Strategic Oversight of Enterprise Innovation and Investment Growth: A Narrative Review

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ABSTRACT

BACKGROUND

The management of innovation and investment activities plays a crucial role in addressing contemporary economic and technological challenges. Effective coordination of these processes is essential for promoting sustainable development and enhancing the competitiveness of enterprises. The study explores the interdependence of innovation and investment activities and their influence on business growth.

MATERIALS AND METHODS

The research is based on narrative review of current trends, theoretical approaches, and practical aspects of innovation and investment development management. It synthesizes relevant literature and policy documents, alongside an assessment of enterprise-level practices, to identify key management priorities and strategic directions.

RESULTS

The study highlights major challenges in managing innovation and investment activities, including market volatility, technological shifts, and limited access to funding. It emphasizes the strategic importance of attracting external partners and investors to support technology implementation, mitigate risks, and enhance innovation efficiency. The role of financial management in aligning innovation with broader enterprise strategies is also underscored.

CONCLUSION

Effective management of innovation and investment activities requires an integrated strategic approach that considers financial planning, stakeholder engagement, and technological advancement. Enhancing these processes can strengthen the competitive position of enterprises, particularly in rapidly changing market environments. The study provides practical recommendations for improving innovation and investment development management in line with sustainable growth goals.

Keywords: Sustainable development linkage, Industry 4, Innovation–investment strategic management, Organic vs Mechanistic organisational structures, Risk-oriented investment planning, SME innovation financing in Ukraine

Highlights:

- Effective innovation and investment management is essential for enterprise competitiveness and sustainable economic growth.
- Flexible, organic organisational structures enhance adaptability to dynamic market conditions and technological change.
- State support, including tax incentives and public financing, is vital to fostering innovation and investment in SMEs.
- Risk assessment and forecasting tools must be tailored to the uncertainties of Ukraine's innovation environment.
- An integrated, adaptive management approach is required to align innovation strategies with evolving business and market contexts.

Introduction

In the context of Ukraine's integration into the European community and modernisation of the state economic policy with a focus on compliance with European standards aimed at increasing market competitiveness and efficiency of innovation activities, corporate structures are actively exploring new investment prospects and implementing modern approaches to investment. However, the active development of innovations and investments based on the introduction of modern technologies and progressive management approaches aimed at creating high-tech products remains a key incentive for enterprises' economic development.

During periods of economic turbulence, corporate executives tend to prioritize short-term profitability, often pushing longer-term investments aimed to stimulate growth to the back burner. However, studies show that organizations which invest in growth and innovation across the business cycle regularly outperform their contemporaries.[1] Organizations that aim to build pathways for future growth might achieve a competitive advantage that lasts even during periods of uncertainty. In reality, innovation can help to deal with uncertainty. When the "next normal" is unknown, as it is today, firms that seek methods to modify their business models or processes and build routes for future growth can acquire a competitive advantage that often lasts throughout the recovery.[2]

Moreover, to maximize the impact and effectiveness of innovation ecosystems, trust between all parties involved in the process is essential. But it is crucial to emphasize that building trust among stakeholders is a process which takes time for innovation ecosystems to function properly. Strong collaborations, a long-term vision, and consistent, cogent goals and policies are necessary for smart specialization. Therefore, to ensure its effectiveness, inclusive and open processes including all regional stakeholders—including universities — are required. Only when the process is sufficiently independent of public financing cycles and has ongoing community support can innovation ecosystems be considered sustainable.

The study aims to outline the theoretical implications and evidence in the domain of impact of investment and innovation activity on improving an enterprise's economic performance and sustaining growth.

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Literature Review

The issue of managing an enterprise's innovation and investment development attracts considerable attention from scientists, emphasising its importance and overall significance.

In the scientific literature, sufficient attention is paid to the operational management of innovation[3] and strategic management of the innovation process.[4] In particular, Chikán and Sprague[5] democratized the project approach to implementing a single innovation. Attention is drawn to the need to identify, analyse, and plan step-by-step the needs for resources, the expanded use of which is due to the introduction of innovation and the problem of changing logistics tasks as a result of the innovative development of the enterprise. Kłosok-Bazan and Machnik-Słomka,[4] analysing the implementation of individual innovations, do not clearly distinguish at what level of government these innovations should be implemented.

Zaman and Tanewski[6] are looking into the "learning to export" and "learning by exporting" hypotheses in small and large businesses. The empirical study, which employs instrumental variable (IV) regressions and route analyses, provides evidence that R&D and innovation should be treated as distinct constructs. The authors also discover strong mediating effects between R&D and Export via Innovation, but only in the large company cohort. SMEs do not demonstrate evidence of simultaneity between R&D, innovation, and exporting, nor do the findings support the "learning by doing" theory in SMEs. The findings help us understand how the variables interact across different business sizes, which is critical for targeted resource support and regulations.

Garrido-Prada et al.[7] investigate the difficulties surrounding SMEs' innovation investment strategy to boost innovation output during economic crises. This study is evaluating their innovation investment level and relative innovation investment effort during crises. The positive values of the difference between the SME's innovation investment and what was anticipated given its internal and external characteristics serve as a proxy for relative effort. This study uses a Spanish SME panel and a sequential multistage methodology. The findings demonstrate the importance of relative effort in producing novel products in times of crisis. Additionally, above a certain amount of innovation expenditure, the relative effort is high, which balances the findings of earlier research.

The paper by Simone et al.[8] investigates the dynamic connections among capital investments, product innovation, and earnings. A virtuous circle concept is put out in which investment and product innovation serve as the primary engines of profitability, which in turn foster capital accumulation and technical advancement. The idea of a "virtuous circle" is presented, whereby product innovation and investment are the main drivers of profitability, which in turn encourage capital accumulation and technological improvement. According to the authors' concept, there are two different ways that sectors can innovate and invest: either knowledge-related and trying to become technologically competitive, or "embodied" in machinery and equipment and trying to become cost competitive.

Many studies argue for the relationship between sustainable development and innovation.[3] Mironova et al.,[9] noted that innovation is at the centre of the challenges associated with the implementation of the idea of sustainable development and that innovation at the enterprise level should be seen as a tool that supports the implementation of a sustainable development strategy. It is indicated that they enhance the competitiveness of the enterprise.

According to Asgari and Asgari,[10] there is a growing global trend of embracing the circular economy's tenets as a means of resolving the problems associated with the linear economy. According to related research, circularity is a characteristic of systems rather than of individuals. Therefore, thorough and in-depth understanding of the design process, ecosystem component transformation, and transition requirements toward circular ecosystems is necessary for any ecosystem design process, including the implementation of circular innovation ecosystems (CIEs).

An intriguing topic that has remained unclear in earlier research is the integration of CE concepts into the design processes of innovation ecosystems. The Circular Innovation Ecosystems (CIEs) were examined from a number of angles in the research. To investigate the internal and exterior behaviors of the CIEs, some writers used the ecosystem approach lens.[11] Others attempted to investigate the CIE features by combining the ecological structures and entities.[12] Studies have also been conducted to examine the benefits and challenges of incorporating circular concepts into ecosystem design procedures.[13] The reviews of this field of study also revealed that, from the perspective of the circular economy, the majority of recent research has concentrated on the elements of innovation ecosystems, such as circular supply chains, circular business models, and other elements of innovation ecosystems.[14]

According to Neto et al.,[15] achieving the objectives of the innovation ecosystem community depends on an understanding of how to manage and control the elements that contribute to a constructive relationship. Academics, companies, startups, investors, mentors, and other kinds of communities are all part of an ecosystem. Investors like venture capital, angel investors, and investment funds, for instance, provide financial support and direction to companies and open innovation initiatives that engage in the sharing of resources, concepts, and information. A business strategy based on open innovation can be used to introduce new concepts, technology, or goods to the market by working together with external stakeholders, including partners, suppliers, customers, and even rival companies. Actors in the ecosystem look for this tactic to quicken and streamline company models or technical items.

Ghobakhloo et al.[16] pointed out the interconnection between the concept of Industry 4.0 and sustainable innovation. They also noted that Industry 4.0 shapes the direction of the sustainable innovation process through the mutual coordination of the classified functions. In

addition, the implementation of Industry 4.0 requires the introduction of new organisational norms that promote sustainable innovation by supporting constructive communication and achieving development values.[12,13,17]

According to Khan et al.,[18] the integration of sustainability and sustainable development paradigms into the industry 4.0 (I4.0) and innovation dyad has become essential to maintaining businesses' competitive advantage as this dyad has drawn increased attention from scholars, practitioners, and policymakers. The main conclusions demonstrate that I4.0 leads to a variety of innovation types, such as supply chain, organizational, open, marketing, business model, product, and process innovations that promote circular economy (CE), triple bottom line (TBL) sustainability, sustainable business models (SBMs), and the accomplishment of sustainable development goals (SDGs). More study is needed to address important but understudied areas including open, organizational, and marketing innovations to advance business model sustainability and SDGs, even if the majority of studies concentrate on process, product, and business model innovations with TBL and CE consequences.

With the introduction of contemporary technologies, businesses are changing their production methods not only for financial gain but also to invest in environmentally friendly innovations that can enhance the procedures by lowering emissions and waste, controlling pollution, encouraging recycling, and conserving energy.[15]

The articles by Sytnyk et al.[19] and Kalina et al.[20] consider the formation of a sustainable business based on models developed in the context of innovative enterprise development. They detail the theoretical aspects of using tools to implement sustainable, innovative business models.

Rosati et al.[21] proposed a six-phase approach to optimising the increase in central bank deposits, which allows for the formulation of innovative enterprise strategies. This approach's methodology is based on risk assessment and identification of ways to reduce risks.

Phonthanukitithaworn et al.[22] proposed assessing the effectiveness of innovation using "modelling based on structural equations on second-order factor analysis". Hrabchuk et al.[23] suggested the innovation development efficiency ratio as an integral criterion, the calculation of which is based on expert indicators of profit growth, profitability, payback period, discounted income, profitability index, and internal discount rate.

According to Chen et al.,[24] improving company innovation performance is essential for sustaining competitive advantage and promoting economic growth in the age of globalization and technological innovation. The impact that equity structure has on businesses' innovative endeavours makes it stand out among the other facets of corporate governance. The impact of ownership structure on the innovation performance of high-tech listed businesses is examined in this study, together with the moderating influence of market competition and the mediating role of R&D spending. Both low and high concentration can be harmful, according to the findings, which point to an inverted U-shaped link between equity ownership concentration and innovation performance.

Despite the availability of a huge array of publications devoted to the innovation-investment binding or ecosystem, there is actually no well-defined and formulated theory describing correlation between these two crucial components of economic growth and sustainability, in particular, within institutional landscape. With this in mind, the article aims to outline patterns of the above-mentioned ecosystem. It considers approaches to managing enterprise innovation and investment development aimed at increasing its competitiveness and sustainability. It analyses the impact of innovative strategies on the efficiency of production and management processes. The possibilities of attracting investments, mainly through venture capital, government support, and partnerships with the private sector, to ensure sustainable enterprise development are studied separately. The relationship between innovation and the economic performance of the company is determined. The mechanisms and tools that facilitate the introduction of innovative technologies into business processes and optimise the use of investment resources are also investigated.

Research Methods

The research is based on narrative review approach. Although we used elements of scoping review to identify appropriate entries and compile a sample of literature sources, processing of the sample was carried out based on qualitative paradigm. We used Elicit AI-based application (https://elicit.com/solutions/systematic-reviews) for literature search and filtering. This allowed us to consider more evidence, avoid human bias, and apply iterative refining. In total, 216 entries were selected, in particular those based on Ukrainian context. The following search inquiries were applied: innovation and investment correlation in business; innovation growth and companies' investment; interrelation of company' innovation and investment; Ukrainian companies' innovation and investment patterns.

On the next stage, manual scoping was carried out. At this stage, final sample for analysis was compiled. Among 216 founded publications, 46 appeared duplicated (presented in several scientometric databases). 17 publications considering Ukrainian context had low scientific quality. 8 publications had only title in English while the text was in Spanish, as well as Chinese. 98 publications did not actually consider innovation-investment interrelation, but only one of these. Thus, 47 entries were included in the final sample for narrative review.

The narrative review method allowed us to identify the main components of innovation and investment activities and highlight their key characteristics, and synthesis of findings based on narrative review toolkit enabled integrating the data obtained into a holistic management concept. This ensured a systematic understanding

of the problem and the development of recommendations for enterprises.

The application of narrative review allowed to identify patterns and theoretically generalise the research results. In particular, on the basis of the processed information, conclusions were drawn about the relationship between the level of innovation activity of enterprises and their economic performance.

To ensure transparency and reproducibility of the review, an adapted protocol was used in accordance with PRISMA recommendations. Bibliographic searches were conducted in the Scopus, Web of Science, Google Scholar, and EconLit databases between January 2018 and January 2025. Inclusion criteria: (a) availability of empirical data or analytical models of innovation and investment processes; (b) relevance to the entrepreneurial or regional level; (c) publications in peer-reviewed journals.

Comparative analysis was used to assess the effectiveness of different enterprises' innovation activities. It allowed us to identify the most successful practices that other enterprises can use. All methods were combined within a systematic approach, which ensured the integrity of the study.

Results and Discussion

The development of any enterprise is impossible without formulating strategic directions for its innovation-oriented activities, i.e., activities of an innovative nature. It is important to note that the process of introducing innovations stimulates innovation activities – activities aimed at applying and commercialising the results of scientific research and development, which, in turn, leads to the creation of new competitive goods and services.[24]

In this sense, innovation covers the entire process - from developing a scientific and technical idea to commercialising a product. The main feature of the innovation process is the novelty of the decision made, and its implementation at the enterprise requires changes in some specific components of its functioning. Depending on the specific areas of innovative transformations, the company should implement a transparent system of innovative development based on developing an effective innovation strategy that will ensure its competitiveness.[25]

According to the new edition of the EU Industrial R&D Investment Scoreboard, Europe's industry will increase its investment in research and development (R&D) by 9.8% in 2023, outpacing the growth of corporate R&D investment in the United States (+5.9%) and China (+9.6%) for the first time since 2013. In 2023, the EU ranked second internationally in R&D private investment (18.7%), trailing the United States (42.3%) but ahead of China (17.1%), Japan (8.3%), and the rest of the world (13.6%). Despite a decreasing worldwide R&D growth rate (+7.8% vs. +12.6% in 2022), the top 2000 firms spent a record €1257.7 billion on R&D in 2023. The top 50, including 11 EU corporations, accounted for 40.1% of investments, indicating a substantial concentration of R&D in the largest players.[26]

Corporate innovation, as previously said, can have an impact on a company's corporate investment. According to Schumpeter's Theory of Creative Destruction, economic growth and progress are driven by innovation. To replace out-of-date ideas, goods, or processes, firms must invest in research, development, and execution. Failure to comply may result in the company being obsolete. As a result, corporate innovation necessitates spending on R&D and other creative endeavours in order to grow and maintain a competitive advantage. Investments, or the use of corporate resources by management, are sparked by business innovation and lead to important positive changes in the sector. Additionally, by producing new goods, corporate innovation encourages the growth of new industries and makes a substantial contribution to the overall economic development of the nation.

At first glance, the relationship between investment and innovation is clearly two-way: investment is a prerequisite for the implementation of innovation, and innovation, in turn, increases the efficiency and profitability of investment, creating new value. It has been found that successful companies often use a growth strategy, focusing on long-term prospects and investing in new projects and start-ups that can become sources of future income. Examples of such strategies are Google and Microsoft, which are actively investing in new technologies, artificial intelligence, and cloud computing. However, as Rana and Debata[27] demonstrate in their study, the favourable association between corporate innovation and corporate investment weakens with uncertainty. Furthermore, financial constraints play an important influence in determining the relationship. Executives and companies who are willing to take risks are more likely to invest.

At the same time, in conditions of economic uncertainty, many companies resort to a stabilization strategy, which consists of preserving existing assets and limiting risks. This is especially true for organizations operating in industries subject to market fluctuations (for example, in the energy sector or in the oil and gas sector). A diversification strategy, which consists of distributing investments in different sectors, has also proven its effectiveness in reducing risks and increasing financial stability.

One of the most important conclusions is that effective management of innovations and investments is possible only if they are integrated. The research results show that the greatest success is achieved by those companies that can combine innovative developments with long-term investment projects aimed at developing new technologies and expanding markets. For example, Tesla, thanks to the integration of innovative technologies in electric vehicles and battery systems, was able to attract significant investments, which allowed it to enter new markets and significantly increase its capitalization. It is important to note that the integration of these processes requires a high level of coordination between various divisions of the company, including research and investment departments, as

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well as strategic vision and flexibility in decision-making from the management.

The peculiarities of reproduction of such a complex investment resource as new technology are determined by a number of circumstances: firstly, by the peculiarities of technology as a resource (technology is an integral set of scientific and technical knowledge, processes, materials, equipment, organization and management that can be used in the development, production, and (or) operation of products); secondly, by the peculiarities and specifics of the state of the economy and its technological base; thirdly, by a set of priorities in the social and scientific and technical spheres, in the economy as a whole.

The analysis of these concerns gives grounds to highlight the following features of the reproduction of new technologies as an investment resource:

- the integrity of the totality of initial scientific knowledge, including scientific and technical, organizational and managerial;
- social, psychological and other knowledge. Their presence determines the ability of the economy to reproduce modern macrotechnological systems, they act as the initial innovative resource;
- a high degree of intellectualization of labor at all stages of a single reproduction process, including distribution and exchange phases;
- as a rule, the closest connection with the reproduction of a new type of technology, or rather with several reproduction processes that are ahead of the reproduction of technologies in time;
- a determining impact on the transfer of economic systems to an innovative type of development, on the renewal of the production apparatus;
- a pronounced inter-industry and interregional nature;
- the highest aggregate efficiency of the investment resources used;
- just as in the reproduction of new system technology, a high integration of science, production and the market with the continuation of production at the consumption stage;
- a variety of investment sources, the use of virtually all types of capital (equity, venture, depreciation, banking, bond, share, etc.).

Economic policy decisions are unclear due to the unpredictability of national and international government policies. Businesses may become less confident in their capacity to make decisions on innovation and capital investments as a result of policy uncertainty, which can also create a turbulent business environment.[28] The interaction between economic policy uncertainty (EPU), business innovation, and investment is intricate and multidimensional. On the one hand, more policy uncertainty may make companies more cautious and less inclined to fund long-term or risky innovation initiatives. This prudence may stem from worries about impending legal, tax, or trade agreement changes that could affect how successful and lucrative businesses run.[29] Businesses may, however, make investments in innovation as a tactical reaction to the changing business environment if economic policy is unclear. Businesses may seek innovative solutions during uncertain times in order to adapt to market shifts, stay competitive, and seize new possibilities.

Lou et al.[30] examine economic policy uncertainty and company innovation using evidence from a risk-taking viewpoint. The study looks into the impact of EPU on firm innovation. Using data from China's A-share listed companies from 2001 to 2017, the authors discovered that EPU is generally adversely correlated with firms' innovation output. Furthermore, they found that the negative relationship between EPU and innovation is most pronounced in organizations with leaders that have a low risk tolerance and firms with limited risk-taking ability. Furthermore, it was discovered that corporate innovation has a greater beneficial influence on company value when EPU is low. Thus, this study provides critical information about the impact of EPU on corporate innovation from a risk-taking standpoint.

In addition to the practical and organic use of different countries' economic policies, solving this task will allow creating attractive conditions for investment and innovation, taking into account the requirements

Table 1 | Forms of state support for innovation processes in different countries of the world

Countries	Forms of Incentives	Organisational Structures of the Innovation Process
USA	Preferential taxation, investment tax loans, subsidies, preferential depreciation charges, earmarked allocations from budget, removing expenses on R&D related to trade and production activities of the amount of taxable income	Technological capital network (TCN) technopolises, science and technology parks, quasi-risky form of corporations, small innovative firms, research consortia and organisations, business incubators, research and technology centres, research and engineering centres, joint industrial-university research centres, venture capital firms
Germany	Targeted grants, subsidies, payment of technical expertise costs, soft loans, system credit insurance, tax discounts and benefits, accelerated depreciation	Science and technology parks, small innovative firms, research and development consortia, venture capital firms, technopolises
France	Grants, subsidies, long-term loans, tax credits, credit guarantees, preferential taxation	Technopolises, technology parks, small innovative firms, research consortia, venture capital firms, technology transfer centres
Japan	Concessional loans, preferential taxation, subsidies	Japan Research Development Corporation, Technopolises, Science and Technology Technical parks, small innovative firms, research consortia and organisations

Source: Compiled by the author based on Polishchuk.[19]

(recommendations) of supranational structures that Ukraine has already joined or intends to join (EU countries).

The instruments for applying state support in foreign countries and their features are presented in Table 1.[31]

EU countries use many innovation policy instruments to attract investment to finance innovation. The financial support provided by these countries goes far beyond national borders and allows them to reach a broader range of stakeholders from different countries.

These instruments include direct government funding (provided through subsidies, loans, and grants), tax or fiscal incentives, government guarantees, support for risk financing, and, most importantly, creating a favourable infrastructure for innovation.

Around the world, the following incentives are used to support cutting-edge research and development: loans, subsidies, public procurement, tariff and non-tariff barriers, and tax rebates.

However, increased geopolitical tensions exacerbate global economic shocks that invariably affect the economy. Economic policy is currently a tool that governments can use to stabilize the economy and reduce shocks. Frequent changes in economic policy might lead to heightened uncertainty for economic agents. Tang and Cao[32] investigate how enterprises' strategic orientation is impacted by economic policy uncertainty and whether it presents a threat or an opportunity. Based on A-share listed companies from 2012 to 2023, this study found that the opportunity expectation effect, which is caused by economic uncertainty, might cause businesses to shift their strategic focus from long-term gains to short-term development. By reducing budgetary constraints and strengthening managers' myopia, this effect is accomplished. When uncertainty rises, businesses are more likely to take quick action and engage in active innovation. In the end, this shift will motivate businesses to take more proactive strategic measures in reaction to shifts in the outside world. By seizing chances and taking the initiative to make sure they stand out in a crowded market, businesses try to reduce risk and increase their competitiveness.

Additionally, developing new goods and entering untapped markets are crucial, which creates a pressing need for funding. Relying entirely on internal capital is insufficient; hence, it is important to increase external funding outlets to gain extra financial resources.[33] However, the company's strategic orientation tends to adopt a more conservative attitude because of the constraints imposed by external financing.[34] Second, due to economic policy uncertainty, weaker enterprises face more difficulty in securing external financing, resulting in more severe financing limitations that influence their strategic decisions.[35] When these enterprises anticipate capitalizing on the opportunities created by economic policy uncertainty, they will pursue a profit-oriented approach.[36] If the firm is more concerned about loss, it will pursue a growth strategy.

Moreover, in unpredictable geopolitical contexts, innovation and investment confront major obstacles, since geopolitical risk (GPR) can cause delays, increased financing costs, and supply chain disruptions. Huang et al.[37] investigate whether geopolitical risks affect corporate innovation. The research was carried out within global supply chain perspective. The results appear quite unexpected. Applying the customer-induced GPR, the authors discovered that R&D investment is positively impacted by GPR. Following the use of various GPR metrics and an instrumental variable approach, the results are reliable. Additionally, we look into how GPR influences firm R&D investment and discover that the primary mechanisms are growth options and firm liquidity.

The need to shorten the innovation cycle drives the need to bring an enterprise's innovation (e.g., a new product or service) to market as quickly as possible. After all, any innovations are systemic, covering all aspects of the enterprise's activities, and are a crucial factor in achieving economic growth.

According to the State Statistics Service, in 2023, 13.6% of companies in Ukraine innovated, an increase from 12.8% in 2022, 11.5% in 2021, and 10.7% in 2020. For comparison, in G7 countries, the share of such companies ranges from 70–80%.[38]

As shown in Table 2, the share of enterprises in Ukraine implementing innovations remains low. In 2023, 1,037 enterprises sold innovative products worth UAH 36.2 billion, only 3.3% of total industrial output. This indicator shows a negative downward trend, decreasing from 6.7% in 2018 to 3.3% in 2023, which is half as much.[39]

Table 2 | Implementation of innovations at industrial enterprises

Year	Specific Gravity Enterprises that Implemented Innovations, %	New Ones Were Introduced Technical Processes, Units	Including Low-Waste Ones, Resource-Saving, Units	Production has Been Mastered Innovative Products, Titles, Units	Of them are New Types of Equipment	Specific Gravity Realised of Innovative Products in the Volume of Industrial Products, %
2018	11.5	1419	634	2526	881	6.7
2019	10.8	1647	680	2446	758	5.9
2020	10.7	1893	753	2685	641	4.8
2021	11.5	2043	479	2408	663	3.8
2022	12.8	2510	517	3238	897	3.8
2023	13.6	2188	554	3403	942	3.3

Source: Compiled by the author based on Official website of the State Statistics Service of Ukraine.[27]

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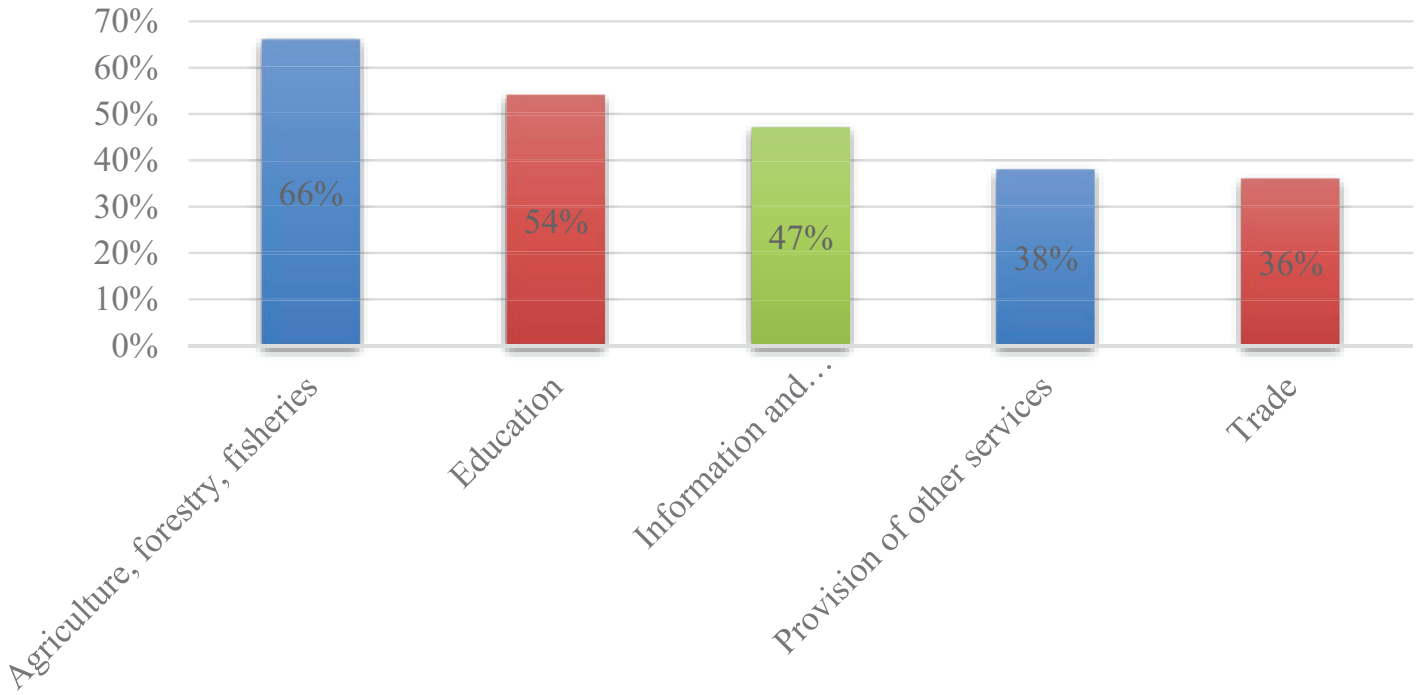

Fig 1 | Investment activity of small and medium-sized enterprises by sector of activity
Source: Compiled by the author based on data from the Official website of the State Statistics Service of Ukraine.

The label "confidential statistics" means that certain indicators are concealed due to commercial or state secrecy requirements, when disclosure of details could reveal sensitive data about individual enterprises. Aggregated data show a gradual decline in the share of innovative products in Ukraine's industrial production, from 6.7% in 2018 to 3.3% in 2023. These processes indicate that even despite the growth in the number of enterprises implementing innovations, their economic results remain limited and do not have a significant impact on the structure of industrial output. This trend results in the risk of the national economy falling behind developed countries in terms of technology, reduced opportunities for exporting high-tech products, and increased dependence on imported technologies.

Innovative activities resulted in the development of 3,403 new products, of which 942 are new to the market, and 2,188 new technological processes, including 554 low-waste and resource-saving ones.[39] The successful implementation of innovative projects requires significant financial investments. This will help boost innovation in the Ukrainian industry and create conditions for companies that use innovative technologies and engage in research and development.

In Ukraine, at all levels - macro, regional, and local - there are no appropriate conditions for small and medium-sized enterprises (SMEs) to play the role of an innovative element of the national economy. Regulating the innovative development of the SME sector is to stimulate innovation activity, which will be possible only if the investment potential of this sector is maximised, taking into account its regional characteristics.[40]

First, the authors propose introducing targeted tax incentives specifically for the purchase of research and development and production equipment, which will stimulate the development of domestic innovation capacities of enterprises. Second, it is advisable to intensify the use of mixed financing for innovation for SMEs, combining state funds, bank loans, and private investments, which will help overcome barriers to access resources. Third, during wartime, state guarantees and insurance mechanisms are also crucial for reducing investment risks and supporting long-term projects. The state must ensure the consistency of policy measures so that investors can be confident in the stability of the environment. Finally, it is also necessary to develop a more transparent monitoring system with performance indicators (number of technologies implemented, share of innovative products, employment rate).

This negative trend is usually attributed to insufficient funding. However, when analysing the lending volume in this sector, it can be noted that more than half of all loans are granted to small, medium and micro enterprises. As of 1 January 2023, their volume amounted to UAH 431 billion, which roughly corresponds to the share of these enterprises in Ukraine's gross domestic product (GDP). This is stated in the report on state support for small and medium-sized businesses.[38]

An analysis of the investment activity of small and medium-sized enterprises and the changes in investment volumes shown in Figure 1 shows that the largest share of investment is in the healthcare and social assistance sectors, agriculture, forestry and fisheries.[38] Due to the nature of these industries, investments in these sectors are recurring and not focused on the development of new technologies or products (Figure 1).

In 2021, the SME Development Strategy until 2023 was approved, and the SME Development Office was established to implement it. The document defined 35 main tasks covering the following key areas:

1. Creating conditions for the development of small and medium-sized businesses;
2. Improving access to finance for SMEs;
3. Simplification of tax administration;
4. Supporting entrepreneurial culture and developing entrepreneurs' skills;
5. Improving competitiveness and innovation potential;
6. Establishing organisational support and mechanisms for implementing the Strategy.[40]

Table 3 | Dynamics of capital investments in the area of Electricity Generation, Transmission and Distribution for 2021–2023, UAH million

	2021	2022	2023
Code for KVED-2010	D 35,1	D 35,1	D 35,1
Capital investment volume	70869528	31605714	42733933
Investments in tangible assets	70039243	31301436	41678934
Engineering structures	55339268	9377	confidential statistics
Residential buildings	confidential statistics	864758	1136708
Non-residential buildings	1419727	20575854	31735760
Machinery, equipment and inventory	12171448	8641548	12241223
Vehicles	643845	729606	1556042
Land	confidential statistics	confidential statistics	confidential statistics
Other tangible assets	443652	304278	1071572
Investments in intangible assets assets	830285	10851	1106898
Software and databases	603077	272233	942012

Source: Compiled by the author using data from the Ministry of Energy of Ukraine.[32]

An action plan was created for each of the areas, and the analysis of implementation shows that out of 63 planned activities, the areas of "strengthening competitiveness and innovation potential" and "promoting entrepreneurial culture and developing entrepreneurial skills" have been fully implemented.

The most difficult to implement were measures related to the functioning of the financial development mechanism. In particular, as of the beginning of 2023, loans to small businesses accounted for 56.1% of the total loan portfolio, of which 24.7% were for medium-sized businesses, 9.8% for small businesses, and 21.7% for microloans. At the same time, loans to large integrated structures accounted for 79.1%[39]. The implementation of the strategy is shown in more detail in Figure 2.

Managing entrepreneurship's innovation and investment development, particularly small and medium-sized enterprises, requires state support to create conditions that allow for the effective use of the main functions of entrepreneurship to ensure the sustainable development of the national economy. This includes

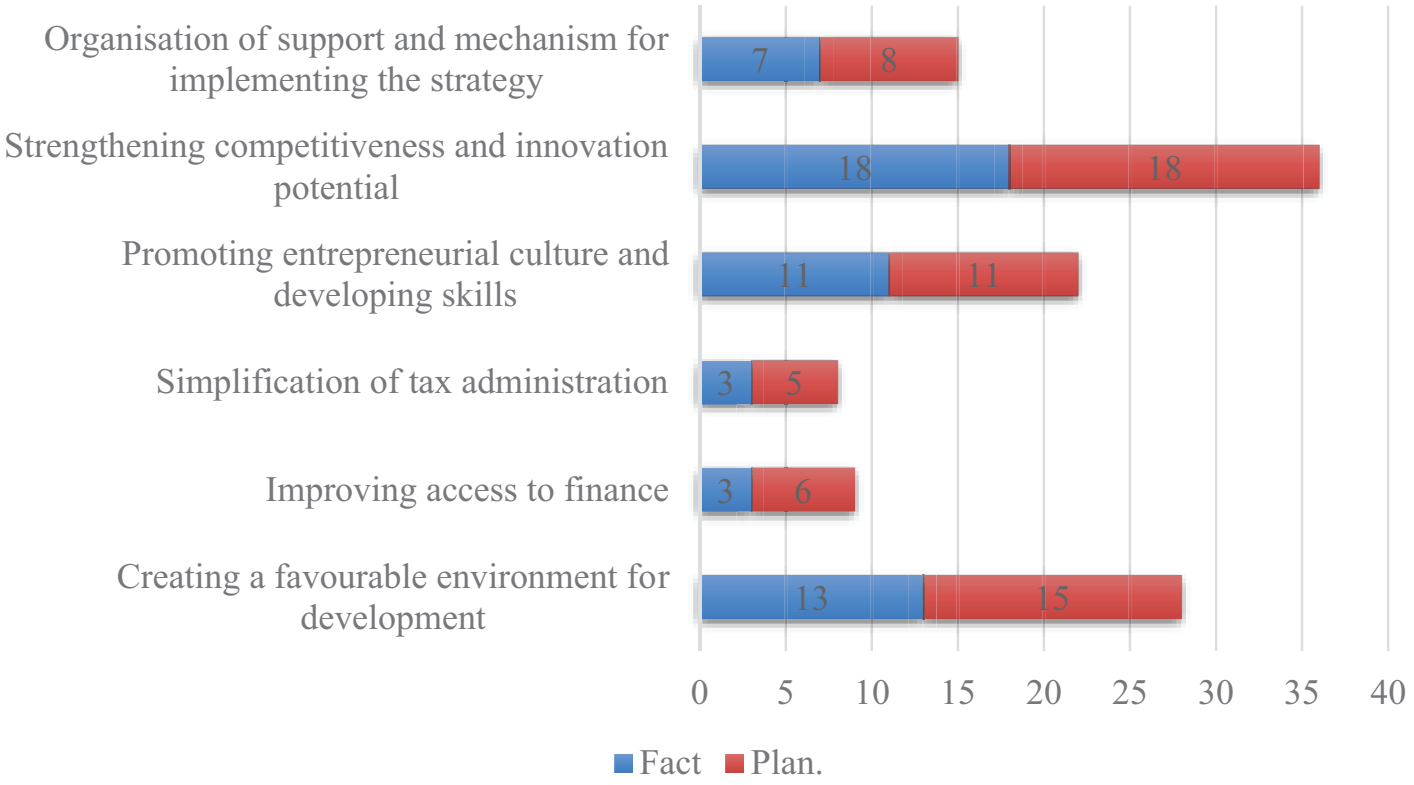

Fig 2 | Status of implementation of the SME development strategy until 2020
Source: Compiled by the author according to the Strategy for the Development of Small and Medium Enterprises in Ukraine until 2020.

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Table 4 | Sources of financing innovation activities, UAH million

Year	General Sum Costs	Including at the Expense of			
		Own	State Budget	Foreign Investors	Others Sources
2018	10850,9	7999,6	144,8	321,8	2384,7
2019	11994,2	7264,0	336,9	115,4	4277,9
2020	7949,9	5169,4	127,0	1512,9	1140,6
2021	8045,5	4775,2	87,0	2411,4	771,9
2022	14333,9	7585,6	149,2	56,9	6542,2
2023	11480,6	7335,9	224,3	994,8	2925,6

Source: Compiled by the author using data from the Ministry of Energy of Ukraine.[32]

achieving such goals as employment growth, formation of a rational production structure, development of specific economic sectors, increase in tax revenues to the state budget, improvement of welfare, growth of per capita income, increase in GDP and stimulation of innovation activity.

Supporting the development of the middle class, which is the basis for stable social relations and political stability, should also be a top priority. In addition, the management of innovation and investment development of small and medium-sized enterprises should be based on a detailed analysis of the business environment and ensure adequate support for infrastructure organisations.

In the current environment of instability and external aggression, as well as due to the prolonged accumulation of internal problems in Ukraine's energy sector, strategic management plays an important role in determining ways to ensure the innovative and investment development of electricity companies. This requires a clear specification of the periods, nature, and direction of the necessary transformations.

Analysing the dynamics of the Ukrainian electricity sector before the war, we can note positive trends in investment growth and innovative development. Thus, funding for this strategic direction increased from UAH 20,622.86 in 2019 to UAH 54,520.90 in 2021.[40]

Assessing the current challenges and threats to the development of Ukrainian electricity companies, several key issues can be identified: significant physical depreciation of fixed assets, lack of high-quality domestic fuel, low efficiency and outdated equipment, damage from the aggression of Russian troops, significant losses of electricity during transmission in the networks, insufficient environmental impact of power plants, and limited access to resources and time for the restoration of power plants. To effectively overcome the problems in the electricity sector, it is necessary to ensure continuous and sufficient investment. However, an analysis of their development shows instability (Table 3).[38]

To maintain and expand the existing energy capacities, it is necessary to regularly invest in companies' fixed assets, ensuring their overall innovation orientation. In today's reality, the innovative development of enterprises should be viewed as a process that combines innovation and investment, as each innovation requires financing, and investment projects should be evaluated in terms of their innovative potential.[41-44]

The critical tasks of strategic management in the field of investment by electricity companies in the coming period are as follows:

1. Expansion of the company's existing facilities will increase production capacity in less time and at lower costs than building new similar facilities.
2. Full or partial reconstruction, including the re-equipment of production facilities by replacing outdated and worn-out equipment, aims to increase the level of mechanisation and automation of production, eliminate bottlenecks, and increase the volume of electricity produced. When implemented within a single project, such reconstruction usually takes less time and requires lower costs than new construction or expansion of existing facilities.
3. Technical renewal and re-equipment, carried out without expanding production facilities in accordance with the enterprise's technical development plan, aim to increase the level of technology and improve the technical and economic performance of equipment and infrastructure.

To implement long-term investment plans in the electricity sector, it is advisable to use the following strategic management tool as part of an investment project.

Successful development and implementation of innovative projects require the attraction of significant financial resources. This will help boost innovation in the Ukrainian industry and create conditions for companies that use the latest technologies and conduct research and development.

In Ukraine, the following sources of funding are used to support innovation activities:

a) state budget funds;
b) investments from individuals and legal entities;
c) own funds of specialised state and municipal financial institutions;
d) resources received from innovation entities, both owned and borrowed;
e) other sources permitted by Ukraine's legislation.
f) A detailed breakdown of the structure of innovation funding by source is presented in Table 4.

The structure of funding sources for innovation shows us that companies' own funds dominate, while the contribution of the state budget is minimal. The participation of foreign investors should be considered sporadic and unstable. The imbalance we have identified limits the possibilities for large-scale innovation projects, especially in high-risk areas that require significant start-up capital. As a result, innovation activity remains fragmented and Ukrainian enterprises are unattractive to global investors.

A study of innovation and investment processes in Ukraine has shown the following results. Only a few Ukrainian enterprises have engaged in innovative activities in recent years. The main focus of innovation is on the purchase of new production equipment. The primary sources of financing for innovation remain

companies' resources and loans. The current taxation system does not encourage companies to build up long-term savings that could be used to implement innovative projects. The innovation sector in Ukraine has not yet become attractive to foreign investors. This situation contradicts the findings of Tang and Cao, and likely can be a starting point for the investigations of country-based multifaceted specifics - from entrepreneurship traditions to martial law. At the same time, the results for Ukraine appear in line with the findings of Jung and Kwak.[45] Their study looks at how research and development investments behave in the face of uncertainty. The authors make the assumption that, depending on a firm's characteristics, the impact of uncertainty on R&D expenditure varies. The findings indicate that the negative association between uncertainty and R&D expenditure is positively moderated by a firm's size and ability for innovation. When the entire sample is divided into large and small-and-medium enterprises, as well as those with high and low innovation capacity, it is discovered that a firm's innovation capacity is a more important factor in positively moderating the negative relationship between R&D investment and uncertainty than its size. These findings have policy implications, particularly for small and medium-sized firms (SMEs) seeking to support R&D activity.

Still, a critical topic is the state's role in stimulating innovation and investment development by creating a favourable investment climate.[46] Public policies based on international experience, such as direct financing, tax incentives or support for risk financing, contribute significantly to the intensification of innovation. However, questions remain as to the effectiveness of these instruments in the Ukrainian economic environment, mainly due to political and economic instability challenges.

The issue of risk assessment in the innovation planning process also remains controversial. The high uncertainty of market conditions and technological innovation requires improved methods for forecasting the revenues and costs of innovation projects. An important question is: Can existing approaches, such as scenario modelling or risk management, be adapted to the specifics of Ukrainian enterprises? The answer to this question will determine the prospects for the innovative development of the national economy.[47]

However, it is necessary to emphasize again that EPU exposure has a significantly negative effect on corporate innovation investment, while still "firm characteristics shape the relationship between EPU exposure and innovation investment".[46] In turn, uncertainty in economic policy will, on the one hand, encourage businesses to strengthen their sense of crisis, actively conserve cash flow, cut back on wasteful spending, and increase innovation investment in their core business to boost their competitiveness; on the other hand, it will make financing more difficult for businesses, which will raise enterprise risk, and businesses will cut back on investment and innovation efforts to mitigate the risk.

In this context, in attempts to solve this paradox, in particular, one should note the research by Zhao and Sahari,[47] which ties improvement of corporate investments and innovation perspectives with sustainability domain, namely – CSR. The authors observe that economic policy uncertainty has a significant impact on enterprises' investment decisions, mostly in terms of increased risk and uncertainty for firms planning future investments. This study seeks to investigate the impact of corporate economic policy uncertainty on corporate investment, as well as how corporate social responsibility disclosure modifies the relationship between economic policy uncertainty (EPU) and corporate investment. 33,791 observations from a sample of Chinese listed companies between 2010 and 2022 were used in the study. Ordinary least squares (OLS) regression with clustered standard errors is used in the investigation. The empirical findings of the basic and robust regression demonstrate that corporate investment is negatively impacted by economic policy uncertainty. Corporate social responsibility, however, acts as a significant moderator between them. The endogeneity issue of reverse causation is resolved using the two-stage least squares approach (2SLS)[48]. While corporate social responsibility (CSR) is effective in mitigating this negative effect, particularly among non-state-owned and low-cash-flow firms, where this moderating effect is more pronounced, the heterogeneity results demonstrate that economic policy uncertainty significantly dampens business investment. According to the study's findings, businesses should give priority to CSR initiatives since they improve information openness and investor confidence, which in turn helps them stay competitive and appealing to investors in unstable markets. This also emphasizes the strategic value of corporate social responsibility (CSR) in reducing external risks, like those brought on by unstable economic policies.

The changing list of desired and required preferences of individuals, their groups and society as a whole is a form of reproduction of economic information, which determines the humanization of the results of economic growth. In this case, individuals, their groups, and society as a whole act as consumers of various types and kinds of reproduced goods, including various information products. While earlier the understanding of the effectiveness of growth results was a positive (descriptive) category, now it is turning into a normative (recommended) category. At the same time, in the model of economic growth, the information factor can affect reproduction not directly, but through the functioning of the system of institutions that reduce the uncertainty of the use of other factors of production for subjects, their groups and the economy as a whole. Thus, a framework for the analysis of innovation-investment tie pattern can be depicted as a landscape, a kind of 'culture media' for designing this pattern (see Figure 3).

In conclusion, innovation and investment development management requires an integrated approach that combines planning, organisation, motivation and

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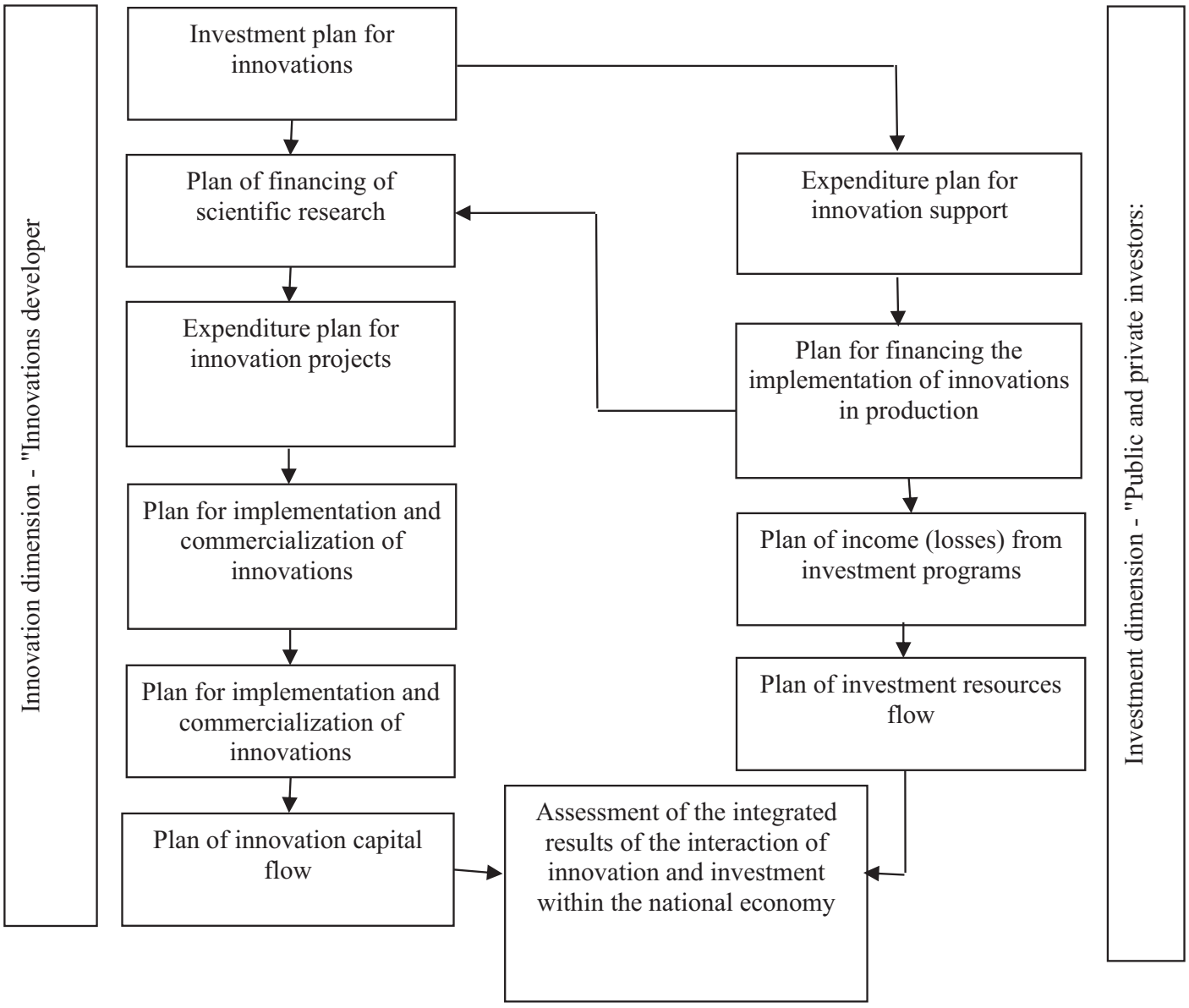

Fig 3 | A conceptual framework for the analysis of innovation-investment tie pattern
Source: Developed by the authors.

control. However, each of these elements acquires a specific meaning in the context of innovation activities, and their interaction should be considered in the context of the unique characteristics of the enterprise and the external environment.[49] Thus, the topic remains open for further research and discussion.

Despite the comprehensive nature of the analysis, our study has a number of methodological limitations. First, the time frame for studying literary sources and empirical material (2018–2025), combined with a focus on English- and Ukrainian-language publications, may have narrowed the range of international practices and experiences. In addition, the selectivity of the sample, due to the exclusion of some publications due to inadequate methodological quality, lack of access to full texts, or non-compliance with established criteria, potentially affects the representativeness of the results obtained. Future scientific research should focus on larger studies of the functioning of specific economic entities using combined methodological approaches (integration of quantitative questionnaires and qualitative case studies), which will provide an in-depth understanding of the internal logic of state innovation and investment decisions. We consider sectoral analysis in the fields of energy, agro-industrial complex, and high-tech industries to be an important direction, which will contribute to the identification of specific obstacles and catalysts for development. We also see the implementation of quasi-experimental methods for verifying the effectiveness of state mechanisms for supporting innovation and investment, in particular fiscal preferences, guarantee schemes, and mixed financing initiatives, as a pressing task.

Conclusion

To sum up the topic of managing enterprises' innovation and investment development, various management strategies exist, including the active use of innovations, effective resource management, and flexibility in making informed management decisions.

The management of innovation and investment development in entrepreneurship, particularly in small and medium-sized businesses, requires state support measures to create conditions for utilising the critical functions of entrepreneurship. This is aimed at ensuring the sustainable development of the national economy, including achieving objectives such as employment, establishing a rational production structure, developing specific economic sectors, increasing tax revenues to the budget, improving welfare, raising per capita income, boosting GDP growth, and stimulating innovation within the economy.

In addition, the management of innovation and investment development of small and medium-sized businesses should be based on an analysis of the business environment and be ensured by the efficiency of support infrastructure organisations.

It should also be noted that the success of these strategies depends on an integrated approach that considers the specifics of the business, market conditions, and technological trends. Important aspects are the adaptation and flexibility of management strategies to the specifics of the enterprise and changes in the economic environment, which allows for an effective response to challenges and new opportunities in the external environment.

That is why we recommend continuous monitoring of the innovation environment and adapting management strategies to changes in the economic, technological, and social contexts. To advance research, new strategies and improved management practices must be actively developed.

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