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

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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

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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.

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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$cogs
          x2 <- Work_t_5_power$sga_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)
```

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