration. In 2022, the company opened 16 new flights, including international flights to Azerbaijan, Turkey, Uzbekistan, Kazakhstan, Dubai. Overseas flights increased 3.6 times to 1.905 billion passenger-kilometers.

According to the company's press release, the airline is expanding its flight program in the Khanty-Mansiysk Autonomous District in 2023, with the opening of 15 new routes and increased flight frequencies on existing routes. The program will now offer 56 destinations, a 20% increase from the previous season, to connect cities within the region as well as other regions and countries including Azerbaijan, Armenia, Kazakhstan,

Kyrgyzstan, Tajikistan and Uzbekistan. The majority of the new flights are domestic, however, the airline is also increasing flights form Khanty-Mansiysk to international destinations such as Almaty, Baku, Bishkek, Yerevan, Osh, Tashkent, Ferghana and Khujand. The new routes for the winter program within Russia include flights from Khanty-Mansiysk to Chelyabinsk, from Kogalym to Perm, from Nizhnevartovsk and Nyagan to Yekaterinburg, from Surgut to Gorno-Altaisk, Novokuznetsk, Chelyabinsk.

From April to October of 2022, similarly to LLC Pobeda PJSC Utair was supposed to receive 6.9 billion rubles of subsidies from the Federal Air Transport Agency, and its subsidiaries in small aircraft and helicopter transportation – another 32 million and 4.7 billion rubles respectively. However, in September, the Federal Air Transport Agency reduced the funding by 2.3 billion rubles and allocated it to other airlines. Despite an increase in international passenger traffic by almost 300%, Utair did not meet the criteria, as its passenger turnover in the Russian Federation did not reach 60% of the 2021 level, with a minimum of 72%. Nevertheless, the company received most of the remaining 4.6 billion rubles and the Federal Air Transport Agency did not demand from Utair the return of 4.6 billion rubles of an "anti-sanction" subsidy, despite the fact that in April-October the carrier flew less than 60% of 2021's levels in the country and increased flights abroad by 3.6 times.

Finally, PJSC Utair resumed flights of four Boeing 737s after a one-year downtime which were decommissioned last March at the request of foreign leasing companies. Before Russia's military operation in Ukraine in February last year, Utair had 59 aircraft in its fleet, but it had to transfer 50 out of the 59 airliners to the Russian register due to international sanctions and the suspension of airworthiness certificates by the Bermuda aviation authorities, where most of the imported aircraft of Russian companies were registered. The remaining nine Boeing 737-800s had to be taken out of service because they were on operating lease from foreign leasing companies, and PJSC Utair couldn't buy them as planned. Earlier, the company had planned to purchase the remaining nine Boeing 737-800 aircraft to operate them and maintain its reputation as a reliable customer, but as of now, only four of the aircraft have been acquired and put back into operation.

To conclude, PJSC Utair post sanctions turnaround strategy includes operating initiatives that supposed to help the company cope with challenges it faced and to support growth initiatives in 2023.

In terms of operational restructuring, the company changed focus and began to develop overseas destinations. At the same time, the company continued to open new flights in Russia, increase its helicopter operations in Siberia and the Urals. It is also necessary to note the actions of the company's management, thanks to which, during the negotiations, the leased aircraft were purchased and registered on the territory of the Russian Federation.

There are no actions oriented to managerial restructuring of the company because all of the top-management saved their positions. Also, the company did not hold the financial restructuring as it demonstrates quite stable financial position.

There was no portfolio restructuring since the company did not express any intention to restructure its other business units such as helicopter business and airplane business.

Comparative analysis of stakeholder value creation through business turnaround in Russian airlines

Accounting approach

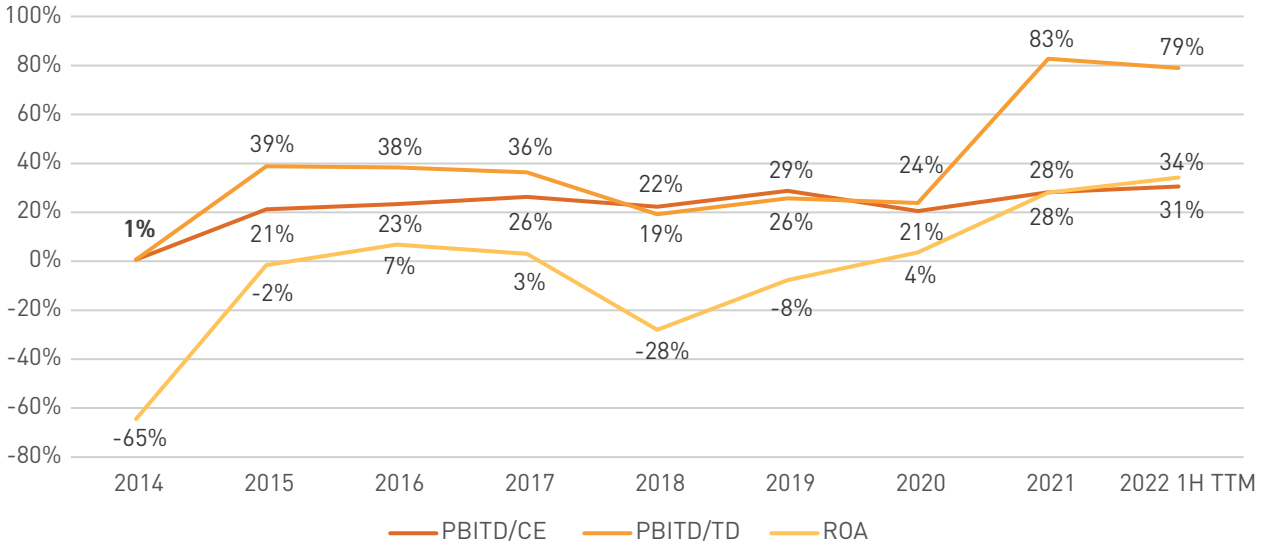
To assess the effectiveness of companies' turnaround strategies it suggested to use both traditional indicators based on accounting data – different ratios and coefficients, as well as metrics of a more modern approach of VBM. As mentioned earlier, the use of an approach based on coefficients and metrics obtained from financial statements is necessary not only for a brief analysis of the turnaround strategies effectiveness, but also for comparing the results of such approach with the results of a more comprehensive VBM one.

The main sources for data search are Bloomberg and Thomson Reuters systems, financial and non-financial reports of companies, as well as other public data provided by companies that are the objects of the study. To calculate accounting metrics for PJSC Utair, the data from consolidated reporting according to IFRS standards for the period from 2014 to the latest available period, namely 1 half of 2022 will be used. In turn, for Pobeda LLC, data collected from RAS reporting since between 2014 and 2022 will be used.

Firstly, let us compare the profitability of the PJSC Utair and LLC Pobeda in relation to the long-term capital attracted for the activities and the efficiency of the assets used. It is supposed to use PBITD/CE, PBITD/TD and ROA. An analysis of PJSC Utair's performance reveals that the company experienced a significant recovery after the 2014 crisis, then company's performance fell against the backdrop of a deterioration in the company's financial condition in 2018, and again began its gradual recovery with acceleration in the period after the COVID-19 recovery. It is noteworthy that from 2018 to 2020 PBITD / CE, PBITD / TD are practically at the same level, which indicates that the company actually operates at the expense of creditors. The situation changes in 2021 after the completion of the financial restructuring.

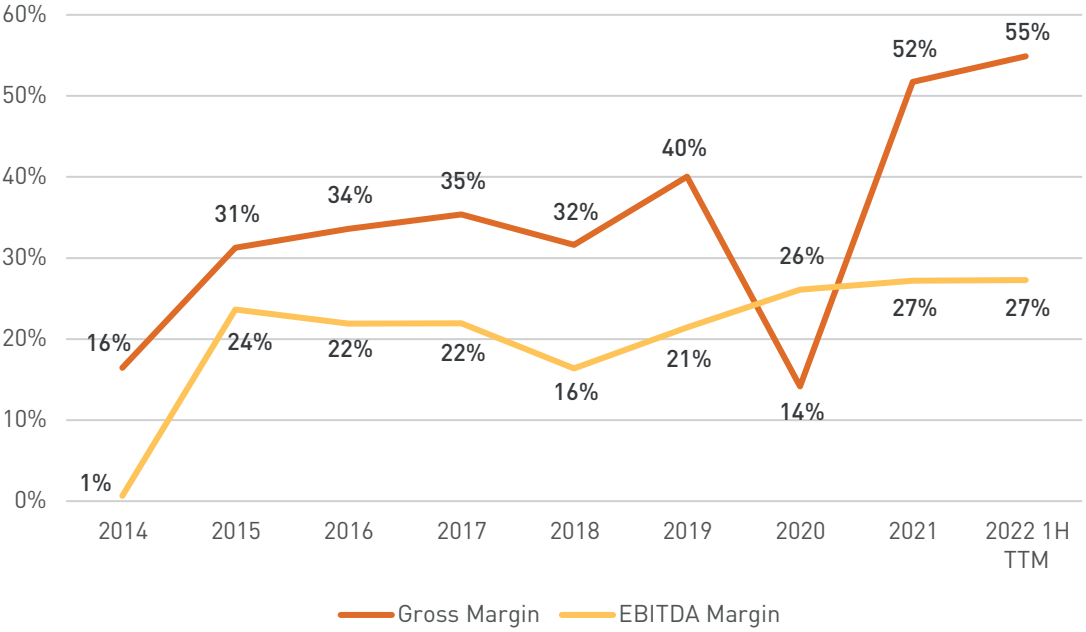
It should be noted that after the crises of 2020 and 2022 the company remains relatively stable: a slight decline in PBITD/TD and an increase in ROA (Figures 1–2).

Figure 1. Efficiency of use of assets and capital of PJSC Utair



Source: Authors' calculations.

Figure 2. Operating profitability of PJSC Utair



Source: Authors' calculations.

However, in the case of LLC Pobeda, it is advisable to exclude the PBITD/TD indicator from the analysis. According to the company's RAS (Russian Accounting Standards) reporting, Pobeda has no interest-bearing loans or borrowings. This can be attributed to its position within the Aeroflot group of companies, which likely provides non-lending mechanisms for redistributing funding within the group. Therefore, when assessing Pobeda, it is more appropriate to consider the PBITD/CE (Profit Before Interest, Taxes, Depreciation, and Amortization to Capital Employed) and ROA (Return on Assets) indicators.

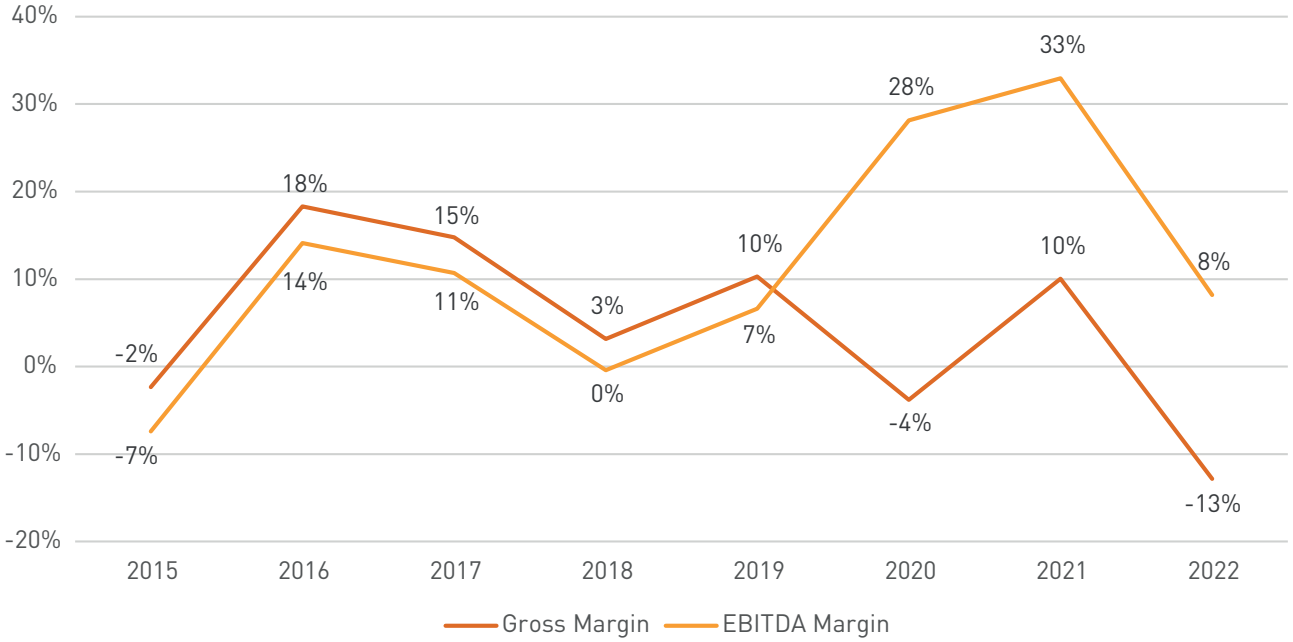
Examining these indicators reveals a weaker overall trend for Pobeda. The company experienced a notable recovery from the 2014 crisis but has shown a gradual decline over the past six years. In terms of return on capital employed and asset efficiency, Pobeda has struggled to recover from the 2020 crisis. While the near-zero growth rate may indicate some resilience to the 2022 crisis, the financial performance remains weaker compared to PJSC Utair. However, in the case of LLC Pobeda, it is advisable to exclude the PBITD/TD indicator from the analysis. According to the company's RAS (Russian Accounting Standards) reporting, Pobeda has no interest-bearing loans or borrowings. This can be attributed to its position within the Aeroflot group of companies, which likely provides non-lending mechanisms for redistributing funding within the group. Therefore, when assessing Pobeda,

it is more appropriate to consider the PBITD/CE (Profit Before Interest, Taxes, Depreciation, and Amortization to Capital Employed) and ROA (Return on Assets) indicators. Examining these indicators reveals a weaker overall trend for Pobeda. The company experienced a notable recovery from the 2014 crisis but has shown a gradual decline over the past six years. In terms of return on capital employed and asset efficiency, Pobeda has struggled to recover from the 2020 crisis. While the near-zero growth rate may indicate some resilience to the 2022 crisis, the financial performance remains weaker compared to PJSC Utair.

In order to evaluate operating profitability, Gross Margin and EBITDA Margin will be studied. Looking at the dynamics of PJSC Utair's operating margin (Figure 1), one can see a very sharp recovery from COVID-19 and relatively stable performance for the first half of 2022.

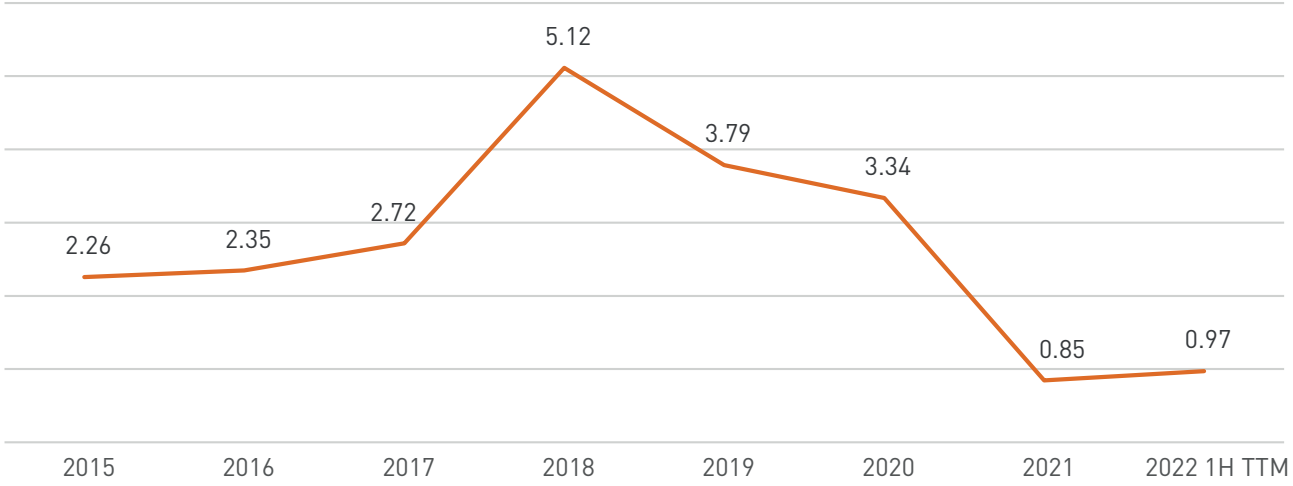
Gross margin exceeds 50% and EBITDA Margin exceeds 25%. The company demonstrates the relative stability of the business model in terms of return on sales. In turn, the profitability of the Russian low-cost carrier LLC Pobeda shows a significant drop of more than 20 percentage points in terms of Gross Margin and EBITDA Margin. The company's low financial strength led the company to achieve negative gross margin in 2022 (Figures 3–4).

Figure 3. Operating profitability of LLC Pobeda



Source: Authors' calculations.

Figure 4. Net Debt to EBITDA ratio PJSC Utair



Source: Authors' calculations.

Finally, let us evaluate the company's debt burden and assess the likelihood of companies' bankruptcy before 2022 crisis and at the last available date. There is no chance to calculate the debt burden metrics for LLC Pobeda because it is a zero-debt company that has neither long-term nor short-term interest-bearing debt according to RAS financial statement. However, it is possible to calculate Net Debt to EBITDA and Financial Leverage ratios for PJSC Utair. There is a steady decrease in debt burden of the company since the peak of 2018 caused by attracting credit leverage to cope with poor economic conditions. The financial restructuring that company totally finished in 2021 results in great reduction of debt. Notably that company does not increase debt amid severe sanctions pressure in 2022. Calculating Financial Leverage will not allow to get additional information about company's debt burden because there are many periods in which denominator is a negative value due to the significant accumulated loss.

Having considered the effectiveness of the anti-crisis turnaround strategies implemented by Russian airlines PJSC Utair and LLC Pobeda in 2022 in terms of analyzing key accounting indicators, two main conclusions can be drawn:

- Historically, the financial performance of PJSC Utair looks stronger than LLC Pobeda. This applies both to indicators of the effectiveness of the use of long-term capital and assets, and operating profitability.
- PJSC Utair's accounting-based performance shows greater resilience to the 2022 crisis triggered by external sanctions pressure than LLC Pobeda's performance. According to the results of the first half of 2022, PJSC Utair shows a slight decrease in the efficiency of its capital employed and a drop in operating profitability against the backdrop of a slight increase in leverage (Figure 5).

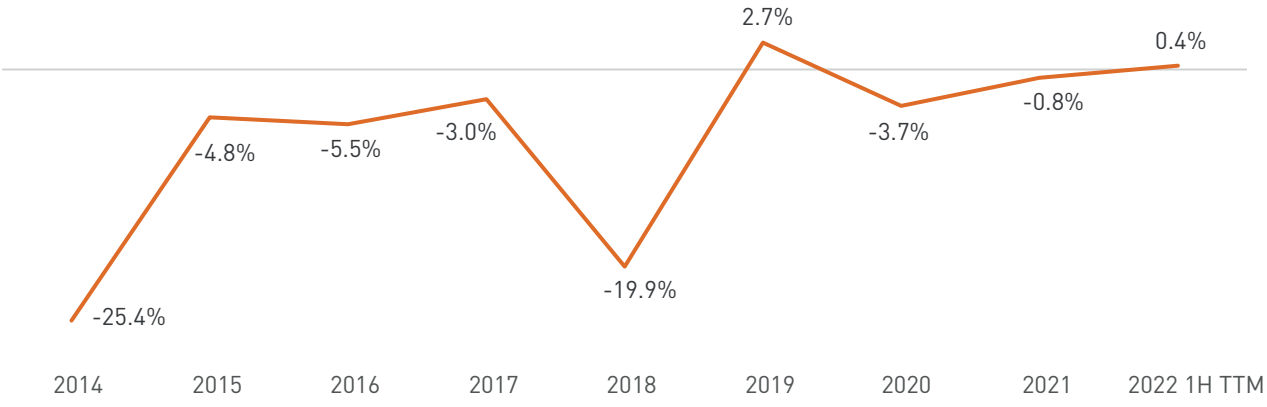
Value based management approach

At the second stage of evaluating the effectiveness of turnaround strategies, it is proposed to turn to more advanced financial analysis metrics that take into account the concept of required return or investment opportunity costs and reflect the increment or destruction of the company's intrinsic value. According to the VBM approach, it is proposed to calculate EVA in order to evaluate whether the company generates additional income on the invested capital or not.

When analyzing PJSC Utair, it becomes evident that the EVA (Economic Value Added) indicator has shown a consistent downward trend since 2014, indicating a continuous erosion of the company's internal value. The EVA indicator has consistently generated negative values in almost every year. The only instances of positive values occurred in 2019, following a substantial reduction in the cost of debt, and in the first half of 2022. Notably, there was a significant drop in EVA in 2018, which was primarily caused by the company's default on its debt obligations.

The dynamic of EVA spread allows looking at performance of PJSC Utair from another side. There is sharp decrease of EVA spread in 2018 and a great recovery after financial distress. Positive EVA spread confirms the effectiveness of financial restructuring that started in 2019. The major beneficiaries are shareholders of the company. As it was mentioned, the restructuring finished by writing-down the significant amount of debt, so it is impossible to say that the restructuring was also effective for creditors of the company. There is another drop in EVA spread in 2020 caused by the Pandemic and recovery in 2021. It should be noted that despite the severity of sanctions and prohibitions introduced by west regulators in 2022 the PJSC Utair was able to create value for shareholders (EVA > 0 in 2022 1H).

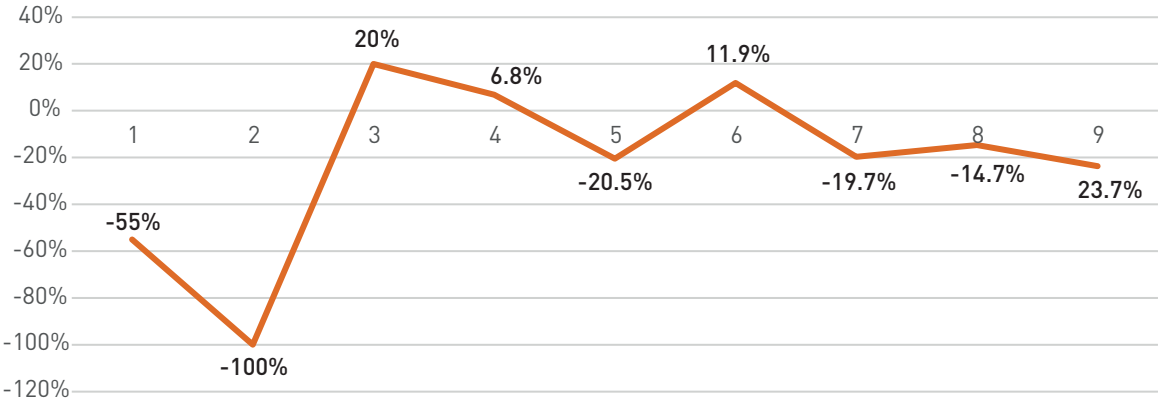
Figure 5. EVA spread for PJSC Utair



Source: Authors' calculations.

As well as financial performance of the LLC Pobeda based on accounting approach, performance based on VBM approach is poorer than PJSC Utair ones. Until 2019 there is near zero dynamic of cumulative EVA figure, however the situation changed rapidly in 2020. It is possible to see sharp decrease of EVA. It seems that the effectiveness of company operations was greatly worsen. It is partly true but it should be noted that actually such a deep decline is mainly connected with the great increase of Capital employed in 2020 in comparison with 2019 and earlier periods. Anyway, it is possible to state the presence of deteriorating of company's value for financial stakeholders, precisely Aeroflot Holding Company that owns 100% of LLC Pobeda.

Figure 6. EVA spread for LLC Pobeda



Source: Authors' calculations.

To have a deeper look at the ability of LLC Pobeda to create value for financial stakeholders through business restructuring after sanctions of 2022 it is proposed to look at EVA spread figure (Figure 6).

There is clear evidence that LLC Pobeda has not been created internal value since the crisis of 2020. There was a trial to improve situation in 2021: EVA spread increased by 5 percentage points but still was negative. In 2022 there is a new round of internal value destruction that does not allow to conclude that the company's turnaround strategy is effective enough.

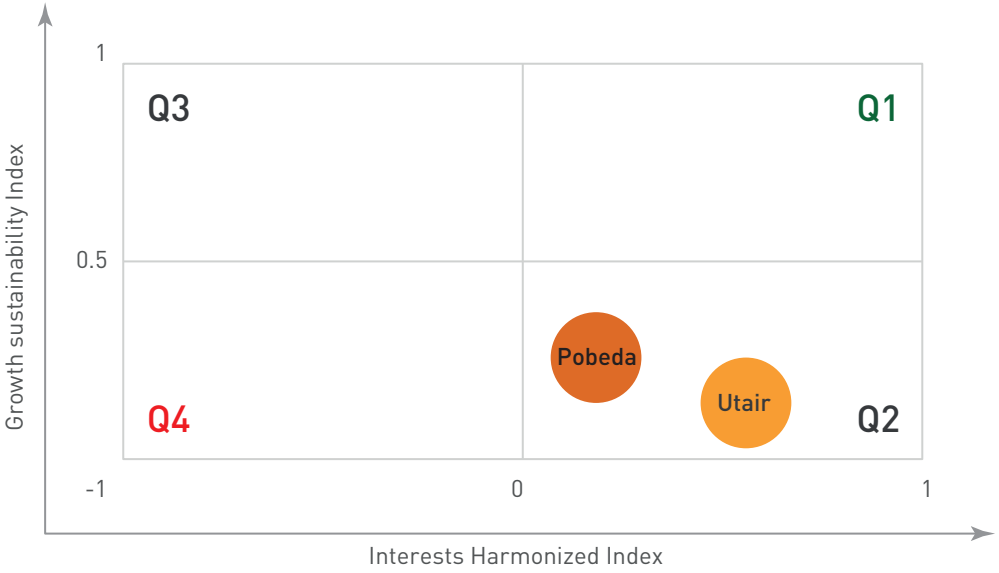
Growth sustainability matrix

To conclude the comparative analysis of stakeholder value creation through business turnaround in Russian airlines it is suggested to create the Growth sustainability matrix that comprise two components: Interests harmonized index (IHI) and Sustainable growth index (SGI).

The IHI index measures changes that result from actions and decisions made within a strategic alternative to meet the interests of key stakeholders. It is proposed to evaluate key actions and decisions made by management of companies in order to cope with challenges and instability of 2022 crisis. According to the analysis of key initiatives within turnaround strategies of companies, the IHI index for LLC Pobeda is 0.22 and for PJSC Utair is 0.42 that means that PJSC Utair is more oriented to consider interests both of financial and non-financial stakeholders. It is assumed that PJSC Utair is in a more favorable position to ensure the growth of internal company's value. Harmonization of stakeholders' interests is a prerequisite for a company to achieve a long-term sustainable growth.

Taking into account both SGI and IHI indexes it is proposed to create the Growth sustainability matrix (Figure 7).

Figure 7. Growth sustainability matrix for LLC Pobeda and PJSC Utair



Source: Authors' calculations.

Based on the matrix analysis, both LLC Pobeda and PJSC Utair are positioned in Quadrant Q2, which signifies a situation where the companies have not generated sufficient economic returns on their invested capital in most periods. However, the growth strategy pursued by these companies does not adversely affect the harmonious alignment of interests between the companies and their strategic non-financial stakeholders. Being situated in this quadrant allows the companies to potentially generate positive economic profit through stable relationships and the absence of conflicts of interest with non-financial stakeholders.

Nevertheless, despite the fact that PJSC Utair has lower SGI value it has positive dynamic in contrast to LLC Pobeda. With the fact that its turnaround strategy is more oriented to take into account interests of all major stakeholders it is possible to assume that PJSC Utair has a good opportunity to achieve a sustainable growth after the period of instability finishes.

Conclusion

Within the framework of this study, there was an applied problem of identifying the key challenges faced by Russian airlines after the introduction of sanctions in 2022 solved and the effectiveness of turnaround strategies implemented by Russian airlines in terms of creating value both for financial and non-financial stakeholders was evaluated.

As the results of the study, the following insights can be highlighted:

1) The study considered the major features of the financial difficulties experienced by Russian airlines due to the sanctions imposed in 2014. It also analyzed the subsequent actions to cope with negative effects of external shocks.
2) The use of a new approach in the field of assessing the effectiveness of business restructuring is proposed, the main purpose of which is to consider the effectiveness of turnaround through creating internal value of the company for both financial and non-financial stakeholders.
3) The study analyzed cases of airline turnarounds in the developing Russian market following the 2022 sanctions. It identified the main challenges caused by Western restrictions, determined the measures implemented by management to stabilize the situation, and evaluated the effectiveness of these business turnaround strategies in terms of value creation for stakeholders.

Using the method of evaluating the effectiveness of turnaround strategies, based on the calculation of traditional accounting ratios and coefficients, it was observed that PJSC Utair demonstrated greater resilience to the 2022 sanctions compared to LLC Pobeda. This was supported by stronger financial performance, including the effective utilization of long-term capital and assets, as well as higher operating profitability.

Furthermore, an evaluation of the effectiveness of turnaround strategies using metrics from the Value-Based Management approach revealed that financial performance of LLC Pobeda was weaker than PJSC Utair one. LLC Pobeda failed to create internal value since the 2020 crisis, and despite attempts to improve the situation in 2021, there was another decline in internal value in 2022. Conversely, despite the severity of the 2022 sanctions and regulatory restrictions imposed by Western entities, PJSC Utair was able to generate value for its shareholders in the first half of 2022.

To evaluate whether the turnaround strategies of Russian airlines created value for both financial and non-financial stakeholders, a growth sustainability matrix was constructed. The analysis suggests that PJSC Utair has an opportunity to achieve sustainable growth once the period of instability finishes, as its turnaround strategy takes into account the interests of all major stakeholders. While both LLC Pobeda and PJSC Utair avoid violation of stakeholders' interests, the negative trend in creating internal value for financial stakeholders in LLC Pobeda may indicate that the company's turnaround strategy is less effective compared to the PJSC Utair one.

References

1. Hotchkiss E.S., John K., Mooradian R.M., et al. Chapter 14 - Bankruptcy and the Resolution of Financial Distress. *Handbook of empirical corporate finance*. 2008;2:235-287. https://doi.org/10.1016/B978-0-444-53265-7.50006-8
2. Hopkins M. What is corporate social responsibility all about? *Journal of Public Affairs: An International Journal*. 2006;6(3-4):298-306. https://doi.org/10.1002/pa.238
3. Bibeault D. B. Corporate Turnaround: *How Managers Turn Losers into Winners* –1982. – Vol. 38, No. 1 – C. 10+77-78.
4. Hatipoglu E., Peksen D. Economic sanctions and banking crises in target economies. *Defence and Peace Economics*. 2018;29(2):171-189. https://doi.org/10.1080/10242694.2016.1245811
5. Eisdorfer A., Hsu P.H. Innovate to survive: The effect of technology competition on corporate bankruptcy. *Financial Management*. 2011;40(4):1087-1117. https://doi.org/10.1111/j.1755-053X.2011.01172.x
6. Gilson S.C., John K., Lang L.H.P. Troubled debt restructurings: An empirical study of private reorganization of firms in default. *Journal of financial economics*. 1990;27(2):315-353. https://doi.org/10.1016/0304-405X(90)90059-9
7. Hotchkiss E.S. Postbankruptcy performance and management turnover. *The Journal of Finance*. 1995;50(1):3-21. https://doi.org/10.1111/j.1540-6261.1995.tb05165.x

8. Alderson M.J., Betker B.L. Assessing post-bankruptcy performance: An analysis of reorganized firms' cash flows. *Financial Management*. 1999;28(2):68-82. https://doi.org/10.2307/3666196
9. Forte S., Peña J.I. Debt refinancing and credit risk. *The Spanish Review of Financial Economics*. 2011;9(1):1-10. https://doi.org/10.1016/j.srfe.2010.10.001
10. Bowman E.H., Singh H. Corporate restructuring: Reconfiguring the firm. *Strategic Management Journal*. 1993;14(S1):5-14. https://doi.org/10.1002/smj.4250140903
11. Hofer C.W. Turnaround strategies. *Journal of business strategy*. 1980;1(1):19-31. https://doi.org/10.1108/eb038886
12. Brickley J., Smith C., Zimmerman J. Transfer pricing and the control of internal corporate transactions. *Journal of Applied Corporate Finance*. 2020;32(1):120-127. https://doi.org/10.1111/jacf.12393
13. Kraemer Jr H.M., Mauboussin M.J., Rappaport A. A CEO's Playbook for Creating Long-Term Value: Ten Essential Resource Allocation Practices. *Journal of Applied Corporate Finance*. 2020;32(3):108-117. https://doi.org/10.1111/jacf.12423
14. John K., Lang L.H.P., Netter J. The voluntary restructuring of large firms in response to performance decline. *The Journal of Finance*. 1992;47(3):891-917. https://doi.org/10.1111/j.1540-6261.1992.tb03999.x
15. John K. Managing financial distress and valuing distressed securities: A survey and a research agenda. *Financial Management*. 1993;22(3):60-78.
16. Dial J., Murphy K.J. Downsizing and Value Creation at General Dynamics: A PE-Like Solution for Industries That Must Shrink. *Applied Corporate Finance*. 2021;33(3):114-124. https://doi.org/10.1111/jacf.12468
17. Denis D.J., Kruse T.A. Managerial discipline and corporate restructuring following performance declines. *Journal of financial economics*. 2000;55(3):391-424. https://doi.org/10.1016/S0304-405X(99)00055-0
18. Denis D.K., Shome D.K. An empirical investigation of corporate asset downsizing. *Journal of Corporate Finance*. 2005;11(3):427-448. https://doi.org/10.1016/j.jcorpfin.2004.04.003
19. Hakkala K. Corporate restructuring and labor productivity growth. *Industrial and Corporate Change*. 2006;15(4):683-714. https://doi.org/10.1093/icc/dtl015
20. Markides C.C. Diversification, restructuring and economic performance. *Strategic management journal*. 1995;16(2):101-118. https://doi.org/10.1002/smj.4250160203
21. Milano G.V., Whately R., Tomlinson B., et al. A Deeper Look at the Return on Purpose: Before and During a Crisis. *Journal of Applied Corporate Finance*. 2021;33(2):95-111. https://doi.org/10.1111/jacf.12460
22. Barker III V.L., Patterson Jr P.W., Mueller G.C. Organizational causes and strategic consequences of the extent of top management team replacement during turnaround attempts. *Journal of management Studies*. 2001;38(2):235-270. https://doi.org/10.1111/1467-6486.00235
23. Mueller G.C., Barker III V.L. Upper echelons and board characteristics of turnaround and nonturnaround declining firms. *Journal of Business Research*. 1997;39(2):119-134. https://doi.org/10.1016/S0148-2963(96)00147-6
24. Elloumi F., Gueyié J.P. Financial distress and corporate governance: an empirical analysis. *Corporate Governance*. 2001;1(1):15-23. https://doi.org/10.1108/14720700110389548
25. 25. Pandit N.R. Some recommendations for improved research on corporate turnaround. *M@n@gement*. 2000;3(3):31-56.
26. Eberhart A.C., Altman E.I., Aggarwal R. The equity performance of firms emerging from bankruptcy. *The Journal of Finance*. 1999;54(5):1855-1868. https://doi.org/10.1111/0022-1082.00169
27. Franzen L.A., Rodgers K.J., Simin T.T. Measuring distress risk: The effect of R&D intensity. *The Journal of Finance*. 2007;62(6):2931-2967. https://doi.org/10.1111/j.1540-6261.2007.01297.x
28. Zimmerman B. J. A social cognitive view of self-regulated academic learning. *Journal of educational psychology*. 1989;81(3):329-339. https://doi.org/10.1037/0022-0663.81.3.329
29. Acharya V.V., Subramanian K.V. Bankruptcy codes and innovation. *The Review of Financial Studies*. 2009;22(12):4949-4988. https://doi.org/10.1093/rfs/hhp019
30. Love E.G., Kraatz M. Character, conformity, or the bottom line? How and why downsizing affected corporate reputation. *Academy of management Journal*. 2009;52(2):314-335. https://doi.org/10.5465/amj.2009.37308247
31. Sudarsanam S., Lai J. Corporate financial distress and turnaround strategies: An empirical analysis. *British Journal of Management*. 2001;12(3):183-199. https://doi.org/10.1111/1467-8551.00193
32. Berman S.L., Wicks A.C., Kotha S., et al. Does stakeholder orientation matter? The relationship between stakeholder management models and firm financial performance. *Academy of Management journal*. 1999;42(5):488-506. https://doi.org/10.2307/256972

33. Perrini F., Tencati A. Sustainability and stakeholder management: the need for new corporate performance evaluation and reporting systems. *Business strategy and the environment*. 2006;15(5);296-308. https://doi.org/10.1002/bse.538

34. Ivashkovskaya I.V. Strategic monitoring of value creation for all stakeholders of the company. *Finansy: teoriya i praktika. = Finance: theory and practice*. 2008;(3):69-85. (In Russ.)

35. Ivashkovskaya I. Assessing the sustainability of the company's growth: the stakeholder approach. *Finansy i kredit = Finance and Credit*. 2010;16(43):14-18. (In Russ.)

Contribution of the authors: the authors contributed equally to this article.

The authors declare no conflicts of interests.

The article **was submitted** 10.10.2023; **approved after reviewing** 12.11.2023; **accepted for publication** 05.12.2023.

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.78-92
JEL classification: G30, G32

How Do Inclusive Growth Practices Affect Financial Performance and the Value of Metallurgy Companies?

Evgeniia Naumova ✉
Chief Financial Officer Virazh LLC, Moscow, Russia,
e.b.naumova@gmail.com, ORCID

Gleb Silkin
Senior analyst, Department of Structured Products and Structuring, VTB Bank, Moscow, Russia,
silkin_gleb@yahoo.com, ORCID

Abstract

The article examines inclusive growth practices used in metallurgical companies and assesses their impact on financial results and value. An analysis of data from 102 of the largest companies in the metals industry between 2016 and 2021 showed that reducing greenhouse gas emissions, improving air quality, proper waste disposal, building an inclusive supply chain, respecting human rights and building community relations in the places where the company operates have a positive impact on its financial results and value. The results of the study can be used by top managers of metallurgical companies to formulate an inclusive growth strategy that meets the interests of all stakeholders, which will improve financial results and contribute to the growth of company value.

Keywords: sustainable development, inclusive growth, metallurgy, environmental practices, social practices, human capital practices, business model and innovation, management practices, financial results, company value

For citation: Naumova E., Silkin G. (2023) How Do Inclusive Growth Practices Affect Financial Performance and the Value of Metallurgy Companies? *Journal of Corporate Finance Research.* 17(4): 78-92. https://doi.org/10.17323/j. jcfr.2073-0438.17.4.2023.78-92

Introduction

In recent decades companies have been paying increasing attention to ESG agenda (environment, social and governance factors), sustainable development and inclusive growth, which ensures an improvement of the quality of life and equal opportunities for all population groups. The investors heed attention to ESG ratings increasingly more frequently when making investment decisions, while ESG funding market grows annually [1]. According to McKinsey's research, the companies that improved their ESG ratings surpassed their competitors in *total shareholder return* (TSR) in 2017–2021 [2]. In this case, such companies have to focus not just on their ESG image, but also on the real benefit they provide to all their stakeholders. For this purpose, they have to determine the priority inclusive growth practices. A consistent implementation of such practices will improve the *total societal impact* (TSI) [3], generating value for the whole society instead of just stakeholders. We also are going to use *return on assets* (ROA), which shows the company's performance and relative TSR (RTSR) (hereinafter – PREMIUM), which is calculated as the deviation of the total shareholder return from the mean value (calculated in the same way and within the same period) for the industry.

In this research inclusive growth practices are considered using the metallurgical industry as an example that is, on the one hand, a driver for machine building and construction and, on the other hand, one of the main sectors that adversely affects the environment. Thus, in 2021 approximately 8% of the total greenhouse gas emissions accrued to metallurgy [4].

The research objective is to evaluate the influence of the effectiveness of various inclusive growth practices on financial performance and the value of metallurgical companies.

In order to achieve this objective, it is necessary to:

- define the inclusive growth practices that are prioritized by metallurgical companies;
- review the academic literature that examines the influence of the practices on financial performance and the value of companies;
- generate hypotheses about influence of inclusive growth practices on financial performance and company value on the basis of the academic literature review;
- assess the hypotheses about influence of the effectiveness of each priority practice on financial performance and company value;
- draw conclusions on the basis of the obtained results.

The *research object* is 102 largest metallurgical companies from different countries with publicly available non-financial information for the analyzed period (2016–2021).

The research subject is the influence of the effectiveness of inclusive growth practices of metallurgical companies.

The academic novelty of the research consists in the following:

- defining the inclusive growth practices for metallurgical companies and determining the indicators of their effectiveness that are constituent parts of TSI;
- use the economic profit spread (EPS, hereinafter – SPREAD) as the intrinsic value indicator, which is calculated as the difference between the return on invested capital and the weighted average capital cost, and PREMIUM – as the market value indicator. These indicators have not been used before in the studies that analyze the influence of certain inclusive growth practices on company value.

The research is *practically relevant* because its results may be used by top managers of metallurgical companies to develop an inclusive growth strategy which serves the interests of all stakeholders, by investors to make investment decisions and other company stakeholders to build relationships with them.

Influence of the Effectiveness of Various Inclusive Growth Practices on Financial Performance and the Value of Companies

According to the standards of the Sustainability Accounting Standards Board (SASB), inclusive growth practices are subdivided into five components: 1) environmental practices; 2) social practices; 3) human capital practices; 4) business model and innovation; 5) management practices.

Environmental Practices

In spite of an enormous number of publications, there is no consensus among the scientists concerning the interrelation between the environmental practice and corporate financial results [5].

The proponents of *trade-off theory*, for example, T. Levitt [6] and S. Feldman [7], asserted that environmental practices involved use of company resources, such as labour and capital, hence, they brought about lower financial results and erosion of competitiveness [8]. Thus, in their opinion, voluntary environmental impact mitigation is considered to be charity, which is against the profit maximization concept [9].

The defenders of another approach base their position upon the *win-win or mutually beneficial strategy,* in which environmental practices enable the company to enhance its competitiveness. Thus, Porter states that although environmental regulation may be associated with extra expenditures, it also provides an impetus to research and development and encourages application of new technology in order to boost profits [10]. The most important theoretical foundations of this strategy are the natural resource-based approach and the stakeholder theory.

According to the *natural resource-based approach* introduced by S. Hart [11] a reduction in the company's environmental impact promotes the development of rare and

unique organizational resources and capabilities, and this entails a competitive advantage and better financial results [12].

The *stakeholder theory* [13] also explains the positive relationship between environmental practices, financial results and company value. Meeting the requirements of stakeholders, the company may gain such competitive advantages as better reputation, building long-term relationships with customers, suppliers, employees and other stakeholders [5]. Also, the company may improve its relations with investors, mitigating market risks and increasing capital value [14].

The *environmental practices of inclusive growth for metallurgical companies* are as follows: reducing greenhouse gas emissions and air pollution; efficient energy utilization; water resources management; waste management; influence on biodiversity and land resources.

Social Practices

In most cases in academic literature *social practices* and *practices of respecting human rights* are considered as a component of *corporate social responsibility* (CSR). The fundamental research project dedicated to CSR [15] asserts that it comprises economic, legal, ethical and philanthropic expectations that any society has in relation to any business. M. Porter and M. Kramer in 2011 stated the "shared value" concept [16], which is defined as the "policies and operating practices that enhance the competitiveness of a company while simultaneously advancing social and economic conditions in the communities in which it operates". The conventional view is that CSR is expensive because social responsibility entails extra expenditures and results in the deterioration of competitivity [17].

There are several theories that explain a positive relationship between CSR and corporate financial results.

According to *stakeholder theory,* in order to operate efficiently a company has to meet not just the requirements of its shareholders, but also those of other important stakeholders [18; 19].

In conformance with the *resource-based approach,* meeting the requirements of stakeholders is considered a strategic initiative [20]. As a result, companies develop valuable, rare and irreplaceable assets, such as leadership and positive social reputation.

From the point of view of the *transaction costs economics,* one may assert that companies try to satisfy the requirements of stakeholders in order to minimize potential transaction costs [21–23].

A generally recognized reason for the varied and contradictory results of the search for the relationship between CSR and financial results is the measurement problem [24]. There are four main methods of CSR measurement.

The first and most widespread method is compiling CSR ratings [25] including the Dow Jones Sustainability Index (DJSI) established by Standard and Poor's in 1999, MSCI KLD, ratings made by analytical agencies Bloomberg and Refinitiv. The second, also widespread method of CSR measurement, is the content analysis of corporate communication of a company with stakeholders. The third method involves polling. The fourth method of CSR measurement consists in applying one-dimensional indicators that focus on only one indicator, for example, charity [24].

Human Capital Practices

According to SASB, *the share of employees who are members of independent trade union organizations and signatories to collective employment agreements* is an important indicator for metallurgical and mining companies.

There are two contradictory approaches to explaining the influence of trade unions on companies' performance in academic literature. One group of scientists – proponents of *conventional theory* – thinks that an increase in salaries, improvement of working conditions, enhancement of occupational safety involve extra expenditures of companies, thus, a decrease in corporate financial results [26; 27]. The other group of scientists – defendants of the *collective voice and institutional response theories* – believe that serving the interests of employees may have a positive impact on labour efficiency, thus, improve financial results [28].

Apart from trade unions, an important practice for the metallurgical industry is *work conditions safety*. Obviously, any personnel injury or death incident has a negative impact on corporate financial results. Moreover, the company is obliged by the government to ensure safe work conditions.

Another inclusive practice important for metallurgical companies is the narrowing of the gap between the *top management's salaries and the average employee salary*. E. Lazear and S. Rosen proposed the *tournament theory,* which stated that employees may be remunerated for their rank in the organization because they had applied more efforts for their career progress [29].

But some scientists support the *behaviour theory,* also known as *social comparison theory,* which holds that for self-evaluation in the absence of objective criteria people compare themselves with others. As a consequence, a serious gap between employee salaries may produce a negative effect on their motivation [30].

The last important practice of human capital development for the metallurgical industry is *personnel training*. It enables the employees to adapt to new technology, enhance efficiency and productivity. The organizations that invest in the effective training and development of human resources, as a rule, gain both short-term and long-term benefits [31; 32].

Business Model Practices

According to SASB, *supply chain management* is an important practice for mining companies out of the *practices of business model and innovation management*. The standards state that these practices comprise verification, selection, monitoring and interaction with suppliers in relation to their impact on the environment and social sphere, environmental responsibility, human rights, working practice, ethics, corrupt practices etc.

In academic literature supply chains are subdivided into *green, sustainable* and *social* ones. In general, the logic of the influence of the green and sustainable supply chain management on corporate financial results is similar to the logic of influence of environmental practices. However, an enhancement of companies' performance may also be achieved by means of improving cooperation between suppliers [33] and development of new opportunities within green supply chains [34]. Social responsibility practices also lead to the enhancement of corporate performance due to risk mitigation along the whole supply chain and more active participation of stakeholders [35].

Management Practices

Adherence to *business ethics* and *risk management* are *management practices* important for the metallurgical industry. Unethical behaviour has a negative influence on reputation and, ultimately, on company value [36]. Such influence is due to the effect of the legitimacy theory, according to which the management tries to control people's perception, creating a good reputation or corporate image [37].

Influence of corrupt practices on financial results and company value should be considered separately. Thus, R.J. Fisman et al. used a sample of 88,000 companies in 141 countries in 2006–2020 and discovered that companies that do not make non-official payments, as a rule, grow slower than the ones that hand out bribes [38]. At the same time, influence of corrupt practices is stronger (weaker) in the countries with a stronger (weaker) defense provided for shareholders.

The last practice is *risk management,* which is considered to be one of the key mechanisms that assist companies in attainment of their goals, improvement of their financial reports and protection of their reputation [39]. Absence of information on risk management may mislead investors when they make investment decisions.

Research Hypotheses Advancement

On the basis of the analysis of literature dedicated to the assessment of the influence of the inclusive growth practices on financial results and company value we may advance the research hypotheses.

The first hypothesis is related to environmental practices:

H1: *Effectiveness of environmental practices of inclusive growth has a positive influence on financial results and company value.*

Since the metallurgical industry influences the environment in several ways, the effectiveness of environmental practices should be measured by several indicators. For this reason, we have to generate a hypothesis for each indicator individually (Table 1).

Table 1. Hypotheses of effectiveness of environmental practices

Hypotheses	ROA	SPREAD	PREMIUM
Reducing greenhouse gas emissions	H.1.1.1	H.1.1.2	H.1.1.3
Reducing emissions of the nitrogen oxide group	H.1.2.1	H.1.2.2	H.1.2.3
Reducing emissions of the sulphur oxide group	H.1.3.1	H.1.3.2	H.1.3.3
Consumption of renewable energy	H.1.4.1	H.1.4.2	H.1.4.3
Reducing water intake from water bodies	H.1.5.1	H.1.5.2	H.1.5.3
Reducing waste generation	H.1.6.1	H.1.6.2	H.1.6.3
Reducing hazardous waste generation	H.1.7.1	H.1.7.2	H.1.7.3
Growth of the waste recycling coefficient	H.1.8.1	H.1.8.2	H.1.8.3
Initiatives of reducing influence on land resources	H.1.9.1	H.1.9.2	H.1.9.3

Source: compiled by the author.

Then we have to generate the hypotheses on the effectiveness of social practices:

H2: *Effectiveness of social practices of inclusive growth has a positive influence on financial results and company value.*

Since the effectiveness of social practices and effectiveness of corporate operations are measured by several indicators, we have to generate a hypothesis for each indicator individually. We are going to use the indicator of awards for social/public activities (AWARD) and ESG-ratings: ESG Community Score and ESG Human Rights Score (Table 2).

Table 2. Hypotheses on effectiveness of social practices

Hypotheses	ROA	SPREAD	PREMIUM
AWARD	Hypothesis H.2.1.1	Hypothesis H.2.1.2	Hypothesis H.2.1.3
ESG Community Score	Hypothesis H.2.2.1	Hypothesis H.2.2.2	Hypothesis H.2.2.3
ESG Human Rights Score	Hypothesis H.2.3.1	Hypothesis H.2.3.2	Hypothesis H.2.3.3

Source: compiled by the author.

The next practice is the one related to human capital. The first important indicator of this practice is trade union activity in the company. On the basis of collective voice and institutional response theories, we consider the following hypotheses:

H3.1.1: *Representation of employees' interests by trade unions produces a positive influence on ROA.*

H3.1.2: *Representation of employees' interests by trade unions produces a positive influence on SPREAD.*

H3.1.3: *Representation of employees' interests by trade unions produces a positive influence on PREMIUM.*

The second important indicator of this practice is the relationship between the traumatism, financial results and company value.

H.3.2.1: *Reduction in the general traumatism ratio has a positive influence on ROA.*

H.3.2.2: *Reduction in the general traumatism ratio has a positive influence on SPREAD.*

H.3.2.3: *Reduction in the general traumatism ratio has a positive influence on PREMIUM.*

The third important indicator of this practice is the influence of the gap between the top management's salaries and the average employee salary on financial results and company value.

H.3.3.1: *Reduction in the ratio of the salary gap produces a positive influence on ROA.*

H.3.3.2: *Reduction in the ratio of the salary gap produces a positive influence on SPREAD.*

H.3.3.3: *Reduction in the ratio of the salary gap produces a positive influence on PREMIUM.*

The fourth important indicator of this practice is training of employees. Hypotheses on the influence of training are as follows:

H.3.4.1: *Training of employees has a positive influence on ROA.*

H.3.4.2: *Training of employees has a positive influence on SPREAD.*

H.3.4.3: *Training of employees has a positive influence on PREMIUM.*

The next practice is related to business model and innovation. Within this practice the supply chain management practice is the priority for metallurgical companies. The hypotheses on supply chain management are as follows:

H.4.1: *Management of an inclusive supply chain exerts a positive influence on ROA.*

H.4.2: *Management of an inclusive supply chain exerts a positive influence on SPREAD.*

H.4.3: *Management of an inclusive supply chain exerts a positive influence on PREMIUM.*

The last practice that we consider is the management practice that comprises adherence to business ethics and risk management. In relation to the influence of business ethics we set forth the following hypotheses:

H.5.1.1: *Disputes over business ethics, tax fraud, anticompetitive behaviour have a negative influence on ROA.*

H.5.1.2: *Disputes over business ethics, tax fraud, anticompetitive behaviour have a negative influence on SPREAD.*

H.5.1.3: *Disputes over business ethics, tax fraud, anticompetitive behaviour have a negative influence on PREMIUM.*

An efficient system of risk management is considered to be one of the key mechanisms that assist companies to achieve their goals, improve their financial reports and protect their reputation. The hypotheses on the effectiveness of risk management are as follows:

H.5.2.1: *Efficient risk management has a positive influence on ROA.*

H.5.2.2: *Efficient risk management has a positive influence on SPREAD.*

H.5.2.3: *Efficient risk management has a positive influence on PREMIUM.*

The Research Models and Description of Variables

The indicators of effectiveness, the intrinsic and market value of a company will be *dependent variables* in this research:

- ROA – as an *indicator of effectiveness* because the metallurgical industry is capital-intensive.
- SPREAD – as an *indicator of the intrinsic value* of the company. It allows to take into consideration alternative costs related to the invested capital risk.
- PREMIUM – as an *indicator of the market value*. We took the S&P Metals&Mining Select Industry Index as the industry average total shareholder return. It determines the total shareholder return for the companies that industry classifier GICS assigns to Metals&Mining.

Now we are going to consider *independent variables*. The *greenhouse gas emission factor* (GHG) shows the effectiveness of the practice for the reduction of greenhouse gas emissions. There is no point in using the absolute value of greenhouse gas emissions because the company may ramp up production and absolute emissions will grow, while emissions per a unit of manufactured products will decrease. It is more reasonable to consider the amount of emissions normalized by revenue.

According to the 1997 Kyoto Protocol, six categories of emissions are considered greenhouse gases in corporate reports: CO_2 (carbon dioxide), CH_4 (methane), N_2O (nitrous oxide), HFCS (fluorohydrocarbons), PFCS (perfluorohydrocarbon), SF_6 (sulfur fluoride) [40]. In the current research, greenhouse gas emissions take into consideration the first scope of emissions (Scope 1), which comprises direct emissions from the sources owned or controlled by the company and the second scope of emissions (Scope 2), which comprises indirect emissions from consumption of purchased electric power, heat or vapour that occur at the facility where the electric power, vapour or heat are produced.

Just like greenhouse gas emissions, the rest of the indicators of environmental effectiveness will be normalized by revenue. The emissions of the nitrogen oxide group (NOX) and the sulphur oxide group (SOX) are used as the air quality indicators. According to SASB, the nitrogen oxide group (NOX) comprises the following gases: NOx (nitrogen oxide), including NO (nitrogen oxide) and NO_2 (nitrogen dioxide); the sulphur oxide group (SOX) comprises: SO_2 (sulphur dioxide), SO (sulphur monoxide), SO_3 (sulfur trioxide).

Since energy consumption from unrenewable sources is the main reason for greenhouse gas emissions, it is pointless to add this indicator to the list of variables. Apart from that, an important aspect in the energy management practice is its consumption from renewable energy sources. However, the number of observations concerning the amount of the energy consumed from renewable energy sources is small in the analyzed sample, which is why we will use RENEW, a dummy indicator of energy consumption from renewable sources, in the analysis.

The effectiveness of the water resources' management practice is measured by the specific sweet water intake (WATER) instead of its general consumption. Since companies may reuse water in manufacturing cycles, the reduction in water intake from sweet water sources is an inclusive practice.

The effectiveness of the waste management practice is measured by the specific indicators of total waste (WASTE) and hazardous waste (HWASTE), waste recycling ratio (WASTERR).

Since there is no clear indicator that would be indicative of a reduction in a company's impact on biodiversity and land resources, a dummy indicator of initiatives for the reduction of impact on land resources – LAND – is used in the paper. It shows the fact of disclosure in the company's reports of information on land recultivation.

As previously mentioned, several indicators are used to evaluate the effectiveness of social practices. The first one is awards for social/public activities (AWARD). However, awards for social and public activities do not sufficiently describe a company's efforts in terms of respect for human rights and building relations with the society because it is a one-dimensional indicator [24]. Therefore, additional variables in this practice are ESG ratings calculated by Refinitiv, in particular: the ESG Community Score, which measures the effectiveness of the company in building relationships with the society and the ESG Human Rights Score, which measures the effectiveness of the company concerning compliance with the main human rights conventions.

The inclusive growth practices related to human capital are represented by the following indicators:

- the share of employees who are members of independent trade unions or signatories to collective employment agreements (UNION);
- the total salary of the top management (or the highest salary) divided by the average salary and allowances (SALARYGAP);
- expenditures for training per one employee in US dollars (TRAINING). In this case it is most reasonable to use the specific indicator in order to take company size into account;
- the total number of injuries and deaths, including injuries without lost working days relative to one million of hours worked (TIR).

In order to assess the *effectiveness of supply chain management,* we compiled the management index (INCLUSIVE_INDEX) which, apart from the principal indicators, comprises such additional practices as rights and health of suppliers' employees. The initiatives and policies used to build the index are presented in Table 3.

The index is a sum of dummies for 10 presented policies. It measures the extent of inclusivity of the supply chain from 0 (weak) to 10 (strong).

Table 3. The constituent elements of the index of the inclusive supply chain management

Indicator	Indicator description	Value
Policy of environmentally sound supply chain	Does the company have the policy of adding the supply chain to the corporate efforts aimed at decrease of the total impact on the environment?	1 – yes; 0 – no

Indicator	Indicator description	Value
Environmentally sound management of supply chains	Does the company use environmental criteria when choosing its suppliers or partners for supply?	1 – yes; 0 – no
Environmental monitoring of the supply chain	Does the company conduct studies of its suppliers' environmental indicators?	1 – yes; 0 – no
Termination of partnership in the supply chain	Does the company inform or show that it is ready to terminate cooperation with a partner if environmental criteria are not met?	1 – yes; 0 – no
Teaching ESG factors to suppliers	Does the company provide training on ESG factors to its suppliers?	1 – yes; 0 – no
Health and safety policy in the supply chain	Does the company have the policy of employees' health and safety improvement in the supply chain?	1 – yes; 0 – no
Occupational health and safety training in the supply chain	Does the company train its managers or key employees in employees' health and safety issues in the supply chain?	1 – yes; 0 – no
Improvement of health and safety in the supply chain	Does the company use polling or measurements to show that it enhances the employees' health and safety in its supply chain?	1 – yes; 0 – no
Respecting human rights	Does the company inform about or show that it applies the human rights criteria when choosing or monitoring its suppliers or partners in looking for suppliers?	1 – yes; 0 – no
Human rights violations	Does the company inform about or show that it is ready to terminate cooperation with a partner-supplier if human rights criteria are not met?	1 – yes; 0 – no

Source: Refinitiv agency.

The indicators of effectiveness of a management practice are as follows:

the number of disputes over business ethics, tax fraud, anticompetitive behaviour (CONTR);

risk management system in place (CRIMGT).

In the research we use the following *control variables*:

Company size (SIZE). Large companies may produce a positive impact on their financial results and value due to the scale effect. The sign of the variable may be positive or negative.

Growth (GROWTH). Growth opportunities may generate additional revenue from getting into new markets or implementation of products. A positive influence on financial indicators and company value is expected.

EBITDA margin (EBITDA_MARGIN). EBITDA is earnings before interest, taxes, depreciation and amortization. EBITDA is a proxy of the cash flow indicator. A positive influence of the EBITDA margin on financial results and company value is expected.

Leverage (LEVERAGE). A significant leverage may be indicative of a company's high risks. A negative influence on financial results and company value is expected.

Capital intensity (CAPEX). Previous empirical studies asserted that capital intensity was an important determinant of financial indicators and company value. However, the ratio sign may be positive or negative.

In order to verify the hypotheses, three models will be built for each independent variable in this research. The first model will comprise only the dependent variables related to environmental practices, the second one – social practices and the practices associated with human capital, the third one – management practices and the practices associated with business model.

Formulas of research regression models are as follows:

$$CFP_t = \alpha_0 + \sum_{i=1}^{N} Metric_{t\ enviromental} + \sum_{k=1}^{K} FCV_t + \text{å}_t; \quad (1)$$

$$CFP_t = \alpha_0 + \sum_{i=1}^{N} Metric_{t\ social} + \\ + \sum_{i=1}^{N} Metric_{t\ human} + \sum_{k=1}^{K} FCV_t + \text{å}_t; \quad (2)$$

$$CFP_t = \alpha_0 + \sum_{i=1}^{N} Metric_{t\ businessmodel} + \\ + \sum_{i=1}^{N} Metric_{t\ governmental} + \sum_{k=1}^{K} FCV_t + \text{å}_t, \quad (3)$$

where CFP are dependent variables of the research; $Metric_{t\ enviromental}$ are independent variables of the envi-

ronmental practices; $Metric_{t\ social}$ are independent variables of the social practices; $Metric_{t\ human}$ are independent variables of the inclusive growth practices related to human capital; $Metric_{t\ businessmodel}$ are independent variables of the inclusive growth practices related to business model; $Metric_{t\ governmental}$ are independent variables of the management practices; FCV are financial control variables.

The studied sample consists of 602 observations on 102 largest companies of the Metals&Mining industry in 2016–2021. The source of the extensive financial information on international companies taking into consideration the preset parameters necessary for a complete analysis is the Refinitiv agency. It also compiles its own ESG rating on the basis of over 630 companies' publicly available non-financial indicators [41].

The sample has a panel data structure because such structure can take into consideration the individual effects of each observation taking into account change over time. The sample comprises the data on companies from 29 countries. Besides, 17 countries are developed economies and 11 countries are emerging ones. Over 50% of companies of the analyzed sample pertain to the following five countries: China, Australia, Canada, Russia and Republic of South Africa. All financial data is expressed in US dollars. The time interval of 2016–2021 was chosen as the research period.

Further we are going to consider the descriptive statistics of the sample (Table 4), calculate the coefficient of variation, which indicates heterogeneity for each variable. The most heterogeneous indicator in the sample is PREMIUM. Also, gas emissions of the sulphur oxide and nitrogen oxide groups, waste generation are heterogeneous indicators. The coefficient of variation is also rather high for the CONTR indicator (number of disputes over business ethics, tax fraud, anticompetitive behaviour). In general, the sample is balanced, the indicators are rather uniform.

Table 4. Descriptive statistics

Variable	Number of observations	Mean	Standard deviation	Coefficient of variation	Minimum	Maximum
GHG	612	1.2342	1.4714	1.1922	0.0012	9.7318
NOX	612	0.0038	0.0241	6.3302	0.0000	0.3297
SOX	612	0.0036	0.0176	4.8538	0.0000	0.2484
RENEW	612	0.7565	0.4295	0.5678	0.0000	1.0000
WATER	612	15.4835	19.0237	1.2286	0.0014	174.8304
HWASTE	612	1.1829	4.0241	3.4020	0.0000	29.1705
WASTERR	612	22.3339	33.6645	1.5073	0.0000	99.9230
WASTE	612	25.4730	47.3159	1.8575	0.0003	368.6643
LAND	612	0.6503	0.4773	0.7339	0.0000	1.0000
AWARD	612	0.5131	0.5002	0.9750	0.0000	1.0000
ESG Community Score	612	63.6418	28.4230	0.4466	3.5000	99.9022
ESG Human Rights Score	612	58.0771	28.3735	0.4885	2.0642	97.3684
UNION	612	68.2770	29.1674	0.4272	0.0000	100.0000
SALARYGAP	612	124.5127	296.1682	2.3786	0.0824	931.6400
TRAINING	612	250.9382	530.4904	2.1140	0.0000	3659.6900
TIR	612	4.7486	4.3375	0.9134	0.0270	37.9100
INCLISIVE_INDEX	612	4.2157	2.9205	0.6928	0.0000	10.0000
CRIMGT	612	0.6520	0.4767	0.7312	0.0000	1.0000
CONTR	612	0.2402	0.9311	3.8764	0.0000	10.0000
ROA	612	0.0590	0.0854	1.4482	–0.1859	0.5072

Variable	Number of observations	Mean	Standard deviation	Coefficient of variation	Minimum	Maximum
SPEAD	612	0.0950	0.1575	1.6585	–0.2106	0.5860
PREMIUM	612	0.0561	0.5430	9.6839	–1.4904	3.1842
SIZE	612	22.9142	1.1455	0.0500	18.9083	25.6329
GROWTH	612	0.1445	0.2675	1.8517	–0.4756	1.6014
EBITDA_MARGIN	612	0.3120	0.1965	0.6300	0.0140	0.7980
LEVERAGE	612	0.1979	0.1512	0.7637	0.0000	0.9051
CAPEX	612	0.0575	0.0431	0.7485	0.0000	0.2694

Source: compiled by the author.

Research Results

Panel analysis implies the construction of regression models using three main specifications: the pooled model of panel data (Pool), the fixed effects model (FE) and the random effects model (RE). In order to choose the most suitable model, the Wald test, the Breusch-Pagan test and the Hausman's test have been conducted.

The results for the environmental practices are presented in Table 5. According to the conducted tests, the fixed effects models are preferable for the models with the dependent variables ROA and SPREAD, while the pooled panel data model (Pool) is preferable for the model with the dependent variable PREMIUM.

Table 5. Regression analysis results for the environmental practices

	ROA		SPREAD		PREMIUM	
	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
GHG	–0.0113**	–0.0057	0.0047	–0.0087	0.0006	–0.0148
NOX	–0.494**	–0.2000	–0.3130	–0.2220	1.5740	–1.0790
SOX	–0.4570	–0.3680	–2.025***	–0.3670	–1.6150	–1.2120
RENEW	–0.0054	–0.0091	0.0113	–0.0156	0.0067	–0.0553
WATER	–0.0002	–0.0002	–0.0006	–0.0004	0.00231**	–0.0012
HWASTE	–0.0009	–0.0008	0.0006	–0.0011	0.0017	–0.0053
WASTERR	0.00027***	–0.0001	0.0005	–0.0003	0.0001	–0.0007
WASTE	–0.0003	–0.0002	–0.000450*	–0.0002	–0.0004	–0.0006
LAND	0.0263	–0.0172	0.0271	–0.0185	–0.0304	–0.0537
SIZE	0.0298	–0.0244	–0.126***	–0.0276	–0.0384*	–0.0209
GROWTH	0.0619***	–0.0123	0.0558***	–0.0157	0.476***	–0.0836
EBITDA_MARGIN	0.0472	–0.0299	0.650***	–0.0671	0.517***	–0.1290
LEVERAGE	–0.322***	–0.0477	–0.285***	–0.0475	0.246*	–0.1440
CAPEX	0.0685	–0.0839	0.300***	–0.0884	–0.6190	–0.5310
2017.years			0.0032	–0.0067	0.489***	–0.0708

	ROA		SPREAD		PREMIUM	
	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
2018.years			0.0023	–0.0073	0.375***	–0.0703
2019.years			0.0074	–0.0104	0.462***	–0.0700
2020.years			0.0590***	–0.0125	0.458***	–0.0715
2021.years			0.0400***	–0.0120	0.1250	–0.0777
Constant	–0.5780	–0.5560	2.784***	–0.6180	0.3590	–0.4710
Observations	612		612		612	
R-squared	0.381		0.589		0.206	
Number of ric	102		102			
P-value	0		0		0	
Specification	FE		FE		Pool	

*** p <0.01; ** p <0.05; * p <0.1.

According to the obtained results, specific greenhouse gas emissions and specific gas emissions of the nitrogen oxide group have a negative impact on ROA at the 5% significance level. A reduced relationship between greenhouse gas emissions and revenue by one (1 ton/1 thousand US dollars) increases ROA by 1.13%, while a decrease in the relationship between emissions of the nitrogen oxide group and revenue by 0.1 (1 ton/1 thousand US dollars) increases ROA by 4.94%. There is no point in interpreting the decrease by one of specific emissions of the oxide group gases because their maximum value in the analyzed sample is – 0.3297. Thus, hypotheses H.1.1.1 and H.1.2.1 are confirmed. Also, the waste recycling ratio at the 1% significance level exerts a positive impact on ROA. The growth of the waste recycling ratio by 1% encourages growth of ROA by 0.027%. Hypothesis H.1.8.1 is confirmed. The rest of the environmental effectiveness indicators are statistically insignificant for ROA. Hypotheses H.1.3.1, H.1.4.1, H.1.5.1, H.1.6.1, H.1.7.1, H.1.9.1 are disproved.

The company size is statistically insignificant for ROA. The GROWTH control variable is statistically significant at the 1% level with the positive sign, as we have assumed in the research. EBITDA margin is statistically insignificant for ROA. LEVERAGE is statistically significant at the 1% level with the negative sign, as expected. The CAPEX control variable is statistically insignificant. Also, the conducted F-test for ROA with the independent variables that demonstrate the environmental practices effectiveness shows that it is pointless to add temporal effects to the model.

At the 1% significance level the specific emissions of the sulphur oxide group gases have a negative impact on SPREAD. It means that a reduction in the relationship between the sulphur oxide gas emissions and revenue by 0.01 (1 ton/1 thousand US dollars) improves SPREAD by 2.03%. Hypothesis H.1.3.2 is confirmed. Also, specific waste generation at the 10% significance level has a negative impact on SPREAD. It means that a reduction in the relationship between the waste generation amount and revenue by one (1 ton/1 thousand US dollars) improves SPREAD by 0.045%. Hypothesis H.1.7.2 is validated. The rest of the environmental effectiveness indicators are statistically insignificant for SPREAD. Hypotheses H.1.1.2, H.1.2.2, H.1.4.2, H.1.5.2, H.1.6.2, H.1.8.2, H.1.9.2 are rejected.

For the dependent variable SPREAD, all control variables are significant at the 1% level, the signs match the expected signs. According to the conducted F-test, the temporal effects should be included in the regression; 2020 and 2021 are significant at the 1% level. For the global community these years are related to the COVID-19 pandemic, but they showed a positive impact on SPREAD and other indicators of metallurgical companies. So, in comparison to 2019, the net profit in 2020 increased by 15%, the cash on hand – by 40%, while market capitalization grew almost by two-thirds [42]. According to the Statista information base, the average multiplier of EV/EBITDA for the Metals&Mining industry in 2019 amounted to 6.03, in 2020 – to 7.57, in 2021 – to 10.2 [43].

The variables of the environmental practices effectiveness are insignificant for PREMIUM, except for the specific sweet water intake (WATER). However, the sign of this variable does not meet expectations. Hypotheses H.1.1.3–H.1.9.3 are disproved. This result may indicate that the environmental practices effectiveness does not assist companies in surpassing their competitors in value creation for shareholders. The control variables GROWTH and EBITDA_MARGIN are statistically significant at the

1% level with the signs matching the expected ones and the control variable SIZE is significant at the 10% level with the sign matching the expected one. The variable LEVERAGE is significant at the 5% level with the positive sign. In numerous cases debt financing may decrease the cost of company's capital. An increase in debt financing may have a positive impact on the creation of shareholder return. CAPEX is insignificant. Temporal effects were added to the regression based on the results of the F-test.

Thus, the environmental practices' effectiveness may produce a positive impact on financial results and company value. At the same time, trade-off theory about the negative influence of environmental practices on financial results and company value is not confirmed. In other words, the general hypothesis for environmental practices H1 is confirmed partially.

The results of regression analysis for social practices and practices related to human capital are presented in Table 6.

Table 6. Results of regression analysis for social practices and practices related to human capital

	ROA		SPREAD		PREMIUM	
Indicators	**average marginal effect**	**standard error**	**average marginal effect**	**standard error**	**average marginal effect**	**standard error**
AWARD	0.0038	−0.0110	−0.0143	−0.0126	0.124***	−0.0443
ESG Community Score	0.0000	−0.0003	0.0000	−0.0003	−0.0005	−0.0009
ESG Human Rights Score	0.0000	−0.0003	0.0003	−0.0003	0.00152*	−0.0008
UNION	0.0002	−0.0003	−0.0005	−0.0004	0.0003	−0.0007
SALARYGAP	0.00003***	0.0000	0.0000	0.0000	0.0000	−0.0001
TRAINING	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TIR	0.0027	−0.0021	0.0013	−0.0013	0.0013	−0.0050
SIZE	0.0232	−0.0255	−0.114***	−0.0262	−0.0464**	−0.0207
GROWTH	0.0692***	−0.0135	0.0590***	−0.0148	0.480***	−0.0827
EBITDA_MARGIN	0.0359	−0.0284	0.649***	−0.0689	0.479***	−0.1170
LEVERAGE	−0.321***	−0.0536	−0.303***	−0.0464	0.294**	−0.1400
CAPEX	0.0157	−0.0744	0.305***	−0.0872	−1.085**	−0.5330
2017.years	−0.0013	−0.0076	0.0057	−0.0066	0.478***	−0.0705
2018.years	0.0115*	−0.0067	0.0102	−0.0087	0.364***	−0.0700
2019.years	0.0116	−0.0080	0.0178	−0.0110	0.448***	−0.0695
2020.years	0.0190**	−0.0083	0.0741***	−0.0148	0.437***	−0.0699
2021.years	0.0278**	−0.0133	0.0591***	−0.0177	0.0920	−0.0767
Constant	−0.4760	−0.5830	2.533***	−0.5950	0.4460	−0.4780
Observations	612		612		612	
R-squared	0.381		0.57		0.212	
Number of ric	102		102			
P-value	0		0		0	
Specification	FE		FE		Pool	

*** p <0.01; ** p <0.05; * p <0.1.

The variable AWARD is statistically significant at the 1% level only for PREMIUM; there is no statistically significant effect for ROA and SPREAD. Thus, the awards for social or public activity entail an increase in PREMIUM by 12.4%. Hypothesis H.2.1.3 is confirmed, while hypotheses H.2.1.1 and H.2.1.2 are rejected.

The ESG Human Rights Score calculated by Refinitiv is statistically significant for PREMIUM at the 10% level. An increase in the ESG Human Rights Score by 1 basis point encourages the growth of PREMIUM by 0.15%. Hypothesis H.2.3.3 is validated. For other considered dependent variables, the ESG Human Rights Score is statistically insignificant. Also, the ESG Community Score produces no statistically significant effect on any of the variables. Hypotheses H.2.2.1–H.2.3.2 are disproved. Thus, the general hypothesis for the social practices H2 is confirmed partially.

As for the inclusive practices related to human capital, the first analyzed variable is the share of employees represented by independent trade unions or signatories to the collective employment agreement. This variable is not statistically significant for any of the dependent variables. Thus, hypotheses H.3.1.1–H.3.1.3 are disproved.

The general traumatism ratio is statistically insignificant in all three models. Hypotheses H.3.2.1–H.3.2.3 are not confirmed. This result indicates that benefits from investment in workplace safety do not exceed the investment amount, therefore the traumatism level does not influence financial results and the value of metallurgical companies.

The next inclusive practice related to human capital is a reduction in the gap between the CEO's (top management) salary and the average employees' salary. The gap in the salary is statistically significant for ROA at the 1% level and is insignificant for the dependent variables SPREAD and PREMIUM. A growth in the salary gap by one entails an increase in ROA by 0.003%. These results support the tournament theory, which states that the salary gap enhances managers' motivation and has a positive impact on productivity. Thus, hypotheses H.3.3.1–H.3.3.3 are disproved.

The last considered practice related to human capital is employee training. The independent variable of expenses for the training of one employee is statistically insignificant in all models. The obtained results indicate that investment in employee training yields no competitive advantage to the company. Thus, hypotheses H.3.4.1–H.3.4.3 are not confirmed.

The control variables in all three models preserve significance, signs and relative stability in the evaluation of ratios, except for the variable CAPEX in the model with the dependent variable PREMIUM. The control variable CAPEX in the model with the dependent variable PREMIUM is statistically significant with the negative sign, as expected.

Moreover, according to the conducted F-test, temporal effects should be added to each of the three analyzed models; 2020 and 2021 are statistically positively significant for the dependent variables ROA and SPREAD, which has been explained above in the present research.

The results of regression analysis for management practices and practices related to the business model are presented in Table 7.

The inclusive index of the supply chain is statistically significant at the 10% level for the dependent variable PREMIUM. An increase in the index by one entails the growth of PREMIUM by 1.28%. We may make the conclusion that building an inclusive supply chain is assessed positively by the market and creates additional return for shareholders as compared to the market. However, there is no statistically significant effect for ROA and SPREAD. Thus, hypothesis H.4.3 is validated, while hypotheses H.4.1 and H.4.2 are rejected.

The number of disputes over business ethics, tax fraud, anticompetitive behaviour is statistically insignificant in all models. These results contradict the legitimacy theory, which states that unethical behavior of companies brings about problems and loss of reputation. At the same time, it is not confirmed that, for example, corrupt practices encourage a growth of corporate effectiveness. Thus, we may make the conclusion that losses in case of public disclosure of violations of a company's business ethics may be compensated by the benefits gained by the company as a result of such violations. Hypotheses H.5.1.1–H.5.1.3 are disproved.

Table 7. Results of regression analysis for management practices and practices related to business model

	ROA		SPREAD		PREMIUM	
Indicators	**average marginal effect**	**standard error**	**average marginal effect**	**standard error**	**average marginal effect**	**standard error**
INCLISIVE_INDEX	0.0027	–0.0026	0.0001	–0.0032	0.0128*	–0.0083
CRIMGT	–0.0145*	–0.0084	–0.0172	–0.0147	–0.0509	–0.0462
CONTR	–0.0031	–0.0023	–0.0055	–0.0034	–0.0029	–0.0234
SIZE	0.0237	–0.0258	–0.109***	–0.0273	–0.0443**	–0.0216
GROWTH	0.0697***	–0.0138	0.0596***	–0.0143	0.465***	–0.0827
	ROA		SPREAD		PREMIUM	

Indicators	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
EBITDA_MARGIN	0.0346	–0.0282	0.648***	–0.0693	0.495***	–0.1110
LEVERAGE	–0.330***	–0.0528	–0.294***	–0.0473	0.207*	–0.1390
CAPEX	0.0279	–0.0745	0.306***	–0.0911	–0.7670	–0.5250
2017.years	–0.0041	–0.0075	0.0052	–0.0064	0.479***	–0.0706
2018.years	0.0072	–0.0068	0.0113	–0.0084	0.361***	–0.0700
2019.years	0.0062	–0.0082	0.0199*	–0.0114	0.447***	–0.0698
2020.years	0.0133	–0.0088	0.0770***	–0.0148	0.441***	–0.0709
2021.years	0.0222*	–0.0131	0.0605***	–0.0163	0.0990	–0.0775
Constant	-0.4490	–0.5880	2.415***	–0.6150	0.5280	–0.4870
Observations	612		612		612	
R-squared	0.372		0.568		0.199	
Number of ric	102		102			
P-value	0		0		0	
Specification	FE		FE		Pool	

*** p <0.01; ** p <0.05; * p <0.1.

The last practice of inclusive growth for metallurgical companies is risk management. At the 10% significance level, the existence of a risk management system is statistically significant for ROA, in particular, it is reduced by 1.45%. Building a risk management system may be expensive for companies and ultimately has a negative impact on financial results. At the same time, there is no significant effect for SPEAD. On these grounds we may assume that the existence of a risk management system mitigates a company's risks, therefore, there is a negative impact on ROA and no impact on SPEAD. Thus, hypotheses H.5.2.1–H.5.2.3 are disproved.

Control variables in the models for management practices and practices related to the business model behave in the same way as in the previous two cases. A relative stability of evaluation ratios is observed. Also, according to the conducted F-test, temporal effects should be added to each of the three analyzed models; 2020 and 2021 are statistically positively significant for dependent variables ROA and SPREAD.

When building all models, we conducted the Breusch-Pagan tests for heteroscedasticity, and when heteroscedasticity was discovered, we took robust errors into consideration. The constructed models were tested using the variance inflation factor. There was not a single result exceeding 4, which is indicative of absence of multicollinearity.

Conclusion

This paper is dedicated to the assessment of influence of the inclusive growth practices on financial results and the value of metallurgical companies. In this research, we determined the practices for metallurgical companies, carried out analysis of academic literature, which demonstrated the absence of a consensus between scientists on the issue of influence of each of the considered practices on financial results and company value, set forth hypotheses on the influence of these practices on financial results and company value. The research confirmed some of the hypotheses. At the same time, we proved that far from all inclusive growth practices have a positive impact on financial results and company value.

- There is a range of limitations for this research, namely:
- SASB standards were mainly used to define the inclusive growth practice;
- only one industry was considered in the paper; the results are not applicable to other industries;
- panel data analysis was used, alternative methods were not considered;
- testing of nonlinear dependence was not implied for the indicators of environmental practices effectiveness.

Limitations of this paper are also potential fields of further analysis.

References

1. Alexander O., Charles A., Kastoun R., et al. *Asset and wealth management revolution 2022: Exponential expectations for ESG.* PricewaterhouseCoopers; 2022. URL: https://www.pwc.com/gx/en/industries/financial-services/asset-management/publications/asset-and-wealth-management-revolution-2022.html (accessed on 19.07.2023)
2. Pérez L., Hunt V., Samandari H., et al. *Does ESG really matter and why?* The McKinsey Quarterly; 2022. URL: https://www.mckinsey.com/~/media/mckinsey/business%20functions/sustainability/our%20insights/does%20esg%20really%20matter%20and%20why/does-esg-really-matter-and-why-vf.pdf (accessed on 19.07.2023)
3. Beal D., Eccles R., Hansell G., et al. *Total societal impact: A new lens for strategy.* Boston Consulting Group; 2017. URL: https://www.bcg.com/publications/2017/total-societal-impact-new-lens-strategy (accessed on 19.07.2023)
4. Ritchie H., Rosado P., Roser M. CO_2 and Greenhouse Gas Emissions. Published online at OurWorldInData.org. 2023. URL: https://ourworldindata.org/co2-and-greenhouse-gas-emissions (accessed on 19.07.2023)
5. Endrikat J., Guenther E., Hoppe H. Making sense of conflicting empirical findings: A meta-analytic review of the relationship between corporate environmental and financial performance. *European Management Journal*. 2014;32(5):735–751. https://doi.org/10.1016/j.emj.2013.12.004
6. Levitt T. The Dangers of Social Responsibility. *Harvard Business Review*. 1958:36:41–50.
7. Feldman S.J., Soyka P.A. Ameer P.G. Does Improving a Firm's Environmental Management System and Environmental Performance Result in a Higher Stock Price? *The Journal of Investing.* 1997;6(4):87–97. https://doi.org/10.3905/joi.1997.87
8. Preston L.E., O'Bannon D. The Corporate Social-Financial Performance Relationship. *Business and Society*. 1997;36:419–429.
9. King A., Lenox M. Exploring the Locus of Profitable Pollution Reduction. *Management Science*. 2002;48(2):289–299.
10. Porter M.E., Van der Linde C. Green and Competitive: Ending the Stalemate. *Harvard Business Review*. 1995;73:120–134.
11. Hart S.L. A Natural-Resource-Based View of the Firm. *The Academy of Management Review*. 1995;20(4):986–1014. https://doi.org/10.2307/258963
12. Hart S. L., Dowell G. Invited Editorial: A natural-resource-based view of the firm fifteen years after. *Journal of Management*. 2011;37(5):1464–1479. https://doi.org/10.1177/014920631039021
13. Donaldson T., Preston L.E. The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review*. 1995;20(1):65–91. https://doi.org/10.2307/258887
14. Ambec S., Lanoie P. Does it pay to be green? A systematic overview. *Academy of Management Perspectives*. 2008;22(4):45–62.
15. Carroll A.B. A three-dimensional conceptual model of corporate performance. *The Academy of management review*. 1979;4(4):497–505. https://doi.org/10.2307/257850
16. Porter M. E., Kramer M. R. Creating Shared Value: How to reinvent capitalism and unleash a wave of innovation and growth. *Harvard Business Review*. 2011;89:62–77.
17. Alexander G.J., Buchholz R.A. Corporate social responsibility and stock market performance. *The Academy of Management Journal.* 1978;21(3):479–486. https://doi.org/10.2307/255728
18. Freeman R.E. *Strategic Management: A Stakeholder Approach*. Boston: Pitman; 1984. 276 p.
19. McWilliams A., Siegel D., Wright P. M. Guest editors' introduction. Corporate social responsibility: Strategic implications. *Journal of Management Studies*. 2006;43(1):1–18.
20. Russo M.V., Fouts P.A. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal.* 1997;40(3):534–559. https://doi.org/10.2307/257052
21. Williamson O.E. *The economic institutions of capitalism.* NY: The Free Press; 1985.
22. Cornell B., Shapiro A. Corporate social responsibility and financial performance. *Academy of Management Review*. 1987;4:497–. https://doi.org/10.1177/0258042X0503000301
23. Peloza J. Using corporate social responsibility as insurance for financial performance. *California Management Review*. 2006;48(2):52–72. https://doi.org/10.2307/41166338
24. Galant A., Cadez S. Corporate social responsibility and financial performance relationship: A review of measurement approaches. *Economic research-Ekonomska istraživanja*. 2017;30(1): 676–693. https://doi.org/10.1080/1331677X.2017.1313122
25. Volkova O.N. The Impact of Corporate Social Responsibility on the Corporate Financial Performance: Evidence from Russian and Dutch Companies. *Journal of Corporate Finance Research*. 2022;16(2):15–31. https://doi.org/10.2139/ssrn.3863541

26. Hirsch B.T., Addison J.T. *The Economic Analysis of Unions: New Approaches and Evidence*. London: Allen & Unwin; 1986. 348 p.
27. Flaherty S. Strike activity, worker militancy, and productivity change in manufacturing, 1961–1981. *ILR Review*. 1987;40(4):585–600. https://doi.org/10.1177/001979398704000410
28. Freeman R.B., Medoff J.L. *What do unions do.* N.Y. Basic Books; 1984.
29. Lazear E.P., Rosen S. Rank-order tournaments as optimum labor contracts. *Journal of political Economy*. 1981;89(5):841–864.
30. Gao J. Literature review of executive compensation gap and company performance. *American Journal of Industrial and Business Management.* 2019;9(1):109–123. https://doi.org/10.4236/ajibm.2019.91009
31. Olaniyan D. A., Ojo L. B. Staff training and development: A vital tool for organizational effectiveness. *European journal of scientific Research*. 2008;24(3):326–331.
32. Khan A.A., Abbasi S.O.B.H., Waseem R.M., et al. Impact of training and development of employees on employee performance through job satisfaction: A study of telecom sector of Pakistan. *Business Management and Strategy*. 2016;7(1):29–46. https://doi.org/10.5296/bms.v7i1.9024
33. Gavronski I., Klassen R.D., Vachon S., et al. A resource-based view of green supply management. *Transportation Research Part E: Logistics and Transportation Review*. 2011;47(6):872–885. https://doi.org/10.1016/j.tre.2011.05.018
34. Vachon S., Klassen R.D. Environmental management and manufacturing performance: The role of collaboration in the supply chain. *International journal of production economics*. 2008;111(2):299–315. https://doi.org/10.1016/j.ijpe.2006.11.030
35. Fahimnia B., Jabbarzadeh A. Marrying supply chain sustainability and resilience: A match made in heaven. *Transportation Research Part E: Logistics and Transportation Review*. 2016;91:306–324. https://doi.org/10.1016/j.tre.2016.02.007
36. Melinda A., Wardhani R. The effect of environmental, social, governance, and controversies on firms' value: evidence from Asia. In: Barnett W.A., Sergi B.S., Eds. *Advanced Issues in the Economics of Emerging Markets (International Symposia in Economic Theory and Econometrics, Vol. 27).* Leeds: Emerald Publishing Limited; 2020:147-173. https://doi.org/10.1108/S1571-038620200000027011
37. Lindblom C.K. The implications of organizational legitimacy for corporate social performance and disclosure. In: *Critical Perspectives on Accounting Conference*. New York, 1994.
38. Fisman R.J., Guriev S., Ioramashvili C., et al. *Corruption and firm growth: evidence from around the world*. Sciences Po publications; 2021. https://doi.org/10.2139/ssrn.3828225
39. Ghazieh L., Chebana N. The effectiveness of risk management system and firm performance in the European context. *Journal of Economics, Finance and Administrative Science*. 2021;26(52):182–196. https://doi.org/10.1108/JEFAS-07-2019-0118
40. Bhatia P., Corbier L., Schmitz S., et al. The Greenhouse Gas Protocol. Corporate Accounting and Reporting Standard (Revised Edition). 2017. URL: https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf (accessed on 17.04.2023)
41. Refinitiv Eikon. Environmental, social and governance scores from Refinitiv. May 2022. Available at: https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf
42. Goddard M., Syed A., Chong A., et al. *Mine 2021: Great expectations, seizing tomorrow.* PricewaterhouseCooper, 2021. URL: https://www.pwc.com/gx/en/energy-utilities-mining/assets/mine-2021/pwc-mine-2021.pdf (accessed on 17.04.2023)
43. Statista, Statista Search. URL: https://www.statista.com/ (accessed on 17.04.2023)

Contribution of the authors: the authors contributed equally to this article.

The authors declare no conflicts of interests.

The article **was submitted** 11.10.2023; **approved after reviewing** 13.11.2023; **accepted for publication** 05.12.2023.

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.93-113
JEL classification: C33, G32, G41

The Impact of ESG Ratings on Financial Performance of the Companies: Evidence from BRICS Countries

Anastasia Strekalina
Specialist of Procurement Department in Shlumberger, Tumen, Russia,
a.strekalina.sas@gmail.com, ORCID

Renata Zakirova ✉
Head of Financial Department, Union Chemical Solutions LLC, Ufa, Russia,
re.zakirova@gmail.com, ORCID

Alena Shinkarenko
Leading Specialist of Department of Budgeting and Performance Management, PJSC NOVATEK, Moscow, Russia, alena.shinkarenko@yandex.ru, ORCID

Evgenii Vatsaniuk
Deputy Head of VC, Social Discovery Group, Limassol, Cyprus
E.Vatsaniuk@yandex.ru, ORCID

Abstract

Non-financial factors become the relevant topic in the context of understanding the successful development of companies over the world. The purpose of this paper is to study the relationship between ESG scores and financial performance of firms operating in emerging markets, in particular BRICS countries. This study includes three financial performance indicators to cover three different perspectives: accounting measure (ROA), market performance (TSR) and economic metric (EVA spread). The ESG scores, its pillars and other financial metrics are taken from Refinitiv Eikon. The sample consists of 257 listed companies operating in BRICS countries throughout 2017–2021. The main method of the research is the Fixed Effect method for panel data. The results showed that there is no statistical significance between ESG and ROA. Besides, government pillars negatively affect ROA through CSR that is explained by legitimacy theory. As for TSR, ESG, social and environment pillars have positive effects on market performance measure, following stakeholder theory. Regarding economic performance, ESG and social pillar have negative influence on EVA spread.

Keywords: ESG, sustainable development, financial performance, BRICS

For citation: Strekalina A., Zakirova R., Shinkarenko A., Vatsaniuk E. (2023) The Impact of ESG Ratings on Financial Performance of the Companies: Evidence from BRICS Countries. *Journal of Corporate Finance Research.* 17(4): 93-113. https://doi.org/10.17323/j. jcfr.2073-0438.17.4.2023.93-113

Introduction

Key determinants of financial performance (FP) had always been the topic of current interest. Every management team would like to know "the right" path that leads to the successful development of their corporation. Unfortunately, there is no single formula on how to achieve it. Nowadays, it is academically clear that the level of corporate financial performance can be determined by both financial and non-financial factors and their combinations.

In the recent decades, the rise of socio-economic and environmental problems became more and more critical, which made most economies pay attention to sustainable practices. Most companies tend to transition towards green growth to try and prevent climate changes and environmental degradation issues. The most pressing environmental, social and governance issues have been brought together by the United Nations. Based on these issues, they formed the overarching Sustainable Development Goals (SDGs), with the aim of preserving and improving the economic, social and environmental spheres.

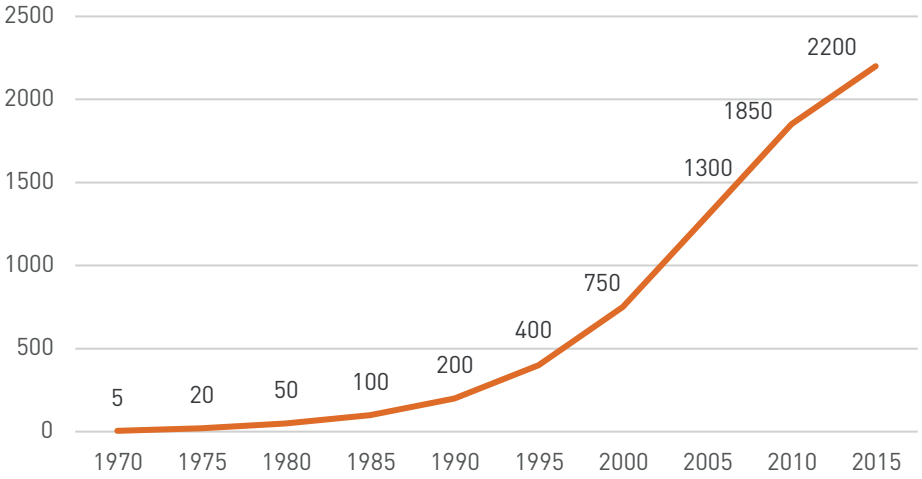
All these innovations have caused increased attention to the corporate actions of companies from both internal stakeholders and external stakeholders. Customers expected the implementation of higher ESG standards. Regulators and policymakers have sought to tighten controls on environmental impact, resource consumption, respect for human rights, and company transparency. Employees and managers aimed to be in line with the international community's vision for more environmentally friendly technological processes and manufacturing strategies [1].

As the ESG agenda began to attract significant attention from world business leaders, it entailed significant capital inflows, investments and costs. The natural question arose as how the integration of sustainable practices affects the financial performance of companies – both in the short- and long-term perspective.

The purpose of this paper is to confirm or refuse the question of the existence of a significant relation of ESG performance to financial performance of firms, and to assess whether these connections are positive or negative.

The relevance of the research comes from the fact that the impact of ESG performance on the financial performance of a firm remains uncertain. More than 2000 research articles devoted to the relations between ESG activities and corporate financial performance have been published by 2015 [2]. And the number is constantly growing. Despite the fact that the question has been vastly studied, some studies provided strong positive effect of ESG performance on FP, while others proved a vice versa hypothesis.

Figure 1. The growth of the number of studies on the ESG-FP relation over time



Source: [2].

Furthermore, results vary depending on the region of study. Related articles tend to be mostly concentrated on the performance of companies from developed economies like European and North America companies [3]. Firms representing emerging economies were not frequently studied in the ESG-FP related studies, despite the fact that they form a significant part of the business around the globe (Table 1). This literature gap could be explained due to reliable data unavailability up to a certain period. However, in recent years, academical studies showed that positive correlation between sustainable performance and financial performance of companies from the emerging countries could be even higher than in the developed markets [2].

Table 1. Active countries on ESG literature

Rank	Country	Documents	Citations
1	United States	26	456
2	Italy	25	360
3	Germany	22	450
4	United Kingdom	22	255
5	Spain	20	307
6	France	13	219
7	South Korea	13	74
8	Australia	10	202
9	Malaysia	10	20
10	India	9	43
11	Canada	7	137
12	Netherlands	6	18
13	China	5	53

Source: [4].

The novelty of this study is represented in usage of new financial performance proxy, based on Boston Consulting Group methodology: Total Shareholder Return [5]. By exploring the relationship between ESG scores and TSR, the study contributes to the growing body of research on sustainable investing and responsible corporate practices. This new methodology of TSR allows both investors and academics to consider other perspectives of financial performance of companies and its link to sustainable practices.

The implication of the findings may be useful for investors who want to form a portfolio consisting of companies from different industries and want to know how the value of their portfolio may be affected by information about these companies' ESG activity. This study could help investors and regulatory bodies to understand the impact of the ESG performance on firms' financial results and make necessary investment decisions. This study could also encourage management of corporations to adopt more efficient and effective ESG policies and initiatives, as ESG performance can maximize market value.

The main contribution of the current study to the existing literature is that previous papers considered mainly accounting financial metrics of companies operating in developed markets, while this paper is also considering market and value-based measures of financial performance and is focused on the firms operating in emerging markets.

The Influence of Sustainability Practices on Financial Performance: Literature Trends

The origin of sustainable initiatives implementation

Successful financial performance has always been one of the main priorities of business firms and organizations. Many research papers study and analyze various economic and non-economic aspects that affect the financial performance of the companies. Moreover, the concepts of corporate social responsibility and sustainability became more popular in the context of the financial market and the growth of the company's outcomes. In this sense, there are recent studies that have investigated the relationship between such concepts as ESG and corporate financial performance.

The ESG framework consists of three major components: environment, social and governance. The comprehensive definitions of the ESG components are presented in the article "Understanding the Effects of Environment, Social, and Governance Conduct on Financial Performance: Arguments for a Process and Integrated Modelling Approach" by M. T. Lee and I. Suh [6]. The environmental pillar (E-pillar) determines how well companies prevent environmental damage such as climate change, depletion of natural resources, waste and pollution. The social pillar (S-pillar) is identified by the employee relations, working conditions, organizational diversity, human rights, employee equity and justice, inclusion, product responsibility, and community health and safety. The governance pillar (G-pillar) shows the quality of the company's management that include the following characteristics: board functions, structure, firm policies, compensation, lobbying, corruption, donation.

Companies implement special initiatives inside the business processes in one or several ESG dimensions that boost the sustainable development. However, some of these actions may promote value creation of the company, while others can reduce financial value. Companies dedicated to ESG principles tend to utilize resources more efficiently, resulting in higher revenues, increased dividends, and reduced reputational risks [7]. Additionally, McKinsey & Company (2019) has highlighted the various ways in which a strong ESG proposition generates value, including top-line growth, cost reductions, productivity gains, and optimized investments and assets [8]. However, while many surveys have investigated stakeholder perspectives, ongoing research is still underway to quantify the precise impact of ESG on value creation.

Thereby, the ESG score is used as a non-financial factor of evaluation of companies' sustainable performance and explains how the companies deal with environmental, social and governance issues [9]. Nowadays, there are different ESG rating agencies that evaluate sustainable performance of the firms: Refinitiv, MSCI, Bloomberg, Sustainalytics

and others. Each ESG rating provider employs its unique methodology for assessing the pillars of ESG, utilizing diverse datasets and assigning varying weights to each category. Comparatively, the average correlation among the seven most commonly used ESG rating providers is only 0.55, while different credit rating providers exhibit a significantly higher correlation of 0.99 [10].

Theoretical Framework

There are two academic opinions in terms of the relationship between ESG activities and financial performance of a firm. The first strand follows one of the most frequent modern theoretical frameworks, called Stakeholder theory. The primary contention revolves around the notion that "good governance" practices play a key role in reducing agency costs, aligning the interests of managers and shareholders, and implementing strategies that enhance productivity. Furthermore, extensive literature has demonstrated that firms that embrace ESG principles effectively mitigate long-term risks associated with events and litigation. These findings have been supported by studies conducted by H. Servaes and A. Tamayo, R. Eccles et al., and R. Albuquerque et al. [11–13].

The second strand follows the line of increased costs to support ESG activities, thereby serving short-term interest and private benefits rather than generating real value of the company [14]. Thus, despite the emerging academic interest in sustainable development studies, the relationship between ESG activities and financial performance of a company remains uncertain and understanding of the effect of the ESG activities on financial performance of the company becomes an essential question for the discussion [2; 15; 16].

As it has been mentioned before, increasing disclosure of ESG information, immediately attracted both academics' interest and investors' attention. It brought to the popularization of two main theories, connected to G pillar of ESG agenda – the Shareholders theory, which then rapidly transformed into Stakeholder theory [9].

Stakeholder theory became one of the leading theoretical frameworks in the ESG literature [4]. Increased availability of non-financial information led to the increased transparency of business and increased trustworthiness of the stakeholders, for whom sustainable performance was a way of meeting their expectations. According to Cheng et al., commitment to transparency lower informational asymmetries among companies and shareholders, thereby mitigating risks [17]. Thus, ESG ratings became a useful tool to measure stakeholders' satisfaction and demonstrate low risks for the stock market [18; 19].

Talking about socially responsible actions of firms, it is important to mention Legitimacy theory, that plays a significant role in the development and worldwide integration of ESG disclosure. The theory is connected with S-pillar of ESG and promotes an idea that there is a tacit contract between a company and surrounding society. The contact has its own terms and conditions including compliance with applicable social laws and regulations required by government as well as satisfying the expectation of the society in terms of ESG issues.

In ESG literature, Legitimacy theory is used as a theoretical framework that helps to understand the value creation process through disclosure of non-financial information. Corporations are constantly forced to become more and more transparent under the social and political pressure. Despite subsequent costs, this could be a way to comply with the terms of the deal between business and society, as well as to highlight the legitimacy of corporate actions [4]. Legitimacy theory is an example of how a company can go beyond the goal of economic profits and achieve non-financial value, which at some point can be transformed into the increase in financial performance metrics.

On the one hand, the positive impact of ESG agenda on financial performance can be explained by the social impact theory. While on the other hand, there is evidence of negative influence of sustainability on financial success of companies, following trade-off theory.

Social impact theory complies with stakeholder theory stating that for long-term value creation companies should take into account all agents' interests. Social impact theory is based on the idea that favorable social performance will lead to favorable financial performance, through meeting the needs of various stakeholders [20]. Moreover, the implementation of ESG activities help companies to achieve a competitive market advantage. Failure in satisfying stakeholder's needs increases risks and costs, leading to the loss of profitability. Thus, serving the interests of stakeholders boosts a firm's reputation in the first place, which then affects financial results of the company [21].

On the contrary, there are academic articles that follow the idea of trade-off hypothesis. It states that social activities may have a negative effect on financial results of the company due to increase financial costs. In other words, the trade-off hypothesis or traditionalist view implies that the growth of costs and the drop in profitability could be due to the achievement of social and environmental goals [20].

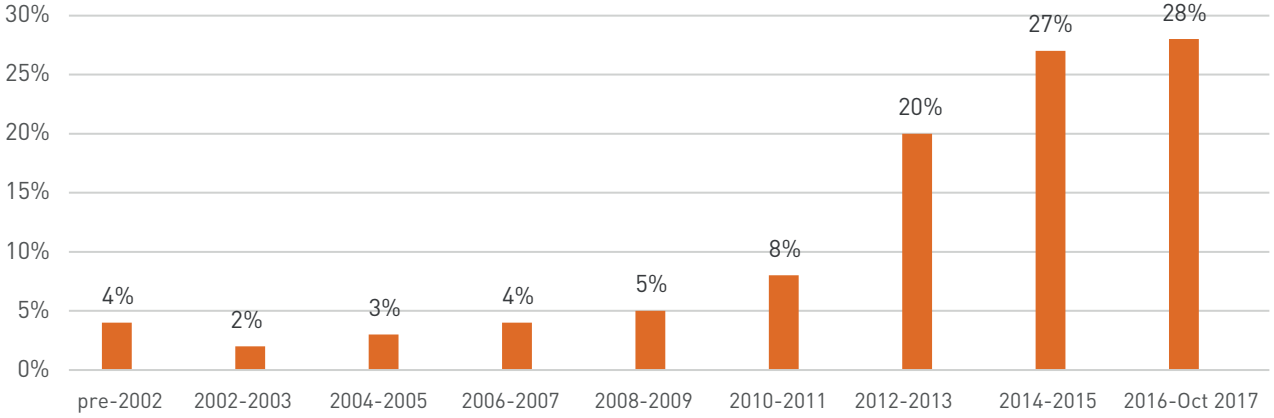
Companies with strong socially responsible activities including charity, environmental innovations, community investments etc., may suffer from resource and capital outflow leading to a relative disadvantage compared to less socially active firms. What is more, some research articles showed that such companies can experience declining stock prices, due to growing financial costs [21].

Discussion of existing researches

Time period distribution

The increasing number of research on this topic can be observed in the last decades. According to Friede et al., approximately 2,250 empirical studies on the nexus between ESG and financial performance were published from the 1970s to 2014, more than 1,000 research studies have appeared since 2015 [2; 6; 16]. Nevertheless, the numerous papers did not accelerate into the final unified conclusion about the impact of ESG performance on financial outcomes.

Figure 2. Percentage of ESG-CFP related articles publications by time period



Source: [22].

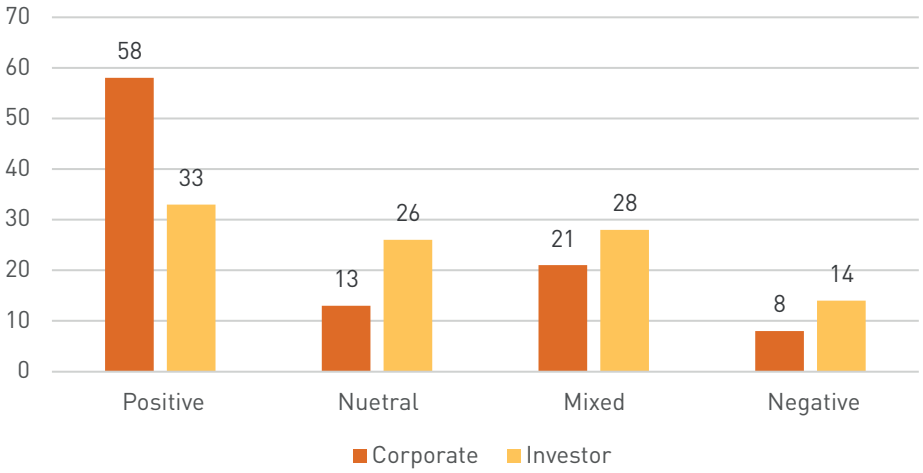
The studies about the relationship between ESG and financial performance may be divided into various groups by different methods, different samples of companies, different variables as proxy for financial performance and different measures for the sustainable development of the firms.

Financial performance metrics distribution

Generally, there are two types of papers: corporate-oriented and investor-oriented research. The corporate-oriented studies examine the operating metrics such as return on equity (ROE), return on assets (ROA), or stock performance as the earning per share (EPS). As for investor-oriented, the company's performance is considered from the investor's point of view with the following measures: Tobin's Q or Sharpe ratio on a portfolio of stocks.

The report of the members of NYU Stern Center investigated the difference in the results of these two types of papers on the basis of approximately 245 research papers between 2015 and 2020 [16]. The main outcomes are presented in the diagram from their article below. Regarding corporate-oriented studies, 58% of papers that used operational metrics concluded about positive and statistically significant impact of ESG on financial performance, 8% showed negative results, 21% concluded about mixed effects, and in 13% there was no statistical significance. For investment-oriented research, 33% of research papers showed positive effects, 14% of studies – negative outcomes, 26% – mixed results, and in 26% there was no statistical significance. Thus, there is no consensus in the studies about the impact of ESG and financial performance of the companies in both corporate-oriented and investor-oriented studies.

Figure 3. Research results for correlation between ESG and financial performance



Source: [16].

As mentioned above, corporate-oriented research papers use the operating measures of financial performance, such as ROA, ROE, ROCE, etc. However, there is no consensus among these studies: some papers found positive relationships [23; 24], others concluded about negative [25], there were examples with mixed results for different accounting metrics [26] and finally several researchers found no statistically significant effects [27; 28].

On the one hand, there is a considerable body of research that supports the idea that ESG success is positively correlated with financial performance. According to this point of view, a firm's high ESG performance is a reflection of its dedication to sustainable development and risk management, both of which may contribute to improved financial success for the organization. Researchers have discovered that companies with high ESG ratings often have better

long-term financial performance compared to their competitors. According to the findings of this research, businesses that have strong ESG practices have a tendency to have higher operational performance and to be less hazardous. Changhong Zhao and his colleagues investigated the relationship between ESG and financial performance in 20 large listed power generation companies in China for the period of 10 years [24]. The conclusion stated that ESG scores have a positive impact on Return on capital employed (ROCE).

On the other hand, some researchers have claimed that there may be a negative association between ESG and financial success, while others have suggested that there is no substantial correlation between the two. According to this point of view, ESG efforts can take resources away from activities that generate profits, which would have a detrimental effect on the company's financial performance. E. Duque-Grisales and J. Aguilera-Caracuel explored the effect of ESG scores and ROA for 104 companies from Brazil, Chile, Colombia, Mexico and Peru between 2011–2015 [25]. The conclusions showed a statistically significant negative effect of ESG score and its pillar on ROA. This means that firms that demonstrated superior ESG performance tended to exhibit lower financial performance. In other words, companies that performed exceptionally well in sustainable activities were not necessarily the most profitable ones. This result posits an inverse relationship between environmental stewardship and profitability in the corporate world.

Furthermore, the effect on different accounting metrics can be different. Carnini Pulino and his colleagues investigated the impact of ESG on EBIT and ROA for the sample for largest Italian listed companies from 2011 to 2020 [26]. The outcomes show positive effects of ESG components on EBIT, but negative impact for ROA. In particular, the environmental pillar and the social pillar have a positive impact on EBIT.

Besides, investor-oriented studies also include market metrics of financial performance such as Tobin's Q, returns or others. But outcomes are also controversial. For example, one of the past studies by, D. D. Lee, R. W. Faff and K. Langfield-Smith studied the effect of ESG on both ROA, ROS and ROE as accounting performance measures and on 3-year absolute return, one and six-factor alpha as proxies for market performance [29]. The sample included about 500 firms from the Dow Jones Global Index (DJGI) database. As for results, the authors found the negative relationship between ESG and market-based metrics, but there was no effect of ESG on accounting measures. More recent study by Patrick Velte investigated the impact of ESG and its components on ROA and Tobin's Q [19]. The sample included 412 companies listed on the German Prime Standard for the period of 2010–2014. The results of this study are in contrast to the previous one by D.D. Lee, R.W. Faff and K. Langfield-Smith Based on the regression analysis, P. Velte found that ESG and its pillars have a positive impact on ROA but for Tobin's Q there are no statistically significant coefficients. Therefore, the effect on market and accounting metrics of financial performance may be different due to various meanings.

Nevertheless, R. Atan and his colleagues studied the effect of ESG on ROE and Tobin's Q of Malaysian public-limited companies [30]. They analyzed 54 companies for the period 2010–2013. Using regressions analysis, there is no statistical significance for both ROE and Tobin's Q.

Furthermore, in some papers there were found different effects by various ESG pillars. For instance, D. Sharma, S. Bhattacharya, and S. Thukral focused their study of the nexus between ESG score and the disclosure on financial performance of firms in India. The sample covered 99 companies from BSE-500 over the period between 2011–2015. The financial performance was measured by ROA and Tobin's Q. The study concluded about negative influence of ESG and its pillars on accounting and market measures of FP. But social pillar positively affects Tobin's Q and size of the firm has a moderating role in this relationship [31].

A separate scope of articles is devoted to the value-based management topic. Value-based methods contribute the maximization of the economic worth of an organization by allocating company's assets to their most effective use. Capital is not for free; it has a price that must be accounted for when utilizing it. One of the most frequently used VBM metrics in academic articles is Economic Value Added (EVA). EVA gauges the surplus value generated by managers, reflecting the growth or decrease in the company's value over a specific period. It can be used for either forward or backward looking [32]. The EVA, or economic profit, is a calculation of the actual profit generated by a business during a year and is vastly distinct from its accounting profit as the latter does not factor in the cost of equity capital. EVA depicts the remaining income after factoring in the cost of all capital, which includes equity capital whereas accounting profit is determined without including any charges for equity capital [33]. EVA technically is earning before interest less the company's book value multiplied by the average cost of capital [34].

The problem with EVA starts when analytics tried to describe this parameter with a meaning this parameter actually does not have. Value as well as value creation always depend on expectations of stakeholders. It could be real that the EVA figure and the economic profit in specific year have been positive and even higher than were expected, but at the same time the value of the firm or business unit has decreased cause the expectation have become worse due to weak management [34].

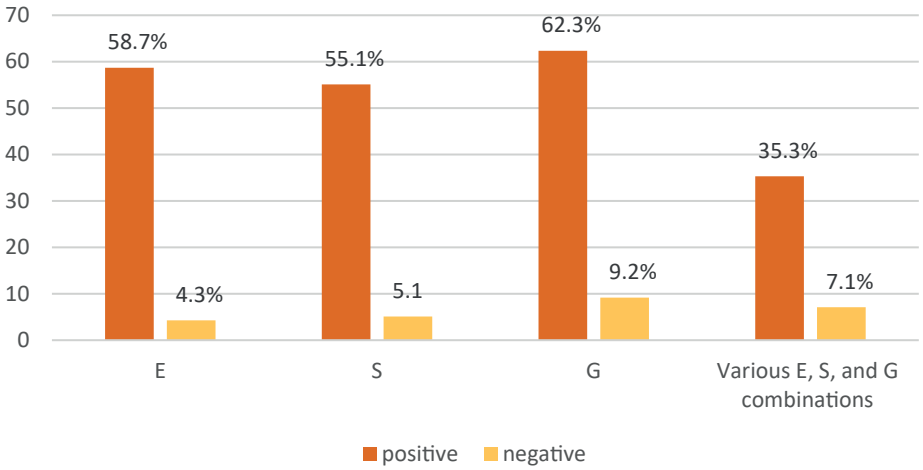
Another study proving that EVA still affects the ESG is "Research on the Correlation between ESG Performance and Economic Value Added" written by Jing Huang, Guiqian Li, Zhishu Li. This paper uses the data of a sample of A-share listed companies selected from 2012 to 2019 as the research sample to analyze the impact effect between ESG performance and EVA through empirical research, proving that ESG performance is significantly and positively related to EVA and well ESG performance can enhance the figure for EVA [35]. All three pillars of ESG have significant-

ly positive effect on EVA. What is even more interesting, this research also revealed that ESG performance remains highly significant in increasing the figure for EVA of companies in high-carbon emission industries.

What is more, various ESG factors differently affect companies' financial results. Certain companies may concentrate on initiatives in one of these three areas, thereby enhancing value, while others may actually diminish financial value. For instance, a firm could prioritize social practices and stakeholder relations, yet neglect environmental responsibility or maintain poor governance standards. Consequently, a more in-depth examination of the individual factors could provide valuable insight into how ESG activities influence financial performance [25].

Thereby, studies may consider only one part of the ESG framework. V.L. Crisóstomo and her colleagues examined the effect of CSR on ROA and Tobin's for 78 companies from Brazil over the period 2001–2006 [36]. The results indicated that CSR had significantly negative correlation between CSR and Tobin's Q. But there was no statistically significant relationship between CSR and ROA. T.G. Landi and M. Sciarelli also considered how CSR affects abnormal returns of Italian firms for the period of 2007–2015 [37]. The abnormal returns were measured by Fama – French approach. In the study they used EBITDA to equity, debt to equity, total assets, and reinvestment rate. Using the Fixed Effects Model for regression analysis, the authors found an insignificant effect of ESG on abnormal returns.

Figure 4. E, S and G categories and their relation to CFP



Source: [2].

Another branch of the studies is the nonlinear relationship between ESG and financial performance. In this sense, Shabbir and his colleagues investigated the linear and non-linear relationship between CSR and financial performance. The study uses data from 350 firms from the Karachi Stock Exchange in Pakistan for the period 2008–2017 [38]. This study comprises two main firm's performance indicators such as excess stock returns, ROA and ROC. They used sales, R&D disclosure expenditure, and leverage as control variables. Using linear panel regression analysis, the authors found that there are no significant relationships between CSR and all financial performance metrics. Nevertheless, the non-linear models indicated that the ESG disclosures scores had significant U-form relationship of ESG for ROA and ROC, but there was still no statistical significance for stock returns.

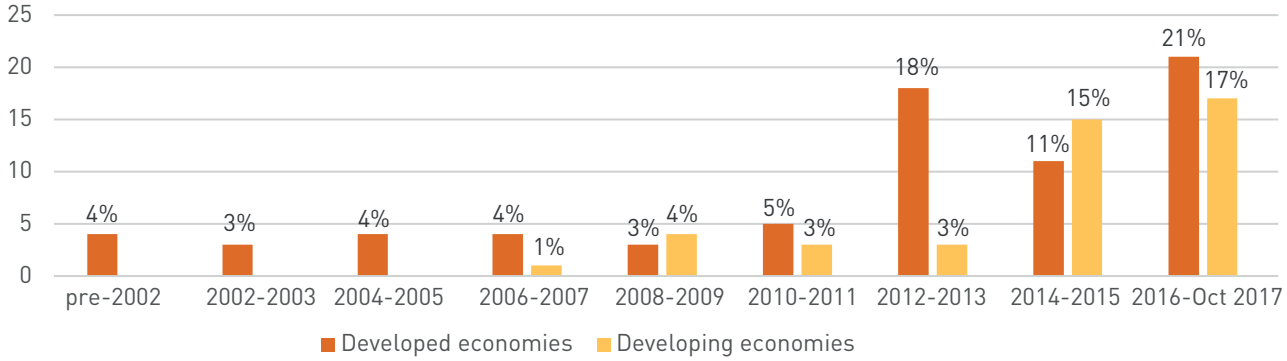
Geographical difference

The ESG-FP relations may also be affected by geographic area in which company operates in. The most common geographical division in academic literature is used in the comparative studies of emerging and developed countries. The institutional context of developed and emerging economies differs significantly. Advanced economies have strong liability laws, efficient information dissemination, and a large number of activist consumers. In contrast, emerging economies have weak liability laws, limited information dissemination, and few activist consumers.

In advanced economies, there is a reliable enforcement of liability laws, which means that individuals or organizations can be held accountable for any harm caused to others. This creates a sense of responsibility among businesses and individuals to act ethically and take necessary precautions to avoid causing harm. Additionally, there is efficient dissemination of information, which enables consumers to make informed decisions about products and services. This is supported by many activist consumers who actively seek out information and hold businesses accountable for their actions.

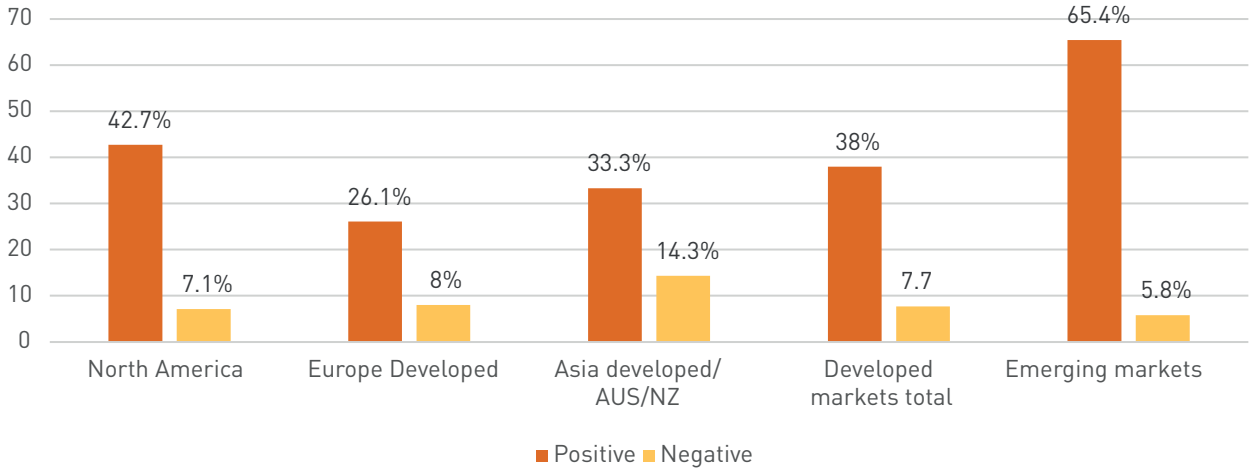
On the other hand, emerging economies have limited enforcement of liability laws, which means that businesses and individuals may not be held accountable for any harm caused. This lack of accountability creates a culture of impunity where unethical behavior goes unchecked. Furthermore, there is a limited dissemination of information, which makes it difficult for consumers to make informed decisions. Finally, there are few activist consumers in emerging economies, which means that there is less pressure on businesses to act ethically [39].

Figure 5. Percentage of publications distribution by development of economy



Source: [22].

Figure 6. ESG-CFP relation in various regions



Source: [2].

In some studies, the authors concentrate on how the impact of ESG performance on the corporate financial performance differs between developed and emerging countries in the context of ROA, ROE and Tobin's Q. For example, N. Naeem, S. Cankaya, and R. Bildik analyzed the sample of 305 environmentally sensitive firms from advanced economies and 78 from developing markets [40]. The findings suggested that the impacts of the ESG performance of environmentally sensitive corporations on the financial performance are higher for developed countries than developing countries. There were no statistically significant relationships between ESG and its pillar with all financial performance variables. Regarding developed countries, E-pillar had positive effect on ROA, S-pillar had negative effect on ROA, ESG and G-pillar had positive influence on ROE. Furthermore, ESG and E-pillar positively impact Tobin's Q for developed countries.

Another example is a comparative study by I.W.K. Ting et al., where authors investigated the difference of impact of ESG score on FP in emerging and developed markets [41]. The study was based on ESG scores in the Thomson Reuters database, and included 1317 emerging market firms and 3569 developed market firms. The paper showed that firms operating in emerging market had higher ESG scores in such points as workforce, human rights, resource use and CSR. However, the impact of ESG scores on firm's value was statistically significant and positive only for developed countries.

In conclusion, based on the experience of other studies, the topic about nexus between ESG score and financial performance of the companies can be considered from different directions. Some studies consider different dependent variables of financial performance: accounting or market metrics. Besides, the samples also vary depending on a single county or mix of countries. Another type of research is an investigation of nonlinear relations. Among this variety of papers there is no one prevalent reply about the effect of ESG on financial performance. In this sense, this study concentrates on the investigation of this nexus from three dimensions of financial performance variables using new approaches from BCG.

Development of hypothesis

Following the analysis of literature, this study considers the relationship between ESG ratings and financial performance as the main subject. We decided to cover three different types of financial performance metric to cover various companies' abilities to generate value. Moreover, we focus this investiga-

tion on BRICS countries to follow the effect of ESG activities in emerging countries. In addition, we include not only a single ESG score in the analysis, but also its sub-pillars to understand dipper effects. Thus, the research gaps mentioned above, motivated us to develop the following hypothesis:

H1a: There is a negative impact of ESG score and pillars on ROA ($\beta 1 < 0$).

We expect that the impact of ESG performance on ROA would be negative.

We assume, that the link between the accounting criteria of financial performance and ESG performance aligns with the principles of legitimacy theory. Legitimacy theory suggests that companies engage in ESG activities to conform to government regulations, satisfy external stakeholders' expectations and demonstrate their commitment to societal well-being, even in the presence of accounting losses and costs. Overall, the negative impact of ESG scores on ROA can be explained by factors such as increased costs, regulatory compliance expenses and market immaturity.

H1b: There is a positive impact of ESG score and pillars on TSR ($\beta 1 > 0$).

We expect that this measure would show a positive relationship with ESG score. Our assumption is a based on several research articles that argue about the increase of investor's expectations and trust based on the high ESG ratings. Positive relationship of market criteria of financial performance with ESG scores goes along with stakeholder theory. Transparency and comparatively more ethical business practices in companies with higher ESG scores attracts investors. Companies, that actively implement ESG agenda in their operations, enjoy stronger confidence and trust of stakeholders, which positively affects their stock prices.

H1c: There is a positive impact of ESG score and pillars on EVA ($\beta 1 < 0$).

We expect that this measure would show a positive relationship with ESG score. This hypothesis is derived from previous studies that have indicated a positive correlation between ESG performance and financial performance. This suggests that sustainable business practices and responsible corporate behavior positively contribute to a company's ability to create economic value above its cost of capital. Overall, the significant positive relationship between ESG performance and EVA can be explained by the interplay of operational efficiency, risk mitigation, stakeholder relationships, and access to capital.

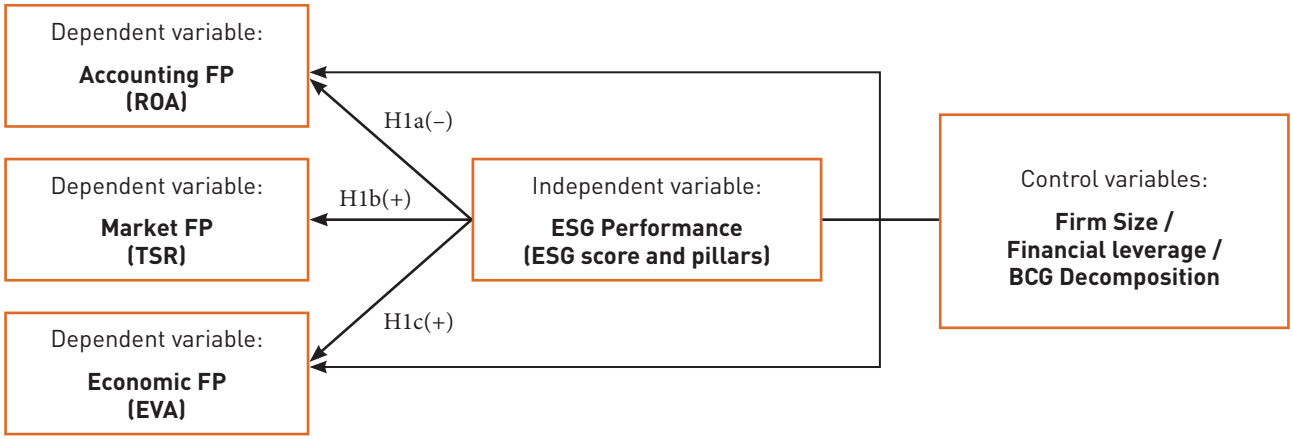
Research design and data

Data and sample selection

The objective of this study is to investigate the impact of ESG scores on financial performance. To achieve this, the research adopts a quantitative approach that emphasizes objective measurements, employing numerical, statistical, and mathematical analysis of data. By employing rigorous quantitative methods, this paper aims to provide empirical evidence and precise insights into the relationship between ESG scores and financial performance.

Figure 7 demonstrate the research framework of our study. The study employs one independent variable presented with ESG score and 3 dependent variables presented by 3 financial performance metrics. For each measure of financial performance, we identified different control variables.

Figure 7. Resource framework of the study



Source: created by the authors.

In this research, we utilize annual data from various companies operating in BRICS countries. The selection of BRICS countries is motivated by the observation that ESG-FP relations of emerging economies are not frequently observed in the existing literature, due to the fact that companies operating in emerging markets often exhibit lower ESG ratings. This can be attributed to factors such as limited disclosure requirements for non-financial information and relatively lower adoption of ESG standards, which can stem from higher investment risks and resource volatility. However, it is worth noting that emerging economies with higher economic growth rates, including BRICS countries, can afford to offer opportunities for companies to invest in and effectively implement ESG practices, thus, achieving higher ESG scores [2].

The final sample for this study includes 257 companies from BRICS countries: 45 companies from Brazil that cover 76% of country's market capitalization (excluding financial firms), 27 companies from Russia (78% country's market capitalization), 63 companies from India (41% country's market capitalization), 82 companies from China (26% country's market capitalization), and 40 companies from South Africa (81% country's market capitalization).

Final dataset covers the period of the last five years, namely 2017–2021. In general, the development of ESG rating in BRICS countries started in 2010 according to the availability of ESG data from the Refinitiv database. Nevertheless, it is vital to mention that some companies have not adopted integrated reporting immediately in 2010. In this sense the range of companies that had ESG scores in 2010 are quite narrow. Thus, the selection criteria to cover as much as possible publicly traded companies from BRICS is availability of data starting from 2017. To sum up, the final sample for this study includes 257 companies from BRICS countries during the period between 2017 and 2021.

Variables measurement and definition

Dependent variables

In our study we apply a set of financial performance metrics including accounting, market and economic metrics. Our approach is based on the idea of evolution of financial performance measures from basic accounting measures like Net Profit or Return on Assets (ROA) to market measures such as Total Shareholder Return (TSR) and Market Value Added (MVA) and economic measures like Economic Value Added (EVA) and Cash Value Added (CVA). Based on literature analysis above, there are corporate-oriented studies focusing on accounting measures of financial performance and investor-oriented papers using market measures for financial performance. The results vary depending on various dependents variables. In this sense, we decided to cover several measures of financial performance to trace the difference in the effect of ESG score on various types of financial outcomes.

The study of Amir Hossein Rahdari focuses on creating a special Triangular Rating Framework for Corporate Governance, Corporate Social Responsibility and Corporate Financial Performance ratings [21]. The part of his rating framework devoted to financial performance considers it from three sides: accounting, market and economic. Based on it, we also decided to choose one metric of financial performance from each of three dimensions.

As for accounting measures, we choose the most common metric from the studies – Return on assets (ROA). It is calculated by the following formula: Net income divided by Total Assets. This ratio characterizes the efficiency with which companies manage their operations and utilize assets to generate profits. The strength of accounting measures lies in their ability to provide comprehensive evidence of the interconnectedness between accounting and economic returns. Furthermore, ROA serves as a vital indicator of financial performance by normalizing the comparison of companies, eliminating the influence of size differences. Additionally, ROA captures changes in business conditions on an annual basis. Previous studies on integrated reporting, such as Sharma et al., Malarvizhi and Matta, Naeem et al., have also utilized ROA as a metric [28; 31; 40]. Nevertheless, ROA can be criticized by the inability to show feature perspective and take into account risk factors. These weaknesses can be reduced by including control variables in the model.

As for market and economic measures, we decided to add novelty to our research and to study the impact of ESG performance on such metrics as Total Shareholder Return and Economic Value Added. These are financial performance measures that help to evaluate companies' performance from external and internal perspective respectively.

TSR is a measure of corporate performance introduced by Boston Consulting Group (BCG) that represent the most important from the investor perspective firm's financial changes [5]. The calculation is based on the percentage change in share price per period and incorporates dividends per share over the given period. Growth of TSR attracts investors as it is a comprehensive ratio that shows the increase in target metrics for investors. This measure also allows investors to make competitive comparisons, as it is hard to manipulate with the calculations.

Nowadays, the influence of the sustainable development agenda has become one of the important factors when taking investment decisions. This is especially true in the context of sustainable investments and responsible corporate practices. Understanding the impact of strong ESG performance on a company's financial performance and shareholder value creation could help investors make informed decisions. This study of the impact of TSR on the ESG contributes to the question of the value of including ESG factors in investment strategies.

Nevertheless, TSR provides an understanding of just external value creation process, thus, there is a need to evaluate internal value creation process that provide insights into the key drivers behind business's fundamental performance. When talking about value-based measures, the most frequently used one in academic literature is EVA. EVA is a financial performance measure that aims to assess a company's ability to generate economic value above its cost of capital. EVA has gained widespread recognition as a valuable tool for evaluating a company's financial performance and value creation.

Economic Value Added (EVA) is calculated by subtracting the company's cost of capital from its Net Operating Profit After Tax (NOPAT). The formula for calculating EVA is as follows:

EVA = NOPAT – (Capital Invested · Cost of Capital).

Here's a breakdown of the components involved in the calculation:

Net Operating Profit After Tax (NOPAT): NOPAT represents the operating profit generated by a company after deducting taxes. It is calculated by multiplying EBIT by one minus tax rate.

Capital Invested: Capital refers to the total capital employed by the company, including both debt and equity. It represents the amount of cash invested in the company's operations and is usually calculated as the difference between total assets and current liabilities.

Cost of Capital: The cost of capital is the rate of return required by investors to compensate them for the risk associated with investing in the company. It represents the opportunity cost of using capital in a particular investment. The cost of capital is usually expressed as a percentage and includes the cost of debt and the cost of equity.

To increase comparability of the variable we use EVA spread. EVA spread is calculated by subtracting cost of capital from ROIC, where ROIC is the ratio of NOPAT to Capital employed. EVA spread provides insights into whether the company is generating returns above or below its required rate of return. A positive EVA spread indicates that the company is generating excess returns, while a negative EVA spread suggests that the company is not meeting its cost of capital. Analyzing the EVA spread over time can help assess the company's value creation performance and its ability to generate returns that exceed its cost of capital, indicating positive economic value added.

Independent variables

The independent variables in our paper are ESG performance metrics. As the proxy for ESG performance, we used Refinitiv ESG score and its pillars [42]. The Refinitiv ESG overall score consists of 3 pillar scores that include 10 ESG category scores. The category scores include 186 data points, relevant for each industry, and these data points in its turn combine more than 630 data points, which makes Refinitiv ESG score one of the most comprehensive ones.

In this sense, E-pillar consists of Resource use, Emissions and Innovation; S-pillar includes Workforce, Human rights, Community and Product responsibility; and G-pillar involves Management, Shareholders and Corporate social responsibility (CSR) strategy. Weights of all categories are normalized to percentages ranging from 0 to 100.

The methodology for evaluating the ESG rating of companies developed by the Refinitiv is a universally recognized tool for analyzing how effectively companies operate in a rapidly changing world, adjusting to issues that are sensitive to the world community. The Refinitiv assessment is as comprehensive as possible, covering an incredible range of issues from global warming to gender equality. Therefore, Refinitiv ESG data is widely used in academic literate to study and test scientific hypotheses [26; 40; 41; 43; 44].

Control variables

Based on the previous research articles, we identified the most frequently used and significant variables and decided to take separate control variables for different financial performance measures.

For ROA and EVA, we chose Firm Size, Leverage and Capex to assets ratio. These variables were selected based on theoretic expectations and are similar to previous studies, which also examined the impact of ESG score on financial performance of firms [3; 31; 40; 43; 45; 46].

Firm Size is determined by the natural logarithm of a firm's sales. Previous research has consistently revealed a positive correlation between firm size and financial performance [4; 47]. This can be attributed to various factors such as the advantages of economies of scale and scope, the availability of slack resources, and greater control over stakeholders enjoyed by larger firms. Additionally, larger companies often face heightened media scrutiny and external pressures, which incentivize them to adhere more extensively to governance policies [43].

Leverage is characterized by the ratio of total liabilities to total assets. On one hand, maintaining regular debt payments can contribute to effective management. However, excessive leverage, high interest rates, or substantial debt payments may limit available cash flow for further investments [40]. Highly leveraged firms are more prone to experiencing agency costs of debt and financial distress costs. Additionally, the increased financial obligations of these firms may render them vulnerable and lead to a reduction in financial performance [43]. Hence, we assume that there is a negative correlation between leverage and firm financial performance.

Capex, which represents capital expenditure as a proportion of total assets, serves as a proxy for investment. In the context of a long-term perspective, it is generally believed that Capex has a positive correlation with a firm's economic performance [43].

For TSR model we followed BCG methodology for TSR decomposition and used the components as control variables [48]. According to BCG, there are three basic drivers that affect TSR: fundamental value, investor expectations and distribution of free cash flow.

Fundamental value represents the present value of a business's future cash flows, taking into account its profit margins, asset productivity, growth prospects and cost of capital. By enhancing these fundamental aspects, a company can influence how the market perceives and values its performance, thus potentially boosting its share price. The combination of sales growth and margin changes provides a rough indication of a company's enhancement in fundamental value. In this study we use EBIT margin change as a proxy for fundamental value.

Investor expectations are gauged through the expectation premium, which measures how a company's valuation multiple compares to that of its industry peers. By positively shaping investor perceptions and generating confidence, a company can foster higher expectations, leading to increased shareholder value. The EBITDA multiple serves as a measure of a company's valuation multiple and is widely utilized by investors to approximate the company's future prospects. It is derived by dividing the enterprise value, encompassing the market value of equity and debt, by EBITDA. In this study, we specifically chose the EV/Revenue multiple over EV/EBITDA metric, considering that certain

companies in our sample reported negative earnings during specific years of our analysis.

Furthermore, optimizing the distribution of free cash flow can contribute to improved TSR. Dividends directly impact TSR, but other mechanisms such as share repurchases and debt payments can indirectly influence a company's value, thereby enhancing overall shareholder returns. Dividend yield, changes in shares outstanding, and net debt change are all means of distributing free cash flow to investors, collectively forming the free cash flow yield.

Methodology

Econometrical Model Specification

H1a: There is a negative impact of ESG score and pillars on ROA ($\beta 1 < 0$).

H1b: There is a positive impact of ESG score and pillars on TSR ($\beta 1 > 0$).

H1c: There is a positive impact of ESG score and pillars on EVA ($\beta 1 < 0$).

The models for the hypothesizes are presented by the following equations:

$$ROA_{n,t} \sim \alpha + \beta_1 \bullet ESG_{n.t} + \\ + \beta_2 \bullet Size_{n.t} + \beta_3 \bullet Leverage_{n.t} + \beta_4 \bullet Capex_{n.t} + \varepsilon_{n.t};$$

$$TSR_{n,t} \sim \alpha + \beta_1 \bullet ESG_{n.t} + \beta_2 \bullet EBIT\_mg_{n.t} + \\ + \beta_3 \bullet Multiple_{n.t} + \beta_4 \bullet FCF_{n.t} + \varepsilon_{n.t};$$

$$EVA\,spread_{n,t} \sim \alpha + \beta_1 \bullet ESG_{n.t} + \\ + \beta_2 \bullet Size_{n.t} + \beta_3 \bullet Leverage_{n.t} + \beta_4 \bullet Capex_{n.t} + \varepsilon_{n.t},$$

where $ESG_{n,t}$ is one of the fourteen ESG metrics described above, α is an intercept that also takes into account unobserved fixed effects and $\varepsilon_{n,t}$ is an error term.

Empirical results

Findings for the accounting metric

Table 2 shows the result of general model with ESG score as independent variable of sustainability and ROA as dependent variable. We controlled for the following variables: Size, Leverage and CAPEX ratio. The signs of the coefficient fully correspond to our expectations that Size and CAPEX ratio has statistically significant positive coefficients, while leverage has statistically significant negative coefficient.

Table 2. The results of regression model for H1a: Fixed effect with Robust Standard Errors

Model 1a: ESG-pillar as independent variable		Model 1a: G-pillar as independent variable		Model 1a: CSR as independent variable	
	Dependent variable: ROA		Dependent variable: ROA		Dependent variable: ROA
ESG	–0.0004	G-pillar	–0.0003*	CSR	–0.0004**
	(0.0003)		(0.0002)		(0.0002)
Ln(Sales)	0.163***	Ln(Sales)	0.159***	Ln(Sales)	0.168***
	(0.046)		(0.044)		(0.044)
Liabilities to Assets	–0.249*	Liabilities to Assets	–0.250*	Liabilities to Assets	–0.250*
	(0.198)		(0.197)		(0.197)
CAPEX to Asset	0.162*	CAPEX to Asset	0.153*	CAPEX to Asset	0.150
	(0.065)		(0.063)		(0.066)
Observations	1,274	Observations	1,274	Observations	1,276
R2	0.216	R2	0.216	R2	0.221
F Statistic	69.323*** (df = 4; 1009)	F Statistic	69.691*** (df = 4; 1009)	F Statistic	71.853*** (df = 4; 1011)
Note: *p<0.1**p<0.05***p<0.01		Note: *p<0.1**p<0.05***p<0.01		Note: *p<0.1**p<0.05***p<0.01	

Note: generated by RStudio ("stargazer").

Source: created by the authors.

Moreover, deeper analysis of ESG pillars, the coefficients of environmental and social scores also show the absence of statistically significant effect. To better investigate this outcome, we examine what category of government pillar plays the key role in this effect. The result presents that CSR category has a negative statistically significant coefficient, namely -0.0004 (statistical significance at 5%) (see Table 2). To sum up, our part one in first hypothesis is not rejected for ESG score and government pillar. The negative impact of ESG scores on ROA in BRICS countries can be attributed to several factors specific to the emerging economies.

BRICS countries may have varying degrees of regulatory stringency and enforcement when it comes to ESG practices. It goes along with Legitimacy theory, as companies operating in these regions may face compliance costs, fines, or legal liabilities associated with environmental, social, or governance issues. These factors can reduce profitability and negatively impact ROA. Moreover, BRICS countries may face resource constraints, such as limited access to sustainable technologies, inadequate infrastructure, or inefficient resource utilization. These limitations can also increase operational costs and reduce productivity, thus, negatively impacting ROA.

Another reason could be that firms operating in BRICS countries are in the process of transitioning towards better ESG practices. The initial investments required to align with ESG standards, such as upgrading infrastructure or implementing environmental innovations, can temporarily reduce profitability. For example, China, who stably has the lowest ESG scores, is currently in transition to more sustainable development. Thus, firms operating in such conditions are forced to implement additional costs to meet the new requirements. Thus, in such emerging markets companies may experience short-term negative impacts of ESG scores on the financial performance.

Investor perception and market dynamics play a crucial role in determining a company's valuation and financial performance. If the market does not fully appreciate or reward companies for their ESG efforts, companies with higher ESG scores may not experience immediate positive impacts on their ROA. This can lead to a negative correlation between ESG scores and ROA.

Findings for the market metric

Table 3 below show the result of general model with ESG score as independent variable of sustainability and TSR as dependent variable. The signs of the coefficient fully correspond to our expectations that all control variable shave statistically significant positive coefficients. So, there is positive influence of ESG scores on accounting performance of the company. In this sense, by the increase of ESG by 1 score leads to the increase of TSR by 0.009.

Moreover, deeper analysis of ESG pillars, the coefficients of environmental and social scores also show the positive statistically significant effect (see Table 3). However, government part of ESG has a no statistically significant coefficient (see Appendix 1).

In this sense, the development of environmental pillar by 1 score leads to the decrease of TSR by 0.006 (statistical significance at 5%). To better investigate this outcome, we also consider various category of environmental pillar. The result presents that Resource use category has a positive statistically significant coefficient, namely 0.005 (statistical significance at 5%) (see Table 3). Based on Refinitiv methodology, Resource use category reflects company's performance and capacity to reduce the use of materials, energy, or water and to find more eco-efficient solutions by improving supply chain management. Therefore, the improvements of resource use practices may lead to higher market performance of the companies.

Table 3. The results of regression model for H1b: Fixed effect with Robust Standard Errors

Model 1b: ESG as independent variable		Model 1b: E-pillar as independent variable		Model 1b: Resource usage as independent variable	
	Dependent variable: TSR		Dependent variable: TSR		Dependent variable: TSR
ESG	0.009***	E-pillar	0.006**	Resource use	0.005**
	(0.003)		(0.002)		(0.002)
EBIT margin growth	0.010*	EBIT margin growth	0.010*	EBIT margin growth	0.010
	(0.008)		(0.008)		(0.004)
EV to Revenue growth	0.277***	EV to Revenue growth	0.278***	EV to Revenue growth	0.226***
	(0.086)		(0.086)		(0.086)
FCF yield	–0.0001	FCF yield	–0.0001	FCF yield	–0.0001
	(0.001)		(0.001)		(0.001)

Model 1b: ESG as independent variable		Model 1b: E-pillar as independent variable		Model 1b: Resource usage as independent variable	
Observations	1128	Observations	1128	Observations	1128
R2	0.079	R2	0.075	R2	0.078
F Statistic	14.908*** (df = 4; 699)	F Statistic	14.244*** (df = 4; 699)	F Statistic	14.915*** (df = 4; 702)
Note: *p<0.1**p<0.05***p<0.01		Note: *p<0.1**p<0.05***p<0.01		Note: *p<0.1**p<0.05***p<0.01	

Note: generated by RStudio ("stargazer").

Source: created by the authors.

Furthermore, social pillar also has positive and statistically significant coefficient in relation with TSR, namely 0.011 (statistical significance at 1%) (Table 4). So, higher social pillar by 1 score leads to the increase of TSR by 0.011. Moreover, the regression with categories of social pillar show that all categories have positive and statistically significant effect on TSR. Thus, all aspects of social pillar, Workforce, Human Rights, Community and Product Responsibility, are important to boost market performance. However, government pillar and its categories have no statistically significant effect in TSR. To sum up, part two in first hypothesis is not rejected for ESG score, environmental and social pillars. The positive impact of ESG scores on TSR in BRICS can be explained by the following reasons:

To begin with, according to the stakeholder theory, companies with higher ESG scores usually have better connection with customers, employers and government. The reason behind that is that when companies are dedicated to more responsible environmental and social processes, as well as transparent governance, they have a better social reputation and gain additional credit of trust among stakeholders. Positive stakeholder relationships can lead to increased customer loyalty, employee satisfaction and productivity, and supportive regulatory environments, ultimately benefiting the company's financial performance and TSR. What is more, there is a growing trend of investors seeking sustainable investment opportunities that align with their values and promote positive environmental and social impacts. Companies with high ESG scores are often perceived as better positioned to address emerging societal challenges, regulatory changes, and stakeholder expectations. This perception attracts socially responsible investors, leading to increased demand for their shares and potentially driving up stock prices and hence TSR.

Table 4. The results of regression model for H1b: Fixed effect with Robust Standard Errors

Model 1b: S-pillar as independent variable	
	Dependent variable: TSR
S-pillar	0.011***
	(0.003)
EBIT margin growth	0.009*
	(0.004)
EV to Revenue growth	0.264***
	(0.040)
FCF yield	–0.0001
	(0.001)
Observations	1128
R^2	0.086
F Statistic	16.508*** (df = 4; 699)
Note: *p<0.1**p<0.05***p<0.01	

Note: generated by RStudio ("stargazer").
Source: created by the authors.

Secondly, companies with strong ESG performance tend to adopt sustainable business practices that consider environmental and social factors alongside financial considerations. These practices can lead to reduced risks, and enhanced reputation, ultimately contributing to long-term value creation. Regarding the risk mitigation issues, ESG-focused companies in BRICS countries are more likely to be compliant with environmental and social regulations. By effectively managing risks related to environmental impacts, social controversies, and governance issues, companies can avoid costly legal penalties, reputational damage, and disruptions to their operations. This proactive risk management approach contributes to higher TSR.

Last, but not least, as the study sample consisted of developing firms, it is important to mention investment opportunities. Firms with higher ESG scores in BRICS countries may have improved access to capital and lower borrowing costs. ESG-conscious investors, including socially responsible investment funds and institutional investors, are increasingly interested in companies that demonstrate strong ESG performance. The increased access to capital and investment opportunities can provide companies with the resources needed to drive growth, innovation, and market expansion, contributing to higher TSR.

Findings for the economic metric

Table 5 represent the outcome for model with ESG score as independent variable of sustainability and EVA spread as dependent variable. The signs of the coefficient fully correspond to our expectations that all control variable shave statistically significant positive coefficients. Considering the effect of ESG on EVA spread, the negative coefficient of ESG is statistically significant, namely –0.008 (statistical significance at 10%). So, there is negative effect of ESG scores on economic performance of the company. In this sense, by the increase of ESG by 1 score leads to the drop in EVA spread by 0.008.

Moreover, deeper analysis of ESG pillars, the coefficients of environmental pillar, government pillar and their categories also show the absence of statistically significant effect. Nevertheless, social part of ESG has a negative statistically significant coefficient, namely –0.007 (statistical significance at 10%) (see Table 5). It means that by the increase of social pillar by 1 score leads to the decrease of EVA spread by 0.007. To better investigate this outcome, we examine what category of social pillar plays the key role in this effect. The result presents that Workforce category has a negative statistically significant coefficient, namely –0.007 (statistical significance at 1%) (see Table 5). Based on Refinitiv methodology, Workforce include the company's effectiveness in promoting job satisfaction, maintaining a healthy and safe workplace, providing diversity and equal opportunities, and offering development opportunities for its workforce. To sum up, our last part of the first hypothesis is not rejected for ESG score and social pillar. The negative impact of ESG scores on EVA in the context of BRICS countries can be attributed to several factors specific to these economies.

Companies in BRICS countries are still be in the early stages of fully integrating ESG practices into their strategies and operations. Limited awareness, lower investor demand for ESG-focused investments or a lack of resources for ESG initiatives could result in a weaker relationship between ESG scores and EVA. The initial investments and adjustments required to align with ESG standards can temporarily impact profitability and hinder EVA growth. However, over the long term, these efforts may contribute to enhanced sustainability and value creation.

Table 5. The results of regression model for H1c: Fixed effect with Robust Standard Errors

Model 1c: ESG as independent variable		**Model 1c: S-pillar as independent variable**		**Model 1c: Workforce as independent variable**	
	Dependent variable: EVA spread		Dependent variable: EVA spread		Dependent variable: EVA spread
ESG	–0.008*	S-pillar	–0.007*	Workforce	–0.007***
	(0.005)		(0.004)		(0.003)
Ln(Sales)	2.501***	Ln(Sales)	2.493***	Ln(Sales)	2.518***
	(0.468)		(0.465)		(0.455)
Liabilities to Assets	–1.224***	Liabilities to Assets	–1.246***	Liabilities to Assets	–1.244***
	(0.452)		(0.455)		(0.446)
CAPEX to Asset	3.180**	CAPEX to Asset	3.300**	CAPEX to Asset	3.418**
	(1.681)		(1.697)		(1.694)
Observations	1,266	Observations	1,266	Observations	1,272
R2	0.078	R2	0.079	R2	0.084
F Statistic	21.271*** (df = 4; 1001)	F Statistic	21.355***(df =4; 1001)	F Statistic	23.114***(df = 4; 1007)
Note: *p<0.1**p<0.05***p<0.01		Note: *p<0.1**p<0.05***p<0.01		Note: *p<0.1**p<0.05***p<0.01	

Note: generated by RStudio ("stargazer").
Source: created by the authors.

To be more detailed, it is worth mentioning that companies operating in emerging markets, like BRICS, and heavily investing in sustainable development face significant costs for the implementation of environmental initiatives and compliance with standards. These costs, which include the costs of improving working conditions, strengthening corporate governance and introducing new technologies, negatively affect the profitability of the company and, consequently, EVA.

Moreover, as it has been mentioned earlier, the BRICS countries face additional challenges in implementing sustainable practices. This may be due to limited access to information technology, insufficient awareness of the society on the topic of sustainable development, as well as inefficient use of resources. These factors also influence the operating costs of firms and negatively affects their economic value.

Finally, due to the fact that EVA is frequently considered from the investor's point of view, it is important to note that BRICS market environment is a subject to volatility, political uncertainty and additional risks. Market uncertainties affect the behavior of investors and their decision-making methods. Investors may be focused on other factors, thereby not fully paying attention to the long-term financial benefits from the integration of ESG practices. It hinders the growth of the EVA, despite companies' efforts to improve the ESG indicators.

Conclusion and recommendations

Discussion of results

The sustainable development agenda is being actively introduced into the business sphere of BRICS countries. Some progress in this direction has been achieved in recent years, however additional efforts are required to overcome the existing difficulties and improve sustainable development practices.

To improve the implementation of the ESG practices in BRICS countries, it is necessary to strengthen the regulatory framework, especially in terms of transparency in data disclosure and the introduction of mandatory standards for sustainable reporting. Another aspect worth noting is the need to pay additional attention to the social aspects of sustainable development in terms of human rights, workforce and community in general. To achieve success, it is necessary to encourage international cooperation and the exchange of knowledge and practices regarding experience in the field of ESG.

Although high ESG scores of BRICS companies may have a negative impact on profitability indicators, in particular ROA, this relationship may vary depending on industrial and geographical aspects. As companies become more committed to sustainable development, reporting requirements will become more regulated and market perceptions of sustainable development will change. Thus, we assume, that in the long term, the negative impact of ESG indicators on ROA is likely to decrease and a more positive relationship between these indicators will appear.

A similar assumption can be made for the case of EVA. As sustainable practices gain momentum and the regulatory frameworks evolve, companies that address sustainability issues effectively can improve their economic value over time. Risk mitigation through the implementation of sustainable practices contributes to the creation of sustainable value in the long-term perspective.

Integration of the ESG agenda into the business processes of companies has a positive effect on the market value of the company and increases the profitability of shareholders, in particular, the TSR indicator. Industry and country specific factors may affect market conditions and hence the magnitude of the positive relationship between ESG performance and financial performance. However, in spite of everything, sustainable development agenda is already increasingly recognized as one of the driving forces for stability and guarantees of high financial results.

Implication of research

This work contains important information for investors. The results of the study provide an understanding of how the ESG valuation of a company's performance can affect the market value of shares, which can affect investment strategies. This information may also interesting to regulators, who will be able to make more informed decisions regarding investments in sustainable development.

Moreover, this study can be valuable for companies' managers and can help them to adopt more efficient and effective ESG policies and initiatives. Recognizing the potential of sustainable practices in term of market value increase, companies could pay more attention in integration of ESG agenda into their business strategies. Thereby, they can enhance their financial performance and contribute to the broader sustainable development goals.

The current study makes a significant contribution to the existing literature by expanding the scope of analysis beyond traditional accounting financial metrics. This paper highlights the importance to study the impact of sustainable development on financial performance by looking at more than one financial indicator, as this allows to look at the results from different perspectives and evaluate different effects.

This study extends the research by incorporating new financial performance proxy – Total Shareholder Return. The results of this study could serve as a guide for investors seeking to align their portfolios with sustainable values, enabling them to make informed decisions. Additionally, the research facilitates informed decision-making for companies as they strive for long-term value creation, highlighting the significance of incorporating ESG practices into their strategies. Ultimately, the study contributes to the advancement of sustainable investing by emphasizing the importance of ESG performance and its impact on financial outcomes. Thus, as a part of a future research perspective, it could be helpful to investigate the impact of TSR on the financial performance of a broader sample of firms.

Furthermore, while previous papers predominantly focused on companies operating in developed markets, the study specifically concentrates on firms operating in emerging markets, thus providing valuable insights into a distinct context and shedding light on the dynamics of financial performance in these economies. By considering a broader range of financial indicators and exploring emerging market settings, this research enriches the understanding of the relationship between financial performance and business environments. The results of the study highlight the importance of studying geographic influences on the ESG-FP relationship. Even within the same group of countries, each country has its own different level of implementation and application of sustainable practices. Despite the existence of common frameworks, each country adapts the sustainable development agenda and makes its own accents in different ways.

Limitations and future research

It is important to acknowledge the limitations imposed by the chosen design of this research. Firstly, the dataset utilized in this study is limited to companies listed in the BRICS countries at a specific point in time. Additionally, the timeframe of the analysis is restricted to the data available during the research period.

Nevertheless, the shortage of existing studies on the topic suggests potential opportunities for future research. Future studies should consider broader sample of emerging economies on a longer time horizon. It is also important to compare different statistical methods to analyze data, and to complement and validate the findings obtained through the current approach.

ESG data availability and quality can pose challenges in BRICS countries, affecting the accuracy and comparability of ESG scores. Inconsistent reporting standards, data gaps and limited disclosure practices can hinder the reliable assessment of a company's ESG performance, making it difficult to accurately evaluate the relationship between ESG scores and financial performance metrics.

Another limitation concerning ESG score measurement is the variation in methodologies across different rating agencies. If the ESG scores do not accurately capture the company's true ESG performance or fail to consider industry-specific nuances, it could result in misleading results.

Given the limitations discussed, future research should consider examining similar hypotheses using alternative databases such as MSCI or Bloomberg. Conducting comparative analyses of the main differences between various ESG scores could offer valuable insights into the variations in ratings and their implications for firm value. Understanding these differences would facilitate cross-checking and enhance stakeholder trust in ESG ratings.

Additionally, conducting further research on the costs associated with ESG implementation would provide firms with a deeper understanding of the potential value increase. Investigating the financial implications and resource requirements of integrating ESG practices could help firms make informed decisions about the allocation of resources and the expected returns on their sustainability efforts. This research would contribute to the business case for ESG adoption and provide valuable insights into the economic aspects of sustainable business practices.

Research conclusion

The focus of previous literature on motivations for superior performance in corporations has predominantly centered around developed economies, overlooking the significance of emerging markets despite their substantial presence in the global business landscape. The limited attention given to ESG performance in emerging markets can be attributed, in part, to the lack of reliable data until relatively recently.

By analyzing data from 257 companies listed in the BRICS countries and utilizing fourteen distinct ESG performance indicators, including overall ESG performance score, ESG pillars, and their respective components, our study aims to test the hypothesis that ESG performance has both a negative impact on the financial performance of BRICS firms, as measured by accounting metrics such as ROA, and a positive impact on economic and market-based metrics of financial performance.

The findings indicate that sustainable practices have a negative effect on accounting and economic performance measures. This negative association suggests that companies with strong ESG performance tend to exhibit lower profitability. These findings align with existing studies on corporate environmental legitimacy among companies from BRICS countries, wherein such firms invest in their ESG practices to safeguard their reputation and meet the required standards.

Furthermore, the study reveals a positive impact of sustainable practices on market performance of companies. The positive correlation suggests that companies with higher ESG scores tend to experience increased stock prices and enhanced shareholder wealth. These findings align with the principles of stakeholder theory, supporting the notion that companies operating in BRICS countries adopt sustainable practices to fulfill the needs of their stakeholders and foster trust.

By demonstrating the favorable relationship between sustainable practices and market performance, the study highlights the importance of considering ESG agenda as one of the key drivers of market success. It provides empirical evidence that companies prioritizing sustainable initiatives are more likely to generate positive outcomes in terms of stock market performance and shareholder value. This insight contributes to the understanding of the broader implications of sustainable practices, emphasizing the alignment of stakeholder interests and the potential for long-term value creation in companies operating within the BRICS countries.

Overall, this study contributes to the understanding of ESG performance in emerging markets, providing insights into the potential trade-offs between sustainable practices

and financial performance. It highlights the importance of considering the specific context of industry and country factors, when examining the link between sustainable and financial performance, thereby enriching the literature in this area.

References

1. Alkaraan, F., Albitar, K., Hussainey, K., & Venkatesh, V. G. (2022). Corporate transformation toward Industry 4.0 and financial performance: The influence of environmental, social, and governance (ESG). *Technological Forecasting and Social Change*, *175*(March 2021), 121423. https://doi.org/10.1016/j.techfore.2021.121423
2. Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance and Investment*, *5*(4), 210–233. https://doi.org/10.1080/20430795.2015.1118917
3. Garcia, A. S., Mendes-Da-Silva, W., & Orsato, R. (2017). Sensitive industries produce better ESG performance: Evidence from emerging markets. *Journal of Cleaner Production*, *150*, 135–147. https://doi.org/10.1016/j.jclepro.2017.02.180
4. Khan, M. A. (2022). ESG disclosure and Firm performance: A bibliometric and meta analysis. *Research in International Business and Finance*, *61*(April), 101668. https://doi.org/10.1016/j.ribaf.2022.101668
5. Boston Consulting Group. (2000). *New Perspectives on Value Creation : A Study of the World's Top Performers*. https://media-publications.bcg.com/pdf/VCR/2000-VCR-New-Perspectives-on-Value-Creation.pdf
6. Lee, M. T., & Suh, I. (2022). Understanding the effects of Environment, Social, and Governance conduct on financial performance: Arguments for a process and integrated modelling approach. *Sustainable Technology and Entrepreneurship*, *1*(1), 100004. https://doi.org/10.1016/j.stae.2022.100004
7. Pedersen, L. H., Fitzgibbons, S., & Pomorski, L. (2021). Responsible investing: The ESG-efficient frontier. *Journal of Financial Economics*, *142*(2), 572–597. https://doi.org/10.1016/j.jfineco.2020.11.001
8. Henisz, W., Koller, T., & Nuttall, R. (2019). Five ways that ESG creates value. *McKinsey Quarterly*, *November*, 1–12.
9. Hedqvist, L., Larsson, A., Hansen, F., & Duras, T. (2020). *ESG or Financial Performance –Does It Have to Be a Choice? May*.
10. Deloitte. (2023). *Quantifying ESG How ESG implementation impacts key valuation metrics* (Issue January). https://www2.deloitte.com/content/dam/Deloitte/be/Documents/mergers-acqisitions/be_quantifying_esg_report_en_.pdf
11. Servaes, H., & Tamayo, A. (2013). The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness. *Management Science*, *59*(5), 1045–1061. https://doi.org/10.1287/mnsc.1120.1630
12. Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science*, *60*(11), 2835–2857. https://doi.org/10.1287/mnsc.2014.1984
13. Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *Management Science*, *65*(10), 4451–4469. https://doi.org/10.1287/mnsc.2018.3043
14. Agoraki, M. E. K., Giaka, M., Konstantios, D., & Patsika, V. (2023). Firms' sustainability, financial performance, and regulatory dynamics: Evidence from European firms. *Journal of International Money and Finance*, *131*, 102785. https://doi.org/10.1016/j.jimonfin.2022.102785
15. Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, *66*(June 2020), 101889. https://doi.org/10.1016/j.jcorpfin.2021.101889
16. Whelan, T., Atz, U., Van Holt, T., & Clark, C. (2021). ESG and Financial Performance: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015-2020. *NYU | STERN Report*, 520–536. https://www.stern.nyu.edu/sites/default/files/assets/documents/NYU-RAM_ESG-Paper_2021 Rev_0.pdf
17. Cheng, B., Ioannou, I., & Serafeim, G. (2014). Corporate social responsibility and access to finance. *Strategic Management Journal*, *35*(1), 1–23. https://doi.org/10.1002/smj.2131
18. Nollet, J., Filis, G., & Mitrokostas, E. (2016). Corporate social responsibility and financial performance: A non-linear and disaggregated approach. *Economic Modelling*, *52*, 400–407. https://doi.org/10.1016/j.econmod.2015.09.019
19. Velte, P. (2017). Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*, *8*(2), 169–178. https://doi.org/10.1108/JGR-11-2016-0029
20. Preston, L., & O'Bannon, D. P. (1997). The Corporate Social-Financial Performance Relathionship. *Business and Society*, *36*(4), 419–429.
21. Rahdari, A. H. (2016). Developing a fuzzy corporate performance rating system: A petrochemical industry

case study. *Journal of Cleaner Production*, *131*, 421–434. https://doi.org/10.1016/j.jclepro.2016.05.007

22. Alshehhi, A., Nobanee, H., & Khare, N. (2018). The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. *Sustainability (Switzerland)*, *10*(2). https://doi.org/10.3390/su10020494
23. Haninun, H., Lindrianasari, L., & Denziana, A. (2018). The effect of environmental performance and disclosure on financial performance. *International Journal of Trade and Global Markets*, *11*(1–2), 138–148. https://doi.org/10.1504/IJTGM.2018.092471
24. Zhao, C., Guo, Y., Yuan, J., Wu, M., Li, D., Zhou, Y., & Kang, J. (2018). ESG and corporate financial performance: Empirical evidence from China's listed power generation companies. *Sustainability (Switzerland)*, *10*(8), 1–18. https://doi.org/10.3390/su10082607
25. Duque-Grisales, E., & Aguilera-Caracuel, J. (2019). Environmental, Social and Governance (ESG) Scores and Financial Performance of Multilatinas: Moderating Effects of Geographic International Diversification and Financial Slack. *Journal of Business Ethics*, *168*(2), 315–334. https://doi.org/10.1007/s10551-019-04177-w
26. Pulino, S. C., Ciaburri, M., Magnanelli, B. S., & Nasta, L. (2022). Does ESG Disclosure Influence Firm Performance? *Sustainability (Switzerland)*, *14*(13), 1–18. https://doi.org/10.3390/su14137595
27. Kim, S., & Li, Z. (2021). Understanding the impact of esg practices in corporate finance. *Sustainability (Switzerland)*, *13*(7). https://doi.org/10.3390/su13073746
28. Malarvizhi, P., & Matta, R. (2016). "Link between Corporate Environmental Disclosure and Firm Performance"-Perception or Reality? *Review of Integrative Business and Economics Research*, *5*(3), 1–34. http://www.latimes.com/world/europe/la-fg-climate-change-talks-paris-updates-htmlstory.html
29. Lee, D. D., Faff, R. W., & Langfield-Smith, K. (2009). Revisiting the Vexing Question: Does Superior Corporate Social Performance Lead to Improved Financial Performance? *Australian Journal of Management*, *34*(1), 21–49. https://doi.org/10.1177/031289620903400103
30. Atan, R., Alam, M. M., Said, J., & Zamri, M. (2018). The impacts of environmental, social, and governance factors on firm performance: Panel study of Malaysian companies. *Management of Environmental Quality: An International Journal*, *29*(2), 182–194. https://doi.org/10.1108/MEQ-03-2017-0033
31. Sharma, D., Bhattacharya, S., & Thukral, S. (2019). Resource-based view on corporate sustainable financial reporting and firm performance: Evidences from emerging Indian economy. *International Journal of Business Governance and Ethics*, *13*(4), 323–344. https://doi.org/10.1504/IJBGE.2019.099565
32. Petravičius, T., & Tamošiuniene, R. (2008). Corporate performance and the measures of value added. *Transport*, *23*(3), 194–201. https://doi.org/10.3846/1648-4142.2008.23.194-201
33. Wallace, J. S. (1997). Adopting residual income-based compensation plans: Do you get what you pay for? *Journal of Accounting and Economics*, *24*(3), 275–300. https://doi.org/10.1016/S0165-4101(98)00009-3
34. Fernandez, P. (2003). *Three residual income valuation merhods and discounted cash flow valuation* (Vol. 31, Issue 2). https://doi.org/10.53841/bpscpr.2016.31.2.33
35. Huang, J., Li, G., & Li, Z. (2022). Research on the Correlation between ESG Performance and Economic Value Added. *Forest Chemicals Review*, *1501*, 1501–1514. http://www.forestchemicalsreview.com/index.php/JFCR/article/view/1019%0Ahttp://www.forestchemicalsreview.com/index.php/JFCR/article/download/1019/957
36. Crisóstomo, V. L., De Souza Freire, F., & De Vasconcellos, F. C. (2011). Corporate social responsibility, firm value and financial performance in Brazil. *Social Responsibility Journal*, *7*(2), 295–309. https://doi.org/10.1108/17471111111141549
37. Landi, G., & Sciarelli, M. (2019). Towards a more ethical market: the impact of ESG rating on corporate financial performance. *Social Responsibility Journal*, *15*(1), 11–27. https://doi.org/10.1108/SRJ-11-2017-0254
38. Shabbir, M. S., Aslam, E., Irshad, A., Bilal, K., Aziz, S., Abbasi, B. A., & Zia, S. (2020). Nexus between corporate social responsibility and financial and non-financial sectors' performance: a non-linear and disaggregated approach. *Environmental Science and Pollution Research*, *27*(31), 39164–39179. https://doi.org/10.1007/s11356-020-09972-x
39. McWilliams, A., Siegel, D. S., & Wright, P. M. (2006). Corporate social responsibility: Strategic implications. *Journal of Management Studies*, *43*(1), 1–18. https://doi.org/10.1111/j.1467-6486.2006.00580.x
40. Naeem, N., Cankaya, S., & Bildik, R. (2022). Does ESG performance affect the financial performance of environmentally sensitive industries? A comparison between emerging and developed markets. *Borsa Istanbul Review*, *22*, S128–S140. https://doi.org/10.1016/j.bir.2022.11.014
41. Ting, I. W. K., Azizan, N. A., Bhaskaran, R. K., & Sukumaran, S. K. (2020). Corporate social performance and firm performance: Comparative study among developed and emerging market firms. *Sustainability (Switzerland)*, *12*(1). https://doi.org/10.3390/SU12010026

42. Refinitiv. (2022). *Environmental, social, and governance scores from Refinitiv*. Refinitiv. https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf

43. Gonçalves, T. C., Louro, D., & Barros, V. (2023). Can Corporate Sustainability Drive Economic Value Added? Evidence from Larger European Firms. *Journal of Risk and Financial Management*, *16*(4). https://doi.org/10.3390/jrfm16040215

44. Umar, M., Mirza, N., Rizvi, S. K. A., & Naqvi, B. (2022). ESG scores and target price accuracy: Evidence from sell-side recommendations in BRICS. *International Review of Financial Analysis*, *84*(October), 102389. https://doi.org/10.1016/j.irfa.2022.102389

45. Gholami, A., Sands, J., & Rahman, H. U. (2022). Environmental, Social and Governance Disclosure and Value Generation: Is the Financial Industry Different? *Sustainability (Switzerland)*, *14*(5). https://doi.org/10.3390/su14052647

46. Saini, N., Antil, A., Gunasekaran, A., Malik, K., & Balakumar, S. (2022). Environment-Social-Governance Disclosures nexus between Financial Performance: A Sustainable Value Chain Approach. *Resources, Conservation and Recycling*, *186*(July), 106571. https://doi.org/10.1016/j.resconrec.2022.106571

47. Ramli, N. A., Latan, H., & Solovida, G. T. (2019). Determinants of capital structure and firm financial performance — A PLS-SEM approach: Evidence from Malaysia and Indonesia. *Quarterly Review of Economics and Finance*, *71*, 148–160. https://doi.org/10.1016/j.qref.2018.07.001

48. Boston Consulting Group. (2004). The next frontier. In *The value creators report*. https://doi.org/10.7748/ldp2011.12.14.10.11.p7144

Appendix 1

Regression model results for H1b: Fixed effect with Robust Standard Errors

Model 1b: Workforce as independent variable

	Dependent variable:
	TSR
Workforce	0.004*
	(0.002)
EBIT margin growth	0.010**
	(0.004)
EV to Revenue growth	0.266***
	(0.040)
FCF yield	-0.0001
	(0.001)
Observations	1128
R^2	0.073
F Statistic	13.760*** (df = 4; 702)
Note:	*p<0.1**p<0.05***p<0.01

Model 1b: Human Rights as independent variable

	Dependent variable:
	TSR
Human Rights	0.005***
	(0.002)
EBIT margin growth	0.010***
	(0.008)
EV to Revenue growth	0.268***
	(0.085)
FCF yield	-0.0001
	(0.001)
Observations	1128
R^2	0.079
F Statistic	15.009*** (df = 4; 702)
Note:	p<0.1**p<0.05***p<0.01

Model 1b: Community as independent variable

	Dependent variable:
	TSR
Community	0.005**
	(0.002)
EBIT margin growth	0.010*
	(0.008)
EV to Revenue growth	0.263***
	(0.086)
FCF yield	-0.0002
	(0.001)
Observations	1128
R^2	0.076
F Statistic	14.338*** (df = 4; 702)
Note:	*p<0.1**p<0.05***p<0.01

Model 1b: Product Responsibility as independent variable

	Dependent variable:
	TSR
Product Responsibility	0.005***
	(0.002)
EBIT margin growth	0.009
	(0.008)
EV to Revenue growth	0.258***
	(0.086)
FCF yield	-0.0002
	(0.0005)
Observations	1128
R^2	0.078
F Statistic	14.794*** (df = 4; 702)
Note:	*p<0.1**p<0.05***p<0.01

Note: generated by RStudio ("stargazer").

Source: created by the authors.

Contribution of the authors: the authors contributed equally to this article.

The authors declare no conflicts of interests.

The article **was submitted** 14.10.2023; **approved after reviewing** 15.11.2023; **accepted for publication** 05.12.2023.

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.114-131
JEL classification: G30, G32

Dividend Policy of Russian Companies: Cancel Culture Effect

Maxim Belous
Senior Auditor, Sberbank, Moscow, Russia,
maks.belous.01@mail.ru, ORCID

Abstract

The paper is dedicated to the dividend policy of Russian companies under the sanctions pressure applied by the USA and the EU, which especially intensified in 2022 as a result of the changed global geopolitical environment. Cancel culture was used against Russia, complicating the financial, investment and operating activity of domestic companies. In the paper we analyze a sample of 73 Russian listed companies from non-banking sectors and 317 observations for 2017–2022. We consider the impact of sanctions against companies, boards of directors and CEOs on the company dividend policy. We used a logistic regression as a model to determine the probability of influence of changes in the studied variables on the decision concerning dividend payment. The sample is divided into two parts: 2017–2020 and 2021, and it illustrates companies' behavior when the political environment in the world was stable and when the situation was aggravated. The research showed that sanctions against boards of directors and direct limitations of company's operations had a negative influence on the probability of dividend payments while sanctions against CEO in the period of aggravation of political risks produced a positive effect. The cancel culture effect, i.e., the refusal of the USA and EU to cooperate with Russia and sanctions imposed on it, produced a significant negative effect on dividend payout by Russian companies.

Keywords: dividend policy, cancel culture, sanctions, CEO, board of directors

For citation: Belous M. (2023) Dividend Policy of Russian Companies: Cancel Culture Effect. *Journal of Corporate Finance Research.* 17(4): 114-131. https://doi.org/10.17323/j. jcfr.2073-0438.17.4.2023.114-131

Introduction

In 2022 the Russian economy encountered difficulties and elevated uncertainty as a result of an enormous number of sanctions imposed by the Western countries. The limitations changed the Russian market environment rather significantly [1]. For this reason, a lot of companies had to take prompt actions to adapt to current reality. Such prompt changes influenced their corporate decisions because sanctions impact the financial, investment and operating activity of companies.

Before 2022 the Russian stock market had been developing rapidly, the investors' attention to the Russian stock market had been growing. It was characteristic of the majority of Russian companies to pay hefty dividends as compared to the rest of the world. However, after the special military operation started, Western countries increased the sanctions pressure on Russia in an unprecedented manner, and many companies decided to cancel dividend payouts. The cancel culture policy was applied to our country as a way to hold some persons, entities or even countries liable for their wrongful acts.

All the above makes relevant the study of the dividend policy of Russian companies in the present-day context. It is important to understand how companies make corporate decisions now. We should consider the factors that influence the stock prices in Russia.

The paper analyzes data for 2017–2022 on the 73 listed Russian companies from non-bankings sector and 317 observations. An attempt was made to determine how sanctions against companies, boards of directors and CEOs impact their dividend policy.

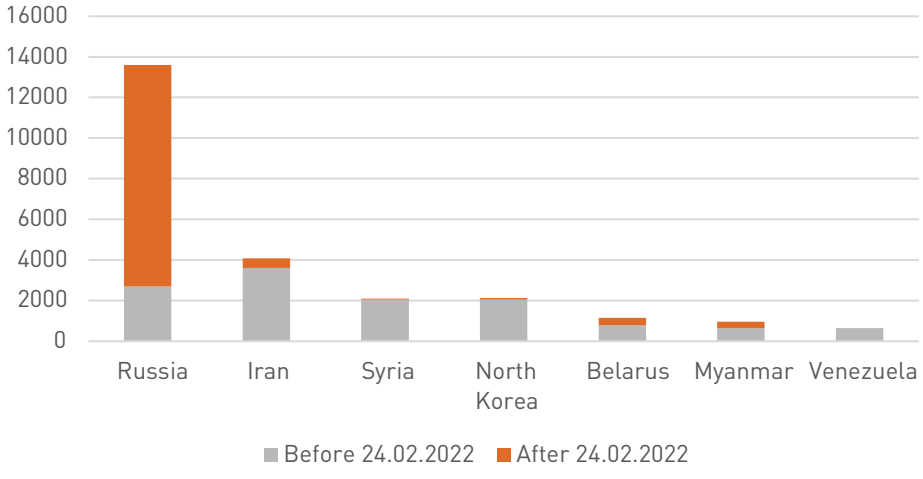
We used a logistic regression as a model to determine the probability of influence of change in the studied variables on the decision concerning dividend payout. The sample is divided into two parts: 2017–2020 and 2021 in order to define companies' behavior when the political environment in the world is stable and when the situation was aggravated.

Review of the Cancel Culture Notion with Reference to Russia

Cancel culture [2] is the term used to describe the practice of public disapproval of persons or entities for their allegedly offensive behavior or beliefs. The supporters of cancel culture assert that it is an effective way to bring to responsibility persons, entities or even countries for their actions and to restore social justice.

In 2022 this approach was applied to Russia [3]. Western countries imposed an enormous number of economic and political sanctions on our domestic companies, their owners, CEOs and assets. They had been introduced on a certain regular basis before 2022, but not on such a vast scale. According to public sources, Iran – the former leader in this indicator –had been subjected to approximately 4,080 sanctions since 1979. Since 22.02.2022, over 13,000 sanctions have been imposed on Russia (Figure 1), and beyond doubt, this affected its macroeconomic indicators and operating activities of domestic companies. The USA introduced the greatest number of limitations.

Figure 1. Number of sanctions imposed on various countries



Source: [4].

American sanctions are divided into direct sanctions, aimed to limit interaction with individual persons and legal entities from the SDN[1] list, and sectoral ones, intended to hinder the functioning of a country's critical industries. The limitations imply asset freezing and prohibition to interact in any way with the designated person. Companies from the SDN list face a number of problems. First, market outlets are limited because American contractors are afraid of legal liability for operations with a designated person, while persons and entities beyond the US legislative envi-

[1] The list of specially designated nationals and blocked persons – a sanctions measure of the US government.

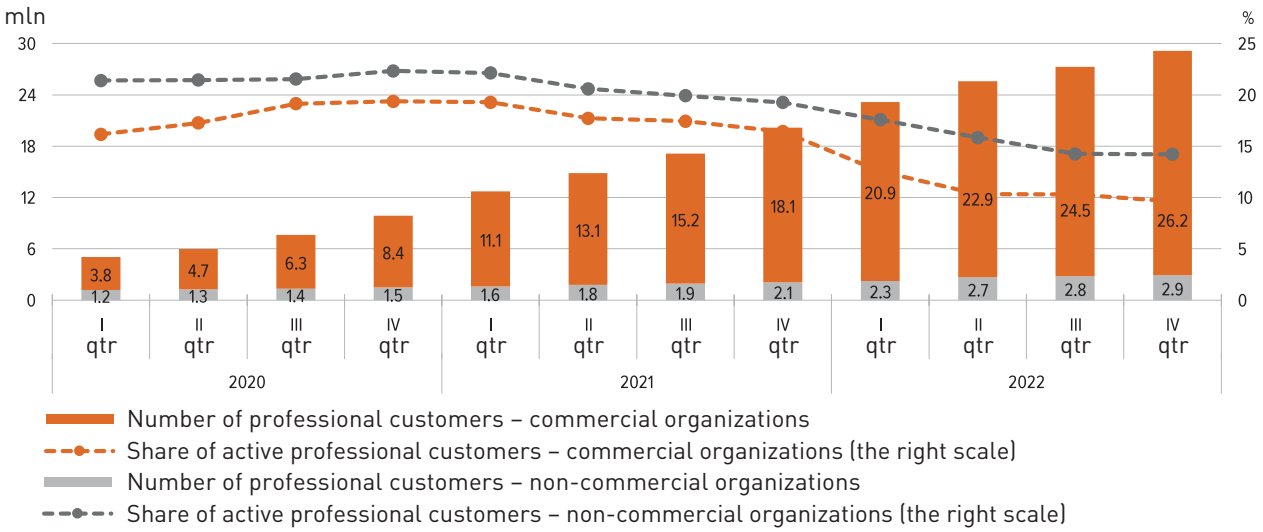
ronment are afraid of secondary sanctions and/or unwilling to assume reputational risks. Companies also encounter the problem of access to capital markets. It becomes more difficult for them to find external funding and attract investments for future projects, which has a negative impact on their scaling potential. It is important to note that sanctions apply not just to the person included in the SDN list, but to all the companies under his/its control if the share of the sanctioned person in the ownership structure exceeds 50% [6]. The European Union implements a similar sanctions policy.

Stock Market Analysis

Review of Trading Participants in the Moscow Exchange

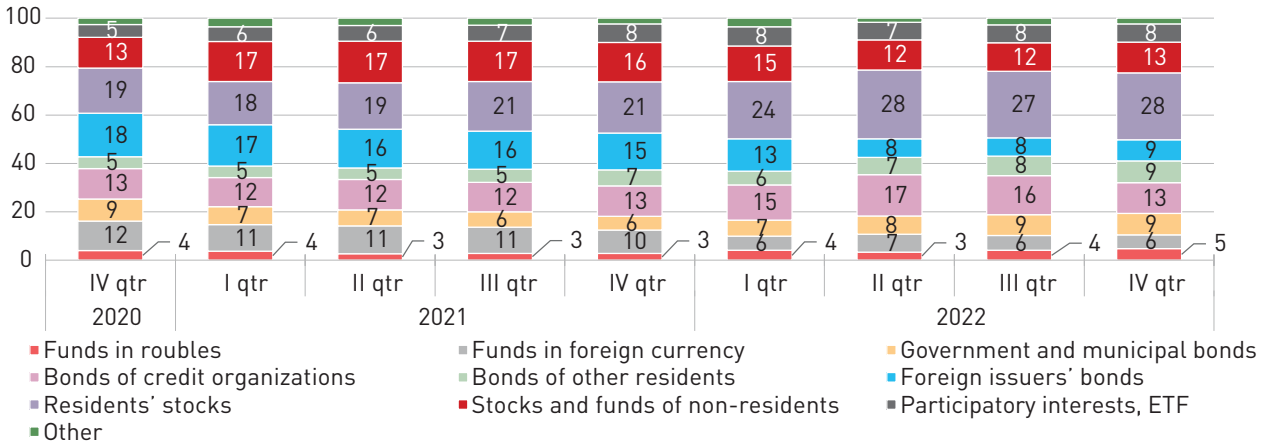
Before 2022 Russian financial markets had been developing rapidly, which is confirmed by the data of the Bank of Russia on the dynamics of the number of registered brokerage accounts. People were highly interested in investments and growth of their capital. In 2020-2022 the number of registered accounts had increased more than five-fold from 5 million users to 29.1 million. This is approximately one third of the economically active population. The number of professional traders also grew almost thrice, which is indicative of an increase in the number of financially literate persons because the professional status is granted after one passes field-specific tests. This attests to an increase in the number of participants who can potentially invest over RUB 6 million. It is important to note that the share of active customers has decreased since 2020, however, it did so slower than the number of accounts, which is indicative of an increase in the number of active market participants in absolute terms. However, in the 1st quarter of 2022 the number of active participants diminished. First of all, it was due to an aggravation of the global geopolitical situation and a lack of understanding by the majority of individuals of their future actions in those circumstances (Figure 2).

Figure 2. Dynamics of the number of brokerage customers and the share of active customers



Source: [7].

Figure 3. Assessment Structure of Brokerage Customers' Assets, %



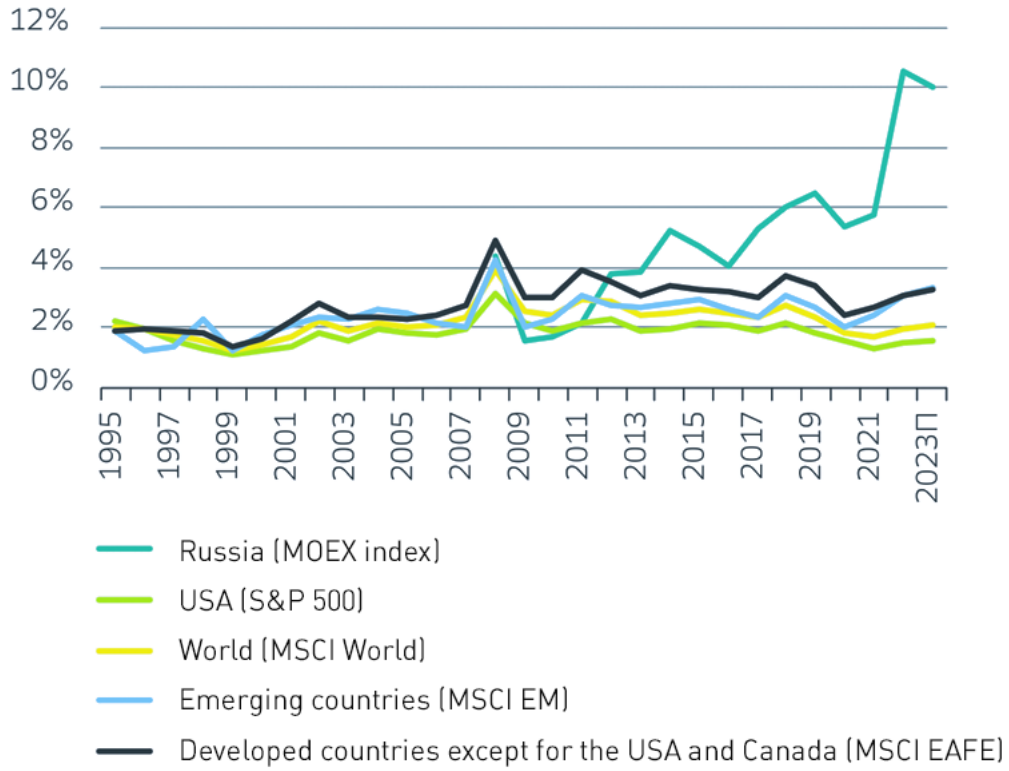
Study of the stock market is relevant because the share of stock items in investors' portfolios has been growing year-over-year, in 2022 the increase amounted to 10.8% – from 37 to 41%. In spite of the growing uncertainty of the Russian economy's prospects in 2022 and a decrease in the aggregate value of assets in brokerage accounts with less than RUB 6 million (–28%) the outflow of funds from Russian companies' stocks showed the minimal dynamics, and the share of their assets increased. The share of foreign companies decreased up to 13% due to elevated political risks (Figure 3).

Thus, despite a deterioration in investment attractiveness of Russian assets, the number of new participants of financial markets is growing. Investors should have a notion how to act in the Russian market, which has undergone significant changes. For this purpose, it is necessary to analyze investment attractiveness and facilitate potential risk mitigation.

Dividend Policy of Russian Companies

In 1995–2013 the dividend yield of Russian stocks was correlated with global indicators. For 23 years global stock earnings averaged approximately 2%, trending upwards (Figure 4). In 2013 an explosive growth of Russian stocks' dividend yield began, in 2022 it reached 10%, outstripping the global yield by 7%.

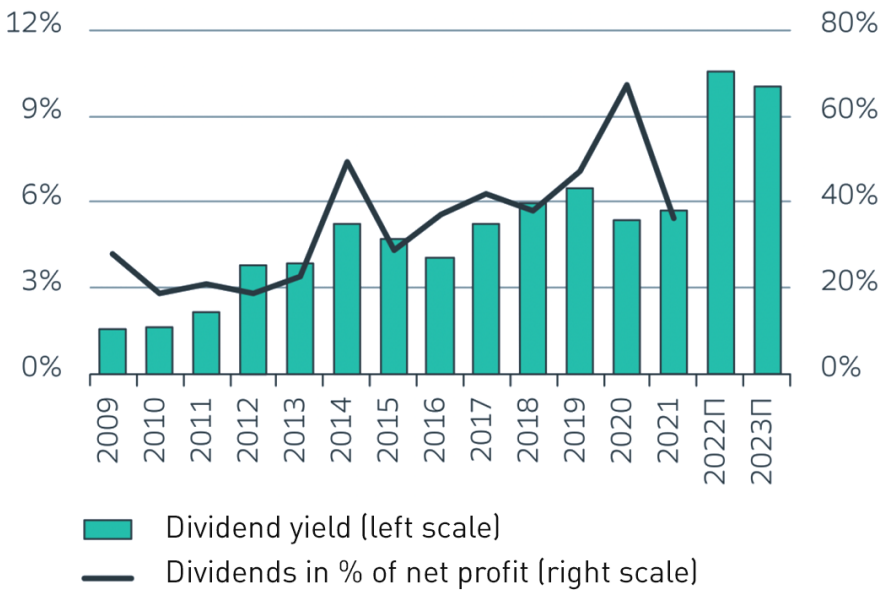
Figure 4. Global dividend yield, %



Source: [8].

To a large extent such explosive growth was caused by several factors. First, Russia is rich in natural resources, so it has a resource-based economy. The majority of companies are export-oriented. In 2014 a serious ruble devaluation started, as a result of which many companies received additional funds from selling currency. Besides, since 2014 the Russian economy has been exposed to high political risks, which lowered the company stocks' prices even more because investors price in the probability of new sanctions that would impede corporate operations. Third, since 2013 there has been a trend to increase the share of payments to investors in net profit. In the first instance, this was due to a low average net debt/EBITDA ratio – a low debt load and the absence of a need to hold additional funds such as undistributed profit and reserves on the balance sheet so as to be prepared for contingencies. This also meant that companies had no attractive projects within the country, while investments in foreign projects were associated with political risks. Therefore, Russian issuers prefer to distribute their funds among the investors.

Figure 5. Dividend yield of the MOEX index and the rate of dividend payout, %



Source: [8].

The dividend policy is one of the most important instruments of corporate governance. Based on its earned and estimated net profit, a company makes a decision regarding profit distribution for dividend payout and reinvestment in business. The payout amount has a direct impact on company value and its development prospects. A properly organized, stable dividend policy attracts and retains investors because it is a reliable source of income. However, if it is nonoptimal, it harms the firm's reputation, reduces its future cash flows and impairs its development prospects. Understanding of the dividend policy assists investors in making justified decisions when they choose companies based on their objectives and risk proneness.

Fundamental Concepts of Choosing the Payout Policy

Agency Theory

In some sense dividends are a corporate governance instrument which enables one to solve the problem of interaction between company's shareholders and top management. Dividends are used to redistribute company profit, reduce the amount of cash held in its accounts. According to agency theory, managers have access to corporate funds and may spend them on themselves, disguising it as corporate privileges and serving only their own interests [9]. This reduces corporate free cash flows and conflicts completely with shareholders' interests. The problem of agency costs may arise because managers lack sufficient incentives to do their best. If they have no share in corporate equity, their benefits do not depend on corporate financial performance and they may afford not to put sufficient efforts into optimizing business processes, thus, reducing the potential net profit of the company. Moreover, managers' welfare depends on the company size to a greater extent than on its profit. Therefore, they are prone to accumulate company assets and its revenue. Usually, managers tend to reinvest profit rather than use it to pay dividends. Money may be invested in a project with a lower net present value if it can lead to significant growth in company value. Such a transaction will reduce the potential net cash flow of the equity holders.

To control the managers' activity, the shareholder meeting appoints a board of directors [10]. This is the body entitled to make decisions on dismissal and employment of the company managers. It also controls the transparency of reports and business, financial performance and makes every effort to increase company value and benefit the shareholders. The board of directors determines the payout policy and makes recommendations to the shareholder meeting as to the size of dividends. According to agency theory, the board of directors is a connecting link between shareholders and company managers that reduces agency costs by means of efficient control and supervision over the company management.

Signaling Theory

One of the problems solved by means of dividends is the reduction of shareholder costs related to information asymmetry [11]. Managers have complete information about the financial and economic status of the company, they can manipulate it when furnishing it to the investors. For this reason, economic agents are in an unequal position. Signaling theory presumes that dividends comprise compensation for information asymmetry. Increased payouts indicate that the company operations are developing in a sustainable way and that management does its job well [12].

Life Cycle Theory

One of the widespread concepts in corporate finance is the theory of the firm's life cycle. It implies that corporate dividend policy correlates strongly with the development stage of the company. Each firm evolves from start-up to maturity, and each new stage is characterized by a reduction in potentially profitable investment projects, development pathways, slowdown in growth rates and the cost of capital raising. As a company goes through its life cycle, its optimal dividend payout policy changes. The key premise of this theory is that a firm has to constantly balance the ratio of funds used for reinvestment in business and dividend payments. As a rule, at early stages, a company has many development pathways, new projects, opportunities to scale up rapidly and take over new markets. All these needs require substantial capital. As a consequence, the optimal dividend policy for new firms will be to allocate profit for reinvestment, thus avoiding overpayment for raising expensive external capital. As the company matures, it gradually hits the ceiling. Markets become glutted, and it becomes difficult to find new one. As a result, growth slows down gradually. At the maturity stage, the optimal dividend policy is distribution of profit among shareholders [13]. However, there is a risk that the management will allocate corporate funds in a nonoptimal way, investing funds in the projects that are not necessarily the most attractive.

Influence of Characteristic Features of the Corporate Governance Bodies on the Dividend Policy

Number of Independent Directors

The Board of Directors defines the size of paid dividends. This problem has been analyzed by many researchers, however, sometimes they obtained contradicting results, because they studied this problem at different time intervals and in different countries. For instance, H. Mohamed et al. examined the companies listed on the London Stock Exchange from 2010 to 2013 [14]. One of the variables is the number of independent members at the meeting of directors. The authors concluded that this variable had a negative impact on dividend size, substantiating it by the fact that independent directors reduced agency costs. They play a fundamental role in corporate governance [15] because they express an objective point of view. Their main incentive for performing the job properly is to maintain a positive image and reputation in the labor market. Unlike executive directors, independent directors are not involved in the daily process of corporate governance, which enables them to have an impartial assessment of company operations, financial performance and the strategic orientation vector. They improve the control and supervision over the management team, making the managers, in their turn, apply effective operational solutions and preventing them from using their status and access to company funds to their personal advantage. This ensures that company operations are performed for the benefit of shareholders, consequently, investor confidence grows and the board of directors is not forced to decide to pay excessive dividends in order to cover agency costs. A. Khan obtained similar results after a study of Turkish companies in 2013–2017 [16]. His model also showed a negative relationship with dividend size, however, he arrived to a different conclusion because the relationship turned out to be insignificant. Turkey is an emerging country characterized by underdeveloped legal institutions, high corruption and a large proportion of family trusts holding controlling interest in companies. Such a negative relationship evidences that independent directors may be insufficiently independent in their decision-making because powerful families exert pressure on them. This may be indicative of their conspiracy with the families that control the companies, and this implies a complete impairment of the minority shareholders' rights. Although this study showed an insignificant influence of the studied variable, the paper is also useful for our analysis. Russia is also an emerging economy with a large number of oligarchs who produce a significant influence on the companies' ownership structure.

However, many authors obtained other empirical results investigating this characteristic feature of the board of directors. R.S. Yarram and B. Dollery studied Australian companies in 2004–2009 and concluded that the number of independent directors had a positive and significant impact on the dividend size, substantiating it by compensation of agency costs [17]. M. Rajput and S. Jhunjhunwala also write about a significant positive relationship, asserting that board independence and dividend size are complementary rather than mutually exclusive [18]. Firms with positive dividends should resort to the capital market to finance their development, and the market, in its turn, performs a firm controlling function. Moreover, the authors obtained results that are completely different from A. Khan's indicators. When the firm is family-owned, independent directors produce a positive significant impact. This shows that such a combination reduces nepotism in companies, improves the governance bodies and guarantees a fair and optimal distribution of profit protecting the interests of minority investors. H. Tahir arrived at the conclusion that this indicator also had a positive but insignificant impact [19]. He considered this relationship using the example of Malaysia, which is an emerging economy.

Influence of the Size of the Board of Directors

Another characteristic feature of the board of directors whose influence has been repeatedly studied in academic literature is its size. Boards of directors with a significant number of members have more opportunities to control the managers' performance. This feature may decrease agency costs, minimizing the chance that managers will take advantage of their position and make excessive use

of corporate bonuses, spending the corporate budget for their own benefit. There is a reduced likelihood that a lot of members will collude with management and that the board of directors will prejudice the shareholders' interests. A large board of directors is more experienced overall, which may exert a positive impact on its effectiveness and decision-making. However, there are studies that suggest otherwise. The larger the board, the more difficult it is for the directors to come to an understanding and agree on a common stand concerning a certain objective and this will have a negative impact on corporate governance [20]. The quality of the governance bodies may affect dividend payouts in two ways. In the first case, due to the ineffective work of the board of directors, company management may reduce the free cash flow, which belongs to the shareholders, and as a consequence, they will receive less dividends than is due. However, the ineffective board of directors may increase dividends as compensation in order to signal to the investors that the company is doing well. H. Mohamed studied the influence of this variable on a sample of small and medium-sized UK companies in 2010–2013 and concluded that a large number of board members exerts a positive impact on dividend payouts [14]. A. Boumosleh and B. Cline also reached the conclusion that there was a positive dependence between these two variables [21]. However, some authors assert that there is a negative influence of this variable. For example, after study of a sample of 81 Iranian companies, R. Ghasemi et al. (2013) obtained exactly the same results [22].

Influence of CEO Duality and its Significance

In international practice, the CEO often also occupies the position of the chairman of the board of directors, thus obtaining additional opportunities to influence company operations and a wide range of powers. In this case, the CEO has the right to veto the motions of other board members using his privileged position as a top manager, which may adversely affect payouts [23]. According to the signaling theory a CEO-led board of directors may increase payouts, thus demonstrating to the market that top managers do not abuse their position. The raised dividends may serve as compensation for relaxed control over the executive bodies of the managing board and as a way to attract investors. Companies with effective governance bodies may prefer to diminish dividends because it is expensive to raise external financing. Such companies have an advantage of low agency costs, control, reputation and shareholder confidence. Use of equity capital can reduce the leverage and bankruptcy risk, thus producing a positive impact on company value [14].

There are other factors that indicate that the CEO has additional decision-making power, which adversely affects governance. Many researchers reached the conclusion that an unreasonably high salary of a CEO produces a negative impact on corporate governance [24; 25]. This indicator may be calculated using a ratio of the CEO's salary to the average of other top managers' salaries. An unreasonably high salary may be indicative of agency problems and the fact that the CEO is maximizing his own benefits. This may also be a demotivating factor for the managers occupying the next lower stage in the management hierarchy. They may underperform because of the sense of unfairness, which will impair the team's overall effectiveness.

Another factor – the share of stock held by the CEO in the corporate capital structure may have a significant influence on corporate governance. When the CEO is simultaneously an owner or a principal shareholder of the company, there is a risk of a conflict of interests, which may undermine governance efficiency. The CEO may place his personal interests above the interests of other stakeholders, e.g., employees, other majority stakeholders or minority investors. This may result in decisions that do not meet the company's long-term interests or contravene its values and mission. Moreover, when the CEO owns a significant block of stock, he may have disproportionately high power and influence on the board of directors, resulting in a lack of checks and balances when he makes decisions. This may also lead to a situation when the CEO has the upper hand on the board of directors and makes decisions without proper control or accountability. It is important for companies to have a governance structure that ensures taking into account the interests of all parties. S.A. Shahbaz considered a set of factors that pointed out CEO's influence on the dividend policy [26]. In his opinion, powerful CEOs are not generally inclined to pay or raise dividends. However, their own benefit from such actions sometimes exceeds the costs. During the period of relatively low profit and high volatility the company may need to attract additional funds. In such tough times American companies with powerful CEOs raise dividends. This signals to the market that the company has good prospects and also increases CEO's benefits because he gains a reputation of a manager who acts solely in the investors' interests.

Influence of CEO's Tenure

Academic literature often raised the issue of influence of the CEO's tenure on the dividend policy. There is an opinion that these two variables have a negative relationship. The CEO's tenure increases his power, providing an opportunity to expand the range of his authority. A long tenure may also improve CEO's relations with the board members as well as their loyalty; as a result the monitoring of the CEO's activity may be slackened leading to an increase in agency costs [27]. Other studies [28] state that CEOs with a long tenure have a positive influence on dividend payouts. The CEO who has worked for a company for a longer period has better knowledge of its operations. Thus, there is a greater likelihood that it was him who had drawn up and obtained approval of the strategic development plan, made effective decisions and defined the company prospects. The researchers also found out that a longer tenure is related negatively to investments in the design and development of new projects as it makes the CEO more conservative. This

fact indicates that agency costs are decreased because the probability that the CEO will act non-optimally is reduced – meaning that he will reinvest profits in new, less profitable projects in order to enhance company value rather than optimize its usefulness for stockholders. A reduction in the share of undistributed profit intended for reinvestment will cause an increase in the share of available cash that will be used for dividend payout. H. Tahir made similar conclusions, substantiating them by the fact that new employees were more likely to risk and invest in new projects because they needed to gain a reputation and demonstrate their skills and experience. A heightened interest in risky projects will reduce the likelihood payout [19].

Influence of Political Risk

The issue of the impact of sanctions on the dividend policy is not very popular, although some authors have explored similar topics. In uncertain times managers who expect a stable growth of the anticipated future profit may reduce all potential risks more than necessary and overrate the cost of attracting external financing. As a result, they may prefer to choose a conservative profit distribution policy, reserving undistributed profit for emergencies. It may be explained from a psychological point of view if we draw an analogy with financial markets' response to different types of news. On average, stock prices go down more steeply and quickly as a result of negative news than they rise as a result of positive ones [29]. The authors have reached the following conclusions: it is most probable that the firms that pay dividends on a consistent basis will cancel the payouts in case of political turmoil and in the run-up to a political crisis. On the other hand, the firms that do not pay dividends are most likely to continue their distribution policy. According to signaling theory, during crisis periods companies may pay dividends to attract investors, sending them a message that the consequences of a potential collapse will not affect company operations. Apparently, political risks and excessive fear outweigh the potential benefits from the reputation of a stable dividend payer. The authors also found out that the influence of political risk depends on the extent of a company's integration into the global economy. International companies have distinct advantages over the firms operating in local markets. Their business is diversified better and to a greater extent because it operates in several markets simultaneously, and it has an opportunity to attract cheaper financing owing to its scale. However, it is exposed to elevated international political risks instead. The influence of such risks on dividend cancellation is especially pronounced in transnational companies. If we consider this problem with reference to country differences, decisions to cancel dividends become less sensitive to these risks in advanced economies with well-developed legal institutions and political system.

However, in academic literature there is another point of view on this topic [30]. After a study of American firms, the authors found out that political risks influence dividend payouts positively. It is partially consistent with the conclusions reached in the previous analysis [29] because the USA is the strongest global economy with minimal country risks. The paper also asserts that companies with excellent corporate governance typically pay out large dividends despite a higher political risk at the firm level. Companies with good growth prospects (a high ratio of the market value to book value or a significant sales growth) and underperforming corporate governance bodies also experience a significant positive effect of political risk at the firm level concerning their dividend policy. The issue of justification of this factor's influence by signaling theory is also raised in the paper by N. Loukil who studied structural changes in the political order of Tunisia, which is characterized by high uncertainty. He concluded that the replacement of the head of the government induces companies that have not paid dividends before to start payouts and prevents dividend payers from cancelling dividends, except for the companies under control of the governing family [31].

Study of Influence of Sanctions, Characteristics of the Board of Directors and CEO on Dividend Payouts

Hypotheses

Sanctions against the CEO

Sanctions against the CEO may have a significant influence on corporate governance because he is often the key leader and decision-maker of the company. If sanctions are imposed on the CEO, they may compromise the proper operations of the company and limit its ability to make decisions and operate efficiently. One of potential consequences of sanctions for the CEO may be the limitation of his ability to perform his duties effectively.

For example, EU sanctions completely ban European banks and companies from engaging in any economic interaction with a sanctioned person and their assets within the EU jurisdiction [4]. This may limit the CEO's ability to make decisions that are in the best interests of the company and its stakeholders. Sanctions may also instill fear and uncertainty, making it difficult for the CEO to perform his duties. If the CEO is concerned with the risk of sanctions, he may have fewer chances to take daring or innovative actions that will be to the company's benefit over the long run. In politically uncertain times it is natural for CEOs to be overcautious and reserve more profit in corporate accounts or highly liquid assets [29]. No doubt, this reduces the potential dividends and the probability of their distribution among stakeholders. Besides, the freezing of CEO's assets may significantly reduce his standard of living, thus, there is a heightened risk that he will be provoked to use company funds to his personal advantage.

Hypothesis 1: Sanctions against the CEO have a negative impact on the probability of dividend payout.

Sanctions against the Board of Directors

Sanctions against the board of directors may produce a significant impact on corporate governance because they may compromise proper work of the board of directors and limit its ability to make decisions and supervise the company's operations.

One of potential consequences of sanctions for the board of directors is the limitation of its ability to attract and retain talent. Russian companies often engage foreign colleagues with international experience to the corporate governance bodies. Apart from that, foreign directors are often unaffiliated persons. The majority of independent directors strengthen control over managers and increase the rationality of decisions. However, the sanctions imposed on some board members scale up reputation risks of foreign employees. They often hold senior positions in several companies simultaneously, and sanctions will adversely affect their image. This enhances the likelihood of independent directors' withdrawal from the board of directors. In such cases, decisions on the restructuring of governance bodies may be made on an urgent basis, producing a negative impact on the choice of new candidates because the scope of choice of competent employees is narrowed significantly. These facts will exert a negative impact on corporate governance efficiency because this enhances the probability of the board restructuring and hiring new employees who require time to adapt. In combination with increased country-related and corporate risks which enhance uncertainty of the future cash flows the board of directors is likely to cancel dividend payouts.

Hypothesis 2: Sanctions against the Board of Directors Have a Negative Impact on the Decision Regarding Dividend Payouts.

Sanctions against the Company

The factor of adding of a company to the US SDN list or EU sanction lists directly affects its operating, investment and financial activity. First, it is legally prohibited to persons and companies incorporated in the EU and USA to engage with a sanctioned company. However, there are few exceptions, for example, EU companies may purchase products of strategic importance for their country. For sanctioned companies it may entail a loss of long-term partnerships and the most profitable sales markets. Expansion into new markets is not always a success for a company because some countries may not have the same demand for its products.

Sanctions may impair the logistics infrastructure which has functioned for years, while the development of a new one will take time. The transportation of raw materials often implies a certain infrastructure. For gas transportation pipelines or liquefied natural gas plants are necessary in order to ship it further by sea. These facilities require serious capital expenditures, so the company will need additional funds and investments to develop them. Besides, the switch of the supply vectors to other markets may take considerable time, which, no doubt, will affect revenue indicators.

Many companies find loopholes to bypass sanctions, purchasing and selling goods through third parties. However, this is a nonoptimal strategy because instead of direct cooperation with the contractor a company has to pay the intermediary, thus increasing the logistical costs.

Investments and financial activities are also subject to restrictive measures. When a company is included in sanction lists, all its assets in the sanctioning country are frozen. Additional risks diminish the scope of investment in prospective international projects.

The company also has a limited access to the international capital market. It becomes more difficult to acquire debt financing, so the effective rate of the cost of debt for the company may potentially grow and the default risk may increase. The equity raising market also narrows down, due to heightened political risks foreign investors invest less frequently and support the companies from the sanctions lists to a lesser extent. Under such pressure on all company's lines of business, the probability of dividend payout will be reduced.

Hypothesis 3: Sanctions against a Company Have a Negative Impact on the Probability of Dividend Payouts.

CEO's Membership in the Board of Directors

In order to study the relationship between a CEO's extent of influence and dividend payouts many authors refer to whether the CEO is also the chairman of the board of directors. In Russia we cannot study this feature because according to the legislation, the CEO cannot occupy this position [10]. Therefore, we are going to consider the influence of the CEO's membership on the board of directors. It is obvious that the CEO occupation of two managerial positions is indicative of greater power. However, even if the CEO is on the board of directors without heading it, he influences corporate decisions in any case. Consequently, agency costs increase, and control over managers lessens.

We presume that in order to compensate for the weakened corporate governance bodies the board of directors will pay dividends more frequently.

Hypothesis 4: CEO's Membership on the Board of Directors Enhances the Probability of Dividend Payouts.

CEO's Tenure

As literature analysis shows, CEO's tenure influences the corporate dividend policy in two ways. We tend to assume that this variable has a positive impact. A CEO with a long tenure will be more involved in corporate business processes and have practical experience in corporate governance. This will produce a positive impact on the company efficiency. CEOs with such a feature are less motivated to invest in innovative projects. We agree that start-up companies, especially high-tech ones, that have not reached the peak of their development have to invest more in innovative projects and a conservative CEO will impair their prospects. However, if we consider this problem from the point of view of Russia, due to characteristics of its economy, the majority of listed companies are raw material suppliers and have reached maturity. The share of innovative companies in the Moscow Exchange is increasing, e.g., *Cian* and *Ozon*, however, their number is small. We believe that CEOs with

a long tenure will have a positive influence on the probability of dividend payout.

Hypothesis 5: CEO's Tenure Has a Positive Impact on Dividend Payout.

Number of Independent Directors

Independent directors play an important role on the supervisory board of a company. This feature implies that a director has no affiliation either with the joint-stock company or the company itself. The main objective of hiring such employees is to determine the company's strategic development for the benefit of shareholders based on their competencies and experience. They are interested in maintaining effective corporate governance more than executive directors because in this way they support their image in the labour market. According to the data we have collected, in the companies where the CEO is a member of the board of directors the number and share of independent directors in the board is greater than in the companies where the CEO does not occupy this position. This fact is another proof that independent directors control the efficiency of corporate governance and reduction of agency costs. In this respect the board of directors does not have to compensate for reputational costs incurred by underperforming corporate governance bodies. Therefore, we presume that companies with a large number of such directors pay dividends less frequently.

Hypothesis 6: Independent Directors Have a Negative Impact on Dividend Payouts.

Size of the Board of Directors

The size of the board of directors is an important factor in the research dedicated to the corporate dividend policy. We have studied academic literature and found out that authors cannot reach firm conclusions with regard to the influence of this variable. To a great extent the results depend on the country and the period in which the data has been tested. We tend to believe that in case of Russian companies, boards of directors with a large number of members are more effective because there is an opportunity to unite people with governing experience in various spheres. Besides, it becomes likelier that the board of directors will control the management's performance better, increasing its productiveness and reducing agency costs. For this reason, the board of directors does not have to refund the expenses incurred because of underperforming governance bodies.

Hypothesis 7: The Size of the Board of Directors Has a Negative Impact on Dividend Payout.

Research Methodology

For our research we collected data from public sources and annual disclosed reports for 2017–2022 about Russian listed companies engaged in non-banking sectors. The sample consists of 73 companies and 317 observations. We could not add the information on all companies for each year to the sample because in certain years some of them failed to disclose complete information. Some companies were listed after 2017, and we added them only for the period following the date of IPO completion.

Dividend payout (hereinafter DIV) was chosen as the dependent variable. We assigned a code to it in the calculations and made it a dummy variable where 1 meant that the company paid dividends in the studied year, and 0 – that the company cancelled dividend payouts. It is important to note that the majority of companies have year-based dividend policy, however, some of them pay dividends several times a year. If, for example, a company has a quarter-based dividend policy and it cancelled only the final dividends, we also assigned 0 to it. We chose the following indicators as independent variables: personal sanctions against board members (DirectorS), personal sanctions against the CEO (CEOS), sanctions against the company (CompanyS), CEO's membership on the board of directors (CEOPart), number of independent directors (DB) and CEO's tenure (CEOTenure).

All three variables containing information about sanctions are dummies, where 0 was assigned if sanctions have not been imposed, and 1 was assigned if they have been imposed. The remarkable thing is that according to the EU and US policy, if a company's majority shareholder has been designated, limitations are imposed on the company by default. We considered sanctions imposed by the European Union and the USA as they are the largest and most influential economies in the Western world. We assume that sanctions influence the probability of delay in dividend payouts. The final annual dividend season of Russian companies is in the summer. Sanctions imposed in the first half of 2022 impact the decision of dividend payouts for 2021 because they have been imposed before the final decision on payouts; the same logic applies to preceding years. CEO's membership on the board of directors is a dummy variable where 0 was assigned if he is not a member of the board of directors, and 1 – if he is a board member. The variable of the number of independent directors was calculated as a share of the total number of people on the board of directors. The CEO's tenure was calculated in years. We also chose the following control variables: earnings to revenue ratio (E/R), debt load (Leverage), liquid funds to assets ratio (Liquidity).

We chose a logistic regression as the model. As long as the dependent variable is a discrete variable, we are going to consider the probability of the influence of independent variables on it.

The logistic regression function – $a(x, w) = \frac{1}{1 + e^{-W^T X}}$.

In order to detect multicollinearity, we calculated VIF ratios, establishing the threshold value of VIF = 5. If this coefficient exceeded 5, it was indicative of the presence of multicollinearity. Then we eliminated the variable or created a new one using the combination of existing variables. Also, in order to improve the model quality, we balanced the data on the CEOS, CEOPart variables because there was a disparity in the sample.

$$\mathrm{VIF}(X_i) = \frac{1}{1 - R_i}.$$

Empirical Study

Table 1 presents the descriptive statistics of the variables for 2017–2020. Table 2 provides information for 2021. One may notice an extensive difference in dividend payment frequency. In 2021, approximately 63% of companies declared dividend cancellation, while previously there had been a tendency for stable dividend payout on average by 74% of companies. As for the sanctions, one may also notice a bias towards 2021. Approximately 50% of the studied companies or their principal shareholders were designated in 2021; in 2017–2020 there were about 20% of them. The data is indicative of a significant growth in the number of personal sanctions imposed by the Western countries. In 2021, the number of designated CEOs increased six-fold. Sanctions against the board of directors are also frequently used to limit companies' operations.

Table 1. Descriptive statistics of the sample for 2017–2020

	Div	CompanyS	DirectorS	CEOS	CEOPart	Ind	DB	CEOTenure	Leverage	Liquidity	E/R
mean	0.74	0.2	0.16	0.05	0.78	0.34	10.5	6.7	1.71	0.09	0.11
std	0.44	0.4	0.36	0.21	0.41	0.2	3.2	5.7	10.3	0.11	0.13
min	0	0	0	0	0	0	5	1	–93	0	–0.4
25%	0	0	0	0	0	0.22	9	2	0.6	0.03	0.03
50%	1	0	0	0	1	0.31	10	5	1.23	0.05	0.09
75%	1	0	1	0	1	0.45	11.25	10	2.63	0.11	0.16
max	1	1	1	11	1	0.88	31	27	31	0.98	1.09

Source: compiled by the author.

Table 2. Descriptive statistics of the sample for 2021

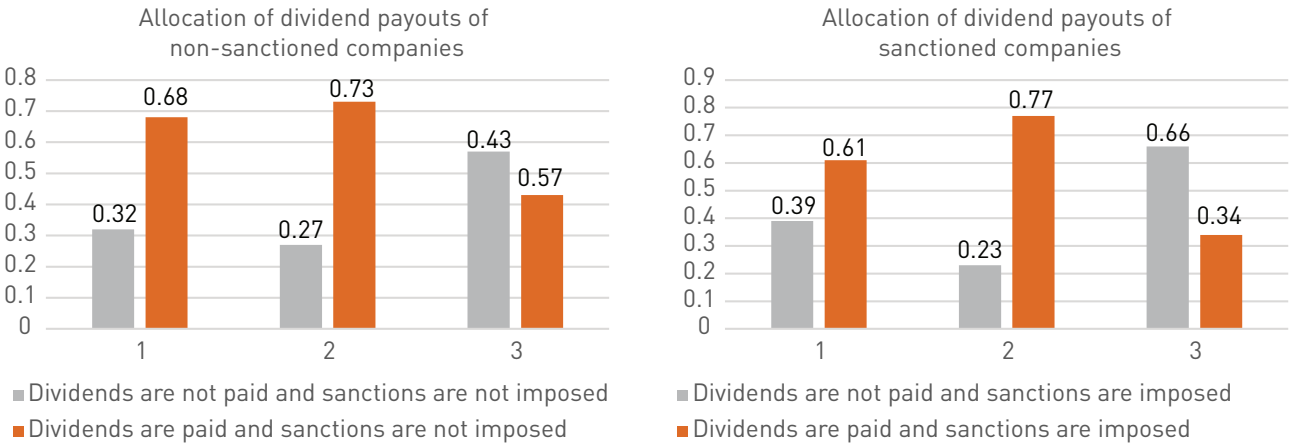
	Div	CompanyS	DirectorS	CEOS	CEOPart	Ind	DB	CEOTenure	Leverage	Liquidity	E/R
Mean	0.37	0.56	0.49	0.3	0.74	0.39	9.7	6.6	225	0.39	0.14
Std	0.49	0.5	0.5	0.46	0.44	0.17	2.1	6.1	9.8	0.14	0.14
Min	0	0	0	0	0	0	5	0	–37	0	0.12
25%	0	0	0	0	0	0.29	9	2	0.95	0.03	0.04
50%	0	1	0	0	1	0.36	9	5	1.08	0.6	0.11
75%	1	1	1	1	1	0.5	11	9	2.7	0.11	0.24
max	1	1	1	1	1	0.85	15	28	68	0.95	0.68

Source: compiled by the author.

The number of companies where at least one board member had been designated more than tripled. Also, the share of independent directors increased. It happened because on average each board of directors fired one executive director, decreasing their total number to 9. The number of CEOs with membership on the board of directors in 2021 also diminished, but the figure is insignificant. The situation is similar with CEO tenure. As for financial performance, 2021 turned out to be outstanding for the majority of companies. More than 50% of firms showed profitability of revenues of over 11%, whereas in the preceding year this indicator amounted to 9.5%. The majority of Russian companies showed record profits. Such growth was caused by a favourable macroeconomic environment in the country, quantitative easing policy and lowering of the interest rate to the minimum.

The data shows that the average mean of credit leveraging in 2017–2020 was significantly lower. However, it is most likely that this coefficient is not relevant, and the high value is due to several outliers. In this case, the median value will be more representative. In 2021, over 50% of companies had the debt leverage of less than 1.07, while in preceding years this indicator amounted to 1.25. The ratio of the amount of liquid funds in companies' accounts to the assets also increased, which may be indicative of lower reinvestments of the earned profit in business.

Figure 6. Allocation of dividend payouts



Source: compiled by the author.

Figure 6 shows distribution of dividend payout and sanctions imposed on a company or one of its governance bodies. One may notice that just 23% of companies on which at least one type of sanctions has been imposed cancelled dividends in the period of 2017–2020. Apparently in 2022 companies became much more susceptible to this negative factor increasing the share of cancellations to 0.66. However, the number of cancellations by non-sanctioned companies grew as well, and it grew significantly – up to 57%. This may indicate that the majority of companies did not eliminate the risk of being sanctioned and took into consideration elevated political uncertainty.

Correlation Analysis

Table 3 shows a correlation matrix of the studied variables. We are going to determine the correlation values where r > |0.7| is a strong dependence, |0.5| < r < |0.7| a medium one, |0.3| < r |0.5| indicates a moderate interrelation, |0.2| < r |0.3| means a weak correlation, while a value below 0.2 indicates a very weak interrelation.

Approximately half of variables' combinations shows statistically insignificant correlations. The dependent variable has a statistically significant interrelation with the following variables: CompanyS, CEOPart, E/R, Liquidity. As for the dependent variables, combinations of CompanyS, DirectorS, CEOS have the highest correlation values of 0.4. There is a direct dependence between these variables, which is quite logical. The US and EU policy concerning the choice of sanctioned persons mainly targets large companies that are vital for the economy and government-owned companies as well as the persons related to politics and government governance bodies. While collecting data, we discovered that in such companies the position of the CEO and a member of the board of directors is often occupied by Russian oligarchs and government representatives who are high-priority targets for Western sanctions. Since the correlation is moderate, we think that in the subsequent research it is reasonable to combine all three variables in one, however, we should also consider their influence separately.

Another interesting consistent pattern can be observed: the number of imposed sanctions is directly proportionate to the number of the board of directors' members. This may be due to the fact that a larger board of directors enhances the probability that a person related to politics may be among its members. A CEO's longer tenure increases the chances of his being included in sanctions lists. If the CEO occupies his position for a long time, it indicates that he does his work impeccably or has close relations with the company owners and the government. The factor of CEO occupying two positions increases the probability of sanctions against the corporate governance bodies, however, the dependence is low, although significant.

Table 3. Correlation matrix

	Div	CompanyS	DirectorS	CEOS	CEOPart	DB	CEOTenure	Ind	E/R	Leverage
CompanyS	–0.01*									
DirectorS	–0.07	0.41***								
CEOS	–0.03	0.37***	0.46***							
CEOPart	0.16***	–0.01	0.15***	0.11**						
DB	–0.01	0.13**	0.2***	0.01	0.02					
CEOTenure	0.04	0.15***	0.14**	0.18***	0.17***	0.17***				
Ind	0.03	–0.05	0.02	0.03	0.17***	–0.1*	0.06			

	Div	CompanyS	DirectorS	CEOS	CEOPart	DB	CEOTenure	Ind	E/R	Leverage
E/R	0.1*	0.08	–0.02	0.08	0.1*	–0.08	–0.04	0.13**		
Leverage	–0.05	0	0.05	–0.03	–0.11*	–0.03	–0.07	0.05	–0.02	
Liquidity	–0.12**	–0.13**	–0.08	–0.03	–0.1*	–0.14**	0.14**	0.05	0.24***	–0.01

Note: *** Statistical significance at the 1% level; ** at the 5% level; * at the 10% level.

Source: compiled by the author.

Table 4. Logistic regression models for 2021

Variables	Model 1	Model 2	Model 3	Model 4
CompanyS	–0.5479	–0.7753*		
DirectorS	–1.413***			
CEOS	1.1675**	0.6537		
CEOPart	1.1190**	0.6671*	0.9596**	0.8202**
DB	–0.0317		–0.0454	
CEOTenure	0.0101	0.0033	0.0382	
Ind	–3.3367***	–4.4776***	–3.8351***	
E/R	5.2844***	5.9847***	6.0177***	6.2723***
Leverage	0.0593*	0.0582	0.0377	0.0277
Liquidity	–2.6587	–1.5925	–2.0757	–5.1655
AllS			–1.2147**	–3.2786***
DBInd				–0.4248***
CEOTenureS				0.1905***

Note: *** Statistical significance at the 1% level; ** at the 5% level; * at the 10% level.
Source: compiled by the author.

First, to verify our hypotheses we built a logistic regression which comprised the data from the 2021 sample (Table 4). Model 1 demonstrated a high quality where LLR p-value tended to 0. However, some coefficients turned out to be insignificant. DB and CEOTenure showed the lowest p-value, CS was also insignificant, which may be due to its correlation with other variables. Other parameters turned out to be significant at the 3% level. DirectorS and Ind exerted a negative impact on dividend payout with the coefficients of 1.413 and –3.336, respectively. Imposition of sanctions on the board of directors reduces the probability of dividend payouts by 141%. If the number of independent directors amounts to 10% of the supervisory board, such structure will decrease this probability by 33%. Also, sanctions against the CEO and CEO's membership on the board increase the probability of payments by 116 and 112% respectively.

Table 5. VIF ratios of the studied variables

Variable	VIF 2021	VIF 2017–2020
CompanyS	3.32	1.56
DirectorS	3.04	1.61
CEOS	2.04	1.29
CEOPart	4.45	4.94
DB	8.52	4.99
CEOTenure	2.65	2.60
Ind	6.25	3.94
E/R	2.27	1.89
Leverage	1.15	1.04
Liquidity	1.94	1.78

Source: compiled by the author.

Then we conducted a multicollinearity test, calculating VIF ratios whose average value amounts to 3.5, which is indicative of a low multicollinearity of the general model, however, the coefficients of the DB and Ind variables exceed the threshold value. We presume that they may have an indirect influence on the values of other variables. In order to verify the significance of CompanyS coefficient, we decided to eliminate two variables with which CompanyS has the highest VIF value, namely DB and DirectorS. Model 2 showed that the number of independent directors and sanctions against the company are significant and produce a negative impact on dividend payout, while the CEOPart variable, just like in the previous regression, is significant and exerts a positive impact, however, this impact was reduced almost twofold. Sanctions against the CEO and his tenure turned out to be insignificant.

As long as all three variables comprising information about sanctions have a moderate and significant correlation with each other, and some of them in some models are statistically insignificant, we decided to consider them taken in totality. We created a new variable – AllS – by multiplying CompanyS, DirectorS and CEOS. It will enable us to understand how a company's dividend policy is developed if sanctions are imposed on the company, the CEO and the board of directors. Model 3 showed that the Ind and CEOPart variables turned out to be statistically significant again: the first one produces a negative influence and the second one – a positive influence with the coefficients of –3.8351 and 0.9596, respectively. DB and CEOTenure were insignificant. The impact of all three types of sanctions against the same company turned out to be significant with the coefficient of –1.2147.

Since the DB and CEOPart variables showed no significant results in the previous models, we decided to combine them with the factors with which they have a significant correlation. We obtained new variables: CEOTenureS = CEOTenure · CEOS and DBInd = DB · Ind. In the new model all variables turned out to be significant at the 5% level. It was discovered that a larger size of the board of directors with a high ratio of independent directors had a negative impact on the likelihood of dividend payouts, and the imposition of all three types of sanctions had a similar effect. In its turn, the model also showed that the probability of dividend payments increased if sanctions had been imposed only on the CEO who had been running the company for a long time. Each year of the designated CEO's tenure in the company increases the probability of dividend payout by 19%.

Let us analyze the models for 2017–2020 (Table 6). After all variables were included in the model, it demonstrated a high quality. Unlike the 2021 sample, only one indicator turned out to be insignificant, i.e., sanctions against the CEO.

All variables except for CEOS were included in model 6. It turned out that Ind, CompanyS and DirectorS had a negative impact on the dependent variable with the coefficients of –1.19, –0.46 and –0.9 respectively, which is less in modulus than similar indicators for 2021. CEOTenure, CEOPart and DB have a positive impact on the decision about dividend payout with the coefficients of 0.066, 0.7548 and 0.059 respectively.

Table 6. Logistic regression models for 2017–2020

Variable	Model 5	Model 6	Model 7	Model 8
CompanyS	–0.4627**			
DirectorS	–0.9073***			
CEOS	24.8			
CEOPart	0.4549*	0.7548***	0.7453***	0.9367***
DB	0.0859***	0.0592***	0.0771***	
CEOTenure	0.0697***	0.0661***		0.0754***
Ind	–1.1931**	–1.12367**	–0.8582*	
E/R	9.4596***	9.2835***	8.1409***	11.4493***
Leverage	–0.075***	–0.0734**	–0.0624***	–0.0516***
Liquidity	–8.027***	–7.947***	–6.954***	–8.4305***
AllS		–1.0772***	–1.0733***	–0.887***
DBInd				–0.0369**
CEOTenureS			2.3906	

Note: *** Statistical significance at the 1% level; ** – at the 5% level; * at the 10% level.
Source: compiled by the author.

VIF ratio of the CEOS variable equals 1.29, which indicates the absence of influence of high multicollinearity. In general, the entire model is not significantly affected by the multicollinearity problem because neither of the coefficients exceeds 5.

Subsequently, we are going to consider model 7 with the variables created before. It is important to note that in this case the CEOS variable will not be included in the All variable because it is insignificant and will only compromise model quality. Therefore, in the subsequent models it will mean that sanctions have been imposed against the company and its board of directors. Simultaneous sanctions against the company and the board of directors show a negative interrelation. This variable reduces the probability of dividend payout by 107%. Since the DB and Ind variables influence the dividend payments in different ways, we decided to modify DBInd slightly in order to understand how DB exerts its impact in effective boards of directors. We took the Ind median as a criterion and assigned 1 if the value exceeded it and 0 – if it was smaller. It turned out that each member of the board of directors will reduce the likelihood of payout by 3% if the number of independent directors exceeds the median value.

Results and Discussion

The results of the two models turned out to be similar, however, the impact of certain variables in the sample for 2021 was more significant. Sanctions against the company and personal sanctions against the board of directors' members had a negative influence in 2017–2020. Our hypotheses proved to be true. Sanctions against a company significantly complicate its operations and strategic development. First, it becomes much more difficult for the company to find long-term partners, suppliers and major purchasers because due to the imposed limitations they have no right to cooperate with a designated person, which adversely affects the company's operating activity. Second, limitations of access to the capital market, both the debt and private one, manifest themselves. The USA and EU are the largest global economies. When the company is put on their sanctions lists, it is deprived of the opportunity to attract new investors for development of prospective projects and obtain debt financing. This reduces the number of opportunities to scale up. Personal sanctions against members of the board of directors produced a negative impact on the decision regarding dividend payouts. Despite the fact that this type of corporate governance body does not participate directly in the company's operating activity, the sanctions against some of its members may severely damage the corporate reputation. The supervisory board is frequently restructured as a consequence of sanctions, which has a negative impact on its functioning.

In the sample for 2021, these variables showed a stronger influence as compared to 2017–2020. This may be due to the fact that the consequences of the sanctions were greater in 2022, political relations deteriorated and uncertainty increased. Many companies cooperated closely with the Western countries. The strained relations made them change their strategic development vector and start cooperating with Asian countries. In particular, oil and gas companies started to rapidly develop the infrastructure for sale of raw materials to Asia, requiring additional significant capital expenditures. A lot of foreign companies decided to exit projects in Russia as, for example, did the Italian company Enel, French Total and British Shell.

Although we did not include banking in the sample because it differs significantly from other economy sectors, the crisis in this sphere influenced other economic sectors as well. Sanctioned companies have fewer access to the global capital market and it has become disadvantageous to get domestic financing. Due to increased uncertainty in the country and fear of the "bank run", the Central Bank of Russia had to raise the refinancing rate to the maximum. This raise happened during the dividend season forcing companies to decide to retain undistributed profits because they had no idea when the current situation would change. One of the facts of a serious negative influence of sanction-related variables in the sample of 2021 is freezing of the National Settlement Depository [32]. Some companies that operate in Russia and belong to Russian citizens are listed in foreign stock exchanges and the Moscow Exchange offers their depositary receipts. As long as NSD was used to transfer dividends to depositary receipts holders this operation is impossible after the sanctions have been imposed. And even if a sanctioned company wished to pay dividends, the majority of investors would have been unable to receive them.

We suppose that in 2022 sanctions against the board of directors had a more serious negative impact in comparison to the preceding years, in particular due to political problems. Foreigners are often present on the supervisory boards of Russian companies. In 2022, they often withdrew from the boards because of the sanctions imposed on their colleagues. The prospects of losing a number of competent foreign employees due to additional risks, the need to replace designated directors produces a negative impact on the potential efficiency of the board of directors. The probability of hiring new employees, less experienced and skilled, also increases. This may result in weakened control over managers and loss of feasibility of the decisions made.

As for the sanctions against the CEO, our expectations were not fulfilled. In the 2017–2020 sample, this variable turned out to be insignificant. Within this time interval the limitations were ineffective and failed to achieve their goal. However, the sanctions imposed in 2022 exerted a positive impact on the decision regarding the payment of dividends for 2021. We assumed above that the freezing of CEO's foreign assets may motivate him more to take advantage of corporate benefits, thus increasing agency costs.

As compensation for an underperforming governance body, the board of directors makes the decision to pay out dividends more frequently. During a relatively stable political period in Russia in 2018–2021, the sanctions only against the CEO produced no significant results and a positive impact on dividends was observed in the time of aggravation of relations with the West. One may conclude

that this type of sanctions produces no influence on company operations and its development. The logic consists in the following: in a stable economic environment, investors did not perceive these limitations as a negative signal, on this premise, the board of directors did not rely on this fact when making a decision on dividend payouts. However, during the period of high market volatility and elevated uncertainty, investors perceive all negative information highly pessimistically.

Relying on the signaling theory, we conclude that with such input data the board of directors will respond to sanctions against the CEO by means of a decision regarding dividend payout in order to send a message to the investors that this negative event will not affect the company's future prospects.

Models of both samples showed that the imposition of all three types of sanctions had a negative and statistically significant influence on the decision regarding dividend payouts. The results turned out to be quite obvious because in this case the company faced reputational costs as well as problems related to financial, investment and operations activities. With such limitations the company is most likely to retain undistributed profit as a cash cushion.

As we anticipated, the CEO's tenure turned out to be significant and showed a positive influence on the dividend payout decision, however, only in 2017–2020. A long tenure implies that the CEO is fully involved in the corporate business processes, has enough experience and knowledge in the company's field of operation and may effectively make decisions that ensure the company's sustainable and stable development, which has a positive impact on its profit.

Nevertheless, this factor had no significant influence on dividend payouts for 2021. As long as the majority of companies made the decision on dividend payout for 2021 in 2022, we believe that this variable produced no impact due to the economic crisis in Russia. We have already mentioned that the CEO gains experience each year of his tenure, which enables him to make effective decisions and "bring the company to a bright future". Besides, restrictions have been imposed on Russian companies for a while. So, the management should already have a notion of how to act under such circumstances. However, the restrictions imposed in 2022 were more severe and their scale expanded. So, the majority of Russian companies had to restructure their business processes. In this case, the probability of influence of the factors independent of the CEO increases.

In-depth analysis of this variable showed that sanctions were imposed more often on the CEOs with a longer tenure because there is a statistically significant and moderate correlation. The fact of sanctioning a CEO with a longer tenure indicated a significant positive impact. Analysis showed that if a country imposes sanctions on the CEO with a tenure longer than the median value, the likelihood of dividend payout will increase even more. We think that the reason for this is that personal sanctions are most often imposed because their target is associated with politics. A matching coefficient of the TenureCEOS variable exceeds CEOS because the chance that the CEO may be additionally sanctioned by another country increases. This will impair the company image even more, so reputational costs should be compensated to a greater extent.

Models with two time intervals showed that CEO's membership on the board of directors produced a positive influence on dividend payout. The obtained results are consistent with our hypothesis. The fact that the CEO may participate in the decision on dividend payouts and make his contribution to it significantly weakens corporate governance bodies. Agency theory supposes that there is a pronounced conflict of interests between company managers and its shareholders. The board of directors performs the function of protecting the stakeholder interests, trying to maximize the usefulness of holding the company's shares. If the CEO is a member of the board of directors, he acquires greater power and may maximize his usefulness function to a greater extent. In their turn, the investors start doubting the reliability of the board of directors. In order to solve this problem of the weakened governance bodies, the majority of board members tend to pay out dividends more frequently and in greater amounts. Besides, this CEO's characteristic, unlike his tenure, has a significant correlation with all three types of sanctions. It is obvious that if limitations are imposed on the CEO, the board of directors will also be exposed to them. As we discovered above, if sanctions are imposed not only on the CEO, they will produce a negative impact on the dividend payout. Thus, occupying two positions at the same time by the CEO will increase the probability of two corporate governance bodies being sanctioned simultaneously. This will adversely affect company operations and its reputation. In order to compensate for potential costs, the company will reimburse for them by means of dividends.

The impact of the number of independent directors turned out to be identical within two different time intervals, however, in the 2021 sample, the coefficient was more significant. The presence of independent directors produces a positive impact on the efficiency of control over company managers and making unbiased, justified decisions. Efficient corporate governance bodies reduce agency costs, so the board of directors does not need to compensate for them. So, the board may afford to pay dividends less frequently. As for the results of payments for 2021, we believe that independent directors had a more serious influence than in preceding years because of the tumultuous economic environment in the country. The directors, who are affiliated persons, will not always act only for the benefit of shareholders. This may happen, for example, if a director owns shares in the company. For this reason, he may, in pursuit of his own interests, push for a decision on dividend payout even if it is not optimal from the point of view of the macroeconomic environment. Since the majority of dividend cancellations for 2021 took place in the summer dividend season of 2022, we believe that the optimal decision for independent directors was not to pay out dividends in view of an aggravated political crisis and expected

economic downturn. In our conclusion we refer to the paper by T. Huang [29], which emphasizes that it is intrinsic to corporate governance bodies to be especially cautious in times of political turmoil and to retain undistributed profit at company's accounts. In more than 50% of companies the share of independent members of the board of directors exceeded 36% in 2021. In a quarter of the companies this indicator exceeded 50%, which is indicative of a significant contribution of independent directors to decision making. In 2017–2020 the median value was lower by 5%, which could also affect the difference in the coefficients.

We assumed that the size of the board of directors would improve the efficiency of company governance, reduce agency costs and produce a negative impact on the corporate dividend policy similar to that produced by the number of independent directors. However, this coefficient turned out to be insignificant in 2021, while the 2017–2020 sample revealed a positive impact. Since we obtained controversial results and there was a correlation between our Ind and DB variables, we decided to consider how the size of the board of directors influenced the dividend policy depending on its efficiency. In efficient boards of directors, where the share of independent members exceeded the median value, the size of the board had a negative impact on dividend payouts in both samples. This once again emphasizes the fact that efficient corporate governance bodies will pay dividends less frequently because they have no reputational problems and there is no need to compensate for agency costs.

Practical Application

Aside from a contribution to the development of scientific topics, this research will also assist investors in forming their strategies on the basis of the obtained results. For some years now Russian companies have been added to sanctions lists, and the domestic economy is exposed to high political risks. Strategies of many long-term investors are based on dividend payouts. So, it is important for them to understand how certain factors influence a company in a stable political environment and in the periods of aggravation of the political situation.

Results

The performed research showed that sanctions against the board of directors and direct limitations of company's operations have a negative impact on the probability of dividend payouts. Sanctions against the CEO led to controversial results. In the period of relative political stability these restrictions have no influence on corporate policy and are ineffective. In the period of aggravation of political risks this type of sanctions exerts a positive impact. This difference emerges because in the crisis periods the investor sentiment is pessimistic and skeptical. For this reason, the company has to compensate for such costs by means of dividends despite the inefficiency of this type of sanctions. Thus, the cancel culture effect, that is, the refusal of the USA and EU to cooperate with Russia and the sanctions imposed on the latter had a significant negative impact on dividend payouts by Russian companies.

We also found out that efficient corporate governance bodies produced a negative influence on dividend payout decisions. CEO's membership on the board of directors and his tenure have a positive impact on the probability of payouts, however, they impair the effectiveness of governance. Also, the number of independent directors and the size of the supervisory board showed a negative impact, however, such a combination improves the effectiveness of the board of directors. During different time intervals, variables showed identical dependence, however, at the time of increased political risks the influence of independent variables rises significantly; for this reason, even a slight change in the structure of the governance bodies during a crisis may significantly reduce the likelihood of dividend payouts.

References

1. Izryadnova O.I., Kovaleva M.A. Dynamics of the domestic market in 2022: development potential and the impact of sanctions. *Ekonomicheskoe razvitie Rossii = Russian Economic Developments.* 2022;29(7):15-20. (In Russ.). URL: http://www.iep.ru/files/RePEc/gai/recdev/r2258.pdf (accessed on 12.01.2023)
2. Subbotina M.V. Cancel culture: a manifestation of social justice or a new way of manipulation. *Obshchestvo: sotsiologiya, psikhologiya, pedagogika = Society: Sociology, Psychology, Pedagogics.* 2022;3(95):34-37. (In Russ.) https://doi.org/10.24158/spp.2022.3.5
3. Nikitin A.V., Orlinskaya O.M., Sedaev P.V., et al. Cancel culture: reasons for development challenges in Russia. V*last' (The Authority)*. 2022;30(3):65-69. (In Russ.) https://doi.org/10.31171/vlast.v30i3.9046
4. Number of international sanctions imposed worldwide as of January 12, 2023, by target country. URL: https/www.statista.com/statistics/1294726/number-of-global-sanctions-by-target-country/f (accessed on 12.01.2023).
5. Overview of Sanctions against Russia, 2022. INTELLECT Law Firm. URL: https://www.intellectpro.ru/en/press/works/obzor_deystvuyushih_sanktsiy_v_otnoshenii_rossii/(accessed on 06.05.2022).
6. Specially Designated Nationals And Blocked Persons List (SDN) Human Readable List. URL: https://ofac.treasury.gov/specially-designated-nationals-and-blocked-persons-list-sdn-human-readable-lists (accessed on 09.05.2023).
7. Review of the key indicators of professional participants of the securities market. Bank of Russia. (In Russ.) URL: https://cbr.ru/Collection/Collection/File/43826/review_secur_22-Q4.pdf (accessed on 10.02.2023).
8. Report: Record Dividends in Russia // SBER CIB URL: https://dokhodchivo.ru/russia-dividends-fin?y-

sclid=lgo74zmzbb548729508 (accessed date: 02.2022).

9. Fama E.F. Agency problems and the theory of the firm. *Journal of Political Economy*. 1980;88(2):288-307.
10. Federal'nyi zakon ot 26.12.1995 N 208-FZ (red. ot 04.08.2023) "Ob aktsionernykh obshchestvakh" [Federal Law On Joint-Stock Companies of 26.12.1995 No. 208-FZ] (In Russ.)
11. Miller M.H., Rock K. Dividend policy under asymmetric information. *The Journal of Finance*. 1985;40(4):1031-1051. https://doi.org/10.1111/j.1540-6261.1985.tb02362.x
12. Bhattacharya S. Imperfect information, dividend policy, and 'the bird in the hand' fallacy. *The Bell Journal of Economics*. 1979;10(1):259-270. https://doi.org/10.2307/3003330
13. Mueller D. A Life Cycle Theory of the Firm. *Journal of Industrial Economics*. 1972;20(3):199-219. https://doi.org/10.2307/2098055
14. Elmagrhi M.H., Ntim C.G., Crossley R.M., et al. Corporate governance and dividend pay-out policy in UK listed SMEs: The effects of corporate board characteristics. *International Journal of Accounting & Information Management*. 2017;25(4):459-483. https://doi.org/10.1108/IJAIM-02-2017-0020
15. Criteria for Defining Independence of the Board Members (Supervisory Board). Moscow Exchange. URL: https://www.moex.com/a3056 (accessed on 10.02.2023).
16. Khan A. Ownership structure, board characteristics and dividend policy: evidence from Turkey. *Corporate Governance*. 2022;22(2):340-363. https://doi.org/10.1108/CG-04-2021-0129
17. Yarram S.R., Dollery, B. Corporate governance and financial policies: Influence of board characteristics on the dividend policy of Australian firms. *Managerial Finance*. 2015;41(3):267-285. https://doi.org/10.1108/MF-03-2014-0086
18. Rajput M., Jhunjhunwala S. Corporate governance and payout policy: evidence from India. *Corporate Governance*. 2020;19(5):1117-1132. https://doi.org/10.1108/CG-07-2018-0258
19. Tahir H., Masri R., Rahman M.M. Impact of board attributes on the firm dividend payout policy: evidence from Malaysia. *Corporate Governance*. 2020;20(5):919-937. https://doi.org/10.1108/CG-03-2020-0091
20. Ntim C.G., Opong K.K., Danbolt J. Board size, corporate regulations and firm valuation in an emerging market: a simultaneous equation approach. *International Review of Applied Economics*. 2015;29(2):194-220. https://doi.org/10.1080/02692171.2014.983048
21. Boumosleh A., Cline B.N. Outside director stock options and dividend policy. *Journal of Financial Services Research*. 2015;(47):381-410. https://doi.org/10.1007/s10693-013-0174-2
22. Ghasemi R.S., Madrakian H., Keivani F.S. The relationship between the corporate governance and the stock institutional ownership with the dividend - a case study of Tehran. *Journal of Business and Management*. 2013;15(2):65-69. https://doi.org/10.9790/487X-1526569
23. Benjamin S.J., Biswas P. Board gender composition, dividend policy and COD: the implications of CEO duality. *Accounting Research Journal ARJ*. 2017;32(3):454-476. https://doi.org/10.1108/ARJ-02-2018-0035
24. Bebchuk L.A., Cremers K.J.M., Peyer U.C. The CEO Pay Slice. *Journal of Financial Economics*. 2011;102(1):199-221.
25. Tarkovska V. *CEO Pay Slice and Firm Value: Evidence from UK Panel Data*. Working paper published by Dublin Institute of Technology 2014.
26. Shahbaz A.S. CEO power and the likelihood of paying dividends: Effect of profitability and cash flow volatility. *Journal of Corporate Finance*. 2022;73:102186. https://doi.org/10.1016/j.jcorpfin.2022.102186
27. Onali E., Torluccio G., Galiakhmetova R. *Are CEO power, monitoring incentives, and dividends related? Evidence from a regulated industry.* AIDEA annual meeting, Lecce, Italy; 2013.
28. Gieskens J.H *The effect of CEO characteristics on corporate financial policy.* Tilburg School of Economics and Management; 2016.
29. Tao H., Fei W., Jin Yu., et al. Political risk and dividend policy: Evidence from international political crises. *Journal of International Business studies*. 2015;46(5):574-595.
30. Ahmad F.M., Aziz S., El-Khatib R., et al. Firm-level political risk and dividend payout. *International Review of Financial Analysis*. 2023;86:102546. https://doi.org/10.1016/j.irfa.2023.102546
31. Loukil N. Does political instability influence dividend payout policy: evidence from Tunisian Stock Exchange? *EuroMed Journal of Business*. 2020;15(2):253-267. https://doi.org/10.1108/EMJB-06-2019-0094
32. Putevoditel' po sanktsiyam i ogranicheniyam protiv Rossiiskoi Federatsii (posle 22 fevralya 2022 g.) [Guide to Sanctions and Limitations against the Russian Federation (after February 22, 2022)]. Base.Garant (In Russ.). URL: https://base.garant.ru/57750632/?ysclid=lhhlbqymkh301266730#friends (accessed on 17.03.2014).

The article **was submitted** 12.10.2023; **approved after reviewing** 14.11.2023; **accepted for publication** 05.12.2023.

DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.4.2023.132-150
JEL classification: G11, G30, G31, G32

ESG Transformation in the Largest Emerging Capital Market of China. A Literature Review

Yanfei Wu
PhD student, Department of Finance, National Research University Higher School of Economics, Moscow, Russia
yavu@hse.ru, ORCID

Abstract

The paper provides a scholarly examination of academic studies of the ESG landscape in China through a systematic literature review with a major focus on the nature and intensity of regulatory guidelines and policies. While many studies indicate positive effects of Chinese ESG policies on corporate ESG performance and investment, they primarily focus on environmental aspects. This analysis of China's ESG rating system exposes relationships between ESG ratings, corporate performance, financing costs, including both debt and equity financing. The research on equity financing costs is inconsistent and limited in scope, indicating the need for additional investigation. Of the factors influencing ESG, the past year has seen a surge in research on the topic of digital transformation and ESG performance. Most studies demonstrate that digital transformation contributes to ESG performance, and a few suggest that digital transformation positively moderates the effect of ESG performance on firm value enhancement. This review discusses the growth of ESG investment in China, focusing on pension funds, commercial banks, and ESG funds, as well as investor preferences. Despite the growing role of ESG in investment decisions, extant research is largely theoretical, underscoring the need for more empirical and quantitative studies. The research identifies gaps in studies devoted to ESG investment, including the need for comprehensive studies on the impact of ESG across various insurance types and industries, and the development of effective ESG quality assessment methods. This review is among the first academic resources summarizing and integrating various studies, and highlighting areas for future ESG research in China.

Keywords: ESG Development, Policy response, ESG Ratings, Digital Finance, Digital Transformation, ESG Investment, Corporate Performance, Financing Costs, China

For citation: Wu Y. (2023) ESG Transformation in the Largest Emerging Capital Market of China. A Literature Review. *Journal of Corporate Finance Research.* 17(4): 132-150. https://doi.org/10.17323/j. jcfr.2073-0438.17.4.2023.132-150

Introduction

Environmental, Social, and Governance (ESG) considerations have become an integral part of the global capital markets, affecting corporate conduct, investment decisions, and government regulations. While substantial advancements have been made in developed markets, China, as the world's largest emerging market, presents a more nuanced and less systematically studied landscape.

China has seen a proliferation of ESG-related research, but a comprehensive understanding remains elusive [1]. There's a deficit of mandatory ESG policy regulation and research of the effects of specific ESG policies on ESG performance and investment. While numerous studies have explored the impact of ESG ratings on financial outcomes, such as financing costs, there is still disagreement about the relationship between ESG and financing. Moreover, the scope of research on the cost of equity financing is narrow, thereby necessitating further exploration. Amid the rapid development of the digital economy, there has been a surge in academic articles on digital transformation and ESG performance across various fields of interest in the past two years. However, there hasn't been any systematic research reviewing the academic landscape of this sector. Studies on ESG investment are relatively scarce, and many remain at the theoretical level, lacking empirical and quantitative analysis. While research has primarily focused on the intersection of ESG with pension funds, insurance, and commercial banks' ESG investment strategies, there is a relative dearth of research on ESG funds, ESG bonds, ESG credits, and equity. Existing studies often do not fully address how these ESG implementations interact with China's unique economic, cultural, and regulatory contexts.

In light of this, our study attempts to systematically analyze the literature, summarizing the methods, data, and conclusions currently used in research, exploring the differences in various related topics, and identifying gaps in the research. This is done with the aim of identifying which topics are worth scholars' efforts.

Therefore, this study aims to identify the areas of focus for researchers in order to clarify this dispersed field and further advance the scientific knowledge on the topic by outlining future research directions.

To achieve this objective, our study seeks to address the following research questions:

RQ1: What are the main topics of debate in the literature on ESG transformation in China's emerging capital markets?

RQ2: What are the main points drawn from the research?

RQ3: What are the differences in the research methods and conclusions across these topics?

RQ4: What are the research prospects for these topics?

After systematically studying the topics discussed in the literature, the authors focused their research attention on the most discussed topics [2]. Upon determining the topics most suitable for the research purpose and methods, we identified important themes related to ESG transformation in China's emerging capital markets (RQ1), methodically summarized the main points drawn from each topic (RQ2), and compared the differences in the methods and conclusions used in these studies (RQ3). Finally, we identified gaps in the literature to address future work in these areas (RQ4).

By synthesising research findings from different sources, this review provides a unified framework covering the development and policies of ESG in China, the impact of ESG ratings on corporate finance, the relationship between digital transformation and ESG, and ESG investment practices in China. By addressing these gaps and providing a more comprehensive view, this review serves as a robust resource for future academic research.

Methodology

The Process Used to Design the Research Framework

To answer these questions, the authors adopted the systematic literature review method proposed by D. Tranfield et al. [3]. This method is considered the most comprehensive and rigorous because it can lay the foundation for the advancement of knowledge [4].

To make the analysis replicable, we followed these steps to identify and evaluate academic contributions related to ESG performance in China, so as to accurately locate the search scope in the database, and the most scientifically relevant themes and sub-themes:

Literature Search: We conducted a search in Scopus, WanFang, and CNKI literature databases using "ESG", "Environment", "Social Responsibility", "Corporate Governance", and "China" as keywords. Each search was performed with one ESG-related keyword paired with "China".

Literature Screening: In Scopus, we applied two screening criteria: the study period from 2003–2023, and literature in English and Chinese. The search was further refined by considering the academic fields referenced in the research [5]. The academic fields selected were "Econ" and "Busi". In terms of study types, we included both theoretical and empirical studies. For literature from Chinese databases, we selected those from Peking University Core rank, CSSCI and CSTPCD (Chinese Science and Technology Papers and Citations Database) to ensure the quality of the literature.

Literature Compilation: We obtained relevant Chinese literature from WangFang and CNKI, and deleted duplicates from the article sample to be analyzed from the two different databases. We formatted these to match the files exported from Scopus and translated Chinese literature from the Chinese databases into English for clustering analysis.

Keyword Clustering Analysis: We processed the retrieved information using VOSviewer to identify keyword clusters. Clustering was determined automatically by the system.

Selection of Relevant Literature: Based on the retrieved literature, we selected the current key research topics using the Network Visualization function in VOSviewer. The selection was made based on the quality and significance of the articles. Ultimately, we summarized a total of 108 core related articles, out of these, there are 12 articles from the year 2018 and before, 24 articles from the years 2019 to 2021 inclusive, 28 articles from 2022, and 43 articles from 2023.

Critical Evaluation: We critically evaluated the identified relevant articles to determine the academic contribution of ESG performance in the Chinese market.

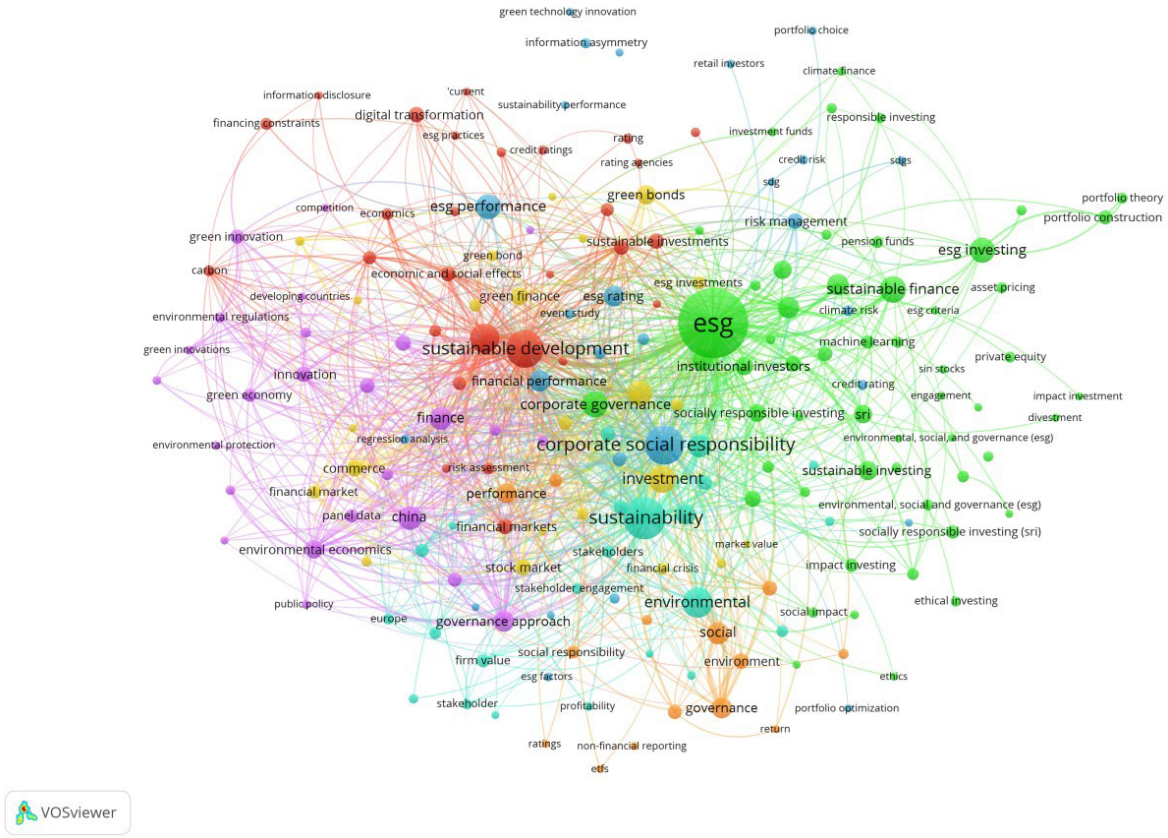
Analysis of Research Gaps and Future Research Directions: For each topic, we analyzed the gap in current research and suggested directions for future research.

Literature research result

Through these steps, we created a comprehensive literature review of ESG performance in China, aiming to deepen the understanding of academic contributions in this field and provide directions for future research.

Following our algorithm, we have identified the distribution of ESG-related topics shown in Figure 1.

Figure 1. Visualization of key words clusters processed and retrieved through VOSviewer



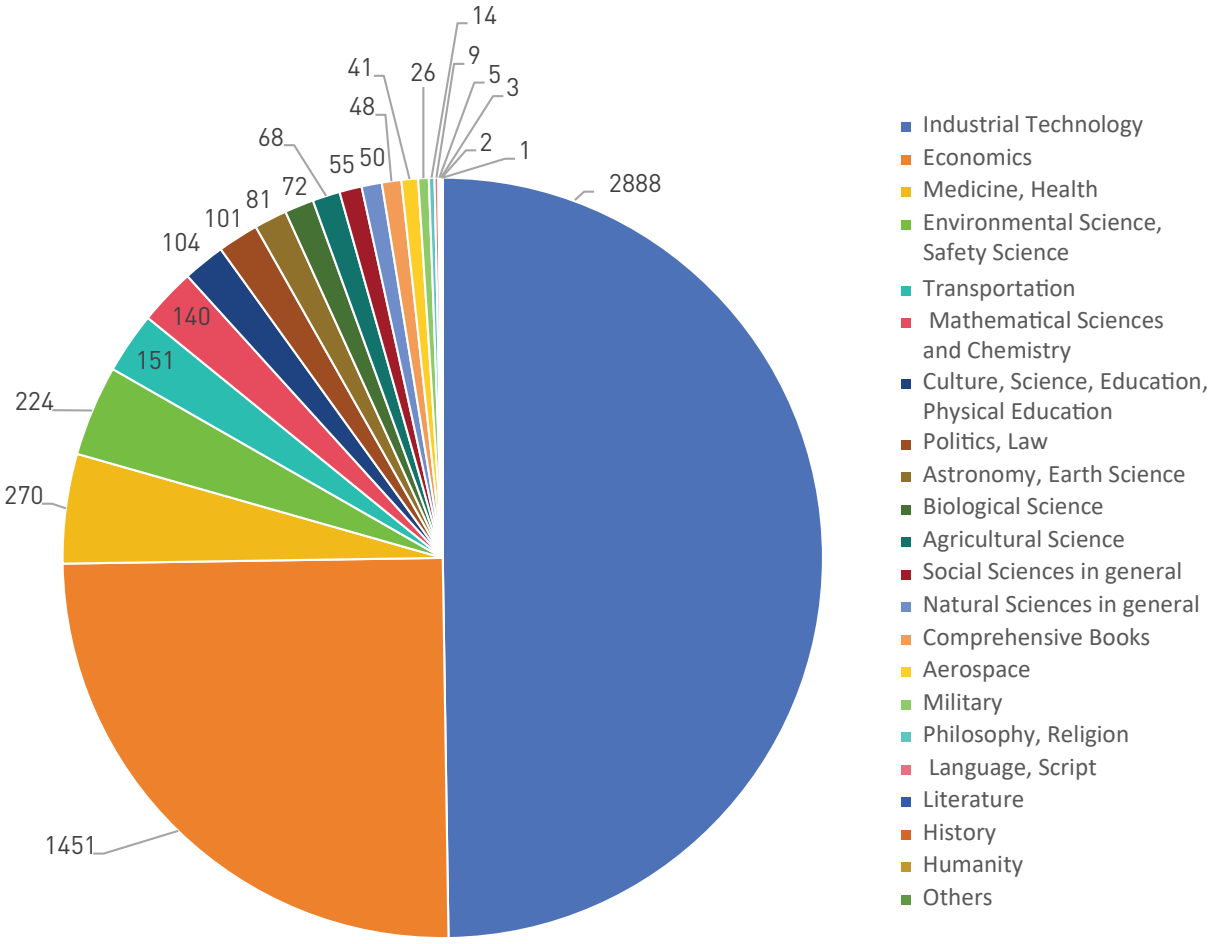
It can be seen that the most critical ESG-related topics are: ESG in China, public policy, ESG investment, green finance, pension funds, investment funds, institutional investors, ESG rating, ESG performance, corporate value, financial performance, and digital transformation. This paper will categorize these key topics and elaborate on the prevailing state of ESG thematic research. The discussion has been divided into four primary sections: "Development and Policy of ESG in China", "The impact of ESG rating on corporate finance", "Digital Transformation and ESG Performance" and "ESG Investment".

As can be seen from Figure 2, there is a clear distribution of ESG-related research across disciplines. Notably, industrial technology dominates the ESG research field, accounting for almost 50% of all ESG-related research, with economics accounting for about a quarter of the total. This dominance may highlight the prominence of ESG factors in these fields and their key role in leading ESG research.

At the same time, the fields of medicine and health (5%), environmental and safety sciences (4%), and transport (3%) also contribute to the ESG research body, albeit on a smaller scale. ESG research in these areas, although less than in industrial technology and economics, demonstrates the growing recognition of the importance of ESG issues in these disciplines.

In summary, this overview maps the distribution of ESG research across the different fields, highlighting the different focus on ESG issues across disciplines. It provides insights into how environmental, social and corporate governance factors are incorporated and studied in various fields, providing a broad perspective on the current state of environmental, social and corporate governance research.

Figure 2. Industry Distribution of ESG-related Research in China



Theoretical Background

The principal theories employed in relevant literature are information asymmetry and financing constraints. These theories provide a theoretical basis for understanding how companies can influence their financial condition by improving their ESG performance. The following analysis will address how these two theories are represented within three research themes.

Impact of ESG Ratings on Corporate Finance

Numerous studies suggest that, due to information asymmetry and financing constraint theories, the ESG performance affects corporate financing costs and corporate value [6– 10]. A. Richardson and M. Welker's [6] research shows that corporate social responsibility information disclosure can significantly reduce the level of information asymmetry, thereby reducing equity capital costs by diminishing company liquidity risk and prediction risk. M. Plumlee et al. [7] found that voluntary disclosure of environmental and social responsibility information increases a company's free cash flow, significantly reduces equity financing costs, and enhances company value. Z. Liu [8] suggests that proactive disclosure of environmental information reduces the level of information asymmetry for external investors, leading to more financing and further reducing capital costs. X. He et al. [9] concluded that the higher the quality of the company's disclosure of social responsibility information, the lower the degree of financing constraints, which aids in equity refinancing. M. Qiu, and H. Yin [10] found that companies with better environmental and corporate governance performance can effectively reduce financing costs, and the quality of ESG information disclosure has a significant impact on this relationship. These results theoretically support that ESG information disclosure can increase corporate information transparency and improve the company's information environment.

Regarding Digital Transformation and ESG

A company's digital transformation can help reduce information asymmetry, which in turn lowers financing costs and alleviates agency problems, ultimately improving the company's ESG performance [11].

Information asymmetry often increases corporate financing costs and causes agency problems, as managers may prioritize short-term goals over the company's long-term sustainability [12]. These factors can hamper ESG performance.

However, a company's digital transformation can address these issues by enhancing data processing and mining capabilities, improving the availability of information [13]. This allows markets to gain a better understanding of a company's operations [14], leading to reduced information asymmetry, lower financing costs, and improved ESG performance.

Theoretical Basis for ESG Investment

Financing Constraints Theory: In ESG investment, companies often face significant financing constraints due to the substantial investments required for conducting green transformations and fulfilling social responsibilities [15]. Investors, particularly those paying heightened attention to a company's ESG performance, can provide the necessary capital to alleviate these constraints [16; 17]. This enables companies to engage in activities that enhance their public image and demonstrate their commitment to sustainable operations.

Information Asymmetry Theory: Investor attention also plays a crucial role in reducing information asymmetry in ESG investment. As investors delve into a company's operational status and development potential, the transparency of corporate information improves [18; 19]. This reduction in information asymmetry can encourage management to pay more attention to long-term sustainable development and social responsibility, thereby enhancing the company's ESG performance [20]. Moreover, to effectively reduce information asymmetry and avoid the risk of adverse selection, companies are motivated to voluntarily disclose ESG-related information, improving the level and quality of information disclosure [21].

In summary, the theories of financing constraints and information asymmetry play a key role in ESG investment, driving companies to enhance their ESG performance and transparency.

Conclusion

In summary, the theories of information asymmetry and financing constraints provide theoretical support for understanding the impact of ESG ratings on corporate finance, how digital transformation affects ESG performance, and how investor attention impacts ESG investment. These theories offer a theoretical basis for understanding how to enhance information disclosure, reduce information asymmetry, lower financing costs, and improve a company's ESG performance.

Current status of ESG research in China

ESG development in China

In recent years, the concept of sustainable development has gradually spread globally, and the focus of the capital market on corporate social responsibility information disclosure has gradually shifted from CSR to ESG. Both ESG and CSR are frameworks for measuring a company's performance in social responsibility and sustainability. However, ESG focuses more on evaluating a company's environmental impact, social responsibility, and governance structure from an investment perspective. Its evaluation standards can be quantified and broadly applied throughout a company's entire operational process. In contrast, CSR primarily focuses on a company's voluntary actions and moral commitments, usually concentrating on specific projects or plans, and its results are often more challenging to quantify. China is currently undergoing a transformation from CSR to ESG [22].

In terms of legal implications, the shift from CSR to ESG signifies the evolution of the core concept of sustainable development, the expansion of concepts, and the strengthening of responsibilities. In terms of functional positioning, the shift from CSR to ESG demonstrates the expansion of sustainable development from risk prevention to system governance, and from promoting sustainable transition to fostering social innovation. The shift from CSR to ESG entails an evolution of the implementation model of sustainable development from unilateral regulation to multi-party co-governance. It manifests as the optimization and upgrade from problem-oriented thinking to systematic arrangements in standard configuration [23].

N. Chen, and F. Sun [24], and X. Xu et al. [1] have pointed out that even though ESG is rapidly developing in China, when compared to the ESG development status in other countries, China's progress is relatively lagging. These researchers argue that the development and research of ESG in foreign countries can provide valuable guidance for the improvement and development of the ESG system in China. This suggests that China's ESG development can benefit from observing and adopting the best practices and lessons learned from foreign countries.

Firstly, the concept of ESG has its roots in international initiatives, with its origins traced back to when the United Nations Environment Programme (UNEP) first advocated for the integration of ESG issues in investments in 2004. Subsequently, the United Nations and other international organizations began to construct ESG-related principles and frameworks, and promote the adoption of ESG disclosure standards by national exchanges, which has gradually formed a more complete ESG disclosure and performance evaluation system [24]. The development of the ESG concept was further shaped by the Principles for Responsible Investment (UN PRI), which was launched by the United Nations in 2006. This international leadership has had a profound influence on the understanding and adoption of ESG principles worldwide [25]. In China, the adoption of ESG started later, but has been largely guided by these international principles. The emphasis on "sustainable development" and "green and low carbon", central to the global ESG discourse, found resonance with China's development strategy. Since 2017, the Asset Management Association of China, drawing inspiration from international practices, initiated ESG research, extensively promoting the ESG concept. The inclusion of A-shares in the MSCI Emerging Markets Index and the MSCI Global Index in June 2018 marked a significant milestone, necessitating ESG research and rating for all the listed Chinese companies. This development, essentially a result of international influence, has spurred ESG research and policy-making in China [25]. A. Zhang, and J. Cai [26] said that the establishment and development of ESG system in China should not only absorb the international advanced experience, but also integrate with China's economic and social development,

integrate the new development concept into the ESG system, and ensure that the direction of ESG development is in line with China's high-quality development strategy. Q. Zhu [27] further emphasizes the instructive role of international practices, using the example of Japan's post-war corporate governance system development. The development of Japan's corporate governance system in the post-war period has been a process of transformation from the supremacy of stakeholder and shareholders' interest to the supremacy of ESG-embedded shareholders' interest. Q. Zhu [27] suggests that China, while learning from international practices, should adapt these to local conditions, exploring the integration of ESG responsibilities into modern corporate law theories. This indicates the ongoing influence of international ESG development on shaping China's ESG landscape.

On the other hand, Q. Zhang, and R. Sun [28], and X. Xu et al. [1], have highlighted that while the demand for ESG among Chinese investors is gradually increasing, and the willingness to invest in ESG is strong, the actual practice of ESG investment in China is still very limited. These researchers argue that the lack of ESG information channels is a significant factor hindering ESG development in China. They propose that a comprehensive ESG system should focus on improving the ESG information disclosure mechanism for enterprises and formulating information disclosure standards. This perspective underscores the need for transparency and standardization in ESG practices to drive further development.

In summary, while there is a consensus on the increasing importance and demand for ESG in China, there is divergence in the focus of the solutions proposed. One group of researchers emphasizes learning from foreign ESG practices [1; 24], while another group prioritizes the enhancement of ESG information disclosure mechanisms and standards in China [1; 28]. This reflects the multifaceted nature of the challenge presented by ESG development in China, suggesting that a combination of these approaches may be required to effectively advance ESG practices.

ESG guidelines and Policies issued by regulatory authorities and exchanges

The development of ESG policies and regulations in China is a topic of considerable interest among researchers, with differing perspectives and findings.

On the policy front, Y. Gao, and L. Li [29] have conducted a detailed analysis of ESG policies and regulations in developed economies such as the EU, the US, Japan, and Hong Kong. They have also categorized all ESG-related policies in China into two types: top-level ESG-related policies and ESG information disclosure-related policies. Meanwhile, J. Xie [30] found that most ESG-related policies are guiding in nature, with the vast majority being encouraging and voluntary. In terms of the strength of ESG policy regulation in China, J. Xie [30] and A. Xie, H. Routh, and L. Gu [31] both highlight the lack of mandatory ESG report disclosures for Chinese funds. This suggests an opportunity for stronger regulatory oversight in this area.

As for the impact of ESG-related policies on ESG performance and investments, X. Chen, and M. Zhang [32] have found that green policies and the implementation of green finance policy, respectively, have a positive impact on ESG investments and corporate ESG performance. While both studies affirm the effectiveness of green policies in influencing ESG investments, they differ in their focus, methodology, and specific findings. M. Zhang concentrate on investment returns, while Chen focuses on corporate ESG performance and use a traditional empirical approach, contrasting with Chen's use of the DID model.

Conversely, H. Shu, and W. Tan [33] argue that carbon control policy risks can negatively impact corporate ESG performance. H. Cai, and Z. Zhou [34] also pointed out that market carbon emission trading policies can enhance the quality of ESG information disclosure, with government environmental subsidies playing an intermediary role in this process. This finding underscores the potential of policy interventions in improving ESG practices and the synergistic interaction between market mechanisms and government support.

However, Q. Chen, and Z. Liu [35] add another dimension by studying the effects of economic policy uncertainty, showing that increased uncertainty can significantly enhance the ESG performance of listed companies, particularly those with high media attention and state-owned enterprises.

In summary, while there is a consensus on the need for more comprehensive ESG policies and regulations in China, opinions diverge in the perceived impact and effectiveness of existing policies. These differing perspectives underscore the complexity of ESG policy development and implementation in China, suggesting that a multifaceted approach that takes into account China's unique national conditions may be most effective.

Conclusion

The literature reveals several gaps in our understanding of ESG development and policy regulation in China. For instance, there is a lack of mandatory regulation, with most policies being voluntary and encouraging. Furthermore, our findings indicate that the majority of policy and research attention is primarily directed towards the environmental and governance facets, with the "social" component often receiving less consideration. Additionally, most studies on the impact of Chinese ESG policies on corporate ESG performance and ESG investment show positive effects, but these studies are largely based on "environmental" and related policies. There is a dearth of research examining the impact of policies in the "social" and "governance" dimensions on ESG performance and investment. Also, there are no studies on ESG policies on corporate performance, and few case studies on the specific impact of specific policies on corporate ESG disclosure, with most policy studies remaining at the macro level of analysis.

The impact of ESG rating on Corporate Finance

Relationship between ESG rating and corporate performance

Most studies show that ESG ratings are positively related to corporate performance [36]. Including a positive effect on corporate stock returns [36]; G. An et al. [37] studied the effects of ESG composite score, environmental responsibility score, social responsibility score, and corporate governance score on earnings per share, respectively, and found that the ESG rating system had different degrees of positive effects on listed companies in different industries. H. Hu [38] also indicated that the improvement of ESG rating has a significant positive effect on the cumulative excess return of listed companies' stock.

In addition, in studies of firm classification, the effect of ESG performance on firm value is more pronounced for non-state enterprises, smaller firms, and firms in non-polluting industries [36]. The implementation of ESG investment concept is conducive to guiding financial institutions to invest capital in green industries, enhancing their green investment capacity, and fostering the sustainable development of green finance self-growth [39].

There are also a few studies that show that ESG ratings are negatively related to firm performance. A. S. Garcia et al. [40] study of BRICS companies shows that the profitability of corporate assets is only related to environmental indicators and the negative sign of the association between the two suggests that the best ESG performing companies tend to be less profitable. Few currently show a negative correlation about ESG ratings.

The impact of ESG factors on the performance of firms varies across industries. According to a study of the literature, about half of the articles in ESG-related studies are about the Industrial Technology sector, followed by the Economy sector, and then the Healthcare sector. For example, J. Li et al. [41] divided Chinese firms into industrial technology industries and non-industrial technology industries to compare the impact of ESG on firms' development performance. The study shows that industrial firms are limited by their own attributes, and the spillover effect of green innovation is not obvious, but the ESG of non-industrial firms can guide their peer firms to adopt green innovation behaviors and improve sustainable development performance. D. Kalia, and D. Aggarwal [42] study the healthcare sector and suggest that the relationship between ESG scores and FP cannot be generalized, in developed economies, the implementation of ESG activities has a positive impact on the performance of healthcare companies; however, in developing economies, the relationship is negative or insignificant.

Discrepancies in Research Findings and Suggestions for future research

Most research shows a positive relationship between ESG ratings and firm performance, meaning that better ESG ratings often lead to improved business outcomes. However, this relationship is complex and can vary based on industry sectors and economies. In some cases, higher ESG ratings have been linked to lower profitability. This shows that the connection between ESG ratings and performance isn't always positive and depends on various factors. More research is needed to understand why these negative correlations occur in certain contexts.

Relationship between ESG rating and financing cost

Cost of debt financing

Most of the findings show that in China, companies with better ESG performance have lower debt financing costs, and this positive impact is realized through different pathways and mediating mechanisms.

A growing body of research suggests that good ESG performance can significantly reduce the cost of debt financing in China. This reduction is achieved through various mechanisms, such as reducing corporate financial, information, and agency risks [43]. Further, it has been suggested that good ESG performance can alleviate corporate financing constraints [41]. However, it should be noted that these studies have used different methodologies and data sets, which could potentially explain the variations in their findings.

In addition, it has also been shown that the impact of ESG performance on the financing cost of firms is greater during the epidemic [44]; furthermore, some scholars have studied E, S, and G components separately and found that the financing cost of firms with better environmental and corporate governance performance is significantly lower [10].

A few studies show that ESG performance increases the cost of capital. From a new perspective, SMEs tend to obtain government subsidies by improving ESG performance based on the "rent-seeking" motive, which ultimately leads to an increase in their own cost of capital, but this negative impact is not irreversible, and increased R&D investment by enterprises can effectively inhibit the negative impact of ESG performance on the cost of capital [45].

Discrepancies in Research Findings

While the bulk of research points towards a positive correlation between ESG performance and lower debt financing costs, there are discrepancies in the literature. J. Liu [45] and X. Chen et al. [46] argue that ESG performance can increase the cost of capital, contradicting the prevailing view. Moreover, the heterogeneity test analysis by Y. Lian et al [43] shows that the effect of ESG performance is more significant in firms with high marketability. This finding diverges from other scholars, revealing a need for further study to confirm these results.

Gaps in Current Research

There are several gaps in the current research. First, while the research related to the impact of ESG on the cost of debt is well-developed, there are some disagreements in

the heterogeneity of this impact, which require further investigation. Second, most studies focus on Chinese A-share listed companies and do not categorize and compare industries. Different industries have varying sensitivities to ESG, and the degree to which debt costs are affected by ESG performance may differ greatly. Consequently, it is necessary to analyze different industries separately. Lastly, recent studies [47–49] show that in digital enterprises, digital transformation significantly improves the level of business credit financing. This suggests that the impact of ESG on debt financing costs might vary depending on the degree of digitalization, and whether there is a coordinating or inhibiting effect between the two needs further investigation.

In conclusion, while the majority of research indicates a positive influence of ESG performance on debt financing costs in Chinese companies, there are discrepancies and gaps in this field that call for further scrutiny. Future research should aim to address these inconsistencies and voids to provide a more comprehensive understanding of the role of ESG performance in debt financing costs.

Cost of equity financing

There are fewer studies on the impact of ESG performance on firms' cost of equity financing. Most studies have concluded that environmental, social and corporate governance performance is negatively related to a firm's cost of equity capital [46; 50]. However, the methods used to calculate the cost of equity capital vary across studies, which may lead to different conclusions.

X. Chen, and L. Yin [46] used the Capital Asset Pricing Model (CAPM) to measure the cost of equity, analyzing data from 2015–2020. Chen's research suggests that the negative correlation between ESG and the cost of equity capital is more pronounced during a recession and in state-owned enterprises. However, when the sample period was shortened to 2018–2020, the analysis showed equal significance for both state-owned and private enterprises.

Contrastingly, W. Lv [50] calculated the cost of equity using the Price Earnings Growth (PEG) model and found that there is an inverted "U" effect of a company's environmental performance on the cost of equity financing. When a company's environmental performance score is low, equity investors are skeptical about its future profitability, and the cost of equity financing for the company may increase as a result; whereas when a company's environmental performance score exceeds a certain level, investors notice that the company's "green" development prospects, and thus increase their investment preference for the company, and the cost of equity financing for the company may decrease as a result.

Discrepancies in Research Findings

In conclusion, while the majority of research points towards a negative relationship between ESG performance and the cost of equity capital, there are discrepancies and gaps in this field that warrant further investigation.

Digital transformation and ESG performance

In 2022, the scale of China's digital economy surpassed 50 billion for the first time, with the digital economy accounting for more than 40% of GDP, reaching 41.5% [51]. ESG and digital transformation, as two hot topics, their relationship is an emerging research field. The number of related studies has surged in the past year, with different research perspectives and several gaps. The following will analyze the current state of literature research from four aspects: quantification standards of digital transformation, the key position of digital transformation in corporate ESG performance, and heterogeneity analysis between different studies.

Quantification Standards of Digital Transformation

Regarding the quantification standards of the level of digital transformation, different scholars have adopted different methods. Most studies use text analysis, utilizing Python technology to identify the degree of digital transformation [52–8]. Additionally, H. Wang et al. [59] used a sample of 314 A-share listed companies included in the MSCI ESG rating to construct a corporate digital transformation feature database. Some scholars use the digital financial index published by Peking University to measure the level of digital transformation [60]. Moreover, S. Wang, and J. Esperança [61] used a questionnaire survey method, conducted comprehensive modeling and empirical analysis through the application of fsQCA and PLS-SEM methods. Q. Zhao et al. [62] analyzed the relationship between digital transformation strategy and ESG performance based on the positioning of the corporate digital transformation level through the Strategic Alliance Model (SAM). They collected data as a sample from 224 large-scale manufacturing enterprises in China and conducted empirical tests using hierarchical regression methods.

Digital Transformation: Dual Role as an Independent Variable and Moderator

Most studies indicate that corporate digital transformation can significantly enhance the company's ESG performance [53; 55; 57–59; 61; 63], but the results of mechanism testing are somewhat different. In mechanism testing, the research of J. Hu et al. [53] shows that corporate digital transformation can promote the company's ESG performance by encouraging green technology innovation, improving corporate internal information transparency, and enhancing corporate decision-making and operational management efficiency. The study of Y. Wang et al. [55] shows that corporate digital transformation improves the company's ESG performance by increasing external legitimacy pressure and alleviating information asymmetry. The mechanism analysis of H. Wang et al. [59] indicates that digital transformation has an indirect effect on ESG responsibility performance through three channels: corporate innovation ability, information interaction, and financial performance.

Z. Han et al. [57] suggest that digital transformation promotes corporate ESG performance by enhancing information transparency and total factor productivity. The path analysis of R. Zhang et al. [58] shows that green technology innovation plays a mediating effect between digital transformation and corporate ESG performance. In addition, Wang, Sh. et al. [61] used a questionnaire survey method and carried out comprehensive modeling and empirical analysis by applying the fsQCA and PLS-SEM methods, revealing that digital resources, organization, adoption, management, and corporate competitiveness indirectly have a positive impact on ESG through the mediating variable (corporate market performance). They innovatively found that the moderating variable (digital innovation culture) positively regulates two paths: digital application and corporate competitiveness, and digital application and digital management. Q. Zhao et al. [62] conducted an empirical test using the hierarchical regression method based on the positioning of the corporate digital transformation level through the Strategic Alliance Model (SAM), and collected data from 224 large-scale manufacturing enterprises in China as a sample through a questionnaire survey. The empirical results show that the two dimensions of the digital transformation strategy, namely business digitalization and platform digitalization, have a significant direct positive impact on corporate ESG performance.

Digital finance, as a specific application of digital transformation in the financial industry, also promotes the improvement of ESG performance. This point has been confirmed by the research of X. Zhao et al. [60], L. Xue et al. [63], and X. Ren et al. [64]. X. Zhao et al. [60] found in their mechanism study that digital transformation is the mediating variable for digital finance to influence corporate ESG performance. Digital finance can promote corporate digital transformation, thereby enhancing corporate ESG performance. The mechanism test of L. Xue et al. [63] shows that digital finance influences corporate ESG performance by promoting corporate green innovation, improving corporate goodwill, and reducing agency costs. In addition, political relationships have a negative moderating effect on the relationship between digital finance and corporate ESG performance, while regional institutional development has a positive moderating effect on this relationship. X. Ren et al. [64] found that digital finance can significantly promote corporate ESG performance, especially environmental and social performance. Secondly, our empirical findings show that digital finance impacts corporate ESG performance through green innovation and external regulation.

Some other scholars have separately studied the impact of digitalization on the E, S and G factors. Regarding the impact of digitalization on corporate governance, most notably in terms of agency costs, studies have shown that digitalization itself has a mitigating effect on agency conflicts, with shareholders becoming more active as a result, with industries such as information technology, communications, finance and healthcare being the most affected. These industries are most affected by innovations in ecosystem-based business models, and digitalization and ecosystem-based business models complement each other in mitigating principal-agent conflicts [65]. In addition, regarding the impact of digitalization on firms' social and environmental scores, M. Fang et al. [66] stated that digitalization helps firms to improve their goodwill and further improve their social (S) scores, but digitalization does not improve firms' environmental (E) scores.

Other scholars have presented different research viewpoints and conclusions. Y. Wang, and Y. Guo et al. [56] found that there is a significant "inverted U-shaped" relationship between the degree of corporate digital transformation and ESG performance. Mechanism analysis indicates that digital transformation mainly influences corporate ESG performance through two channels: corporate green innovation capability and the quality of information disclosure.

In studies on the moderating role of digital transformation, H. Chen, and L. Zhang [67] found that ESG performance can significantly enhance corporate value. Digital transformation can positively regulate the enhancing effect of ESG performance on corporate value by enhancing the company's green technological innovation capability and alleviating corporate financing constraints. X. Wang et al. [54] state that ESG performance partially mediates the impact of corporate R&D investment on corporate market value, while the level of corporate digitalization plays a positive moderating role in the enhancement of R&D investment on ESG performance. Q. Zhang, and Z. Liu [68] found that heterogeneous large shareholder governance has a significant positive effect on corporate ESG performance, and corporate digital transformation has a positive moderating effect on the relationship between heterogeneous large shareholder governance and corporate ESG performance.

Most studies consider corporate digital transformation as a way to significantly enhance ESG performance, mainly through promoting green technology innovation, improving information transparency, enhancing decision-making and operational efficiency, and indirect ways such as alleviating information asymmetry, enhancing innovation capability, and improving financial performance [53; 55;57–; 62; 63]. In the financial industry, digital finance is seen as a form of transformation and a driver to improve ESG performance [60; 63; 64]. However, research views are not consistent, such as the finding of an "inverted U-shaped" relationship between the degree of digital transformation and ESG performance [56]. Future research directions should delve deeper into the negative impacts of digital transformation and the differential moderating roles in different industries, regions, and scales of enterprises, and deepen the research on specific strategies to enhance ESG performance through digital transformation.

Diversification of Heterogeneous Influences

Due to the different research methods, data samples, and measurement tools used in different studies, the results in the analysis of heterogeneity tests are quite varied.

First of all, in terms of corporate ownership, H. Chen, and L. Zhang [67] found that the enhancement of corporate value by ESG performance is more pronounced in state-owned enterprises. This point of view is supported by J. Hu et al. [53], who found that digital transformation of state-owned enterprises has a stronger promotion effect on corporate ESG performance. However, the research results of R. Zhang, and X. Chen [58] show that the impact of digital transformation on corporate ESG performance is more significant in non-state-owned enterprises. This may mean that companies with different ownership structures may face different challenges and opportunities when undergoing digital transformation.

Secondly, in terms of regional differences, X. Zhao, and N. Dong [60] showed that the development of digital finance can significantly promote the ESG performance of enterprises in the eastern and central regions, but the impact on enterprises in the western region is not significant. This view is in line with the research of R. Zhang, and X. Chen [58], who found that the impact of digital transformation on corporate ESG performance is more significant in enterprises in the eastern and central regions. While X. Ren et al. [64] found that digital finance has a more positive effect on the ESG performance of enterprises in the central and western regions and non-low-carbon demonstration cities.

Thirdly, in terms of industry differences, H. Chen, and L. Zhang [67] found that in heavily polluting industries and high-tech industry companies, the enhancement of corporate value by ESG performance is more pronounced. However, Z. Han, and Y. Zhang [57] found that digital transformation has a more significant promoting effect on corporate ESG performance in high-tech enterprises, low-pollution industries, high digital finance regions, and low-pollution regions. X. Ren et al. [64] found that digital finance has a more significant impact on the ESG performance of low-digitally-transformed, low-profitability, regulated industries and high-carbon emission industries. Y. Yang, and J. Han [69] stated that in companies with low financing constraints, private enterprises, and non-technology enterprises, digital transformation has a more prominent effect on improving ESG performance by alleviating FC.

Researching the impact of heterogeneity is a key aspect of understanding ESG performance in China's emerging capital markets. Our review of multiple studies reveals how factors such as corporate ownership, regional differences, and industry differences influence the relationship between digital transformation and ESG. These differences may be due to differences in research methods, data samples, and measurement tools, which result in some degree of variance in research results. Future research needs to delve deeper into these heterogeneous influences to more accurately understand the role and impact of ESG in China's emerging capital markets.

Gaps in Current Research

However, despite these promising findings, the majority of studies suggest that digital transformation contributes to firms' ESG performance [53; 55;57–9; 63], with only a small number of studies linking the extent of firms' digitisation to the relationship between ESG and firm performance [67] . Future research should take this gap into account and investigate the complex interactions between digital transformation and ESG performance. In addition, the results of the heterogeneity analyses varied more widely in their conclusions due to the differences in research methodologies, pending more systematic and in-depth research in the future.

Current status of ESG investment research in China

ESG Investment Development

Despite economic recession and capital market volatility, ESG investment has shown remarkable growth, reflecting the resilience of ESG investment development and the increasing popularity of ESG investment concepts and strategies [70].

Y. Tian, and Q. Wu [71] have studied the development and practice of ESG investment in China. They point out that while the system of ESG investment information disclosure has been gradually established, the overall level of investment needs to be improved. Similarly, K. Wang, and T. Li [72] highlight the uneven development of various themes in Chinese ESG funds and the need for a deeper integration of the ESG investment concept.

X. Ma [73] also echoes that ESG investment strategies in the Chinese capital market are in a nascent stage due to the unclear rules of information disclosure and the difficulty of obtaining relevant information. G. Tu [74] emphasizes the establishment of ESG evaluation standards and participation in corporate governance as crucial steps to provide empirical support for ESG investment in China and help improve its capital market structure.

In recent years, mainstream investors in China are gradually introducing ESG investment concepts, and the fund industry, banking industry, and insurance industry are exploring ESG investment strategies, developing ESG evaluation criteria, and releasing ESG products [75]. X. Shen [76] suggests that ESG investment strategy, which focuses on whether the institutional arrangements of ESG can create value for investors, is more of a tool compared with socially responsible investment.

According to the results of literature search, China's ESG investments are mainly in pension funds, insurance industry, commercial banks' ESG responsible investment products, and ESG funds (the main types include pure ESG funds, environmental funds, social responsibility funds, corporate governance funds and pan-ESG funds), etc. The next step is to analyze and summarize the main academic researches, and to study the viewpoints and conclusions of different scholars.

ESG and pension funds

One of the most researched aspects of ESG investing is the relationship between ESG and pension funds. Since China

launched the construction of a green financial system in 2016, it has also actively explored ESG investment strategies for pension asset management. At present, China's pension funds included in the investment include basic pension insurance funds, enterprise (employment) annuity funds and pension funds, and national social security funds [77].

According to the existing research about ESG and pension funds, it can be mainly divided into two aspects: the relationship between ESG investment and pension funds, the challenges of ESG investment in pension funds.

X. Chen, and M. Zhang [32] discuss ESG investments can satisfy the risk aversion, long-term and public nature of pensions and screen out companies with long-term investment value. In addition, as far as aging is concerned, ESG investments can satisfy the risk aversion, long-term and public nature of pensions and screen out companies with long-term investment value.

Y. Zhang [78] highlights the emerging role of ESG investment in China's pension funds, despite the existence of challenges such as delayed corporate information disclosure and imperfect market rules. The research emphasizes the need for improved systems and market mechanisms, talent cultivation in ESG investment, and learning from international ESG practices to ensure the sustainable development of pension funds.

Discrepancies in Research Findings

While most scholars agree on the importance of ESG investment in pension funds and insurance companies, their views on the challenges and the ways to address them differ. Y. Zhang [77] emphasizes the need to improve the relevant system and market mechanism, while X. Chen, and M. Zhang [32] focus more on the characteristics of pension funds that make them suitable for ESG investments.

Gaps in Current Research

The current body of research mainly focuses on the role of ESG investment in pension funds and insurance companies. However, several gaps remain. First of all, most of the research studies focus on theoretical analysis, and less so on empirical analysis. Second, while the impact of ESG investment on pension funds has been extensively studied, there is less research on its impact on different types of insurance companies. Additionally, the potential moderating variables in the relationship between ESG investment and the performance of pension funds and insurance companies are not well-explored.

ESG and commercial banks

A review of recent literature reveals a vibrant discourse surrounding the need for Chinese commercial banks to adopt ESG investment strategies. Scholars differ in their perspectives on the implementation, benefits, risks, and challenges associated with such strategies.

ESG Investment as an Innovation in Chinese Banking Sector

As the leading financial institutions in China, it is crucial for commercial banks to pay attention to ESG in order to enhance operational efficiency and to advance the high-quality development of the country's social economy [79]. L. Wang [80] notes that institutions such as the People's Bank, ICBC, Industrial Securities, ETF, and Guoshou Asset have already applied ESG responsible investment concepts, launching ESG investment products. J. Li et al. [79] use an innovative model, considering market share, green credit, social donations, executive compensation, and ESG scores, to assess the efficiency of 20 listed banks in China. They found that urban cooperative banks were the most efficient, joint-stock commercial banks performed best in the profit stage, while state-owned commercial banks performed best in the market and sustainable development stages. The study also revealed that state-owned banks lead in ESG investment, while joint-stock banks lag in ESG performance.

ESG Investment: A Strategy and Responsibility

Furthering the scholarly discourse, Y. Luo, and W. Zhang [81] identify the core characteristic of ESG investment as the incorporation of social responsibility into investment decisions. They argue that such strategies lead to improved investment structure, optimized risk control, and ultimately, higher long-term returns. Aligning with this perspective, Z. Yuan [82] suggests that ESG investment strategy in commercial banks' asset management is not only a strategy but also a reflection of the banks' social responsibility.

Risks and Challenges in ESG Investment

Although many scholars advocate for ESG investment, others point out potential risks and challenges. H. Jiang et al. [83] warn of increased risk-taking in commercial banks through reputational spillovers, particularly for joint-stock banks. They suggest that the implications of ESG investment are stronger for such institutions. Z. Cao, and H. Wang [84] pinpoints a significant challenge in the adoption of ESG investment strategies. He argues that commercial banks lack the scientific means to evaluate their customers' ESG quality. Moreover, he notes that the ESG quality of customers varies widely among different industries, with the highest in the banking industry, and the chemical industry being in the middle.

Conclusion and Research Gaps

While a consensus exists on the need for ESG investment strategies in Chinese commercial banks, scholars differ on the associated risks and challenges. Additionally, research is lacking on effective means of ESG quality evaluation in various customer industries. This indicates a need for further research to develop scientific methods of ESG quality assessment and to explore the different implications of ESG investment across various industries in the commercial banking sector.

ESG Funds

ESG funds are recognized as important engines for sustainable development investments. However, scholars diverge in their perspectives on ESG funds' development, impacts, influencing factors, and challenges in China.

Development and Impact of ESG Funds

K. Wang, and T. Li [85] define ESG funds as investment products incorporating non-financial indicators into the decision-making process. They note that ESG funds in China are generalizing, but with uneven development across various themes, necessitating deeper integration of the ESG investment concept. Y. Luo, and W. Zhang [81] investigate the motivations and impacts of ESG funds. They argue that ESG funds carry out due diligence management of their holdings to enhance corporate ESG performance, driven by social needs and their interests. They found that the higher the percentage of holdings, the better the corporate ESG performance, and active ESG funds excel over passive funds in enhancing corporate ESG performance. Y. Qi et al. [86] apply the ESG concept to QDII funds, using simulation to construct the funds on a rolling basis. They found that ESG-constructed QDII funds yield better returns, with no significant risk differences from market indices. These funds are characterized by high mean and low variance, higher deterministic equivalent returns, and better Sharpe ratio performance.

ESG Funds Resilience and Influencing Factors

J. Zhang [87] explores the factors influencing ESG investment funds' willingness to execute. He identifies ESG fund risk rating and fund manager education as the main influencing factors. Interestingly, he found that an ESG fund's historical returns positively influence willingness to execute, while fund manager tenure has a negative influence. X. Chen, and H. Liu [88] explored the impact of investor attention on ESG performance of listed companies. They discovered that different types of investor attention, such as sentiment, interaction, research, and shareholding, all enhance companies' ESG performance.

Challenges and Future Directions

Despite its promise, ESG investment faces significant challenges. J. Xie, and K. Fu [89] notes the increasing prevalence of the "pseudo-ESG phenomenon" in ESG funds and calls for deeper academic research on this issue. K. Wang, and T. Li [85] propose a three-pronged approach for regulatory intervention: guiding ESG investment through policies, developing ESG disclosure standards to promote ESG fund product development, and designing a scientific ESG evaluation system to facilitate the maturation of ESG fund products.

Conclusion and Future Research Directions

While the potential benefits and impacts of ESG funds are well-documented, studies diverge on influencing factors and present challenges such as the "pseudo-ESG phenomenon". Further research is needed to explore these challenges and examine the effectiveness of proposed solutions, such as regulatory interventions and ESG evaluation systems. The role of investor attention in enhancing companies' ESG performance warrants further exploration. It's also critical to investigate the impact of fund manager tenure on the willingness to execute ESG investments, a less-studied area in the current literature.

ESG Investor Preferences and Decisions

Literature on ESG preferences among institutional investors in the A-share market presents a fascinating array of perspectives. Scholars have delved into the relationship between ESG performance and institutional investment, the role of ESG in corporate bond risk, and the preference for green innovation.

F. Zhou et al. [90] and X. Bai et al. [91] suggest a strong preference among institutional investors for firms demonstrating good ESG performance, even at the cost of withstanding lower short-term business performance. This perspective is reinforced by M. Li [92], who establish a positive correlation between a company's ESG social responsibility and the shareholding of institutional investors.

Contrastingly, M. Jin [93] focuses on the preference for green innovation among institutional investors. His research notes that companies with high ESG performance tend to have a higher green innovation capacity, and he suggests that institutional investors are willing to tolerate lower current excess returns for companies with strong green innovation capabilities.

Conclusions and Research Gaps

While these perspectives provide valuable insights, they also underscore the need for further research on the tolerance of institutional investors for lower short-term performance, the role of green innovation, and the impact of ESG performance on corporate bond risk.

ESG and Green Finance

Current research primarily focuses on the development of green finance, the relationship between green finance and ESG performance, and the link between green finance and corporate value. Notably, researchers explore the relationship between green finance policies and ESG performance, analyze the development pathway and strategies of green finance, and investigate how green finance and ESG performance impact the value of a corporation.

Green Finance Development

A paper by J. Zhang [94] proposed a pathway to enhance China's green financial development. The author suggested that the enhancement could be achieved through multi-subject participation, promotion of green finance pilot projects, and strengthening of green finance training. Zhang also emphasized the importance of enriching green finance products and optimizing risk governance mechanisms.

Green Finance and ESG Performance

S. Qian, and W. Yu [95] investigated the effect of green finance policy on ESG performance in heavily polluting enterprises, using China's Green Financial System Guidelines and a difference-in-differences design. Their findings suggest that the adoption of the policy improves ESG performance, with the effect being more pronounced for firms with better internal and external governance.

On the other hand, H. Deng et al. [96] exploited a quasi-natural experiment in China, the Green Financial Reform and Innovation Pilot Zones (GFRIPZ), to analyze the impact of green financial policy on corporate risk-taking. They found that such policies positively affected corporate risk-taking, particularly among companies with low R&D investment and poor ESG performance.

Green Finance and Corporate Value

H. Wang et al. [97] investigated the impact of commercial banks' fulfillment of social responsibility on their corporate value from the green finance perspective. Their research results indicate that the implementation of social responsibility and green finance strategies significantly enhanced the corporate value of the banks.

Tu, Q. Li, and H. Li [98] utilized a triple-difference model to quantitatively assess the enhancement effect of the establishment of green financial reform and innovation pilot zones on the value of green enterprises. The research findings reveal that the establishment of green financial reform and innovation pilot zones significantly boosts the value of green enterprises. Furthermore, they employed the level of ESG information disclosure as a moderating variable. The research shows that an improvement in the level of internal ESG information disclosure positively moderates the promotional effect of the pilot zones on the enhancement of corporate value.

ESG Performance and Green Finance Policy

A study by X. Chen [99] used a difference-in-differences model to analyze the effect of green finance policy implementation on the ESG performance of listed companies. The results suggested a positive correlation between the implementation of green finance policies and ESG performance.

Similarly, Y. Zhu, and D. Li [100] used fixed-effect regression methods to empirically study the relationship between green finance and ESG performance. Their findings indicated that green finance promotes ESG performance, with the effect being more pronounced for companies with higher public attention.

Conclusions and Research Gaps

Despite the growing body of research on green finance and ESG performance, certain gaps remain. For instance, there is a lack of consensus on the causal relationship between green finance and ESG performance. While some studies suggest that green finance improves ESG performance, others indicate that green finance can lead to increased corporate risk-taking. Further research is needed to clarify this relationship.

Conclusion

This study employs a systematic literature review method, searching for literature related to ESG in China's emerging capital markets from three databases: Scopus, WanFang, and CNKI. The literature is analyzed using Vosviewer software, systematically selecting the most significant and cutting-edge themes: "Development and Policy of ESG in China", "The Impact of ESG Rating on Corporate Finance", "Digital Transformation and ESG Performance", and "ESG Investment". These themes' research methods, data, and conclusions are comprehensively summarized, and differences in related thematic research are compared to identify gaps in each theme.

Current research on ESG regulation and policy indicates that China lacks compulsory regulations, with most policies being voluntary and encouraging. Most policies and research primarily focus on environmental and governance aspects, while the "social" part is often less considered. Furthermore, most studies on the impact of China's ESG policies on corporate ESG performance and investment show positive effects, but these studies are mainly based on policies related to the "environment". Research on the impact of "social" and "governance" policies on corporate ESG performance and investment is still lacking. Also, there are few case studies on the specific impact of specific policies on corporate ESG disclosure, with most policy research still at the macro analysis level. Therefore, it is recommended to study this theme in the future.

Our analysis of China's ESG rating system reveals the relationship between ESG ratings, corporate performance, and financing costs, including debt financing and equity financing. We found that conclusions about the impact of ESG on financing costs are inconsistent, and the scope of research on equity financing costs is limited, requiring further investigation. Moreover, we observed that all the studies are based on companies listed on the A-share market in China. However, as different industries have different sensitivities to ESG, the impact of ESG on Corporate Finance will also vary. Therefore, it is suggested to conduct research by industry and make comparisons.

The relationship between digital transformation and ESG is a relatively novel and popular topic in current research. Scholars have adopted various methods to quantify the level of corporate digital transformation, including text analysis, constructing characteristic databases, using digital financial indexes, and questionnaire surveys. Despite heterogeneity, most studies believe digital transformation can improve corporate ESG performance by promoting green innovation, enhancing transparency, and increasing management efficiency. In the financial industry, digital finance, as a form of digital transformation, is also seen as a driver to improve ESG performance. However, some studies have found a "U-shaped" relationship between the degree of digital transformation and ESG performance. Overall, corporate digital transformation is considered an important factor in promoting ESG performance improvement, but this relationship may be influenced by various factors and requires further research and discussion. In addition, current research significantly differs in the heterogeneity analysis of how corporate ownership, regional, and industry differences influence the relationship between digital transformation and ESG. Future research should consider these gaps and study the complex interactions between digital transformation and ESG performance.

Research on ESG investment indicates that although China's ESG investment is still in the early stages, there is an urgent need to improve investment levels and establish related investment systems. Institutional investors and government policy guidance are considered key drivers to promote ESG investment development. Most research focuses on the relationship between pension funds and ESG investments, finding that ESG investments align with the long-term value concerns of pension funds. Although the rapid development of ESG investment in China's pension funds has attracted attention, challenges such as imperfect market rules still exist. A few scholars have begun to study the specific strategies of pension funds' ESG investments in insurance industry companies. Commercial banks and other financial institutions have made significant progress in implementing ESG strategies, launching a series of ESG investment products that satisfy the ESG responsibility requirement of financial institutions and enhance their risk-bearing capacity and ability to obtain excess returns. However, current research on ESG funds, ESG bonds, ESG credit, and equity is still relatively scarce, with most studies still at the theoretical concept level, quantitative studies are few, and the research scope is not comprehensive. This may be due to China's financial market ESG investment still being in the early stages and a relatively small number of cases worthy of study. With the growth of China's ESG investment, the development of ESG investment strategies suitable for emerging developing countries like China will become a key topic. Existing literature emphasizes the importance of continuing to focus on this evolving field, especially understanding the role of various financial institutions and identifying effective strategies to promote ESG investment.

This review provides a comprehensive overview of ESG-related research in China's emerging capital markets, revealing the main themes and development frontiers of current research, as well as the differences in methods, data, and conclusions of each theme's research. We found that although ESG research and practice in China are still in the early stages, some important research results and practical experiences have emerged. However, there are also some research gaps and challenges that future research and practice need to resolve. We look forward to further research and practice, which can provide more effective and targeted ESG practices and investment strategies for China and other emerging market countries, making a greater contribution to sustainable development.

References

1. Xu X., He F., Chen N., et al. Regulatory trend of ESG disclosures and its countermeasures and suggestions to the listed Chinese energy companies. *World Petroleum Industry*. 2020;27(3):13-18,24. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg9zanN5Z3kyMDIwMDMwMDMaCGZvZGE0am91 (accessed on 09.08.2023)
2. Savio R., D'Andrassi E., Ventimiglia F. A Systematic Literature Review on ESG during the COVID-19 Pandemic. *Sustainability*. 2023;15(3):2020. https://doi.org/10.3390/su15032020
3. Tranfield D., Denyer D., Smart P. Towards a Methodology for Developing Evidence: Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*. 2003;14:207-222. https://doi.org/10.1111/1467-8551.00375
4. Mian S., Lamine W., Fayolle A. Technology Business Incubation: An overview of the state of knowledge. *Technovation*. 2016;50-51:1-12. https://doi.org/10.1016/j.technovation.2016.02.005
5. Massaro M., Dumay J., Guthrie J. On the shoulders of giants: Undertaking a structured literature review in accounting. *Accounting, Auditing & Accountability Journal*. 2016;29(5):767–801. https://doi.org/10.1108/AAAJ-01-2015-1939
6. Richardson A.J., Welker M. Social disclosure, financial disclosure and the cost of equity capital. *Accounting, Organizations and Society*. 2001;26(7-8):597-616. https://doi.org/10.1016/S0361-3682(01)00025-3
7. Plumlee M., Brown D., Hayes R.M., et al. Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public Policy*. 2015;34(4):336-361. https://doi.org/10.1016/j.jaccpubpol.2015.04.004
8. Liu Z. Review and enlightenment of related studies on corporate environmental information disclosure. *Business Accounting*. 2019;(2):108-110. (In Chinese). https://doi.org/10.3969/j.issn.1002-5812.2019.02.033
9. He X., Xiao T., Chen X. Corporate social responsibility information disclosure and company financing constraints. *Journal of Finance and Economics*. 2012;38(08):61-72.
10. Qiu M., Yin H., Urban Finance Research Institute, ICBC. An Analysis of Enterprises' Financing Cost with ESG Performance under the Background of Ecological Civilization Construction. *The Journal of Quantitative & Technical Economics*. 2019;(03):108-123. (In Chinese) https://doi.org/10.13653/j.cnki.jqte.2019.03.007
11. Wang Y., Yang R., He K., et al. Can Digital Transformation Improve Enterprise ESG Performance? Research Based on the Legitimacy Theory and Information Asymmetry Theory. *Securities Market Herald*. 2023;(7):14-25. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg96cXNjZGIyMDIzMDcwMDIaCHdpbWFiZ2d0 (accessed on 09.08.2023)
12. Manso G. Motivating innovation. *Journal of Finance*. 2011;66(5):1823-1860. URL: https://www.jstor.org/stable/41305176 (accessed on 09.08.2023)

13. Wu F., Hu H., Lin H., et al. Enterprise Digital Transformation and Capital Market Performance:Empirical Evidence from Stock Liquidity. *Journal of Management World*. 2021;(07):130-144+10. (In Chinese) https://doi.org/10.19744/j.cnki.11-1235/f.2021.0097

14. Yi L., Wu F., Xu S. Research on the performance driving effect of corporate digital transformation. *Securities Market Herald*. 2021;(8):15-25, 69. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg96cXNjZGIyMDIxMDgwMDIaCHlheDN2YnNx (accessed on 09.08.2023)

15. Jiang Y., Qiu J., Zhu R., et al. Investor attention and stock price crash risk: suppression or exacerbation? *Securities Market Herald*. 2020;(3):69-78. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/zqscdb202003008 (accessed on 09.08.2023)

16. Chen Y., Zhang T. Intermediaries and Consumer Search. *International Journal of Industrial Organization*. 2018;57:255-277. https://doi.org/10.1016/j.ijindorg.2017.08.001

17. Martellini P., Menzio G. Declining Search Frictions, Unemployment and Growth. *Journal of Political Economy*. 2020;128(12):4387-4437. https://doi.org/10.1086/710975

18. Zhang S., Chen K. Inhibition or Induction: Investor Attention and Earnings Management: A Textual Analysis Based on Investor Interaction Platforms. *Comparison of Economic and Social Systems*. 2020;(3):130-140. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhFqanNodHpiajIwMjAwMzAxNBoIN28zMzcxdGk%3D (accessed on 09.08.2023)

19. Cheng F., Chiao C., Wang C., et al. Does Retail Investor Attention Improve Stock Liquidity? A Dynamic Perspective. *Economic Modelling*. 2021;94:170-183. https://doi.org/10.1016/j.econmod.2020.10.001

20. Wu L., Kwan H.K., Yim F.H., et al. CEO Ethical Leadership and Corporate Social Responsibility: A Moderated Mediation Model. *Journal of Business Ethics*. 2015;130:819-831. https://doi.org/10.1007/s10551-014-2108-9

21. Zhou F., Pan W., Fu H. ESG responsibility performance of listed companies and institutional investors' shareholding preference. *Sci. Decis. Making*. 2020;11:15-41. (in Chinese).

22. Qian X. How to understand the development and evolution of responsible investment from CSR to ESG? *Sustainable Development Economic Guide*. 2022;(9):52-54. (in Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhJrY3hmempqZGsyMDIyMDkwMTUaCHN5bHNlaHF1

23. Ye Q. The transformation of the implementation paradigm of sustainable finance: from CSR to ESG. *Eastern Methodology*. 2023;(4):125-137. (In Chinese). https://doi.org/10.3969/j.issn.1007-1466.2023.04.010.

24. Chen N., Sun F. Comparative Development of ESG Systems in China and Abroad and Recommendations for China's ESG System. *Development Research*. 2019;(3):59-64. (In Chinese). https://doi.org/10.3969/j.issn.1003-0670.2019.03.008

25. Huang J, Chen D. Rapid Development of ESG in China. *China Tendering*. 2022;(12):71-75. (in Chinese). URL: https://d.wanfangdata.com.cn/periodical/zhonggzb202212027 (accessed on 09.08.2023)

26. Zhang A., Cai J. Embedding Mechanisms and Development Paths of ESG Systems in China. *Southeast Academic*. 2023;(1):182-194. (in Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg1kbnhzMjAyMzAxMDE3GghiOGQ0c3Z2eA%3D%3D (accessed on 09.08.2023)

27. Zhu Q. The Development of ESG in Japanese Corporate Governance System and Its Enlightenment. *Modern Japanese Economy*. 2023;249(3):66-83. (in Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg94ZHJiamoyMDIzMDMwMDYaCG4xMTZyN3Zs (accessed on 09.08.2023)

28. Zhang Q., Sun R. Anchoring Effects in Investor Decision-making and ESG Information Disclosure. *Financial Accounting Communications*. 2015;(29):26-28. (in Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg1ja3R4MjAxNTI5MDA5GghobXdldzY4dg%3D%3D (accessed on 09.08.2023)

29. Gao Y., Li L. Research on ESG-related Policies and Regulations in China and Abroad. *Metallurgical Accounting*. 2022;41(11):22-26. (in Chinese). https://doi.org/10.3969/j.issn.1004-7336.2022.11.005

30. Xie J. Relationship between ESG Fund Market Coverage and Policy Regulations: A Comparative Study of China and Australia. *National Circulation Economy*. 2022;(19):137-141. (in Chinese). https://doi.org/10.3969/j.issn.1009-5292.2022.19.037

31. Xie A., Routh H.J., Gu L. ESG Reporting and Insights from Companies Listed on the Hong Kong Stock Exchange. *Board of Directors*. 2019;(11):42-49. (in Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhdRS0MyMDE5MjAyMDAyMTMwM

DAwNDU4MBoIaGdlcjh3eDU%3D (accessed on 09.08.2023)

32. Chen X., Zhang M. Promoting Economic Structural Transformation through ESG Investment: International Experience and Chinese Practice. *Academic Research.* 2022;(8):92-98. (in Chinese). https://doi.org/10.3969/j.issn.1000-7326.2022.08.016
33. Shu H., Tan W. Does carbon control policy risk affect corporate ESG performance? *Economic Modelling.* 2023;120:106148. https://doi.org/10.1016/j.econmod.2022.106148
34. Cai H., Zhou Z. Market-Oriented Environmental Regulation Policy and ESG Information Disclosure Quality. *Financial Accounting Monthly*. 2022;(24):62-70. (in Chinese). https://doi.org/10.19641/j.cnki.42-1290/f.2022.24.008
35. Chen Q., Liu Z. Economic Policy Uncertainty and Corporate ESG Performance. *Financial Accounting Monthly.* 2023;44(5):69-76. (in Chinese). https://doi.org/10.19641/j.cnki.42-1290/f.2023.05.010
36. Zhang L., Zhao H. Does the Performance of Corporate Environment, Social and Governance (ESG) Affect Corporate Value? An Empirical Research Based on A-Share Listed Companies. *Wuhan Finance.* 2019;(10):36-43. (in Chinese). https://doi.org/10.3969/j.issn.1009-3540.2019.10.006
37. An G., Hua C., Zhang F., et al. Research on the Impact of ESG System on Capital Market Under the Goal of Carbon Neutrality: A Comparative Analysis Based on Different Industries. *Financial Theory and Practice*. 2022;(3):48-61. (in Chinese). https://doi.org/10.3969/j.issn.1003-4625.2022.03.006
38. Hu H. Will an Improvement in Listed Companies' ESG Ratings Bring Excess Returns to Investors? Empirical Evidence from A-Share Listed Companies in Shanghai and Shenzhen Markets. *Financial Economy.* 2021;(8):56-62, 85. (in Chinese). https://doi.org/10.14057/j.cnki.cn43-1156/f.2021.08.008
39. Rao S., Chen Y. Research on the Main Obstacles and Countermeasures of China's Financial Industry in Response to Climate Change. *Southern Finance.* 2020;(7):13-22. (in Chinese). https://doi.org/10.3969/j.issn.1007-9041.2020.07.002
40. Garcia A.S., Mendes-Da-Silva W., Orsato R.J. Sensitive industries produce better ESG performance: Evidence from emerging markets. *Journal of Cleaner Production.* 2017;150:135-147. https://doi.org/10.1016/j.jclepro.2017.02.180
41. Li J., Yang Z., Yi J. Does ESG Performance Help Reduce Corporate Debt Financing Cost? - Micro Evidence from Listed Companies. *Enterprise Economy.* 2023;42(2):89-99. (in Chinese). https://doi.org/10.13529/j.cnki.enterprise.economy.2023.02.009
42. Kalia D., Aggarwal D. Examining impact of ESG score on financial performance of healthcare companies. *Journal of Global Responsibility.* 2022;14(1):155-176. https://doi.org/10.1108/JGR-05-2022-0045
43. Lian Y., He X., Zhang L. Corporate ESG Performance and Debt Financing Cost. *Journal of Finance and Economics (Journal of Zhejiang University of Finance and Economics).* 2023;(1):48-58. (in Chinese). https://doi.org/10.3969/j.issn.1004-4892.2023.01.005
44. Wang L., Yang X. The Correlation between ESG Performance and Corporate Financing Cost. *Chinese Certified Public Accountant.* 2022;(9):47-53. (in Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhB6Z3pja2pzMjAyMjA5MDE3Gghub2x6aWNqMg%3D%3D (accessed on 09.08.2023)
45. Liu J. SMEs' ESG Performance and Capital Cost - Empirical Evidence Based on Government Subsidies. *Business Accounting.* 2023;(2):40-44. (in Chinese). https://doi.org/10.3969/j.issn.1002-5812.2023.02.010
46. Chen X., Yin L. Corporate ESG Ratings and Equity Financing Cost: An Empirical Analysis Based on China's A-Share Listed Companies. *Western Finance.* 2022;(8):59-67. (in Chinese). https://doi.org/10.16395/j.cnki.61-1462/f.2022.08.014
47. Xia Y., Xia P., Lin Z. Digital Transformation and Commercial Credit Financing: A Case Study of China's A-Share Listed Companies. *Industrial Technology Economy.* 2023;42(7):30-39. (in Chinese). https://doi.org/10.3969/j.issn.1004-910X.2023.07.004
48. Luo W. Analysis of the Impact of Digital Transformation on Corporate Debt Financing Costs. *Investment and Entrepreneurship.* 2023;34(12):31-33. (in Chinese). https://doi.org/10.3969/j.issn.1672-3414.2023.12.011
49. Zhang Y., Liu J. Does Corporate Digital Transformation Affect Capital Structure Decisions? — Evidence from Capital Structure Adjustment Speed. *Financial Development Research.* 2023;(7):13-22. (in Chinese). https://doi.org/10.19647/j.cnki.37-1462/f.2023.07.002
50. Lv Wenxi. Research on the Impact of Environmental Performance on Financing Cost of Heavy Polluting Enterprises. *Finance.* 2020, 10: 129. (In Chinese). https://doi.org/10.12677/FIN.2020.103014
51. Hao Y., Zhang Y. ESG Performance, Equity Financing Cost, and Corporate Value: Empirical Evidence from Technology-based Listed Companies. *Technology and Innovation Management*. 2022;43(5):560-569. (in Chinese). https://doi.org/10.14090/j.cnki.jscx.2022.0508

52. China Academy of Information and Communications Technology. *China Digital Economy Development Research Report (2023).* 2023. №202301. (In Chinese). URL: http://www.caict.ac.cn/english/research/whitepapers/202311/P020231101476013122093.pdf (accessed on 09.08.2023)

53. Hu J., Han Y., Zhong Y., et al. How does corporate digital transformation affect corporate ESG performance. *Review of Industrial Economics*. 2023;(1):105-123. (In Chinese). https://doi.org/10.19313/j.cnki.cn10-1223/f.20221104.001.

54. Wang X., Luan X., Zhang S. Corporate R&D investment, ESG performance and market value - the moderating effect of corporate digitalization level. *Scientific research*. 2023;41(5):896-904,915. (In Chinese). https://doi.org/10.3969/j.issn.1003-2053.2023.05.013.

55. Wang Y., Yang R., He K., et al. Can Digital Transformation Improve Enterprise ESG Performance? Research Based on the Legitimacy Theory and Information Asymmetry Theory. *Secur Mark Herald.* 2023;(7):14-25. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg96cXNjZGIyMDIzMDcwMDIaCHp5Y2VlOTZo (accessed on 09.08.2023)

56. Wang Y., Guo Y. Firm Digital Transformation and ESG Performance:Evidence from Chin's A-share Listed Firms. *Financial Research.* 2023;49(9):94-108. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg1janlqMjAyMzA5MDA3GghnOTRham c3dQ%3D%3D (accessed on 09.08.2023)

57. Han Z., Zhang Y. Digital transformation and ESG performance—analysis of intermediary mechanisms based on information transparency and total factor productivity. *Modern management science*. 2023;(3):141-150. (In Chinese). https://doi.org/10.3969/j.issn.1007-368X.2023.03.016

58. Zhang R, Chen X. Research on the impact of digital transformation on corporate ESG performance — Based on the mediating effect of green technology innovation. *Journal of Guizhou Business College*. 2023;36(2):55-65. (In Chinese). https://doi.org/10.3969/j.issn.1671-9549.2023.02.006

59. Wang H., Wang S., Zhang C., et al. Does digital transformation improve corporate ESG responsibility performance? — Empirical research based on MSCI Index. *Foreign Econ Manag.* 2023;45(6):19-35. (In Chinese). (In Chinese). URL: https://qks.sufe.edu.cn/J/WJGL/Article/Details/6b940538-91a3-4d40-828e-ebc108be45da (accessed on 09.08.2023)

60. Zhao X., Dong N. Digital Finance,Corporate Digital Transformation,and ESG Performance:Evidence from Listed Companies on the Shanghai and Shenzhen Stock Exchanges(2011-2021). *J Southwest Univ (Soc Sci Ed).* 2023;49(5):130-140. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhZ4bnNmZHh4Yi1yd3NoMjAyMzA1MDExGghvZGcxa3pzOA%3D%3D (accessed on 09.08.2023)

61. Wang S., Esperança J.P. Can digital transformation improve market and ESG performance? Evidence from Chinese SMEs. *Journal of Cleaner Production*. 2023;419:137980. https://doi.org/10.1016/j.jclepro.2023.137980

62. Zhao Q., Li X., Li S. Analyzing the Relationship between Digital Transformation Strategy and ESG Performance in Large Manufacturing Enterprises: The Mediating Role of Green Innovation. *Sustainability.* 2023;15(13):9998. https://doi.org/10.3390/su15139998

63. Xue L., Dong J., Zha Y. How does digital finance affect firm environmental, social and governance (ESG) performance? - Evidence from Chinese listed firms. *Heliyon.* 2023;9(10):e20800. https://doi.org/10.1016/j.heliyon.2023.e20800

64. Ren X., Zeng G., Zhao Y. Digital Finance and Corporate ESG Performance: Empirical Evidence from Listed Companies in China. *Pacific-Basin Finance Journal*. 2023;79:102019. https://doi.org/10.1016/j.pacfin.2023.102019

65. Ivaninskiy I., Ivashkovskaya I. Are blockchain-based digital transformation and ecosystem-based business models mutually reinforcing? The principal-agent conflict perspective. *Eurasian Business Review*. 2022;12(4):643-670. https://doi.org/10.1007/s40821-022-00209-0

66. Fang M., Nie H., Ruan R., et al. Corporate Digital Transformation and Perception of Economic Policy Uncertainty. *Journal of Financial Research.* 2023;(2):21-39.

67. Chen H., Zhang L.X. ESG Performance, Digital Transformation, and Business Value Enhancement. *Journal of Zhongnan University of Economics and Law.* 2023(3):136-149. (In Chinese). https://doi.org/10.3969/j.issn.1003-5230.2023.03.011

68. Zhang Q., Liu Z. Will heterogeneous large shareholder governance affect corporate ESG performance? — Based on the perspective of mixed ownership and digital transformation. *Account Mon.* 2023;44(14):146-153. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg1ja3lrMjAyMzE0MDIwGghtbmJxMTR1aQ%3D%3D (accessed on 09.08.2023)

69. Yang Y., Han J. Digital transformation, financing constraints, and corporate environmental, social, and governance performance. *Corporate Social*

Responsibility and Environmental Management. 2023;30(6):3189-3202. https://doi.org/10.1002/csr.2546.

70. Chen W. Interview with Shi Yichen, Deputy Director of the International Institute of Green Finance, Central University of Finance and Economics: ESG Investment Awareness Gradually Deepens. *Environmental Economy*. 2022;(4):32-37. (In Chinese). URL: https://www.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2022&filename=HJJI202204006&uniplatform=OVERSEA&v=CKJKIP0MPCv6OJ4WwOS5jyUZ-RyrHHTVFb_TZ0qVwGGX5Bsu8fqsac43VVfvpNB1 (accessed on 09.08.2023)
71. Tian Y., Wu Q. Global ESG Investment Development and China Practice. *China National Conditions and Strength*. 2021;(12):59-62. (In Chinese). https://doi.org/10.13561/j.cnki.zggqgl.2021.12.014
72. Wang K., Li T. ESG Funds: Current Status, Problems, and Prospects. *Finance and Accounting Monthly*. 2022;(6):147-154. (In Chinese). https://doi.org/10.19641/j.cnki.42-1290/f.2022.06.019
73. Ma X. The Obstacles and Prospects of ESG Investment in China. *Financial Market Research*. 2019;79(6):71-74. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhdRS0MyMDE5MjAxOTA4MjIwMDA0NjU0MxoIY3U1cmZjbHE%3D (accessed on 09.08.2023)
74. Tu G. The Philosophy and Practice of ESG Responsible Investment (Part I). *China Finance*. 2019;0(1):13-16. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg16Z2pyMjAxOTAxMDA1Ggg5aWM1dXFpdw%3D%3D (accessed on 09.08.2023)
75. Zheng B., Li C., Pang Q. Theory, Practice and Trend of Pension Funds ESG Investment. *Economic Research Reference*. 2022;(3):18-38. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg9qanlqY2syMDIyMDMwMDIaCHRsbTZ3aGdx (accessed on 09.08.2023)
76. Shen X. ESG Funds in China: Current Status and Prospects. *China Foreign Investment*. 2021;(7):92-93. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg96Z3d6LXMyMDIxMDcwMjcaCHZoa2s3dmZj (accessed on 09.08.2023)
77. Zhang Y. The Fiduciary Responsibility on ESG Approach for China's Pension Funds Investment:Perspective, Trend and Proposals. *Economic Research Reference*. 2022;(3):39-51. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg9qanlqY2syMDIyMDMwMDMaCGdjYXlpMjly (accessed on 09.08.2023)
78. Zhang Y. Sustainable Development of Pension Funds: ESG Investment Preferences and Challenges - Based on Cite Space Visualization Analysis. *Advances in Applied Mathematics*. 2022;11(6):3651-3658. (In Chinese). https://doi.org/10.12677/AAM.2022.116390
79. Ji L., Sun Y., Liu J., et al. Environmental, social, and governance (ESG) and market efficiency of China's commercial banks under market competition. *Environmental Science and Pollution Research*. 2023;30:24533-24552. https://doi.org/10.1007/s11356-022-23742-x
80. Wang L. The Practice, Problems, and Countermeasures of ESG Responsible Investment in China's Financial Institutions. *Hainan Finance*. 2022;(7):31-37. (In Chinese). https://doi.org/10.3969/j.issn.1003-9031.2022.07.004
81. Luo Y., Zhang W. ESG Fund Holdings and Corporate ESG Performance: From the Perspective of Responsible Management. *Business Accounting*. 2023;(5):21-26. (In Chinese). https://doi.org/10.3969/j.issn.1002-5812.2023.05.004
82. Yuan Z. Application of ESG Investment Strategy in Bank Asset Management Business. *China Banking Industry*. 2019;(10):83-84. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhdRS0MyMDE5MjAxOTExMjYwMDA1OTM0MRoIZzZzY3hkbG8%3D (accessed on 09.08.2023)
83. Jiang H., Chen S., Wang Z. ESG investment and commercial banks' risk-taking under the new development concept--a green development perspective based on the 20th CPC Congress report. *Research in Financial Economics*. 2023;38(01):65-83.
84. Cao Z., Wang H. Evaluation of Commercial Bank Customer ESG Quality Based on Big Data. *Shanghai Finance*. 2022;(7):57-70. (In Chinese). https://doi.org/10.13910/j.cnki.shjr.2022.07.005
85. Wang K., Li T. The Current Situation, Problems, and Prospects of ESG Fund Development. *Accounting Monthly*. 2022;(6):147-154. (In Chinese). https://doi.org/10.19641/j.cnki.42-1290/f.2022.06.019
86. Qi Y., Zhao C., Li X., et al. Research on the ESG QDII Fund Construction and Performance Testing Based on Responsible Investment. *Investment Research*. 2020;39(4):42-52. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg10enlqMjAyMDA0MDAzGgg5ZGdmamV1dw%3D%3D (accessed on 09.08.2023)
87. Zhang J. Empirical Study on the Influencing Factors of ESG Investment Fund Execution Willingness.

Finance and Economics. 2022;(4):91-96. (In Chinese). https://doi.org/10.19622/j.cnki.cn36-1005/f.2022.04.010

88. Chen X., Liu H. Does Investor Attention Affect the ESG Performance of Listed Companies - Empirical Evidence from Internet Search Volume. *Journal of Zhongnan University of Economics and Law*. 2023;(2):15-2.7. (In Chinese). https://doi.org/10.3969/j.issn.1003-5230.2023.02.002
89. Xie J., Fu K. Study on the Performance and Prevention of Domestic Pseudo ESG Funds. *Industrial Innovation Research.* 2022;(12):4-8. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg1na2pqMjAyMjEyMDAyGggyZ3YxdjVzNw%3D%3D (accessed on 09.08.2023)
90. Zhou F., Pan W., Fu H. Listed Companies' ESG Responsibility Performance and Institutional Investors' Stock Holding Preference - Empirical Evidence from A-share Listed Companies in China. *Scientific Decision Making*. 2020;(11):15-41. (In Chinese). https://doi.org/10.3773/j.issn.1006-4885.2020.11.015
91. Bai X., Zhu Y., Han J. ESG performance, institutional investor preferences, and Corporate Value. *Statistics and Information Forum.* 2022,37(10):117-128.
92. Li M. Corporate Heterogeneity and Institutional Investors' ESG Preferences — Empirical Research Based on China's A-Share Market. *Manager.* 2022;(14):28-32. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEg1nbHhqMjAyMjE0MDEwGgg2aGUzdGZteQ%3D%3D (accessed on 09.08.2023)
93. Jin M. The Impact of Institutional Investors' ESG Preferences on the Value of Green Innovation. *Financial Theory and Practice.* 2022;(1):65-75. (In Chinese). https://doi.org/10.3969/j.issn.1003-4625.2022.01.009
94. Zhang J.J. Research on the sustainable development path of green finance from the perspective of ESG analysis. *Property Rights Guide.* 2023;(6):46-51. https://doi.org/10.3969/j.issn.1672-8890.2023.06.010
95. Qian S., Yu W. Green finance and environmental, social, and governance performance. *International Review of Economics & Finance.* 2024;89(Part A):1185-1202. https://doi.org/10.1016/j.iref.2023.08.017
96. Deng H., Li Y., Lin Y. Green financial policy and corporate risk-taking: Evidence from China. *Finance Research Letters.* 2023;58(Part B):104381. https://doi.org/10.1016/j.frl.2023.104381
97. Wang H.T., Ma Y., Wang Y.M., et al. The fulfillment of social responsibility by commercial banks and corporate value of banks - Based on the perspective of green finance. *Southern Finance*. 2023;(2):21-35. (In Chinese). https://doi.org/10.3969/j.issn.1007-9041.2023.02.002
98. Tu Q., Li H.Z., Li X.Q. Research on the Improvement of Green Enterprise Value via Green Finance Reform and Innovation Pilots. *Financ Theory Pract.* 2023;44(5):12-18. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhBjamxseXNqMjAyMzA1MDAyGgh6cXNtc2trdQ%3D%3D (accessed on 09.08.2023)
99. Chen X. The impact of the implementation of green financial policies on the ESG performance of listed companies. *Mod Market.* 2022;(33):28-30. https://doi.org/10.19932/j.cnki.22-1256/F.2022.11.028.
100. Zhu Y.J., Li D.M. Green finance and corporate ESG performance: The moderating role of attention. *North Finance.* 2023;(3):46-52. (In Chinese). URL: https://d.wanfangdata.com.cn/periodical/ChlQZXJpb2RpY2FsQ0hJTmV3UzIwMjMwODMxEhBubWdqcnlqMjAyMzAzMDEyGggzbTl5MjViZw%3D%3D (accessed on 09.08.2023)

The article **was submitted** 08.10.2023; **approved after reviewing** 10.11.2023; **accepted for publication** 30.11.2023.