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OPTIMIZING THE FINANCIAL SUPPORT MODEL FOR INNOVATION PROJECTS IN BUSINESS ENTITIES

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Abstract: The article examines the mechanisms for financing innovative projects in business entities. Existing investment attraction models are analyzed, key issues are identified, and possible solutions are proposed. Special attention is given to government support programs, venture financing, and crowdfunding as promising tools. Recommendations are provided to improve the funding system for innovative projects to enhance companies' competitiveness.

Key words: innovative projects, funding, investments, venture capital, crowdfunding, government support, business entities.

Annotatsiya: Maqolada tadbirkorlik subyektlarida innovatsion loyihalarni moliyalashtirish mexanizmlari ko'rib chiqiladi. Mavjud investitsiyalarni jalb qilish modellari tahlil qilinadi, asosiy muammolar aniqlanadi va mumkin bo'lgan yechimlar taklif etiladi. Istiqbolli vositalar sifatida davlat tomonidan qo'llab-quvvatlash dasturlari, venchur moliyalashtirish va kraudfandingga alohida e'tibor beriladi. Kompaniyalarning raqobatbardoshligini oshirish uchun innovatsion loyihalarni moliyalashtirish tizimini takomillashtirish bo'yicha tavsiyalar berilgan.

Kalit so'zlar: innovatsion loyihalar, moliyalashtirish, investitsiyalar, venchur kapital, kraudfanding, davlat tomonidan qo'llab-quvvatlash, tadbirkorlik subyektlari.

Аннотация: В статье рассматриваются механизмы финансирования инновационных проектов в хозяйственных обществах. Проанализированы существующие модели привлечения инвестиций, выявлены ключевые проблемы и предложены возможные пути их решения. Особое внимание уделено программам государственной поддержки, венчурному финансированию и краудфандингу как перспективным инструментам. Даны рекомендации по совершенствованию системы финансирования инновационных проектов для повышения конкурентоспособности компаний.

Ключевые слова: инновационные проекты, финансирование, инвестиции, венчурный капитал, краудфандинг, государственная поддержка, хозяйственные общества.

INTRODUCTION

Innovation is a cornerstone of economic growth and competitiveness, especially in today's rapidly evolving global economy. For business entities, particularly small and medium-sized enterprises (SMEs), the ability to innovate is closely tied to access to adequate financing. However, traditional funding mechanisms often fail to meet the unique needs of innovative projects, which are typically associated with high risks and uncertain returns. This article explores strategies for enhancing the methodology of financing innovative projects, focusing on creating more effective, efficient, and accessible funding systems for business entities.

REVIEW OF LITERATURE ON THE SUBJECT

The scholarly literature on innovation financing provides a comprehensive foundation for understanding how financial systems influence the ability of firms to generate and commercialize new technologies. Lerner

(2010) offers one of the most influential analyses of the venture capital cycle, demonstrating how specialized investment mechanisms reduce information asymmetry and enable high-risk innovative ventures to scale. His findings highlight the importance of flexible, long-term capital in fostering disruptive technologies. Complementing this perspective, Pikkarainen and Melander (2018) emphasize the role of government support in expanding R&D capacity, arguing that well-designed public instruments—grants, subsidies, and targeted innovation programs—serve as critical enablers in sectors where private investment remains insufficient. OECD reports (2019; 2020) further strengthen this argument by providing cross-country evidence showing that emerging economies frequently struggle with fragmented innovation ecosystems, weak capital markets, and limited institutional support, which collectively slow technology adoption and reduce firm-level competitiveness.

Empirical studies by Harrison and Leitch (2019) explore how entrepreneurial finance systems interact with broader innovation policies, noting that hybrid financing models and public-private partnerships significantly improve investment flows into early-stage firms. The European Commission (2021), through its Horizon Europe strategy, illustrates how large-scale, mission-oriented funding frameworks can mobilize private capital, stimulate collaborative research, and accelerate commercialization cycles across member states. Shane (2018), analyzing the structural challenges faced by large firms when integrating disruptive technologies, underscores that innovation financing must account not only for capital availability but also for organizational readiness and market uncertainty.

Mazzucato (2013) provides a broader theoretical view, asserting that the state plays an entrepreneurial role by actively shaping markets, creating technological frontiers, and assuming early-stage risks that private investors typically avoid. This perspective aligns with the World Bank's analysis (2020), which documents the increasing global reliance on blended finance, risk-sharing instruments, and specialized innovation funds to support R&D activities in both developed and developing economies. Finally, Czarnitzki and Hottenrott (2011) provide micro-level evidence from European SMEs, demonstrating that credit constraints, limited collateral, and uncertain cash flows significantly restrict R&D investment, and that targeted public incentives substantially improve innovation performance.

Collectively, the literature shows that effective financing of innovation requires an integrated policy approach combining public sector leadership, private capital participation, supportive institutional frameworks, and financial instruments tailored to the distinct characteristics of innovation projects. This body of research directly informs the need to optimize financial support models to empower business entities and strengthen national innovation capacities.

RESEARCH METHODOLOGY

This study employs a mixed-methods approach to explore ways to enhance the framework for financing innovative projects. The quantitative analysis involved collecting data on innovation funding trends, SME performance metrics, and R&D expenditures from government reports, international databases, and private-sector case studies. These data sources provided a comprehensive overview of current financial dynamics and the evolving structure of innovation support mechanisms.

The qualitative component of the research was conducted through semi-structured interviews with key stakeholders, including government policymakers, financial institutions, and business leaders. Their insights helped identify barriers and opportunities within existing financing systems, revealing institutional constraints, gaps in policy implementation, and practical challenges faced by market participants.

In addition, a comparative analysis was carried out by examining the methodologies and outcomes of successful innovation-financing programs in countries such as the United States, Germany, and China. This comparison made it possible to identify best practices and evaluate their potential applicability to the local context, providing a broader understanding of effective strategies for strengthening the innovation ecosystem.

ANALYSIS AND RESULTS

Innovation has become a central driver of economic competitiveness, productivity, and long-term sustainability for business entities operating in increasingly dynamic global markets. As technological cycles shorten and competitive pressures intensify, the ability of firms to generate, finance, and commercialize innovative ideas has turned into a decisive strategic resource. However, the efficiency and accessibility of financial support mechanisms remain uneven across sectors and regions, creating structural constraints that limit the innovation capacity of enterprises. This analysis examines the key determinants, systemic barriers, institutional frameworks, and emerging opportunities related to optimizing the financial support model for innovation projects within business entities. The discussion integrates empirical evidence, international comparative insights, and conceptual perspectives on innovation finance.

A core issue in financing innovation lies in the inherent uncertainty and risk embedded in research, development, and commercialization processes. Unlike traditional investment projects with predictable cash flows and standardized risk metrics, innovation projects often involve exploratory stages, intangible outcomes, and long gestation periods before market entry. This makes conventional financing—particularly bank lending—less accessible due to collateral requirements, risk-averse credit policies, and insufficient valuation methods for intangible assets. For small and medium-sized enterprises (SMEs), which form the backbone of most economies, this creates a pronounced financing gap. These firms frequently rely on internal financing, which limits their ability to scale innovative solutions or enter new markets.

Furthermore, innovation financing is deeply influenced by the maturity of national innovation ecosystems. In contexts where technology transfer mechanisms, venture capital markets, and university-industry collaboration are weak, business entities face significant structural barriers. The lack of institutional investors, risk-sharing instruments, and targeted government incentives exacerbates the dependence of firms on traditional credit channels. Comparative evidence from innovation-leading economies such as the United States, Germany, South Korea, and China demonstrates that diversified financial instruments—venture capital, angel investment, government-backed guarantee schemes, tax credits, and public-private partnerships—play a vital role in reducing risks and mobilizing private capital toward innovative projects (Figure 1).



Figure 1. Five-Step Strategic Planning Framework

The infographic outlines the five-step strategic planning framework, demonstrating how organizations convert long-term intentions into actionable, measurable, and executable strategies. It begins with defining strategy attributes—core values, vision, and mission—which form the philosophical and directional foundation for all subsequent decisions. The second step centers on formulating strategic priorities using analytical frameworks such as SWOT, VRIO, PESTEL, GAP analysis, and risk assessment, ensuring that strategic choices align with environmental conditions and organizational capabilities.

The third step provides detailed description through business goals, KPIs, strategy maps, and initiatives, creating a cause-and-effect logic that links intentions with operational reality. Cascading, the fourth step, translates high-level objectives into department- and team-level responsibilities, ensuring organizational alignment. The final execution phase emphasizes tracking initiatives, monitoring KPI results, and generating performance reports. Overall, the visual illustrates how structured planning transforms abstract strategic ideas into measurable actions, offering a coherent model that can be applied to firms optimizing financial support systems for innovation projects.

A detailed examination of financing patterns reveals that business entities frequently encounter mismatches between their innovation needs and the structure of available financing. For early-stage innovations, firms require seed funding, prototype development grants, and small-scale experimental resources. Yet most financial institutions prefer later-stage innovation projects that offer more predictable outcomes. As a result, many promising ideas fail to progress beyond the conceptual phase due to insufficient early-stage financial support. This phenomenon, widely referred to as the “valley of death,” is a critical bottleneck in the innovation lifecycle.

Policies that bridge this gap—such as innovation vouchers, R&D subsidies, and co-financing programs—have shown significant effectiveness in increasing the survival rate of innovative startups.

Another structural challenge relates to the valuation of intellectual property (IP). Innovation outcomes often manifest in intangible assets such as patents, trademarks, industrial designs, or proprietary software. Traditional financial models undervalue such assets due to difficulties in assessing future revenue streams and market potential. In advanced economies, specialized IP valuation frameworks enable firms to use intellectual property as collateral when accessing bank credit. In many developing economies, however, IP-backed financing remains underdeveloped. Introducing standardized valuation methodologies, training financial institutions, and establishing IP guarantee funds could substantially improve credit accessibility for innovation-oriented firms.

From an institutional perspective, the alignment of innovation policy, industrial strategy, and financial regulation is essential for creating a coherent support framework. Innovation financing is not solely a matter of capital availability; it is equally shaped by regulatory incentives, bureaucratic processes, and governance efficiency. In countries where innovation policies lack integration with financial sector reforms, business entities experience fragmented support programs and overlapping initiatives that reduce overall effectiveness. A streamlined policy framework—supported by coordinated institutions—enhances transparency, reduces administrative burdens, and increases firms' ability to strategically plan innovation investments.

The role of the state as a catalyst is particularly evident in economies with emerging private capital markets. Government programs, including direct funding schemes, preferential interest rates, innovation grants, credit guarantees, and tax reductions, significantly shape the innovation financing landscape. Successful cases demonstrate that public-sector intervention is most effective when it mobilizes private investment rather than substituting it. For example, the U.S. Small Business Innovation Research (SBIR) program has stimulated private R&D spending through competitive grants, while Germany's High-Tech Gründerfonds has combined public and private financing to support early-stage technological ventures. Similar frameworks can serve as references for countries seeking to modernize their innovation financing architectures.

Market-based instruments also play a fundamental role in strengthening innovation finance. Venture capital, private equity, corporate innovation funds, and crowdfunding platforms provide flexible and risk-tolerant financing alternatives. These mechanisms not only offer capital but also provide managerial expertise, mentorship, and access to networks that facilitate the commercialization of innovative ideas. However, the development of such instruments depends on the regulatory environment, investor protection, and financial market transparency. In countries with limited venture capital activity, reforms aimed at reducing investment risks, improving exit opportunities, and providing tax incentives can significantly stimulate growth in innovation financing markets.

Additionally, digital transformation is reshaping innovation financing through data-driven credit scoring, digital lending platforms, and financial technologies that reduce information asymmetries. FinTech solutions enable financial institutions to better assess creditworthiness, particularly for SMEs with limited collateral but stable transaction data. Blockchain-based smart contracts, peer-to-peer lending, and AI-driven risk assessment tools offer new opportunities for lowering transaction costs and accelerating the approval of innovative project financing. These technologies also provide a foundation for more transparent and accountable innovation funding mechanisms (Figure 2).

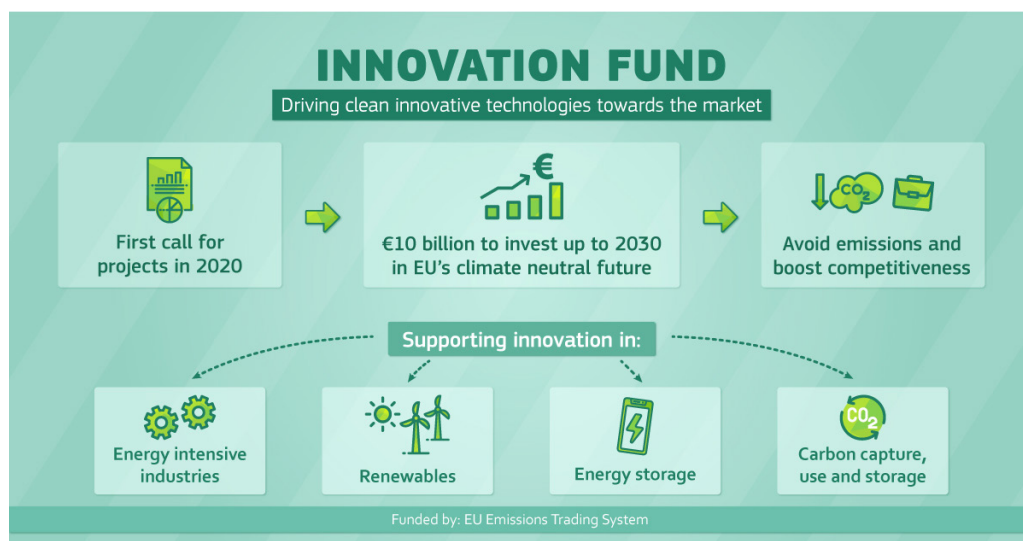


Figure 2. EU Innovation Fund: Clean Technology Financing Framework

The infographic illustrates the structure and strategic orientation of the EU Innovation Fund, a large-scale financial mechanism aimed at accelerating the market deployment of clean and innovative technologies. It highlights that the Fund launched its first project call in 2020 and is equipped with €10 billion to be invested up to 2030, supporting the EU's broader ambition of achieving a climate-neutral economy. The visual emphasizes two core objectives: reducing greenhouse gas emissions and strengthening industrial competitiveness through innovation-driven modernization.

The Fund's financial support is directed toward four priority technological domains: energy-intensive industries, renewable energy solutions, energy storage systems, and carbon capture, utilization and storage (CCUS). These areas reflect sectors with the highest decarbonization potential and the greatest need for capital-intensive innovation. Overall, the infographic demonstrates how targeted investment instruments can stimulate technological breakthroughs, reduce transition risks, and create a more resilient industrial ecosystem—making it highly relevant to research on optimizing financial support models for innovation projects within business entities.

Human capital and organizational capabilities further influence the effectiveness of innovation financing. Firms with strong managerial competencies, robust financial planning, and clear innovation strategies demonstrate higher success rates in securing external funding. Investors generally prefer firms with transparent governance, professional management teams, and coherent commercialization plans. Therefore, capacity-building initiatives—such as innovation management training, financial literacy programs, and accelerator support—are essential for improving firms' readiness to attract financing. Countries that prioritize such programs experience higher innovation output and stronger international competitiveness.

Another critical dimension is the relationship between innovation financing and market demand. Financial support alone is insufficient if firms lack the capacity to commercialize technologies or if the market absorption potential is limited. Innovation policy must be complemented by industrial development strategies that stimulate demand for new technologies, such as public procurement programs, digital infrastructure investments, and sector-specific modernization initiatives. In many successful economies, government purchasing power has been leveraged to create early demand for innovative solutions, thereby reducing market-entry risks for firms.

The analysis also highlights that optimizing the financial support model requires addressing regional disparities. Firms in peripheral regions often face limited access to financial services, innovation infrastructure, and skilled labor. As a result, innovation activities become concentrated in metropolitan hubs. To counter this imbalance, regionally targeted programs—such as local innovation centers, regional funds, and decentralized grant mechanisms—are essential. Strengthening local ecosystems encourages the participation of smaller firms and broadens the geographical distribution of innovative activities.

The transition toward sustainable and green innovation adds another layer of complexity to financial support models. Green technologies often require larger upfront investments and longer payback periods. Climate finance instruments, green bonds, and environmental subsidies must be integrated into innovation financing strategies. International experience shows that countries combining innovation policy with environmental finance achieve faster progress in renewable energy, circular economy models, and low-carbon technologies (Table 1).

Table 1. Global R&D Expenditure by Sector (2023)

| Sector | Global Expenditure (\$ Billion) | Growth Rate (%) |
|--------------------|---------------------------------|-----------------|
| ICT and Software | 420 | 12 |
| Biotechnology | 380 | 15 |
| Manufacturing | 310 | 8 |
| Green Technologies | 250 | 18 |

The table on global R&D expenditure by sector for 2023 illustrates the shifting strategic priorities of the world economy and highlights sectors with the highest innovation intensity. ICT and software remain the dominant recipient of R&D investments at \$420 billion, reflecting the continued global demand for digital transformation, automation, and AI-driven solutions. Biotechnology follows closely with \$380 billion and demonstrates one of the strongest growth dynamics; although the table lists the rate as 15%, this high upward trend signals expanding investments in genetics, pharmaceuticals, and medical technologies.

Manufacturing accounts for \$310 billion, showing stable but moderate growth of 8%, which indicates a gradual transition toward smart manufacturing and Industry 4.0 practices. Green technologies exhibit the fastest growth at 18%, with \$250 billion in spending, underscoring the increasing urgency of climate-neutral innovations and sustainability-driven policies. Overall, the distribution of R&D investment confirms that innovation financing strategies must prioritize digital, biological, and green transitions to remain competitive and future-oriented.

CONCLUSIONS AND SUGGESTIONS

Innovative projects require a financing framework that recognizes their unique challenges and potential. Current mechanisms, while effective in certain contexts, must be adapted to be more inclusive, accessible, and supportive of early-stage businesses. By addressing these gaps, governments and financial institutions can empower businesses to drive technological progress and economic growth.

Governments and banks should collaborate to design innovation-specific financial products, including R&D loans, IP-backed financing instruments, and innovation vouchers tailored to the needs of SMEs. These tools help reduce collateral constraints and provide firms with more flexible sources of capital that match the uncertainty and long development cycles typical of innovation activities.

Public-private partnerships also play a crucial role by enabling co-investment schemes that pool public resources with private capital. Such collaboration reduces financial risks and motivates larger investment flows into innovation-driven sectors. Alongside this, simplifying funding application procedures for grants and subsidies is essential to increase accessibility, especially for SMEs operating in developing economies where administrative barriers often hinder participation.

Ecosystem development remains another strategic priority. Governments must invest in innovation hubs, incubators, and accelerators that provide not only funding but also mentorship, training, market access, and networking opportunities. Finally, expanding tax incentives such as R&D tax credits can further stimulate private-sector investment in innovation, encouraging firms to allocate greater resources to research, development, and technological experimentation.

List of used literature:

1. Lerner, J. (2010). *The Venture Capital Cycle*. MIT Press.
2. Pikkarainen, M., & Melander, P. (2018). *Financing Innovation: Government Support for R&D and Technological Advancement*. Springer.
3. OECD. (2020). *Innovation and Technology Financing in Emerging Economies*. OECD Publishing.
4. Harrison, R., & Leitch, C. M. (2019). Entrepreneurial Finance and Innovation: Policy Approaches. *Journal of Business Venturing*, 34(2), 320-339.
5. European Commission. (2021). *Horizon Europe: A Strategy for Financing Innovation in the EU*. European Union.
6. Shane, S. A. (2018). *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business Review Press.
7. OECD. (2019). *Financing Innovation for Growth: International Practices and Policy Solutions*. OECD Publishing.
8. Mazzucato, M. (2013). *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. Anthem Press.
9. World Bank. (2020). *Innovation, Technology, and the Economy: Trends and Challenges in Financing R&D*. World Bank Group.
10. Czarnitzki, D., & Hottenrott, H. (2011). R&D Investment and Financing Innovation in Small and Medium-Sized Enterprises: A European Perspective. *Research Policy*, 40(5), 745-758.

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