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# The impact of innovation on the performance of small and medium-sized enterprises in Russia: Empirical analysis

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## Abstract

The article is devoted to the study of the impact of different types of innovation on the efficiency of Russian SMEs. The purpose of the study is to assess the importance of different types of innovation for Russian SMEs and to determine the impact of types of innovation on the efficiency and competitiveness of SMEs. The research methodology involves a consistent approach combining qualitative and quantitative analysis. As a collection of information, a survey was conducted among owners of small and medium-sized enterprises in Russia on the use of innovations in the course of business activities in the last three years (2020-2023) and their impact on the company's performance. In addition, the experiences of some participants were explored through in-depth interviews. In total, 112 entrepreneurs took part in the survey. The results of the study showed that innovations are used by the vast majority of small and medium-sized enterprises in Russia. There is no stable relationship between the size of enterprises and the innovations they choose, although in some cases we can say that certain companies tend to a certain type of innovation depending on the number of employees. Organisational innovations are the least popular in enterprises innovation, and the greatest marketing; marketing innovations showed the highest percentage of negative experiences during implementation, despite the fact that they are the most popular category of innovations.

The majority of respondents see an improvement in the financial situation of the company according to various criteria and are satisfied with the results of innovation; at the same time, the larger the company, the more goals it pursues trough innovations. The smaller the business, the more interested it is in solving specific problems to increase sales, profits and customer loyalty. The larger the company, the more it follows the 360 strategy: that is, it pays attention to the creation of new goods and services, as well as to the introduction of innovations in production processes.

**Keywords:** small and medium-sized businesses, innovations, financial results, product innovations, process innovations, efficiency of SMEs, competitiveness of SMEs.

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# 创新对俄罗斯中小企业绩效的影响：实证分析

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## 简介
文章研究了各种类型的创新对俄罗斯中小企业（以下简称为中小企业）绩效的影响。研究的目的是评估不同类型的创新对俄罗斯中小企业的重要性，并确定这些创新类型对中小企业绩效和竞争力的影响。研究方法采用了定性和定量分析相结合的连续方法。信息收集通过对俄罗斯中小企业主进行调查，了解他们在过去三年（2020-2023年）中在商业活动中使用创新的情况及其对公司绩效的影响。此外，还通过深度访谈方法研究了一些参与者的经验。研究总共涉及112位企业家，他们参与了调查。研究结果显示，绝大多数俄罗斯中小企业都在使用创新；虽然没有明确的证据表明企业规模与其选择的创新类型之间存在稳定的关联，但在某些情况下，可以看到某些企业根据员工人数倾向于选择特定类型的创新。组织创新在企业中最不受欢迎，而营销创新最受欢迎；然而，营销创新在实施时也表现出最高的负面经验比例。
大多数受访者表示，公司在各项财务指标上都有所改善，并对创新实施的结果感到满意。企业规模越大，实施创新的目标就越多；企业规模越小，越注重解决提高销售和利润、增加客户忠诚度的具体问题。企业规模越大，越倾向于采用360度战略，即不仅注重新产品和服务的开发，还注重在生产过程中实施创新。
**关键词：** 中小企业，创新，财务结果，产品创新，过程创新，中小企业绩效，竞争力。

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## Introduction

Small and medium-sized businesses are traditionally one of the most dynamic participants in market relations. Great competition and changes in industry and consumer demand force companies to look for new solutions and adapt to changing market conditions. In this regard, a special role is played by the innovative activities of firms that, through the development and implementation of specific innovations, can ensure greater competitiveness, improve financial performance and the quality of management decisions, and, in general, ensure their further development. Thus, the innovative practice taking place within the framework of small and medium-sized enterprises (hereinafter referred to as SMEs) is of particular interest.

SMEs in Russia play a very important role in ensuring employment and contributing to the country's gross domestic product, accounting for about 20% (Table 1). For comparison, in Japan this figure is 55%, in the USA - 53%[1].

Table 1
Share of SMEs in Russian GDP (%)

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| Share of SMEs in Russian GDP | 22 | 20.4 | 20.7 | 20.8 | 20.3 |

*Source:* compiled by the author based on Rosstat data: https://rosstat.gov.ru/search?q=доля+мсп+в+ввп+рф.

To increase the share and development of SMEs, Russian government agencies are taking certain actions. In particular, in 2019, the national project 'Small and Medium Entrepreneurship and Support for Individual Entrepreneurial Initiatives'[2], was launched, which includes a range of measures to support entrepreneurial initiatives. These measures include creating simplified tax conditions for operations, simplifying reporting requirements, offering preferential loan programmes and subsidies, providing support for issuing securities, and creating opportunities for SMEs to participate in a competitive procurement, among other things. As of

[1] http://doklad.ombudsmanbiz.ru/2021/7.pdf.
[2] https://www.economy.gov.ru/material/directions/nacionalnyy_proekt_maloe_i_srednee_predprinimatelstvo_i_podderzhka_individualnoy_predprinimatelskoy_iniciativy/.

Table 2
Statistical information on innovation activities of SMEs (excluding microenterprises)

| Type of economic activity | Share of SMEs engaged in innovative activities in the total number of surveyed enterprises (%) | | Volume of innovative goods, works, and services (million roubles) | | Share of innovative goods, works, and services in the total volume of shipped products (%) | |
|---|---|---|---|---|---|---|
| | 2019 | 2023 | 2019 | 2023 | 2019 | 2023 |
| *Medium-sized businesses* | | | | | | |
| Cultivation of annual crops | 6.4 | 13.7 | 3679.8 | 1449.7 | 2.2 | 0.6 |
| Cultivation of perennial crops | 4.8 | — | — | — | — | — |
| Cultivation of seedlings | 25 | — | 88 | — | 4.8 | — |
| Animal husbandry | 4.6 | 6.3 | 1939.9 | 1249.9 | 1.2 | 0.5 |
| Mixed agriculture | 6.1 | 9.5 | 205.4 | * | 3.8 | 2.1 |
| Auxiliary activities in the field of agricultural crops production | 14.3 | — | 27.4 | * | 1.7 | 1.9 |
| Mining | 2.6 | 2.6 | 32.8 | * | 0 | 0 |
| Manufacturing industries | 21.2 | 25.4 | 62557.8 | 84596.6 | 3.7 | 3.2 |
| Supply of electricity, gas, steam, and air conditioning | 7.8 | 12.2 | 208.8 | * | 0.4 | 0.8 |
| Water supply, sewage, waste collection and disposal | 7.1 | 7.2 | 368.4 | 3180.5 | 0.7 | 3.5 |
| Construction | 6.1 | 7.2 | 5908.8 | 6783.7 | 0.6 | 0.9 |
| Transportation and storage | 2.1 | 3.1 | 2728.9 | 3553.7 | 1.3 | 0.9 |
| Publishing | 6.9 | 19.4 | 0.8 | * | 0 | 0 |
| Telecommunications activities | 14.6 | 8.1 | 559.9 | * | 3 | 2.2 |
| Computer software development and consultancy in this area | 24.1 | 27.6 | 8688.3 | 10764.4 | 21.2 | 9.4 |
| Information technology activities | 8.1 | 19 | 781.8 | 3781.7 | 3.9 | 11.2 |
| Legal and accounting activities | 6.5 | 6.3 | 13.7 | * | 0.2 | 2.6 |
| Management consulting | 6.5 | 9.3 | 11064.8 | 470.1 | 6.5 | 1.3 |
| Architecture and engineering design activities | 21.2 | 19.4 | 123.1 | 994.8 | 0.2 | 0.8 |
| Scientific research and development | 56.6 | 65.3 | 5681.9 | 7654.2 | 12.8 | 13.7 |
| Advertising and market research | — | 10.3 | — | * | — | 3.5 |
| Other professional, scientific, and technical activities | — | 28.6 | — | * | — | 1 |
| Activities in the area of healthcare and social services | 5.9 | 9.9 | 102.7 | 221.3 | 0.3 | 0.3 |
| *Small businesses* | | | | | | |
| Mining | 2.7 | 3.3 | 1129.9 | 2395.5 | 0.9 | 1.4 |
| Manufacturing industries | 6.5 | 7.6 | 63638.9 | 100236.5 | 2.6 | 2.7 |
| Supply of electricity, gas, steam, and air conditioning | 1.9 | 2.4 | 751.9 | 3568.9 | 0.7 | 2.6 |
| Water supply, sewage, waste collection and disposal, pollution remediation | 3 | 3.5 | 1537.2 | 12625 | 0.9 | 5.4 |

* Information cannot be disclosed in accordance with Federal Law No. 282-FZ dated 29 November 2007 ‘On Official Statistical Accounting and the System of State Statistics in the Russian Federation’ (art. 4, paragraph 5; art. 9., paragraph 1).
*Source:* compiled by the author based on Rosstat data: https://rosstat.gov.ru/statistics/instituteconomics.

7 April 2023, under the preferential lending programme, SMEs have concluded 7.3 thousand contracts for a total amount of over 101 billion roubles. (the average loan amount was RUB 13.8 million)[3]. As for innovation activity, according to the information provided by Rosstat, despite the increase in the share of SMEs engaged in innovative activities, the share of innovative products is decreasing in almost all industries (Table 2).

Industry-specific features of innovation activity are evident, which are reflected not only in the degree of firms' involvement in the innovation process and activities but also in the dynamics of the given indicators. For example, medium-sized enterprises engaged in storage and transportation proved to be the least innovative, while within small businesses, companies providing electricity, gas, steam, and air conditioning services were found to be less innovative.

According to statistical data, companies' expenditures during innovation activities are distributed across ten categories: acquiring new machinery and equipment, researching and developing new products and methods of production, marketing, training and staff development, design, engineering, development and acquisition of computer software, purchasing patent and license rights, planning and implementing new business methods, workplace organisation, and external relations.

In 2009 and 2023, medium-sized enterprises spent 25.3 billion roubles and 41.8 billion roubles, respectively, on innovation activities, while small enterprises (excluding micro-enterprises) spent 27.3 billion roubles and 54.4 billion roubles, respectively. Thus, the total expenditure on innovation activities by SMEs amounted to 52.6 billion roubles in 2019 and 96.3 billion roubles in 2023. The almost twofold increase in spending indicates an increased focus of SMEs on innovation.

Expenditure figures for medium and small enterprises, excluding industry-specific features, are presented in Table 3. It is worth noting that the provided data represents average values and do not account for the industry-specific characteristics of SMEs, resulting in the total sum of these values exceeding 100%.

Key categories within innovation activities include research and development of new products and manufacturing methods, as well as the acquisition of new necessary equipment. For some production sectors, expenses in these categories amounted to 80-100%. This situation demonstrates the critical dependency of SMEs on access to new, more advanced machinery and equipment, as well as their focus on improving their production activities. In third place in terms of spending are activities related to the development and acquisition of specialised computer software as part of digital transformation and the implementation of information technologies, a trend in the modern economy. Minimal expenses during innovation activities are related to staff training and development, averaging less than half a percent.

Table 3
Average values of categories of SMP subjects' expenditures on innovation activities (% of total expenditures)

| Expenditure category | 2019 | 2023 |
|---|---|---|
| Research and development of new products and methods of their production | 40.68 | 40.66 |
| Purchase of machinery and equipment | 42.18 | 41.63 |
| Marketing and brand creation | 3.35 | 0.96 |
| Personnel education and training | 0.47 | 0.39 |
| Design | 3.32 | 0.34 |
| Engineering | 7.29 | 3.93 |
| Computer software development and acquisition | 19.87 | 13.78 |
| Acquisition of patent rights | 2.33 | 6.68 |
| Planning, development, and implementation of new business practices, workplace organisation, and external relations | 0.47 | 0.27 |
| Others | 11.43 | 15.72 |

*Source: compiled by the author based on Rosstat data*: https://rosstat.gov.ru/search?q=категории+расходов+мсп+на+инновационную+деятельность.

Meanwhile, research confirms that innovation is a key driver of growth and development for SMEs [Expósito et al., 2018]. Studies also claim that small and medium enterprises engaged in innovative activities achieve better results [Vermeulen et al., 2005; Westerberg, Wincent, 2008]. Innovations provide small entrepreneurs with the opportunity to enhance their business efficiency through better market positioning [Expósito et al., 2018], form competitive advantages over rivals, and increase their business competitiveness [Tan et al., 2009].

Small and medium enterprises implement various types of innovations - from new technologies to new products. These products and technologies aim to increase SME efficiency by introducing innovative business methods [Expósito et al., 2018]. Cost reduction, market entry time, and risks, as well as acquiring missing knowledge, are key drivers of innovation adoption in SMEs [Vrande et al., 2009]. Additionally, collaboration with partners, such as suppliers, clients, and research institutes, can significantly boost the innovation potential of small and medium enterprises [Klewitz, Hansen, 2014].

[3] https://www.economy.gov.ru/material/news/maksim_reshetnikov_obem_lgotnyh_kreditov_po_nacproektu_msp_v_2023_godu_prevysil_100_mlrd_rubley.html.

Therefore, this study aims to investigate which types of innovations most significantly influence the efficiency of Russian SMEs.

## 1. The Impact of Innovations on the Efficiency of SMEs

There is a considerable body of foreign research dedicated to the impact of innovations on the efficiency of SMEs. For instance, the authors of [Bouwman et al., 2019] argue that the necessity of digital transformation inevitably entails the implementation of innovations in SMEs. They note that small and medium enterprises generally lack the resources to adapt their business models to digitalisation, but those who embrace digital transformation achieve better results in their operations. Research focused on British SMEs [Saridakis et al., 2019] demonstrates that innovative SMEs are more likely to engage in international export compared to non-innovative ones. According to this study, innovations in products, services, and processes play a crucial role in the internationalisation of SMEs. Moreover, innovations are a key element for global competitiveness and effectiveness for SMEs [Lee et al., 2017].

[Shashi et al., 2019] empirically prove that the effectiveness of operational and innovative activities positively influences business efficiency in SMEs. The authors argue that achieving efficiency in both operational and innovative activities significantly impacts financial performance and sustainable development. In [Ioanid et al., 2018], data from a survey of Romanian SMEs show the impact of marketing innovations on social networks on the effectiveness of small and medium-sized businesses. Interaction on social networks between business owners, clients, suppliers, and communities supports conditions for open innovations and co-creation of value.

The authors of [Yu et al., 2015] conducted a study of several examples of Chinese SMEs in the manufacturing industry and demonstrated how Chinese firms successfully transition from pure imitation (imitative innovation) to original innovations. The study describes the challenges faced by SMEs during this transition and identifies the skills necessary for a successful shift. This approach, adopted by most Chinese manufacturing SMEs, is a significant factor in enhancing innovation activity and creating radical innovations in SMEs. [Wang, 2018] shows that SMEs in developing countries are often resource-constrained, and implementing innovations is crucial for achieving high results and ensuring competitiveness. Moreover, in response to growing market instability, SMEs should not only develop new skills and competencies but also implement incremental innovations in existing products and services. The author suggests that, in conditions of high turbulence, a key factor determining the success or failure of SMEs is having a relevant technological innovation strategy and maintaining high productivity [Wang, 2018].

Research on the impact of innovations on the activities of Russian SMEs is limited. Therefore, this study aims to explore the role of innovations in the activities of SMEs in Russia and has the following objectives:

- assess the importance of different types of innovations for Russian SMEs;
- determine the impact of innovation types on the efficiency and competitiveness of SMEs;
- investigate whether SME efficiency can be a competitive advantage in the Russian market.

## 2. Research Methodology

To analyse the impact of various types of innovations on the efficiency of SMEs, a sequential approach combining qualitative and quantitative analysis was employed. Information was collected through a survey of small and medium business owners in Russia regarding their use of innovations in commercial activities over the past three years (2020-2023) and their impact on company performance. The focus of the study was to identify the most frequently used types of innovations (product, marketing, organisational, and technological), as well as to record the reasons for successes and failures in applying selected innovations. Additionally, some participants' experiences were explored through in-depth interviews. The study included 112 entrepreneurs who participated in the survey.

The qualitative analysis involved a survey consisting of 16 questions designed to identify challenges and successes in implementing innovations, specific types of innovations used, and financial metrics - costs of implementation in absolute and relative terms (relative to the firm's revenue). The survey also included questions assessing the effectiveness of implemented innovations based on their impact on key financial indicators: revenue growth, profit growth, average transaction value, market share increase, cost reduction, and others. Respondents were also allowed to provide their own answers.

The categorisation of enterprises was based on Federal Law No. 209-FZ dated 24 July 2007 (as amended on 29 December 2022) 'On the Development of Small and Medium Entrepreneurship in the Russian Federation.' The law defines two criteria for classifying a firm as a small or medium enterprise - average number of employees and the firm's revenue for the previous calendar year. For small enterprises, these criteria are set at 16-100 employees and up to 800 million roubles in revenue. The law also identifies a special category of microenterprises with up to 15 employees and annual revenue of up to 120 million roubles. For medium enterprises, the criteria are 101-250 employees and up to 2 billion roubles in annual revenue. The law also includes provisions for classifying firms with larger employee numbers as medium-sized under

certain conditions outlined in Government Resolution No. 1412 dated 22 November 2017, and other regulatory documents. For research purposes, it was not possible to account for the annual revenue of companies in the sample due to respondents' refusal to provide such information. Therefore, categorisation of respondents was based on the average number of employees. The firms that agreed to participate in the study were categorised into five groups:

1) firms with up to 15 employees (microenterprises);
2) firms with 16-100 employees (small enterprises);
3) firms with 101-300 employees (first category of medium enterprises);
4) firms with 301-500 employees (second category of medium enterprises);
5) firms with more than 500 employees (large enterprises).

The distinction between the two groups of medium enterprises is due to the variability in the size of firms agreeing to participate in the study. This distinction is somewhat arbitrary, and in some cases, both categories of medium enterprises will be considered as a single cluster in the presentation of research findings.

The general initial data are as follows. About 68% of companies have fewer than 100 employees: up to 15 employees - 26.9%, 16-100 employees - 42.3%. An additional 3.8% and 7.7% are relatively large firms with 101-300 and 301-500 employees, respectively. The third largest representative group consists of owners of large companies with over 500 employees - 19.2%. Despite the study's focus, the author considered it important to include the innovation practices of larger businesses, as this would allow for comparative insights into innovation practices among firms of varying sizes and enhance the current study's findings.

60% of firms operate in Moscow and the Moscow region, about 27% in St Petersburg and the Leningrad Region, with the remainder based in various cities across Russia, predominantly (80%) concentrated in the Central Federal District.

The survey included enterprises providing various services and producing different goods. The number of service-providing firms (53%) is roughly equal to the number of enterprises engaged in production and direct product sales. For the purposes of this study, the sector of activity is irrelevant, although it plays a role in innovation implementation, as determined during data processing. However, operationalising the influence of the sector on innovation usage is not feasible within the scope of this research.

It is worth noting that some firms participating in the study identified themselves as start-ups focused on creating new technologies or solutions in their field. Consequently, additional comments will be provided where they may affect the overall conclusions on specific research questions. Overall, the number of such firms is not substantial in the sample (less than 4%), allowing them to be treated as a general group without specific clustering in the overall statistics.

Subsequently, in-depth interviews were conducted with some respondents from each identified category of firms that agreed to participate in the study. That way, in-depth interviews were conducted with five representatives from small and medium enterprises and larger businesses. These interviews followed a set of thirty questions divided into six thematic sections.

The survey and in-depth interviews aimed to identify the following elements:

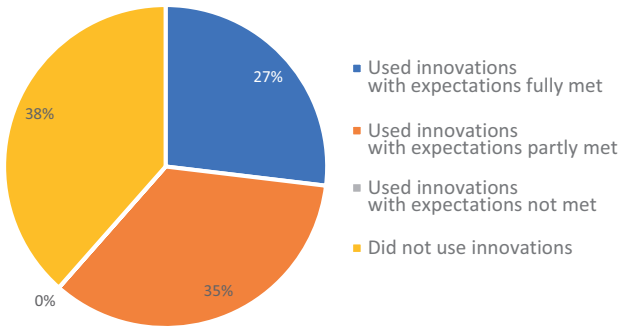
1) what innovations are primarily used by SMEs;
2) what challenges do SMEs face when implementing innovations;
3) how SMEs overcome barriers to innovation implementation;
4) what are the key success factors for implementing innovations in SMEs?

Quantitative analysis included regression analysis of the impact of innovation implementation in small and medium businesses in Russia on their performance indicators.

## 3. Qualitative Stage of the Study

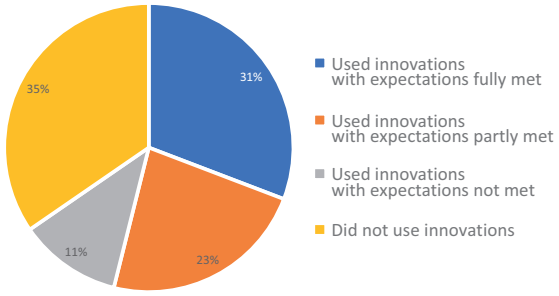
To some extent, innovations were used by almost all respondents - 96%. Organisational innovations, such as implementing supply quality control, outsourcing, employee training activities, new workplace organisation, new systems of responsibility and delegation of authority, were applied by 62% of respondents (see Figure 1). However, these innovations were the least popular among those surveyed. Moreover, businesses with more than 300 employees used organisational innovations on average less than other categories. This is partly due to established business processes and commercial relationships with partners and clients. A larger share of innovations in this category was used by businesses with 16-100 employees (75% of companies in this category).

Fig. 1. Use of organisational innovation (% of respondents)
*Source:* compiled by the author.



Technological innovations ranked second in frequency of use. 65% of participants worked on implementing these innovations (see Figure 2). ons. No specific dependency in the use of technological innovations across different business categories was identified. On average, the use of this type of innovation is related to the specific characteristics of the business. Due to the focus of technological innovations on improving productivity and using modern technologies in product creation, companies providing services in rapidly developing sectors in Russia (e.g., online education and medical services) are the most frequent users of these innovations. It is worth noting that 11.5% of respondents in this category reported significant challenges in using technological innovations.

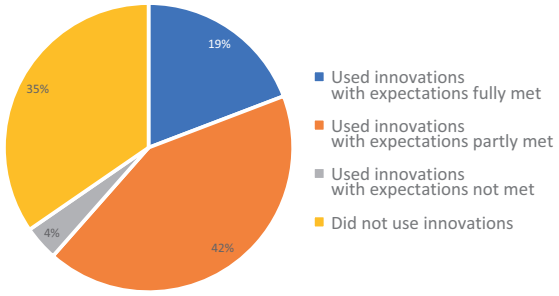
Fig. 2. Use of technological innovation (% of respondents)




*Source:* compiled by the author.

Product innovations share second place with technological innovations (see Figure 3). Respondents provided specific examples such as innovations aimed at improving the quality of previously released products based on up-to-date information about changing consumer needs and preferences. Other examples included shifting to the production of goods in a different product classification group, often intended for different consumers and the launch of entirely new products. In the latter case, this included both a new product category for the specific company and a new product category for the market in general. It is noteworthy that compared to technological innovations, the number of product innovations where the implementation goals were fully

Fig. 3. Use of product innovation (% of respondents)

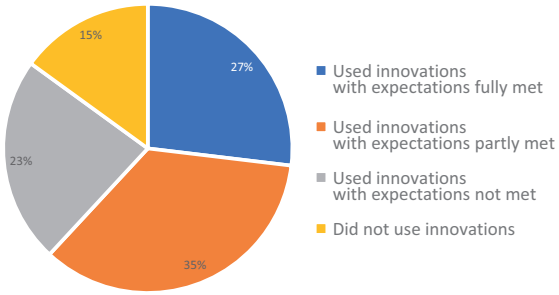



*Source:* compiled by the author.

met drops significantly. Based on the interview data, this is attributed to higher expectations for the new product and the difficulties associated with introducing a new product to the market, despite prior hypothesis testing and trials.

Marketing innovations were the most popular type, with 85% of respondents utilising them, the highest among all categories (see Figure 4). Respondents cited specific changes that can be grouped as follows: changes in product design that do not affect functional or consumer characteristics, new sales methods or product presentation techniques, new pricing strategies (excluding seasonal and regular ones), and new strategies aimed at expanding the customer base or market reach. As shown in Figure 4, this category of innovations has the highest proportion of negative experiences among all mentioned. Despite the apparent clarity of marketing technologies and the wide range of available tools, respondents identified the main issue as the difficulty in predicting results. They also noted certain limitations related to the company's field of activity. For example, opportunities such as using social media for positioning and advertising sometimes fail due to the inability to effectively reach the target audience. This was particularly noted by firms with B2B (business-to-business) clients.

Fig. 4. Use of marketing innovation (% of respondents)




*Source:* compiled by the author.

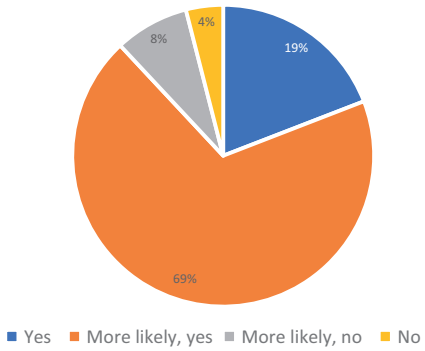
The primary goals of implementing innovations were to increase sales (58% of respondents) and improve company control (54%). These were followed by gaining a competitive advantage (38%), increasing customer loyalty (34%), reducing costs, and speeding up the production process (30% each). Rounding out the list were creating new products for the market (27%) and developing new products that are novel to the specific production process of the firm (15%).

At the same time, 19% of respondents cited increasing sales as their sole goal. This choice was predominantly associated with developing firms with 16-100 employees. The remaining 81% of respondents viewed innovation implementation as a solution to complex business development issues, including not only increasing profit and average transaction value but also optimising internal business processes. This situation is typical for companies

that have either recently entered the market and are trying to grow rapidly or are facing competition that requires them to address multiple aspects simultaneously.

Overall, respondents rated their experience with innovation implementation positively. 19% of respondents reported achieving all their goals, while 69% achieved partial but satisfactory success. Only 8% felt they had expected better results from their innovations, and 4% reported a failure in applying innovations (see Figure 5).

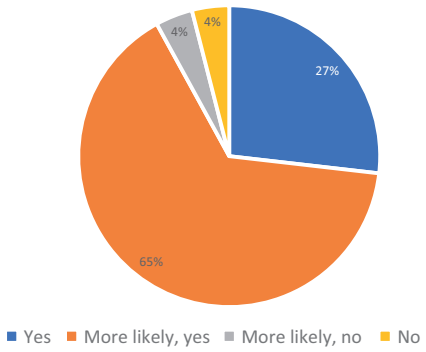
Fig. 5. Answers to the question: 'In general, has the application of your selected innovations achieved the objectives originally set for them?' (% of respondents)




*Source:* compiled by the author.

27% of respondents unequivocally confirmed an increase in financial indicators following the implementation of innovations (see Figure 6). An additional 65% agreed that there was a certain increase in financial indicators. The remaining 8% of respondents did not notice significant improvements or explicitly stated that there were none. These assessments were predominantly given by managers of small firms with up to 15 employees.

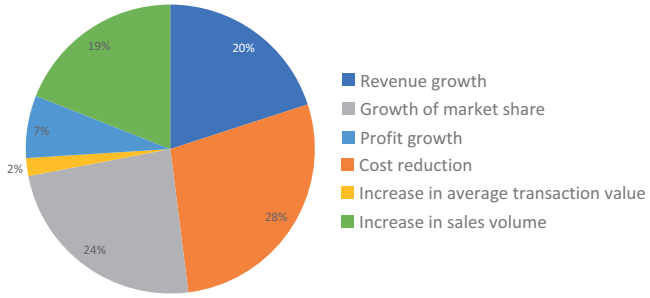
Fig. 6. Answers to the question: 'Did the introduction of innovations affect the increase in the company's financial performance?' (% of respondents)




*Source:* compiled by the author.

Among the assessments of the effectiveness of innovation implementation, the most notable are profit growth, an increase in sales volume, and an increase in the average transaction value (see Figure 7). Thus, firms primarily associate innovation implementation with improvements in commercial performance indicators, while they are less likely to define the success of innovations by cost reduction parameters. It is also worth noting that the increase in market share was the least frequently mentioned criterion for determining the success of innovation implementation.

Fig. 7. Answers to the question: 'What is the main criterion you have chosen to assess the positive effect of innovation implementation?' (% of respondents)




*Source:* compiled by the author.

Respondents were also asked to evaluate the impact of innovation implementation based on the percentage change in their chosen key performance indicator. The distribution of responses is shown in Table 4. Overall, the survey indicated that the innovations implemented have a significantly positive effect on the financial and other metrics of SMEs. On average, financial indicators increased by 1% to 5%. The second group of indicators varied from 6% to 10%. Interviews with respondents revealed that a 6-10% increase in profit growth and sales volume was considered good, while anything above 10% was considered excellent. Some respondents achieved significant results from the implementation of innovations, with more than 20% growth in revenue and profit over a certain period.

Let's consider the overall level of satisfaction with the implementation of innovations. The results are similar to the financial outcomes: 20% of respondents stated that the innovations fully met the objectives set for them, 69% agreed that innovations addressed most of the tasks, and another 12% noted that the innovations had a very limited impact or did not meet expectations at all.

The implementation of innovations across different categories of small and medium-sized enterprises (SMEs) has its own characteristics. Let's track certain dependencies and positions on the implementation of innovations in small and medium-sized enterprises based on the size of the company.

*Microenterprises.* Enterprises with up to 15 employees made up 27% of the respondents. For 57% of such enterprises, the average costs of implementing innovations amounted to up to 100,000 roubles over the past few years. Another 28% spent between 100,000

Table 4
Distribution of answers to the question: 'To what extent have the indicators used to assess the impact of innovation implementation changed?' (% of respondents)

| Key indicator changes | Revenue growth | Profit growth | Increase in average transaction value | Growth of market share | Cost reduction | Increase in sales volume |
|---|---|---|---|---|---|---|
| < 1% | 9 | 15 | 5 | — | 13 | 15 |
| 1–5% | 42 | 35 | 32 | — | 71 | 31 |
| 6–10% | 33 | 29 | 38 | — | 16 | 33 |
| 11–15% | 9 | 13 | 21 | — | 0 | 15 |
| 16–20% | 6 | 5 | 4 | — | 0 | 6 |
| > 20% | 1 | 3 | 0 | — | 0 | 0 |

*Source:* compiled by the author.

and 300,000 roubles. The remaining respondents were represented by start-ups with significant investments for small businesses, exceeding 1 million roubles. The innovation costs for 42% of respondents in this business category amounted to less than 1% of their revenue, for 28% - 2-5% of revenue, and for 14% of respondents - 6-10% of revenue. The remaining respondents, whose activities are conducted in relatively technological and competitive sectors of the economy, spent over 30% of their revenue on implementing innovations. In terms of the specific allocation of these expenses, 70% were related to investments in new forms of firm representation and marketing campaigns. Another 40% of the costs were associated with the purchase of new equipment or transitioning to new computer programmes and software, primarily CRM systems.

For 71% of respondents, the main goal of implementing innovations was to increase sales and improve enterprise control. The latter involved enhancing awareness of the current operational activities of the firm and identifying bottlenecks to develop additional solutions for their elimination.

86% of respondents used marketing innovations, although only 16% of them fully met their expectations for this category of innovations. Product innovations were the least commonly applied, chosen by 58% of respondents. Overall, about 70% of enterprises in this category used various combinations of technological, organisational, product, and marketing innovations. The average satisfaction with the results was 3.8 points on a 5-point scale.

The key problem with implementing innovations was the unpreparedness of personnel for the changes. About 90% of all respondents noted that the firm's employees often did not have sufficient competencies to immediately cope with changes in their work processes. Innovations, even if they were not directly related to current operational activities, caused disruptions in the usual work processes of 40% of enterprises. Despite the widespread issues with personnel during the implementation of innovations, only a few mentioned conducting training for employees. Predominantly, this problem is overcome either as employees adapt to the innovations and develop the necessary skills in everyday practice, or through personnel decisions. The second problem was unexpected additional costs for companies, as noted by 55% of respondents. This situation was generally associated with financial planning errors or changes in the firm's operating conditions. Additional costs were also linked to attempts to revive the ongoing innovation processes with additional financial investments in the hope of justifying the already spent time and resources.

Small enterprises: 42% of the surveyed companies fall into those whose staff size ranges from 16 to 100. 45% of such enterprises spent over 1 million roubles on implementing innovations; another 18% spent between 600,000 and 1 million roubles, and between 300,000 and 600,000 roubles, while the rest spent 100,000-300,000 roubles; the proportion of investments relative to the revenue amount significantly increased compared to the previous category. If 42% of small companies with up to 10 employees spent up to 1% of their revenue on innovations, then in the presented category, there were twice as few - 20%. 18% of respondents noted that they spent about a third of their revenue on various improvements; 9% of enterprises spent 21-30% of their revenue; 27% - 11-20% of revenue; and the remaining 26% - 2-10% of revenue. In other words, companies that feel relatively confident in the market and can generate sufficient income are willing to invest significant funds in implementing innovations. Such expenditures bring tangible results. For instance,

one respondent reported that with expenses of about 500,000 roubles, the implemented innovation brought benefits of more than 5 million roubles over two years and increased the company's recognition by 80% and the average transaction value by 25%.

As with the previous category, the primary type of innovation used was marketing, mentioned by 90% of firms. Organisational and product innovations came second (72% each), and technological innovations were last (54%). The average level of satisfaction with implementation was 4.3 points on a 5-point scale.

The main goal of implementing innovations remains to increase sales (55%), but the same percentage of respondents also noted tasks related to improving enterprise control. 70% of firms set very broad goals for innovations, ranging from already mentioned financial performance and organisational improvements to gaining a competitive advantage (45%), reducing costs (36%), speeding up production (35%), and increasing customer loyalty (19%). 36% sought to use innovations to create a new product or service for their market. It can be stated that within this business category, innovations acquire more complex and comprehensive goals and, judging by the amount of investment, are viewed as a natural tool for conducting commercial activities. Furthermore, such firms are in a stage of active growth and, as a rule, try to gain competitive advantages through innovations by creating new products and speeding up production and distribution. To achieve this, they address the issue of speeding up feedback collection. However, this is not to say that such behaviour is uncharacteristic for other SME categories, but in this segment, it is most pronounced.

The issue of personnel and their receptiveness to innovation remains a serious challenge, although it manifests much less frequently (46% versus 90% in firms with up to 10 employees). It is also notable that 56% of firms in this category reported conducting regular training and retraining of employees. This is a direct result of the personnel issue. During the interviews, it became clear that the complexity of employee training for organizations is not primarily due to additional financial costs (most interviewees - owners or general directors - noted that education expenses usually pay off quickly), but rather because it disrupts the established procedures of the firm's operational activities. As the company enters the market and develops, the management inevitably institutionalises (formalises) key processes. This concerns interactions with clients and contractors, internal communication between departments, production processes, sales, etc. When facing challenges related to implementing innovations, enhancing employees' competencies is closely linked to changes in the firm's routine operations, necessitating a revision of established business practices. In this regard, not all managers and other decision-makers are willing to review formalised procedures, causing the innovation implementation process to drag out. This, in turn, generates psychological resistance to innovations and, importantly for the firm's budget, reduces financial performance. Thus, professional development courses and other human capital investments are effective only when combined with flexible thinking among managers and require parallel changes in the company's internal 'routine' conditions.

40% of firms noted the need for additional expenses during the innovation implementation. In addition to the costs of retraining employees, respondents mentioned allocating additional funds to attract new contractors if the previous one did not meet expectations. Additional expenses for purchasing extra equipment due to calculation errors were also cited. Another 36% reported technical difficulties in operating and managing new equipment or software.

An additional category of difficulties during innovation implementation was the increased time needed for implementation. Overall, this affected 63% of respondents. This is because firms did not anticipate the potential difficulties and challenges associated with implementing innovations.

This business category also includes companies that received government support for innovation implementation, accounting for 17% of the sample. This mainly concerned receiving tax benefits as residents of technology parks and innovation centres, and in some cases, obtaining grants or interest-free loans for company development. It is worth noting that half of the participants in cooperation with government structures in this area mentioned the complexity and length of bureaucratic procedures associated with obtaining the necessary benefits. However, their average satisfaction with innovation implementation was 4.5 points, which is slightly higher than the overall average for this category of businesses. Overall, the sample does not allow for a specific conclusion about the role of government support in the success or failure of innovations implemented by enterprises in this category.

*Medium-sized enterprises*. Companies with 101 to 300 and 301 to 500 employees represent 4% and 8%, respectively. The sample for each category is not representative, as these enterprises generally do not differ significantly in their indicators, so they are combined and considered together. Thus, 75% of medium-sized firms used marketing, technological, and product innovations with equal frequency. Organisational innovations were the least used. According to the interviews, this is related to well-established internal processes, which are considered sufficient for continued operations in their current form. The experience of using organisational innovations by firms in this category shows that they find it difficult

to restructure already established systems of processes and relationships, as they have previously gone through the need to reorganise the company structure and found clear and effective forms of personnel management and external communication.

According to respondents, there is a noticeable decrease in the number of successful cases, where the objectives of innovation implementation were fully achieved. With the overall satisfaction rating of 4 points on a 5-point scale, there were no cases where innovations fully met expectations after implementation.

As with other cases, a major issue highlighted by almost all respondents was the unpreparedness of staff for innovations. Typically, such companies have some system in place for staff development, but the scale of changes implemented by firms of this size is often large enough to make the transition difficult. Respondents were not unanimous about the significance of the personnel training issue. An indirect confirmation of its seriousness is that, alongside personnel problems, respondents also cited technical difficulties, which included challenges in operating and configuring equipment and coordinating actions of staff in new conditions.

The average costs for innovation in this category generally range from 601,000 to 1,000,000 roubles (50% of respondents), which constitutes 2-5% of their revenue (78% of respondents).

*Large enterprises.* The final category of enterprises includes companies with more than 500 employees. The results of the analysis of their innovation activities do not significantly differ from the previous group.

The same goals for innovation implementation are observed (increasing sales, improving company control), along with the same problems (staff unpreparedness, unexpected technical challenges, and additional time and cost expenditures). The cost of implementation is somewhat higher, ranging from 1,000,000 to 1,500,000 roubles, which for most (60%) companies amounts to up to 1% of their revenue.

In summary, the following can be stated:

the innovative activity of SMEs is still in a formative stage. The proportion of firms participating in the innovation process in 2023 increased compared to 2019, but the share of innovative products relative to the total amount of goods, services, and works remains low and is growing only in specific sectors.

There is a significant variation in innovation activity and expenses depending on the economic sector.

On average, key areas of expenditure during innovation activities include costs for acquiring new equipment and machinery, developing and implementing new products and production methods, and creating or acquiring software.

According to respondent evaluations, medium-sized firms that are already established in the market and can allocate sufficient funds for successful innovation implementation achieve the most significant effects. Such firms have not fully formalised their internal processes, which makes them more receptive to changes.

A major issue in implementing innovations, as noted by respondents, is staff unpreparedness, as well as the need for additional costs related to retraining or technical complications.

The main goal of implementing innovations is to increase the firm's profit and sales. As the number of employees grows, improving company management becomes increasingly important.

The main criteria for evaluating the results of innovation implementation are profit growth, higher average transaction value, and revenue growth.

Implemented innovations, on average, allowed one-third of SMEs to increase profit, average transaction value, and revenue by 6-10%.

As firms grow, the problems they aim to solve through innovation become increasingly complex.

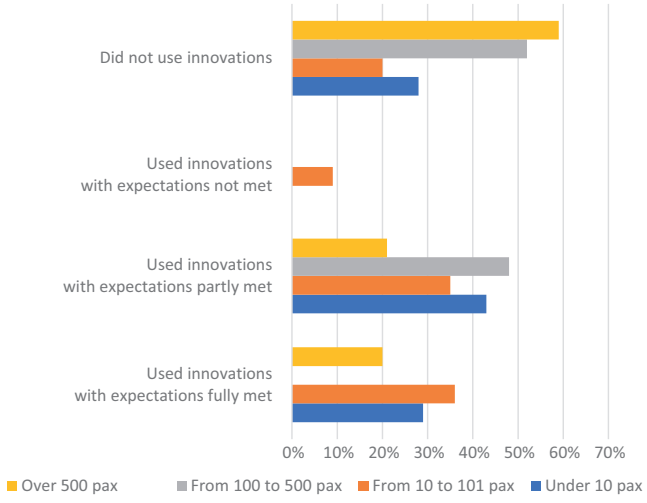
## 4. Quantitative Stage of the Study

The survey and in-depth interview data allow for a quantitative analysis of the impact of various types of innovations on the performance of SMEs.

According to these data, organisational innovations were used by almost all categories of SMEs (see Figure 8). Larger companies paid increased attention to staff training and, in some cases, reorganised workflow control through the implementation of CRM systems.

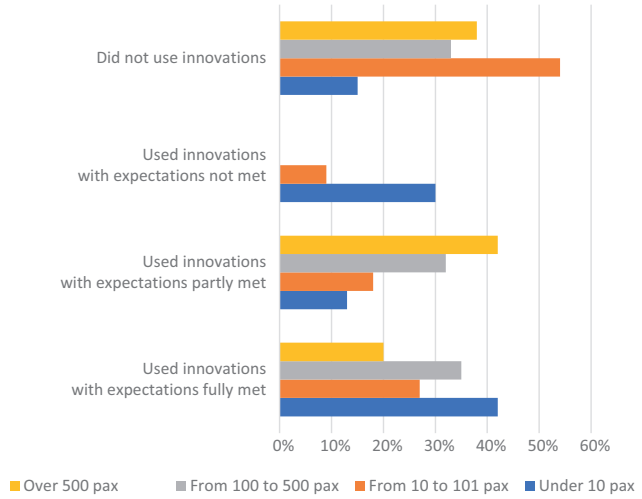
Medium-sized companies with 16-100 employees were the most successful in this category of innovations. In their growth phase, they actively implement organisational innovations to find the optimal organisational and management structure.

Fig. 8. Use of organisational innovation depending on firm size (% of respondents)



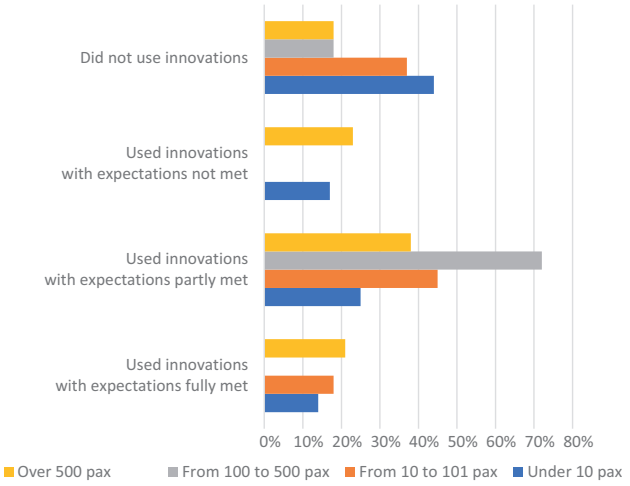

*Source:* compiled by the author.

Fig. 9. Use of technological innovation depending on firm size (% of respondents)




*Source:* compiled by the author.

Fig. 10. Use of product innovation depending on firm size (% of respondents)



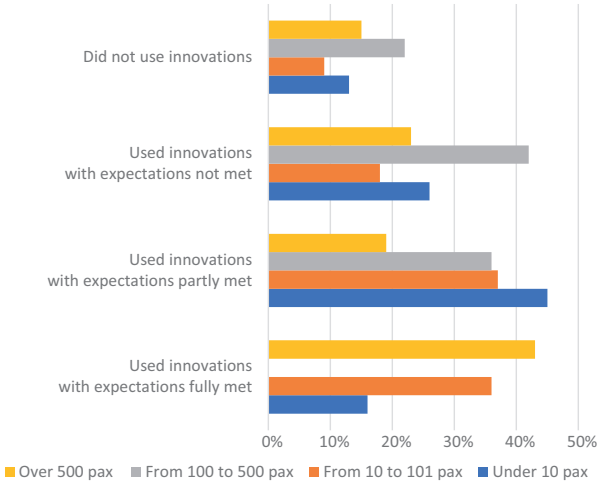

*Source:* compiled by the author.

Technological innovations (see Fig. 9) were predominantly successful for small firms. Successful experiences are primarily characterised by the creation of websites for selling their products, transitioning to new software, and, in some cases, changing production technology with the use of new equipment. The latter is primarily related to identifying and addressing bottlenecks in production.

It is striking that more than half of medium-sized firms did not use this type of innovation in their activities. This is partly due to the relative stability of the production process and the significant costs associated with acquiring equipment and software in specific cases.

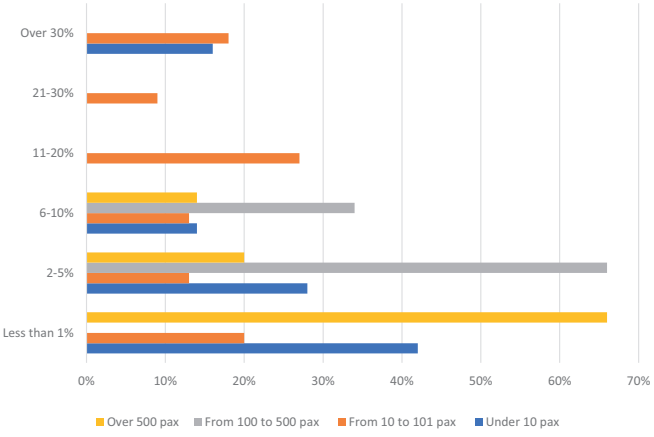
Product innovations (see Fig. 10) were comparatively rarely used by small and medium-sized enterprises. This was mainly related to improving product quality through obtaining timely information about its condition from customers. Large firms, in this case, were the leaders. It is worth noting the relatively low level of fully achieving goals in this area of innovation, which rarely exceeds 20% across all SME categories. As interview results show, this type of innovation is quite difficult to model in terms of potential outcomes. Low satisfaction with results is partly related to high expectations, especially when creating a product that is fundamentally new for the market or the company. Additional elements of the assessment include difficulties encountered in bringing a product or service to market, so this may be the case of a comprehensive evaluation of the work done in the commercialisation of new products.

Fig. 11. Use of marketing innovation depending on firm size (% of respondents)




*Source:* compiled by the author.

Fig. 12. Distribution of firms' innovation costs vs. annual revenue by number of employees (% of respondents)



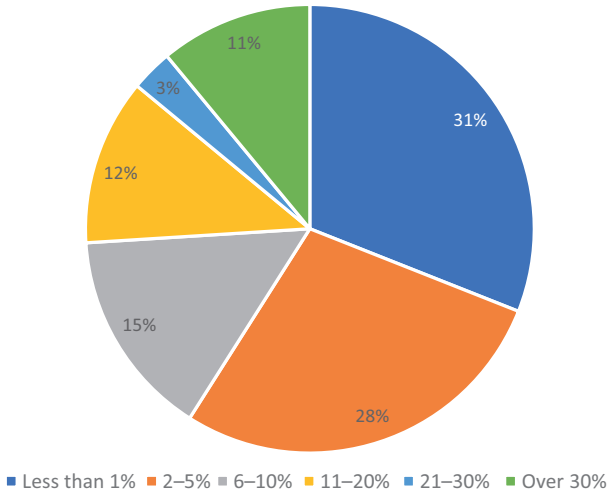

*Source:* compiled by the author.

The final category of innovations implemented by enterprises was marketing innovations (see Fig. 11). They showed the highest percentage of implementation - along with the highest level of negative evaluations among all other types of innovations. The first aspect is explained by the relatively low cost and variety of available tools that firms can use to promote their products or maintain contact with their audience. The latter, particularly characteristic of medium-sized firms, has several reasons. Firstly, in some cases, failures are related to the performance of the firms' promotion departments - in other words, the qualifications of employees in specialised departments are insufficient to handle the tasks. Secondly, a portion of respondents misjudged demand and therefore proposed wrong pricing strategies for consumers, mistargeted the audience for marketing campaigns, or incorrectly allocated the budget across specific sales channels.

After considering specific types of innovations, it is worth paying attention to the costs incurred by firms, the data on which are shown in Fig. 12.

Based on the data provided, it can be concluded that the majority of respondents (30%) allocated up to 1% of revenue to innovations. For firms of up to 10 people, there is a clear reduction of expenditure on expensive innovations. A certain surge in expenditure - over 30% of revenue - in this case is associated with the initial position of the company as a startup under development. The same is true for companies where the number of employees does not exceed 100 people. All categories of firms tend to decrease their innovation expenditure as its cost increases relative to revenue. The majority of firms (59%) spent less than 5% of revenue on innovations (Fig. 13). It appears that this value is the most acceptable for SME firms.

Fig. 13. Distribution of firms' innovation costs depending on revenue (% of respondents)




*Source:* compiled by the author.

The ratio of funds spent and satisfaction with the innovations used is shown in Table 5.

Table 5
Relationship between money spent and satisfaction with innovations used (score on a 5-point scale)

| Cost of innovation compared to revenue | Degree of satisfaction with the introduction of innovations |
|---|---|
| < 1% | 4.125 |
| 2-5% | 4.142 |
| 6-10% | 3.75 |
| 11-20% | 4.6 |
| 21-30% | 4 |
| > 30% | 3.9 |

*Source:* compiled by the author.

The regression analysis revealed, however, that there is no relation between these indicators (coefficient $R^2 < 0.5$). The regression analysis data are shown in Table 6.

Table 6
Regression analysis of the dependence of innovation costs on the level of satisfaction with the implemented innovation

| Expenditure on innovation to revenue share | Share of companies (%) | Assessment of satisfaction from the introduction of innovations (score on a 5-point scale) |
|---|---|---|
| *Input data* | | |
| < 1% | 30.7 | 4.125 |
| 2-5% | 26.9 | 4.142 |
| 6-10% | 15.4 | 3.75 |
| 11-20% | 11.5 | 4.6 |
| 21-30% | 3.8 | 4 |
| > 30% | 11.7 | 3.9 |
| *Regression statistics* | | |
| Multiple *R* | 0.06201011 | |
| $R^2$ | 0.00384525 | |
| Normalised $R^2$ | -0.24519343 | |
| Standard error | 11.3817083 | |
| Observations | 6 | |

*Source:* compiled by the author.

This further supports the thesis revealed during the in-depth interviews: it is relatively unimportant what resources a company invests in innovation implementation; what matters are the skills for implementing innovations, which are associated with employee qualifications and the selection of specific solutions to improve particular processes.

In absolute terms, the costs of implementing innovations were distributed as follows (see Table 7).

Table 7
Absolute costs of SMEs for innovation implementation

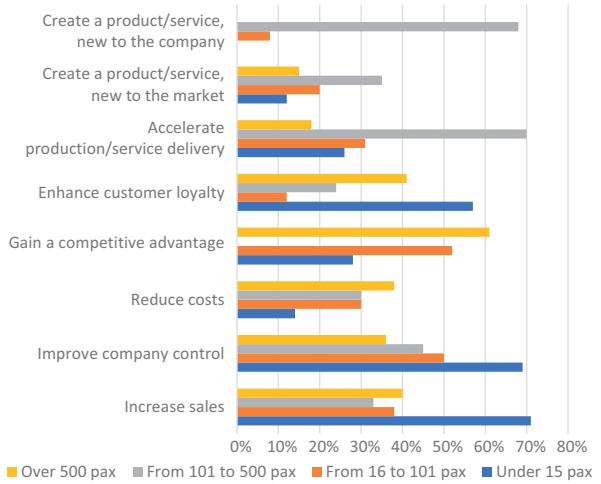
| Absolute cost of innovation (thousand roubles/year) | Share of SMEs (%) |
|---|---|
| Up to 100 | 15.4 |
| 101-300 | 23 |
| 301-600 | 3 |
| 601-1000 | 15.4 |
| 1000-1500 | 38.3 |
| Over 1500 | 5 |

*Source:* compiled by the author.

Overall, the breakdown of absolute costs for firms falls into two ranges: up to 300,000 roubles (38.4%) and from 601,000 roubles to 1.5 million roubles (53.7%). It is clear that in relative terms (as a share of total revenue), these costs may vary depending on the category of SMEs and the specific sector of activity. However, the data provided allows for an estimation of the approximate amounts SMEs require to finance their innovation activities.

A significant difference was identified in the approaches to the innovation process concerning the stated goals of implementing innovations (see Figure 14).

Fig. 14. Declared goals of innovation implementation (% of respondents)



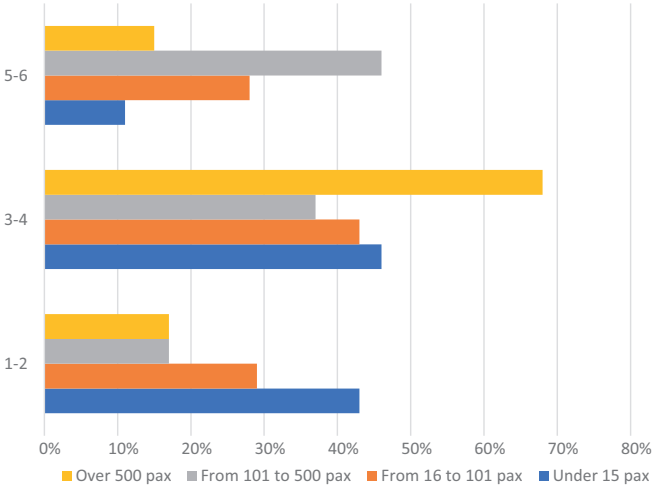

*Source:* compiled by the author.

Depending on the size of the firm, their approach to implementing innovations varies somewhat. Microenterprises primarily focus on increasing sales, improving enterprise control - reflecting an overall understanding of core business processes - and enhancing customer loyalty. Interviews revealed that this is often linked to these companies' unstable market positions and the need to improve financial performance. As these firms grow and expand, they aim to develop their product range and differentiate themselves from competitors. Consequently, their innovations will be directed towards gaining a competitive advantage while maintaining the importance of other innovation areas.

For businesses with 101 to 500 employees (with categories 101-300 and 301-500 considered together due to the small sample size), a notable focus is on accelerating service delivery and creating products or services that are new for the enterprise. This heightened focus on these goals is related to the nature of their internal operational processes: such firms are generally stable, have acceptable cash flows from their product sales, and have somewhat reached the limits of expanding their market presence. In this context, competitive advantage may be achieved through increased production efficiency, such as reducing time costs and introducing new product or service categories.

Another interesting observation is the complexity of the primary goals set by enterprises implementing innovations (see Figure 15).

Fig. 15. Number of goals stated by enterprises when introducing innovations (% of respondents)




*Source:* compiled by the author.

Notably, there is a certain dependency: the smaller the company, the more specific goals it sets for itself when implementing innovations. Conversely, the larger the company, the more complex the tasks it aims to solve through innovation. Interviews revealed that this is related to the company's successes and experience in innovation activities. Larger amounts of funds that entrepreneurs are willing to invest in innovation motivate decision-makers to actively seek innovative solutions across different areas of operational activities. This is especially true if the company has developed an innovation-friendly environment and the management understands the necessity of implementing innovations.

Thus, the empirical analysis leads to the following conclusions: innovations are used by the overwhelming majority of small and medium-sized enterprises (SMEs) in Russia.

There is no strong correlation between the size of the business and the chosen types of innovations, although in some cases companies tend to adopt certain types of innovations depending on their number of employees.

Organisational innovations are the least popular among SMEs, while marketing innovations are the most popular.

Marketing innovations show the highest share of negative experiences in implementation (expectations were not met for 23.1% of respondents), even though they are the most frequently used category of innovation.

Most respondents manage to implement innovations successfully. The vast majority notice improvements in the company's financial position based on various criteria and are satisfied with the results of innovation implementation.

Regarding the financial aspect of innovation activities, 30% of SMEs spend up to 1% of their annual revenue on innovations. Overall, 59% of firms spend no more than 5% of their annual revenue on innovations. Yet, there is no clear connection between the resources spent and the level of satisfaction with innovation implementation.

The typical amount of funds used by SMEs for innovation ranges from up to 300,000 roubles (38.4%) to between 601,000 and 1.5 million roubles (53.7%).

The larger the company, the more goals it pursues by introducing innovations.

The smaller the company, the more interested it is in addressing specific tasks to increase sales and profits and enhance customer loyalty. The larger the company, the more attention it pays to the creation of new goods and services, as well as the acceleration of production processes.

## Conclusion

The results of the study of 112 Russian small and medium-sized enterprises allowed us to draw the following conclusions: innovations are used by the overwhelming majority of small and medium-sized enterprises (SMEs) in Russia. There is no strong correlation between the size of the business and the chosen types of innovations, although in some cases companies tend to adopt certain types of innovations depending on their number of employees. Organisational innovations are the least popular among SMEs, while marketing innovations are the most popular. The latter show the highest share of negative experiences in implementation (expectations were not met for 23.1% of respondents), even though they are the most frequently used category of innovation. Most respondents manage to implement innovations successfully. The vast majority notice improvements in the company's financial position based on various criteria and are satisfied with the results of innovation implementation.

Speaking about the financial side of innovation, it is worth noting that 30% of SME firms spend up to 1% of their annual revenue on innovation. Overall, 59% of firms spend no more than 5% of their annual revenue on innovations. Yet, there is no clear connection between the resources spent and the level of satisfaction with innovation implementation. The typical amount of funds used by SMEs for innovation ranges from up to 300,000 roubles (38.4%) to between 601,000 and 1.5 million roubles (53.7%).

The problems faced by enterprises when introducing innovations are complex in nature. None of them can be solved in isolation and require consideration of the innovation implementation process in the framework of a comprehensive plan. The issue of personnel training in innovation implementation is not only related to the qualifications of specific employees but also to the qualities of decision-makers, who must understand and find resources to address it. The innovation implementation process is closely linked to the company's ability to finance its preparation and execution. Thus, the company needs to have free capital available for investment in its development. However, solving the funding problem is not an end in itself. It is intricately woven into the overall innovation activity framework and concerns not only funds allocated for purchasing new equipment or organising marketing campaigns but also costs related to employee training, maintaining material incentives, and other expenses. Another challenge for companies during innovation implementation is the difficulty in forecasting its execution and risk management.

Overall, recommendations for improving innovation activities within SMEs can be summarised as follows: it is necessary to ensure a higher quality informational space for sharing the latest achievements in innovation activities, improve financial literacy and planning skills of decision-makers, enhance mechanisms for targeted government financial support for SMEs and simplify the procedure for obtaining it, form a pool of potential government tools for targeted assistance, and develop a mechanism for their application using big data to increase efficiency. Additionally, it is recommended to include criteria for supporting the company's innovation activity in employee KPI structures and to develop measures for material incentives based on these criteria.

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