

S. Kapysheva, c.e.s., assoc. professor¹

N. Satanbekov, master, senior lecturer²

A. Kamerova*, master, senior lecturer³

S. Omirzhan, Master of Management, Senior Lecturer⁴

Esil University, Astana, Kazakhstan¹

*Abay Myrzakhmetov Kokshetau University,
Kokshetau, Kazakhstan,²*

* – main author (author for correspondence)

*e-mail: inara1501@mail.ru

ASSESSMENT OF ECONOMIC EFFICIENCY OF INNOVATIVE PROJECTS

The article shows that there is a long-term relationship between innovation and economic growth, and on this basis, there is sometimes a negative relationship between R&D and economic growth, as innovations are constantly being updated and the production process does not have time to adapt to constant changes. In addition, a one-sided causal relationship between the growth rate of the number of patent applications is analyzed. There are many factors that influence the economic growth of countries, and many studies have been conducted to determine what these factors are and the extent of their influence.

Innovation is usually understood as a process that involves the development and subsequent introduction of new or upgraded products into the production process. The innovation process and its progressive development have a significant impact on the economic growth of a country and the well-being of its citizens. Today, a lot of research is devoted to innovations and their impact on economic growth, as demonstrated by the experience of the G7 countries.

The authors consider technologies and innovations as driving forces of economic growth and development. After the Industrial Revolution, the significant impact of innovation on economic growth was widely recognized, and research focused on this issue. The article determines that in many literary sources, the issues of innovation and its effectiveness are interrelated with such economic indicators as variable costs, productivity and profitability, which have a direct impact on the economic growth of a business entity.

Keywords: innovative projects, financing, investments, capital, costs, profits, income and expenses.

Кілт сөздер: инновациялық жобалар, қаржыландыру, инвестициялар, капитал, шығындар, пайда, кірістер мен шығыстар.

Ключевые слова: инновационные проекты, финансирование, инвестиции, капитал, затраты, прибыль, доходы и расходы.

Introduction. To obtain funding, it is necessary to assess the expected effectiveness of innovative projects. Assessing the economic performance of innovative projects is a global economic problem. For example, back in 2006, the US Department of Commerce created an advisory committee, the purpose of which is to constantly measure innovations and their impact on the country's economy, which are dictated by modern challenges in the production process, that is, in the age of innovations, novelties and their positive impact on the country's economy as a whole, its regions and industries in particular.

There is no single typology of innovative projects. Some projects are aimed at technological breakthroughs, others at improving supply or incremental innovations. They are identified by the criterion of novelty and market orientation [1].

Innovative projects are inherently uncertain, and their implementation is often affected by the difficulty of predicting the necessary resources at the right time and access to key resources. Accordingly, it is necessary to assess the economic performance of innovative projects at the global and national levels.

The purpose of the study is to assess the economic efficiency of innovative projects. Many studies confirm that systematic assessment of the economic effect of the implementation of innovative projects plays an important role in the process of implementing management of innovative flows and processes. However, many studies show that in practice and in theory there is no single conceptual basis that would show the process of assessing the effectiveness of the implementation of innovative projects. On this basis, the topic of studying and researching issues of innovative projects has been and remains relevant throughout the world. Also, many works note that this problem is quite explainable by the fact that it is necessary to clearly distinguish innovative projects from investment projects. Investment projects, in turn, set themselves a clear assessment on a systemic basis, in which the level of profitability is calculated, and in

innovative projects this procedure is more difficult to calculate and give a positive effect, since a more specific result can be seen at the output of the innovative product and one can judge its economic effect and impact on the growth of the enterprise. When calculating the level of profitability of an innovative project, its product, one must proceed from the position of long-termism, since its implementation takes a lot of time for research, making changes, and relationships with science. When studying issues of innovation activity, it should be understood that it implies passing through a number of conditions of uncertainty, which in turn increases the occurrence of risks, and therefore, the study of this topic requires detailed elaboration, response to changes occurring in the external environment, in order to be able to predict the expected results in time and achieve the set goal.

Literature review. Sotnikova L.N., Medvedeva A.V. consider the issues of profitability and risks of financial investments in shares of large companies, where the types of financial investments of investors with different status are determined, and an assessment of the dynamics of stock prices of large companies is carried out, a comparison of the level of profitability and risk is carried out.

Zeleneva E.S. believes that the process of innovative development in the financial sector has a direct impact on the overall level of the state's financial system. To do this, it is necessary to conduct a systematic assessment on the issues of studying the features of the development and implementation of digital innovative products in the financial system, since the development of the financial system as a whole depends on their level of protection and efficiency.

Basovsky L.E. and Basovskaya E.N. in the textbook "Economic Assessment of Investments" describe investments in sufficient detail as an economic category. The issues of risk sources in the financial system, as well as the theory and practice on optimization of the structure of capital investments at the enterprise are disclosed in detail.

Khramov E.N. conducts a review of digital financial technologies, which are factors that influence the development of the financial sector of the economy.

The theoretical and methodological basis of the research is the works of scientists from both our domestic and foreign countries. The following methods were used in the study: abstraction, comparison, analysis, synthesis, logical analysis.

The main part. To clarify the subject of the study and determine the scope of measurement, we will limit ourselves to innovation projects. High performance in the development of new products can only be achieved by controlling and reducing technological risks during the process. However, these risks are associated with innovation. If the risks are no longer acceptable at the development stage, they must be concentrated elsewhere, and this can only be at the development stage.

Therefore, we must separate the two processes: innovation and development. R&D activities are often better formalized than innovation activities, since they are not directly aimed at the market. The body responsible for deciding whether to launch new products into development can make a decision only if it has information about the risks of the project and the commercial impact of the new product.

This information must be provided by the technical and marketing functions. The innovation process preceding these operations must be jointly managed by these two functions. It must be understood that the technical and marketing functions are manageable. The product is often determined only by technology, and customer needs sometimes interfere with the technical limitations of the product.

The success of an innovation project depends on the behavior of the participants. Especially for innovative projects, which are inherently disturbing and therefore develop in an uncertain, risky or even hostile environment.

Many researchers on innovation issues study the process of the influence of innovative projects on economic development on an ongoing basis. When studying this issue, they carry out the process of transition from classical research methods to new ones, that is, they transform known research methods to modern market requirements. When studying innovation issues, such methods as measuring the payback period of the invested capital in new developments, as well as measuring the cost efficiency with such a method as the concept of full cost and options are used. This study examines the return period, that is, the payback of previously invested capital. It should be understood that the resources that are invested in the production process during the implementation of an innovative project are called investments, without which innovative development is largely impossible. As the figure shows, when marketing an innovative product, work, service, which are obtained at the final stage of the production process, allow us to talk about the payback of investments. The data in the figure show that the time required to return investment is considered to be the time of return of capital, which was originally invested in the production process.

This capital is subject to adjustment using a discount rate that allows for the selection of innovative projects for which the investment payback period is longer [2].

To manage uncertainty in innovation projects, they propose a time-based approach: a “master plan” based on defining the results to be delivered rather than a schedule of tasks to be completed. They also propose managing the completion of the project by risk analysis rather than progress analysis.

Let us consider the performance indicators, which in turn involve conducting comparative measures on the effectiveness of innovative projects, on which, in turn, the result obtained from the introduction of new products depends.

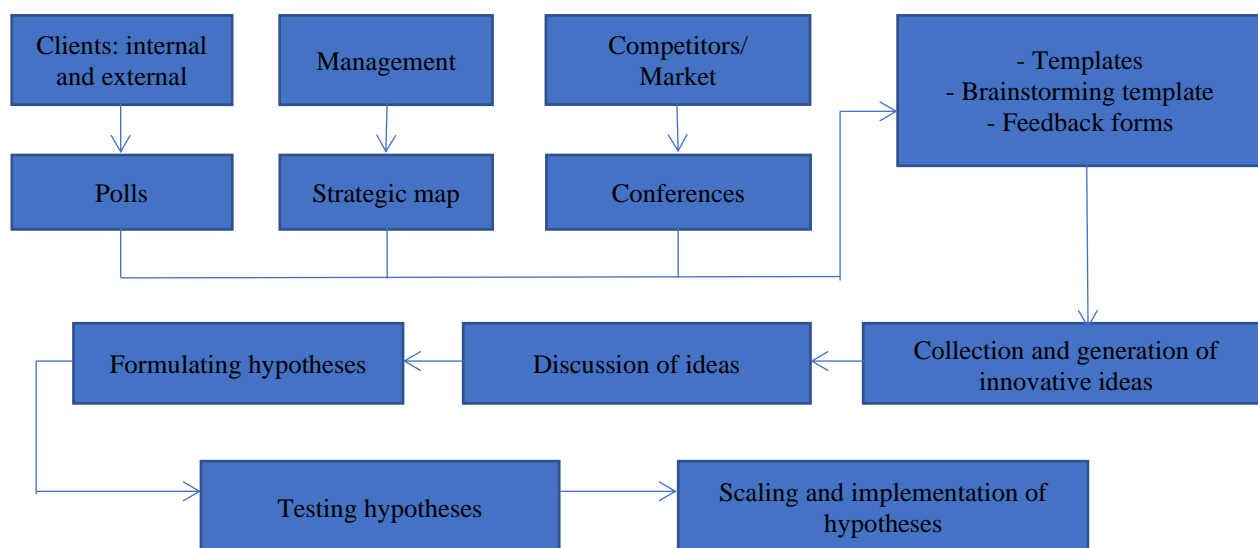


Figure –1. **Idea Collection Process**

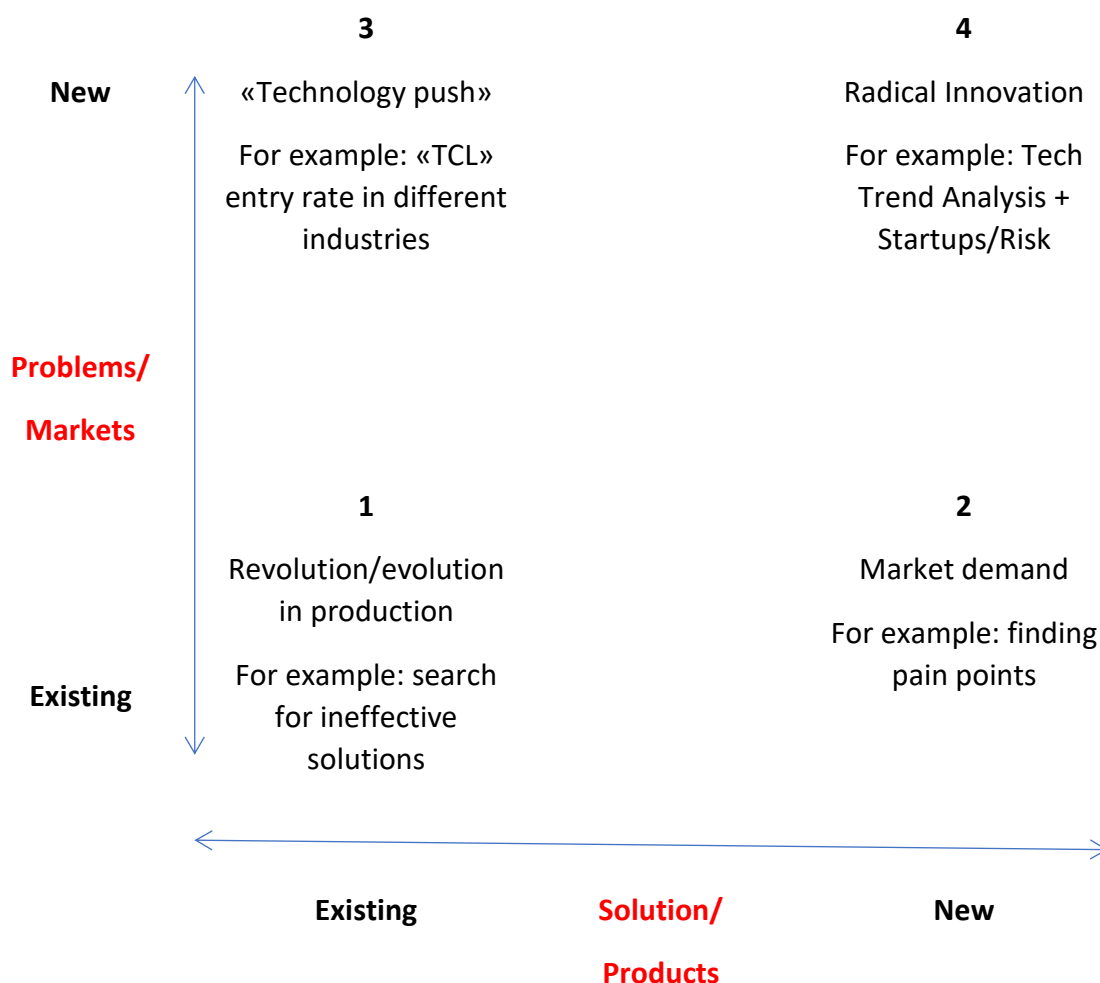
**compiled by the authors based on the source [3]*

According to the indicators in the figure, using the percentage data in combination with the R&D investment related to the product, we obtain the conversion rate of R&D into a new product. For many business entities, profitability acts as a function with possible risks from the expected profit on previously invested capital. The concept of risk assumes a close relationship with the level of profitability, cost effectiveness [3]. Any project requires a clear definition of the intended goal. However, in innovative projects this presents a real difficulty, since if the idea is known, expected by the market, then the goal sometimes cannot be clearly defined. If the goal of the project is to present a new concept with a feasibility and profitability analysis, it is difficult to assess the means to achieve this goal. As an example of a “clean” car that does not emit carbon dioxide, we can of course think of an electric car or a hydrogen car [4]. The stated goal is broad and the risks of not achieving it for various reasons are obvious: mature technology, but the final cost is too high for the market, unstable technology, etc.

The legitimacy of innovation projects within a company is a real challenge. They must be part of a risky strategy based on hypothetical future customers and emerging markets. In order to avoid being denied resources, they must prove their legitimacy.

Note that for innovation projects there is a real difficulty in specifying the project results. The characteristics of the product or service that the innovation project is aimed at are not fully defined, since the market is not clearly defined. This is the case, for example, with smartphones, which have almost replaced digital cameras and GPS devices in vehicles [5].

Having conducted interviews on the issues of the process of assessing the effectiveness of business entities from innovative projects, we came to the conclusion that innovations are an important factor in the life of a business entity, although practices are different and somewhere innovations are underestimated (see Figure 2).

Figure – 2. **Graph of development of innovative projects on the market****compiled by the authors based on the source [5]*

Based on the McKinsey methodology, it follows that 16% of the surveyed business entities do not have clear evaluation criteria for the effectiveness of innovations. 45% of respondents do not track the connection between innovations and investments, as well as the shareholder value of their company, in their activities at all [6].

Research also shows the fact that a number of business entities exhibit a certain self-confidence and complacency, which causes some concern. Most companies are satisfied with the state of affairs that are observed in their activities and do not have any special incentives to improve the effectiveness of the innovation process in the activities of their company. It should be understood that a long-term strategy is assumed for the implementation of production activities, and then the question arises for respondents why the practice of improving the characteristics of the effectiveness of innovation projects is not being developed.

When interviewing large business entities, the results are different. Some business entities pay close attention to assessing the effectiveness of an innovation project, an analysis of the ratio of costs and expected benefits is carried out on an ongoing basis so as not to reduce the latter to negative values [7]. Other large business entities do not conduct an adequate assessment of the effectiveness of innovations for the medium term, as well as a set of projects. Today, it is necessary to go beyond the scope of an innovation project, which involves conducting a comprehensive assessment of the innovation function, as well as the business entity's divisions.

INTERVIEW SUMMARY

Interviews are anonymous and random.

Interview 1:

What is your position in the company?

I am the Director of Research and Development (editor's note: an international company, a designer of energy infrastructure)

Are you responsible for managing innovation projects, and if so, how much?

Yes, about ten projects, including three external ones.

How many innovation projects do you launch each year?

It varies. Our innovation projects are designed for a period of 3 to 5 years.

What are the selection criteria and criteria for launching a project?

We strive for breakthrough innovations to prepare for the opening of new markets. The time horizon is more than 5-7 years.

At the end of the projects, measure the profitability of each project (except patents).

We do not evaluate the profitability of projects directly, but evaluate them retrospectively. In the medium term: from 3 to 5 years, we conduct evaluation reports for several projects, more by market than by projects.

Do you use methods for evaluating the effectiveness of innovation projects? If so, which method?

We monitor intellectual property very closely. We do not use a specific method and do not compare investments in a project with results. The difficulty is that we work for the long term: 5-7 years. Projects may not result in a marketable product and may require an additional step. It is difficult to connect the product to the project.

Have you ever abandoned projects along the way?

Yes. We actively monitor emerging markets; it may happen that our assessments or economic and regulatory news change the position of our goals.

Interview 2:

What is your role in the company?

I am the head of the Innovation Coordination, Customer Relations and Innovation team (Editor's note: a large French banking group)

Are you responsible for managing innovation projects, and if so, how many?

Yes, we have a significant number of innovation projects. Our sector is undergoing a revolution. Customer relations and the impact of digital technologies are constantly evolving.

How many innovation projects do you launch each year?

We launch around twenty new innovation actions each year, some of which do not lead to transformations, but contribute to reflection that influences future actions.

What are the selection criteria and project launch criteria?

Projects are customer relationship oriented. We listen to our clients' innovations and strive to offer them the best service. We have an internal system and the proposal is reviewed in committees. Coordination, for which I am responsible, builds projects by combining ideas and resources.

Measure the ROI of each project at the end of the projects (except patents).

Our innovation plans are difficult to talk about ROI. We quantify the cost of projects and the cost to our agencies.

Do you use methods for evaluating the effectiveness of innovation projects? If so, which method?

Project execution is not evaluated from an economic point of view. Our criteria are more concerned with the impact of the project. We measure progress in customer satisfaction, agency traffic and perceived image. Ease of processing by teams. Project ROI is not evaluated from an economic point of view.

Have you ever abandoned projects along the way?

To the extent that ideas are "filtered" and collected into visible projects. We do not stop ongoing projects. The idea is to advance the results of work, experiments and prototypes through knowledge. Certain results were not achieved: contacted clients, agencies. The knowledge gained is "recycled" in other innovation projects.

Interview 3:

What is your position in your company?

I am the Vice President of Advanced Innovation Development.

Are you responsible for the results of innovation project management?

The team I lead manages 4 projects, but we have many connections with factories around the world. Our activities are in constant contact with other global divisions of the group. I am also involved in global developments.

How many innovation projects do you launch each year?

It varies. But we launch a new project when the previous one ends. We manage innovations on an ongoing basis, taking into account constant resources based on flows. We receive results from the implementation of innovations based on the results of surveys, in which we see the expectations, as well as the perceptions of our clients. It is also necessary to note the fact that the team responsible for the effectiveness of the innovation project conducts an ongoing assessment of the project at all stages of its implementation. But after the launch of production, we carry out one or more assessments of the result. The profitability of the project is not directly related to the result.

What are the selection criteria and project launch criteria?

We are constantly monitoring the search for new materials. Projects are created in cooperation with global companies. We limit external joint projects. The main criterion is economic benefit. Market analysis is necessary.

At the end of projects, measure the profitability of each project (except patents).

The profitability of the target product is our main criterion. The cost of the innovative project is included in the calculation. ROI is a key indicator for us.

Do you use methods to evaluate the effectiveness of innovation projects? If yes, which method?

We monitor project costs and product cost changes in real time (editor's note: new materials development). Product performance is our "heart of development". Project efficiency is important

Have you ever given up on projects along the way?

We stop a project as soon as its economic viability ceases to be evident. Another project immediately takes its place. The exploratory nature of the projects means that they are not 100% successful.

It is necessary to clearly understand that the economic aspect of innovation projects should be assessed in advance, which will affect the process of conducting the assessment and obtaining clear data on the economic feasibility of the innovations obtained. From interview No. 1 it follows that the economic dimension of the innovative product is not considered at the proper level, since the future market is not defined, which means that the issue of assessing the expected benefit from innovation is absent. If innovations are a product for a company, then obtaining a quantitative and qualitative assessment for this business entity is more achievable than if the result of the innovation was a service or process. If we talk about innovations in the customer journey, this process involves a complex path to obtaining the final results. From interview No. 2 we see the process of implementing innovations on the way to the client, and in this case this process of innovation is difficult to link with the number of potential clients. Assessment in this area of the innovation process is carried out on the basis of surveys, the results of which can be used to see desires, expectations and perceptions of possible changes, which has a direct impact on the company's image, which is perceived by potential clients [8].

From interview No. 2 it follows that innovation projects should follow one another based on flows, and profit is also extracted by flows. This indicates that there is a process of creating metprojects, during the implementation of which the theory of options for risk management is used, which are inherent in the issues of studying innovations. The interview also shows that if a business entity knows future markets and implements an approach to integrating innovation marketing, then it is possible to quantitatively assess the innovation process, although this is difficult, but it is an important factor.

It should be clearly understood that the assessment of the effectiveness of an innovative project depends on the success of the project, while it is necessary to take into account the successes and failures from previous periods. From interview No. 3 it follows that having many innovative projects, it is possible to make a choice for those projects for which success is already visible now, at the stage of selection from alternatives. It can be assumed that if a business entity is going to launch several projects in parallel, then here there is an approach to the theory of options, while preserving promising projects. When considering and making a choice of innovative projects to obtain an assessment of effectiveness, it is necessary to be guided by a sample of projects that lead to innovations, as well as those that turned out to be unsuccessful, but allowed the business entity to close the options [9].

A structured interview was conducted during the research. The respondents were selected based on age criteria (30-40 years old).

Conclusions. In order to decide to launch a project, it is necessary to collect the decision-making elements in advance. Therefore, it is necessary to define or estimate the goal and means, target applications, target market and potential customers, and establish positioning in relation to competition. In addition, regulatory and legal restrictions must be taken into account.

The process of turning an invention into an innovation is complex and requires controlled means to develop the idea until it hits the market. Going through maturity stages is even codified in some sectors, such as space. Building innovations from an idea to a proof of concept and then a prototype operating under representative conditions allows you to test the concept and then move closer to an industrial product. However, there are many failures.

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Капышева С.К., Сатанбеков Н.А., Камерова А.А., Омиржан С.М.

ИННОВАЦИЯЛЫҚ ЖОБАЛАРДЫҢ ЭКОНОМИКАЛЫҚ ТИІМДІЛІГІН БАҒАЛАУ

Аңдатпа

Мақалада инновация мен экономикалық өсу арасында ұзақ мерзімді байланыс бар екендігі көрсетілген және осы негізде кейде ҒЗТҚЖ мен экономикалық өсу арасында теріс байланыс бар, өйткені инновация үнемі жанарып отырады және өндіріс процесінде тұрақты өзгерістерге бейімделуге уақыт жоқ. Сонымен қатар, патенттік өтінімдер санының өсу қарқыны арасындағы біржақты себеп-салдарлық байланыс талданды. Елдердің экономикалық өсуіне көптеген факторлар әсер етеді және олардың қандай факторлар екенін және олардың әсер ету дәрежесін анықтау үшін көптеген зерттеулер жүргізілді.

Инновация әдетте өндіріс процесіне жаңа немесе жаңартылған өнімдерді әзірлеуді және кейіннен енгізуді көздейтін процесті білдіреді. Инновациялық процесс және оның прогрессивті дамуы елдің экономикалық өсуіне және оның азаматтарының әл-ауқатына айтарлықтай әсер етеді. Бүгінгі таңда көптеген зерттеулер инновациялар мен олардың экономикалық өсуге әсері туралы, бұл G7 тобының елдерінің тәжірибесін көрсетеді.

Авторлар технологиялар мен инновацияларды экономикалық өсу мен дамудың қозғаушы күші ретінде қарастырды. Өнеркәсіптік революциядан кейін инновацияның экономикалық өсуге айтарлықтай әсерін барлығы мойындады және зерттеулер осы мәселеге бағытталған. Мақалада көптеген әдеби дереккөздерде инновация мәселелері, олардың тиімділігі шаруашылық жүргізуші субъектінің экономикалық өсуіне тікелей әсер ететін айнымалы шығындар, өнімділік және рентабельділік сияқты экономикалық көрсеткіштермен байланысты екендігі анықталды.

Капышева С.К., Сатанбеков Н.А., Камерова А.А., Омиржан С.М.

ОЦЕНКА ЭКОНОМИЧЕСКОЙ ЭФФЕКТИВНОСТИ ИННОВАЦИОННЫХ ПРОЕКТОВ

Аннотация

В статье показано, что между инновациями и экономическим ростом существует долгосрочная связь, и на этой основе иногда наблюдается отрицательная связь между НИОКР и экономическим ростом, поскольку инновации постоянно обновляются, а производственный процесс не успевает адаптироваться к постоянным изменениям. Кроме того, проанализирована односторонняя причинно-следственная связь между темпами роста количества патентных заявок. На экономический рост стран влияет множество факторов, и было проведено много исследований, чтобы определить, что это за факторы и какова степень их влияния.

Под инновациями обычно понимают процесс, который предполагает разработку и последующее внедрение новых или модернизированных продуктов в производственный процесс. Инновационный процесс и его прогрессивное развитие оказывают существенное влияние на экономический рост страны и благосостояние ее граждан. Сегодня много исследований посвящено инновациям и их влиянию на экономический рост, что демонстрирует опыт стран группы G7.

Авторами рассмотрены технологии и инновации как движущие силы экономического роста и развития. После промышленной революции существенное влияние инноваций на экономический рост было признано всеми, и исследования были сосредоточены на этом вопросе. В статье определено, что во многих литературных источниках вопросы инноваций, их эффективности лежат во взаимосвязи с такими экономическими показателями, как переменные издержки, производительность и рентабельность, что оказывает непосредственное влияние на экономический рост субъекта хозяйствования.

