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INSTITUTIONS TO PROMOTE BUSINESS INVESTMENT IN SCIENCE TECHNOLOGY DEVELOPMENT IN VIETNAM

ABSTRACT OF DOCTORAL THESIS IN ECONOMICS

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INTRODUCTION

1. The urgency of subject

The 4.0 industrial revolution opens up many opportunities and many challenges for later-developed countries like Vietnam. If these opportunities are well utilized, they will help Vietnam overcome the middle-income trap and develop rapidly and sustainably; otherwise, they will pose many economic, social and environmental problems. In the process of industrialization and modernization, the development of science and technology is considered a key driving force for the development of modern production capacity with the requirement of "Strongly developing science and technology, innovation and digital transformation to create breakthroughs in productivity, quality, efficiency and competitiveness; having specific and outstanding institutions, mechanisms and policies to promote innovation, application and transfer of technology", "taking enterprises as the center of research and development, application and transfer of technology, application of digital technology" [18, Vol. 1, p. 221] as in the Socio-Economic Development Strategy set forth at the 13th National Party Congress. Accordingly, promoting investment in science and technology development is a necessary condition and an important driving force to realize development goals.The question is, to promote industrialization and modernization, starting from the huge demand for investment resources needed for science and technology development and digital economic development, how should we solve it? Only when we find a solution to this problem can we ensure the conditions to promote rapid and sustainable development on the basis of science and technology and innovation.

The need for a systematic study on the basis of theoretical and practical science on promoting investment in resources for scientific and technological development is becoming urgent. Therefore, the doctoral student chose the topic ***"Institutions to promote enterprises to invest in scientific technological development in Vietnam"*** to research for his doctoral thesis in Political Economy.

2. Objectives and Research Tasks of the Thesis

2.1. Objectices of the Thesis

Based on the theoretical basis of political economy to evaluate the practice, propose directions and solutions to improve the quality of institutions to promote enterprises to invest in science and technology development, contributing to promoting industrialization, modernization, and successfully implementing Vietnam's socio-economic development strategy to 2030, with a vision to 2045.

2.2. Research Tasks of the Thesis

- Building a theoretical framework on institutions to promote business investment in science and technology development in Vietnam.

- Research on institutions to promote business investment in science and technology development in some countries, lessons for Vietnam.

- Analyze and evaluate the current institutional status to promote business investment in science and technology development in Vietnam in the period of 2011-2023, pointing out the main achievements, limitations and causes.

- Proposing directions and solutions to perfect institutions to promote business investment in science and technology development in the 2024-2030 period, with a vision to 2045.

3. Research Subjects and Scope of the Thesis

3.1. Research Subjects

Research on institutions that promote business investment in science and technology development, focusing on formal institutions including laws, rules, and investment promotion environment; business owners participating in economic activities; enforcement mechanisms regulating relationships between entities; systems of schools, institutes, organizations, linkage centers, and markets that create conditions to promote business investment in science and technology development in Vietnam.

3.2. Research Scope

- *Content: Research on official institutions to promote business investment in science and technology development.*

- Spatial scope: to clarify the institutional content promoting enterprises to invest in science and technology development, the thesis covers enterprises of all economic sectors and ownership types.

- Time scope:

+ Assess the current situation in the period 2011-2023

+ Propose directions and solutions for the period 2024-2030

4. Theoretical basis, anh Research Methods

4.1. Theoretical basis

- Regarding theoretical basis, the thesis uses the methodology of dialectical materialism and historical materialism of Marxism-Leninism, Ho Chi Minh's economic thought, the Party's theory on socialist-oriented market economy, on building the legal system and economic institutions in Vietnam.

- Approach methods:

Theoretical approach: From theory to practical verification to select, supplement, and complete the existing theoretical system, determine the theoretical framework as the basis for practical research on building and operating institutions to promote business investment in science and technology development in Vietnam.

Practical approach: Collect and process data from official sources, especially documents from management agencies and enterprises directly related to the establishment and operation of institutions to promote business investment in science and technology development to clarify the research subject, some related situations and propose solutions within the specified time frame.

Approaching the target: Supplementing and perfecting institutions to create conditions and environments in economic spaces for businesses to desire and enhance their ability to invest in R&D, improve technology, and contribute to the development of a modern economy based on the foundation of scientific, knowledge and technological progress.

Interdisciplinary approach: Political economy is related to many other sciences, the research uses knowledge from a number of related social sciences to explain economic phenomena and processes; at the same time, graduate students also use interdisciplinary approaches.

4.2. Research Methods

The author focuses on using common research methods in political economy research: scientific abstraction, systematization, analysis and synthesis, logic combined with history, statistical and comparative methods to clarify the nature, objectives, content and transformation process of the identified research object.

In addition, the Thesis also uses research methods of related sciences, especially economic sciences such as: collecting documents from sources, official reports related to the research subject, methods of summarizing practices, modeling, creating data tables, graphs in analysis, interpretation, induction, and practical evaluation of the subject's movement process; using forecasting methods to determine prospects, directions, and solutions for the coming time.

5. New scientific contributions of the Thesis

5.1. In theory

- Systematize a number of international and domestic research projects related to institutions to promote business investment in science and technology development, especially research related to the development and application of modern technology.

- Clarify the academic "institutional promotion", "institutional promotion of enterprises to invest in science and technology development"...

- Clarify the content, influencing factors, and evaluation criteria of institutions that promote business investment in science and technology development.

- Analyze the limitations and bottlenecks of related institutions that hinder capacity and reduce motivation for businesses to invest in science and technology development.

- Propose solutions to strengthen, promote and innovate institutions to encourage enterprises to boldly borrow capital from funds and state budget sources, take advantage of administrative and legal environment conditions; set up funds, allocate capital and resources, and make effective investments in science and technology development.

5.2. In practice

Assess the current status of establishment, operation, impact and efficiency over the past time; propose directions and solutions to perfect the

institution to promote business investment in science and technology development in Vietnam by 2030.

The research results of the thesis are also the basis for planning policies, building institutions to promote enterprises to invest in R&D, forming policies on capital investment, resources for enterprises to develop science and technology in Vietnam; is a useful reference document for organizations and individuals interested in learning and researching related contents.

6. Structure of the Thesis

In addition to the introduction and conclusion, the Thesis has 4 chapters.

Chapter 1: Overview of research situation related to institutions promoting business investment in science and technology development.

Chapter 2: Theoretical basis and practical experience of institutions to promote business investment in science and technology development.

Chapter 3: Current institutional status to promote business investment in science and technology development in Vietnam in the period 2011-2023.

Chapter 4: Directions and solutions to 2030.

Chapter 1
OVERVIEW OF RESEARCH RELATED TO INSTITUTIONAL RESEARCH PROMOTING ENTERPRISES TO INVEST IN SCIENCE TECHNOLOGY DEVELOPMENT

1.1. RESEARCH PROJECTS ABROAD

1.1.1. The work reflects the relationship between business development and investment in science and technology.

In Volume I of Capital by C. Marx, it is argued that labor productivity has a decisive influence on the increase of wealth and the amount of value of goods. Production capacity is determined by many circumstances, including the level of technological development.

V.I. Lenin considered the improvement of labor productivity to be the most important thing for the victory of socialism. To improve labor productivity, it is necessary to industrialize the national economy; at the same time, it is necessary to thoroughly apply the latest achievements of advanced technology and science to the economy.

Authors and works: P. A Samuelson & W.D.Nordhaus, book *"Economics"* [66]; Robert M. Solow, research *"A contribution to the theory of economic growth"* (1956) [119]; article *"The Effects of Future Capital Investment and R&D Expenditures on Firms' Liquidity"* [98] by authors Christopher F Baum (Department of Economics, Boston University, USA), Mustafa Caglayan (Department of Economics, Sheeld University, UK) and Oleksandr Talavera (Durham University, UK) (2012); The article *"The Interaction Between Capital Investment and R&D in Science-Based Firms"* [121] by Saul Lach, Mark Schankerman, Massachusetts Avenue Cambridge (September 1987); OECD, *"Science, Technology and Innovation in the New*

Economy" [113]… addresses aspects related to the role of science, technology and innovation in the economy, focusing on business development, the issue of how the government can improve the environment to promote the progress of science and technology…

Studies on *"The role of Technology in business"* [116] by the Oklahoma SBDC group; the article *"Role of Science and Technology in Business Growth"* [107] by the author group K. S. Gurupanch, Shreelekha Virulkar (2015); *"The role of science, technology and innovation in the UN 2030 agenda"* [117] by P.P. Walsh, E. Murphy, D. Horan (2020).

The book *"Creating the future: a 2020 vision for science & research"* by the Strategy research group, Business, Innovation and Skills, aims to advise on long-term investment proposals for science and research in the UK during the innovation process; The study *"UNESCO Science Report 2010 - The current Status of Science around the World"* [125], provides some data showing the increasing role of scientific and technological knowledge globally.

Some other publications on the role of science and technology in production, business and economic development. Prominent ones are: *"Technology, globalization, and international competitiveness: Challenges for developing countries"* by Carl Dahlman in the book *"Industrial Development for the 21st Century"* [99]; *"The Political Economy of Science, Technology and Innovation"* [96] by Ben Martin and Paul Nightingale (2000); *"Knowledge, Technology and Complexity in Economic Growth"* [120] by Ricardo Hausmann, José Domínguez (2023)…

Studies share the same perception, in economics, it is widely accepted that R&D and technology products are the main driving force for economic growth of businesses and countries.

1.1.2. Institutional and developmental institutional studies

From the perspective of C. Marx's approach to infrastructure and superstructure, the institutions of the economic infrastructure (production relations) constantly change and at a certain point will lead to changes in the superstructure.

When the issue of institutions was of particular concern, March, J.G and J.P.Olsen (1984) in the work *"The New Institutionalism: Organizational Factors in Political Life"* (American Political Science Review 78, 738-49), approached institutions from the perspective of organizational factors in political life to overcome individualistic tendencies to move towards rational organizational choices.

Geoffrey M. Hodgson (2006) in his article *"What are Institutions"* (Journal of Economic Issues, Vol. XL No. 1 March 2006, p.2, p. 18) argues that institutions are the most important type of structure in society and create the characteristics of society. The modern institutional perspective (New or neo-institutional theory or new institutionalisme) is built on three main studies, including: John Meyer and Brian Rowan (1977), DiMaggio and Powell (1982); and Zucker (1977).

According to Powell and DiMaggio (1991), the approach focuses on studying institutions through organizational models, and also focuses on the relationship between organizations, individuals and their operating environment.

1.1.3. Works related to enterprise development institutions and institutions promoting enterprises to invest in science and technology development

Dasgupta Partha, Paul A. David's research *"Toward a new economics of science"* (1994); European Commission (EC) research report *"Scenarios for future scientific and technological developments in developing countries 2005-2015"* (March 2006) [77], business development associated with innovation, science and technology development is a key concern of many countries.

In the article *"Government support for business research and innovation in a world in crisis"* (OECD, 2021), the author examined how governments allocate public resources for research and innovation; The study by Vu Van Khac and Nguyen Minh Tri *"Science and Technology Development in Vietnam: Current Situation and Solutions"* [124] (2021) shows the importance of institutions promoting science and technology development in transforming the growth model, improving productivity, quality, efficiency and competitiveness of the economy; Chapter 6 *"National policies for Artificial Intelligence: What about diffusion?"* (OECD, 2023) [114], the study examines the attention of policy makers to small and medium-sized enterprises and entrepreneurs (SMEs) in their newly designed artificial intelligence (AI) policy agenda.

1.2. DOMESTIC RESEARCH PROJECTS

1.2.1. Research related to theoretical basis of enterprise development institutions and institutions promoting enterprises to invest in science and technology development

Dr. Tran Thi Ngoc Minh, *"Applying C. Marx's viewpoint on institutions to perfect the socialist-oriented market economic institution in Vietnam"* (Party Building Magazine, December 2022); Hong Anh, *"Investing in science and technology: one capital will bring four profits"* (Vietnam Quality Newspaper, August 2, 2012); Pham Huy Toan, *"Investing in science and technology: A sustainable direction for enterprises"* (Economics and Forecast Magazine, No. 20/2013)…

Associate Professor, Dr. Huynh Thanh Dat (2022), "Continuing to create institutional breakthroughs in science, technology and innovation development, meeting the requirements of renewing the growth model, economic recovery and development"; "Increasing investment at the right level for basic research - The fundamental factor to create breakthroughs in science, technology and innovation development for the sustainable development of the country" (Communist Magazine, September 2022), said that it is necessary to create institutional changes to develop science, technology and innovation to create a leap forward in labor productivity, quality, efficiency and competitiveness.

Nguyen Chinh (2021), *"Improving policy mechanisms to develop science, technology and innovation"*; Prof. Dr. Phung Huu Phu, *"Some key issues on building a fast and sustainable development institution"* (Communist Magazine,

2019), stated that the top requirement in innovation is to build a modern and effective development institution so that science and technology can truly play a role in creating strategic breakthroughs.

The article *"Building and perfecting the institution for fast and sustainable development of the country in the new period"* by Prof. Dr. Ta Ngoc Tan and Assoc. Prof. Dr. Tran Quoc Toan (2023) affirmed that institutions are one of the few factors that play a decisive role in the development of a country in general, in each area of economic and social life in particular. Appropriate institutions will create development momentum, inappropriate institutions will hinder development.

The book *"Rapid and sustainable development institutions: International experience and issues for Vietnam in the new period"* by Tran Quoc Toan, Ta Ngoc Tan, Phung Huu Phu (co-editors) (National Political Publishing House Truth, 2019) clarifies the concepts and contents of development institutions; the relationship between political institutions, economic institutions and social development institutions.

1.2.2. Research related to institutional operation experience to promote business investment in science and technology development

The article *"Linking science with practice: experiences of some countries, lessons for Vietnam"* [43] by Assoc. Prof. Dr. Nguyen Minh Khai, Associate Professor, Dr. Bui Ngoc Quynh (2013) discusses the experience of creating investment capital for science and technology of Japan, the US, China and some other countries; Hai An (2013) *"Creating a breakthrough in the science and technology market"* raises the issue of developing a developed science and technology market, in which institutes and research centers participate in buying and selling, transferring technology with many businesses.

Assoc. Prof. Dr. Nguyen Hong Son, Assoc. Prof. Dr. Pham Thi Hong Diep, Dr. Nguyen Anh Thu (Hanoi National University) (2017) *"Perfecting the socialist-oriented market economic institution in Vietnam: Perceptions and issues raised"* [72]; Central Institute for Economic Management (2020), *"Developing the science and technology market, experiences of China and Vietnam"* [55]; Thanh Chung (2023), *"Institutional reform, attracting investment: Lessons learned from Hanoi, Ho Chi Minh City, Hai Phong and Quang Ninh"...*

Hoang Giang (2023), *"Policy creation to unleash the wave of technology and innovation"*; Dr. Vu Tien Loc (2019), *"Perfecting the institution for enterprise development - important content in building an institution for rapid and sustainable development of the country in the new period"* clearly states the achievements, limitations, "bottlenecks" and new requirements for the institution in the new period...

Le Duy Phong (editor-in-chief), *"Economic institutional barriers to socio-economic development in Vietnam"*, (National Political Publishing House, Truth, 2018); Dr. Ho Ngoc Luat, *"Experience in effectively using state budget capital invested in the field of science and technology"* (Tia Sang Magazine, No. 1/2007); Ho Tu Bao (2008), *"Organizing and managing scientific research topics in Japan"…*

1.2.3. Research related to solutions to improve institutions to promote enterprises to invest in science and technology development

Lai Tran Tung (2014), *"Promoting the development of science and technology"* [78]; Do Phong (2022) *"Unblocking the "bottlenecks" of the science and technology market"*; Ngoc Han (2022), *"Removing institutional obstacles to promote the development of the science and technology market"*.

Thuy Dieu (2022), *"Recommendations for building a database to monitor the "health" of science and technology enterprises"*; Tran Duy Phuong (2022), *"Research and development activities in Vietnamese enterprises: Current situation and solutions"*, consider R&D activities to lead to fundamental innovations, creating significant changes to the products and processes of enterprises based on technological knowledge.

Vietnam Productivity Institute (2023), *"Solutions to encourage science, technology and innovation activities to improve business productivity"*; Dr. Pham Duc Nghiem, *"Removing barriers and bottlenecks for science, technology and innovation development, contributing to creating new economic growth momentum in 2023"* [53]; Mai Huong Giang, *"Developing science - technology and innovation to meet the requirements of sustainable national development"* (Electronic Communist Magazine, September 14, 2023), pointed out some shortcomings, suggested some solutions to improve institutions, policies, and laws on science, technology, and innovation, especially outstanding institutions, accepting risks in science, technology, and innovation activities; developing and exploiting intellectual property...

1.3. EVALUATION OF RESEARCH RESULTS RELATED TO INSTITUTIONAL PROMOTION OF ENTERPRISES INVESTING IN SCIENCE TECHNOLOGY; RESEARCH DIRECTIONS OF THE THESIS

1.3.1. Evaluate research results related to the thesis topic

- Issues that have been addressed:

+ In theory: Some basic studies mention the role of science and technology in economic growth, considering this an increasingly important "input" factor of the economy in general and of enterprises in particular, and the main driving force for economic growth. Investment by enterprises in science and technology is necessary because of the development of enterprises in an increasingly competitive environment.

In addition, other studies analyze the forms of investment capital for enterprise development, scientific development, technology application of different entities and capital mobilized through institutions on various types of capital markets, science and technology markets, etc.

+ In practice: In published works, there are some studies on experiences related to the practice of creating mechanisms and policies to support investment for enterprises developing science and technology, such as experiences in linking scientific research with practice, experiences in developing science and technology markets of some countries... Recommendations to continue to create breakthroughs in the institutional development of science, technology and innovation, meeting the requirements of renewing the growth model. Proposals to perfect policy mechanisms to develop the science and technology market, improve the investment environment.

- ***Issues raised need further research***

+ *In theory:* Up to now, there has been no work that has fully analyzed and systematically built a theoretical framework on the role and importance of this institution at the national level; there has been no research on the mechanism of benefit allocation in that institution, has not pointed out the structure, principles of establishment and operation of the institution, evaluation criteria and factors affecting the process of operating the institution to promote enterprises to invest in science and technology. The lack of theoretical awareness of this institution has limited the investment motivation of enterprises for science and technology development, and limited the promotion of creativity of business people in innovation and application of science and technology.

The requirement for a theoretical framework to build an institution to promote enterprises to invest in science and technology is very important and urgent, it not only outlines the direction for enterprises themselves but also helps the state create an institution to promote enterprises to increase investment in R&D and apply new technologies.

+ *In practice:* To promote enterprises to invest in science and technology, in addition to the endogenous resources of enterprises, it is necessary to have a fair investment environment among entities, to open up investment resources in all types of markets and in society according to an effective mechanism with good reliability. At the same time, there needs to be investment orientation from the State. The goal of the institution is to ensure the stimulation of the motivation of business owners in the economy, considering investment in science and technology as a solution that is both fundamental, practical, and innovative.

1.3.2. Thesis research focus

- Content, concept, evaluation criteria and factors influencing enterprises to invest in science and technology from the perspective of Marxist-Leninist political economy.

- Core issues in building institutions to promote types of enterprises (state, private, FDI enterprises...) to invest in science and technology development in the new situation.

- Relationship and role of State entities in promoting economic entities to invest in science and technology development.

Chapter 2
THEORETICAL BASIS AND PRACTICAL EXPERIENCE ON INSTITUTIONS TO PROMOTE ENTERPRISE INVESTMENT IN DEVELOPMENT OF SCIENCE TECHNOLOGY

2.1. CONCEPT AND ROLE OF INSTITUTIONS TO PROMOTE BUSINESS INVESTMENT IN SCIENCE TECHNOLOGY DEVELOPMENT

2.1.1. Institutional concept promotes business investment in science technology development

2.1.1.1. Concept of institutions and classification of institutions

a. Institutional concept

Institution is a category associated with a model of organization of the leadership and management apparatus of society, including a system of regulations, rules, and standards of the state and society promulgated and established to regulate

the activities and behaviors of organizations and individuals towards a defined goal (“players”, “rules of the game” and “playground” with organizational models and the implementation of laws, regulations and policies). It is both relatively stable because it is formed and built on certain principles; and dynamic because of the constant movement of social practice, the interaction between parts of the system and between this system and other systems.

The above concept shows some important characteristics of institutions: i) It is a product of humans, set at a certain time and implemented by certain institutions and means; ii) It includes the aspects of “rules of the game”, “players” and “playground”; iii) The main purpose is to coordinate and regulate human behavior; iv) Includes both formal and informal parts.

b. Institutional classification

- First division, institutions are divided into formal and informal institutions.

- Based on the nature and level of attracting social resources for development, institutions are classified into inclusive institutions and exclusionary institutions.

2.1.1.2. Concept of economic institutions

Economic institutions are the official "rules of the game" (the Constitution, codes and laws, sub-law documents, policies and mechanisms for implementing those documents set by the State) along with the unofficial "rules" (unwritten rules, norms, taboos that groups of people in society participating in economic activities voluntarily comply with) set for subjects in an economy in a certain historical period.

2.1.1.3. Promoting institutions

From the above analysis, it can be conceived that: The promoting institution includes elements that form the legal framework, regulate the order and operation methods of relations and activities of organizations and individuals in society, thereby stimulating economic and social subjects to invest, innovate, and unleash potentials and resources to achieve the goal of developing economic components and the entire economy faster and more effectively.

For the promoting institution of economic development, it is a synchronous structure consisting of three main components: 1- The legal system and regulations and standards that form the legal corridor for the operation of relations between subjects in society; 2- The organization and operation of subjects in the process of building and developing the country, including the Party, the State, political, social, professional organizations and the people; 3- The operating mechanism creates the environment - the "playground" in which subjects operate. (These are “rules of the game”, “players” and “playing field”).

2.1.1.4. Concept of promoting business investment in science and technology

Promoting enterprises to invest in science and technology development is to create favorable factors, environments, and supporting resources so that

enterprises can desire, increase resources, and be able to effectively implement investment plans for science and technology development.

First, a favorable environment in terms of law, mechanisms, and policies.

Second, there is enough space to connect, trade, and access science and technology products...

Third, the development of the science and technology product market.

2.1.1.5. Institutions to promote business investment in science and technology

Institutions that promote enterprises to invest in science and technology development are systems of regulations, statutes, and processes issued by competent authorities that create a legal framework and unwritten regulations, political, administrative, economic and social environments that impact enterprises to promote investment in science and technology development.

2.1.2. The role of institutions in promoting business investment in science and technology development

First, this institution has a direct role in supporting the development of science and technology.

Second, the more appropriate and complete the institution is, the more it increases trust, the more it allows for the search for information flows that help optimize investment choices and encourage innovative startups.

Third, the institution prevents and overcomes risks in R&D of enterprises.

2.2. EVALUATION CRITERIA AND INFLUENCE FACTORS

2.2.1. Criteria for evaluating institutions that promote business investment in science technology development

2.2.1.1. Rate of enterprises participating in R&D; cooperation between enterprises and research organizations.

2.2.1.2. GII index and innovative startup ecosystem.

2.2.1.3. Level of impact on the development of productive forces.

2.2.1.4. System of institutions for transactions, R&D activities, technological innovation of enterprises; ability to access resources and infrastructure serving enterprises investing in R&D.

2.2.1.5. Criteria on the growth rate of total factor productivity and the relationship with research, development, and technological innovation.

2.2.2. Institutional factors that promote businesses to invest in science and technology development

2.2.2.1. Political and legal environment for business investment

2.2.2.2. Science and technology market

2.2.2.3. Institutional subjects promoting enterprises to invest in science and technology development

2.2.2.4. Factors motivating enterprises to invest in science and technology development

2.2.2.5. Cultural - social and international environment

2.3. INTERNATIONAL EXPERIENCE AND LESSONS FOR VIETNAM

2.3.1. Experience of other countries

2.3.1.1. Singapore

2.3.1.2. Japan

2.3.2. Lessons for Vietnam

Firstly, to develop the economy quickly and sustainably, an institutional foundation is indispensable, in which the institution to promote enterprises to invest in science and technology development must aim to build a modern production - industry - service based on R&D and innovation.

Secondly, to promote and orient capital flows of enterprises to invest in the field of science and technology, there must be close support and intervention from the State through strategies, systems of mechanisms, policies, and creating a favorable environment. The State must be the center in orienting research and allocating resources.

Third, there must be a strong enough policy to encourage enterprises to establish and use their own Science and Technology Development Fund.

Fourth, strengthen measures to ensure intellectual property rights and implement intellectual protection.

Fifth, the cooperation between enterprises and the State from building to implementing institutions to promote investment in science and technology for the national interest is the most important condition.

The experience of Singapore and Japan shows that in order to develop a national industrial foundation and thereby establish an independent and self-reliant economy, it is necessary to first create a truly industrialized manufacturing industry based on innovation, science and technology; not just processing and assembly.

Chapter 3
CURRENT STATUS OF INSTITUTIONS PROMOTING ENTERPRISES' INVESTMENT IN SCIENCE TECHNOLOGY DEVELOPMENT IN VIETNAM IN THE PERIOD 2011-2023

3.1. SITUATION OF ENTERPRISES RELATED TO INVESTMENT IN SCIENCE TECHNOLOGY DEVELOPMENT

3.1.1. Overview of the situation and effectiveness of enterprises investing in science technology development

- Overview of the performance of enterprises related to the level of science and technology

- Regarding the finance of enterprises for R&D, innovation initiatives.

3.1.2. Technology application, transfer and development activities

- On development activities; application, technology transfer.

- On science and technology enterprises.

+ Granting certificates.

+ Development of science and technology enterprises.

+ Some specific situations of science and technology activities.

- High-tech enterprises: overview of high-tech enterprises and high-tech application activities.

3.2. CURRENT STATUS OF INSTITUTIONS PROMOTING ENTERPRISES' INVESTMENT IN SCIENCE TECHNOLOGY IN VIETNAM IN THE PERIOD 2011-2023

3.2.1. Content and form of the legal system on enterprises investing in science and technology development

3.2.1.1. Content summary

The legal corridor system is reflected through legal documents issued by the State and competent organizations, forming a mandatory institutional framework for enterprises, mainly including:

+ Law on Science and Technology

+ Law on Technology Transfer

+ Law on Intellectual Property

+ Law on Investment

+ Budget Law

+ Enterprise Law

+ Enterprise Income Tax Law

+ Related laws

+ System of sub-law documents.

+ System of documents issued by superiors of enterprises.

The institutionalization of the Party's guidelines and policies on promoting enterprises to invest in science and technology development, and building institutions to create favorable conditions for enterprises to operate, apply, and invest in science and technology development has received increasing attention and achieved remarkable results.

* The Law on Science and Technology amended in 2013 (effective from January 1, 2014), followed by the Law on Science and Technology in 2022, with many changes with some breakthrough points.

The organization of scientific and technological activities has promoted the rights of organizations and individuals to propose research ideas or place research orders.

Focus on encouraging the application of products and dissemination of results; improve investment methods and financial mechanisms.

Regarding the purpose of using the state budget, apply the mechanism of spending on R&D activities, technology development and application; focus on the investment mechanism for special, large-scale projects.

- In particular, the 2022 Law has completed the clarification of ownership and copyright over scientific research and technological development results.

- More clearly regulates investment by enterprises, organizations and individuals in scientific and technological activities.

+ Enterprises must allocate investment funds to innovate, improve technological level, improve productivity, quality and competitiveness of products and goods.

+ Investment funds for scientific and technological development of enterprises are calculated as actual expenses arising in relation to the production and business activities of enterprises.

+ Enterprises applying high technology enjoy high incentives.

- Regarding funds to support and invest in science and technology activities.

+ Funds from the State budget: Science and technology development fund; Technology innovation fund, high-tech venture capital fund.

+ Funds of organizations and individuals.

+ Science and technology development investment fund of enterprises.

- Regarding promotion mechanisms and policies: preferential policies on tax, credit, infrastructure for high-tech development; building information infrastructure, national databases and statistics on science and technology.

Attention is paid to building and developing the science and technology market.

Encouraging initiatives, technical improvements, production rationalization and innovation.

**** The Investment Law and the Technology Transfer Law*** provide forms and subjects of investment incentives such as high-tech enterprises, science and technology enterprises, science and technology organizations, and projects with technology transfer.

These advances provide many measures to encourage technology transfer and develop the science and technology market.

Science and technology development funds, the National Technology Innovation Fund, and credit institutions are granted property rights to secure investment loan transactions.

The promotion of commercialization of scientific research and technology development results is increasingly institutionalized to be more practical and specific.

The spaces, material conditions, and institutions that promote enterprises to invest in science and technology development are also legalized in the direction of encouragement and support to promote investment.

Measures to develop the science and technology market are of interest and have been stipulated in the Law on Science and Technology, the Law on Technology Transfer, and other relevant legal documents.

**** Relevant decrees and sub-law documents***

Decree No. 95/2014/ND-CP dated October 17, 2014 of the Government regulating investment and financial mechanisms for science and technology activities (Decree 95); Decree No. 13/2019/ND-CP dated February 1, 2019 of the Government on science and technology enterprises has many regulations to simplify administrative procedures in registering for recognition of science and technology enterprises; Decision No. 18/2019/QD-TTg dated April 19, 2019 regulating the import of used machinery, equipment and technological lines.

Decision No. 1269/QD-TTg dated October 2, 2019 established the Vietnam National Innovation Center (NIC), creating the best supportive environment for businesses to operate creatively and building a space for connections between businesses and factors in the NIS, affirming the central role of businesses.

3.2.1.2. Forms of business investment in science and technology development

** Components of investment in science and technology development.*

- Investment objects.

- Investment products.

** Regarding funds to support and invest in science and technology activities, the Law clearly stipulates the types of funds, which can be divided into 3 types:*

- Funds from the State budget.

- Funds of organizations and individuals.

- Funds for investment in science and technology development of enterprises.

** Forms of enterprises investing in science and technology development*

- Enterprises set up funds from their own financial resources - to invest in science and technology.

- Enterprises invest or cooperate to invest in scientific and technological research in priority and key areas of the State.

- Science and technology enterprises.

- Enterprises in the national innovation system (National Innovation System - NIS).

3.2.2. Mechanisms, policies and specific regulations on promoting business investment in science and technology development

The system of policies and laws on investment in science and technology in our country can be temporarily divided into two groups: i) Group of policies and laws on investment in science and technology using the state budget; ii) Group of policies and laws regulating investment using financial sources outside the state budget.

The process of implementing legal regulations, policies and mechanisms has created clear changes in practice, reflected in the following aspects.

3.2.2.1. Innovation in financial mechanisms, management mechanisms and investment methods

* Innovate financial management mechanisms, strengthen autonomy mechanisms for public science and technology organizations and units; change organization and management methods.

Implement public-private partnership mechanisms, promote administrative procedure reform, attract investment capital to build science and technology infrastructure.

Outstanding results in investment in science and technology development in relation to increased labor productivity.

* Develop national key laboratories and specialized laboratories (16 key laboratories have been completed and put into operation).

* Develop a number of scientific and technological organizations following the world's advanced models such as the Vietnam - Korea Institute of Science and Technology (V-KIST), the Institute for Advanced Study in Mathematics, the Viettel Research and Development Institute, the Vintech Big Data Research Institute and the Vin Hi-Tech High-Tech Research Institute...; establish and operate 4 high-tech parks; 6 high-tech agricultural parks; 6 concentrated information technology parks.

3.2.2.2. Science and technology development strategies

* Science and technology development strategy for the period 2011-2020

- The organizational system, management mechanism, scientific research operation mechanism, technology improvement and application continue to be fundamentally, comprehensively and synchronously innovated.

- National potential is strengthened, key science and technology organizations are focused on investment and gradually developed.

- Applied research in various fields closely follows the Strategy's orientation, is implemented according to the value chain, and focuses on business needs.

- Types of technology services are focused on development.

- Regarding the development of the science and technology market associated with the enforcement of intellectual property rights. A number of mechanisms and policies to facilitate the trading of domestic and foreign products exchanged and traded on the market are issued...

During the 2011-2020 period, most of the main solutions proposed in the Strategy have contributed to socio-economic development, improving the country's research capacity and implementing technology development projects.

The implementation of the Strategy in the 2011-2020 period shows that compared to the goals, orientations and solutions for science and technology development set out in the Strategy, the results achieved are still modest, not commensurate with the potential, and there are still some shortcomings. Many regulations, policies and mechanisms are not really suitable to promote economic sectors, entrepreneurs and enterprises to innovate, apply and develop technology, prioritizing advanced technologies.

* Strategy for science, technology and innovation development to 2030.

Based on the above achievements and limitations, Decision No. 569/QD-TTg dated May 11, 2022 promulgated the “Strategy for science, technology and innovation development to 2030” (Strategy 569), stating: By 2025, reach 1.2-1.5% of GDP in public investment for R&D, technological innovation, of which total national expenditure reaches 0.8%-1% of GDP, social investment contribution accounts for 60-65%. By 2030, reach 1.5%-2% of GDP, of which total national expenditure for research and technological innovation reaches 1%-1.2% of GDP, social investment contribution accounts for 65-70%.

Completing the legal system on science, technology and innovation, adapting to international practices and developing the market; synchronizing relevant legal regulations and policies towards removing bottlenecks and

barriers, creating the best conditions for businesses to increase substantive and effective activities in innovation and technology application.

Completing the public-private partnership mechanism, legal corridor for investment from venture capital funds, community investment funds, digital technology platforms; completing NIS, innovation systems for sectors, regions, and high-tech zones.

Strategy 569 emphasizes promoting the formation and development of organizations as well as human resources for scientific research and technology development in enterprises; supporting the development of a number of domestic enterprises to achieve leading technology levels in the region.

3.2.2.3. Science and technology market development programs

* "Program for developing the science and technology market to 2020" (program 2075) (Decision No. 2075/QD-TTg dated November 8, 2013) aims at the main objectives of: (1) Increasing the value of transactions of buying and selling science and technology products and services on the market; (2) Increasing the proportion of transactions of buying and selling intellectual property such as solutions, processes, technical know-how; (3) Establishing a network of technology trading floors with supporting intermediary service organizations, focusing on large cities and developed urban centers.

- Overall results after 5 years of implementation, Program 2075 has approved 63 tasks out of a total of more than 500 registered proposals (on average, there are more than 100 registered proposals each year). The total implementation cost of 63 approved tasks in the past 5 years is 340 billion VND, of which 194 billion VND is from the state budget (accounting for about 55%), the remaining 45% of the funding is from businesses.

- The results of the intermediary organization's activities have contributed to training human resources, supporting the construction of a database on intellectual property, technology products, promoting the linkage of technology exchanges.

- Supporting the commercialization of research results and intellectual property.

- Creating conditions for mobilizing capital sources, input and output partners, contributing to expanding and developing business, creating long-term benefits for businesses.

- Implement communication projects to develop intellectual product markets.

* Regarding the "National Science and Technology Market Development Program to 2030" (issued under Decision No. 1158/QD-TTg dated July 13, 2021), it has set out specific goals, tasks, and solutions until 2025. Accordingly, it is necessary to form and develop market intermediary organizations with 80 intermediary organizations and 3 networks of specialized intermediary organizations for 3 key export industries.

The program emphasizes specific tasks and solutions: Perfecting the legal environment to create conditions to promote market development, increase market demand; develop intermediary organizations, and expand market promotion.

During the implementation of Decision No. 2075/QD-TTg dated November 8, 2013 and Decision No. 1158/QD-TTg dated July 13, 2021 on Science and Technology Market Development Programs to 2020 and 2030, the science and technology market has gradually formed, developed and achieved remarkable results. Institutions and policies for the development of the science and technology market have been gradually improved; the demand, capacity to receive, absorb and master technology of enterprises have been increasingly improved.

However, many research results have not met market needs; commercialization of research results is still sluggish; enterprises have difficulty accessing quality technology supplies; enterprises' capacity to absorb and master technology is still weak.

Overall, our country's science and technology market still has some problems and "bottlenecks" that need to be promptly removed and overcome.

* Directive No. 25/CT-TTg dated October 5, 2023 on developing a synchronous, effective, modern and integrated science and technology market, aiming to overcome the above-mentioned shortcomings and inadequacies, creating conditions to promote enterprises to invest in science and technology development.

Establish and develop 03 key technology exchanges in Hanoi, Da Nang, Ho Chi Minh City and a number of local science and technology exchanges; build and put into use in 2024 the national information portal and database on the science and technology market (https://sti.vista.gov.vn).

Review, propose adjustments, amendments and supplements to legal regulations on management and use of public assets to clarify regulations on management of assets formed from science and technology tasks using state capital.

3.2.3. Environmental status promotes businesses to invest in science and technology development

3.2.3.1. Environment to promote business innovation

a) Innovation of the scientific and technological organization system.

b) Innovation of the operating mechanism of scientific technological organizations.

c) Efforts towards innovation.

d) Increased financial resources for science and technology.

e) Develop the connection between institutes - schools - enterprises through building and developing NIC, attracting entrepreneurs, enterprises implementing innovation initiatives, technology companies, innovation support companies, domestic and foreign investment funds... to create a rich ecosystem for NIC.

3.2.3.2. Science and technology market institutions

The institutional development of this market is generally more and more complete in terms of names and types of market participants; however, there have not been any breakthrough reforms to develop this market. To promote the technology market, the institutional and policy framework has been gradually built and perfected.

However, compared to the practical needs of Vietnam and other countries' markets, especially developed countries and even compared to some countries in the

region, our country's science and technology market is still slow to develop. Commercialization of research results and intellectual property of research institutes, universities and scientists is still limited.

Institutions to encourage domestic venture capital funds are still weak and slow to operate, especially the National Venture Capital Fund. Regulations and rules to promote technology, R&D, innovation, listing of technology enterprises and venture capital are still too strict and cautious.

Technology trading activities are mainly in the form of contracts for purchasing machinery and equipment, technology transfer, trading on technology floors and e-commerce floors are still limited.

The national infrastructure system of the science and technology market is still backward, lacking the ability to connect and interact between participating entities.

The report stated that total state budget expenditure for science and technology is still low (the whole country accounts for less than 2% of total state budget expenditure).

The institution for developing the science and technology market is still inadequate, lacking in synchronization, and not highly practical, making technology development, technology product development, product commercialization, etc. face many difficulties.

3.2.3.3. Relevant administrative, legal and macro policy environment

Despite many improvements, the establishment of a market mechanism is not complete in some aspects, the reform of administrative institutions is not strong enough, and the principle of the rule of law is not fully ensured, which also reduces the attraction of resources and the development potential of the subjects.

Resolution No. 30c/NQ-CP (November 8, 2011) on the "Overall program of state administrative reform for the period 2011 - 2020" includes 5 goals, 16 national-level component projects, focusing on "Institutional reform", "Administrative procedure reform"... aiming to resolve the relationship between subjects and components in terms of benefit distribution.

In fact, accompanying the sub-licenses are the fees that people and businesses have to pay, and these sub-licenses are even applied to public organizations with charters approved by competent authorities.

3.3. ASSESSING THE EFFECTIVENESS OF INSTITUTIONS TO PROMOTE ENTERPRISES' INVESTMENT IN SCIENCE TECHNOLOGY IN 2011-2023

3.3.1. Achievements

Firstly, the activities of building institutions for enterprise development through creating a business environment have made much progress.

Secondly, creating an environment for enterprises to exploit important scientific and technological products and intellectual property more effectively.

Third, affirming the central role of enterprises in contributing to the development of Vietnam's science and technology, integrating with the world's science and technology levels, and promoting socio-economic activities.

Fourth, the legal environment for the development of the science and technology market.

Fifth, developing a network of science and technology service organizations.

Sixth, the management agency has made positive adjustments to regulations related to the science and technology development fund.

Seventh, many localities and enterprises have paid great attention to scientific research, technological innovation, and helping enterprises improve productivity, quality, and increase the competitiveness of goods.

Eighth, the policy and legal environment has been continuously improved and strongly innovated in the direction of creating motivation for enterprises and considering enterprises as the center of promoting scientific and technological development.

Ninth, the infrastructure and institutional environment has been built to create more favorable conditions for enterprises to invest in scientific and technological development.

3.3.2. Limitations, disadvantages

One is the capacity barriers of small-scale enterprises.

Second, the linkage between the components in the NIS and intermediary units is not really effective.

Third, the private economic components are still not really equal in grasping resources, especially capital and land.

Fourth, the current state of state budget investment sources and financial management in recent times still has many shortcomings.

Fifth, the system of policies and laws still has many points that are not suitable for the characteristics of science and technology activities of enterprises such as creativity, high risk, etc.

Sixth, many businesses do not really have the need to invest in R&D and technological innovation themselves.

The picture of innovation in our country is not clear, the number of invention patents and the number of patents applied for commercialization are still quite far apart; the level of technology absorption and conversion, innovation capacity, and productivity improvement is slower than many Asian countries.

3.3.3. Causes of limitations and weaknesses

Firstly, a large number of enterprises are still not fully aware of investing in research, application, development of science, and technological innovation despite many incentives and favorable conditions in terms of environment, legal corridor, mechanisms, and policies. The R&D capacity of enterprises is still weak in both finance and human resources.

Secondly, the administrative and legal environment lacks transparency, causes inconvenience, and there are many sub-licenses; the implementation of some laws is ineffective. Procedures for enterprises to access state budget funding for R&D activities are not appropriate. There is a lack of flexible mechanisms for

technology transfer, bringing scientific products and technological inventions into practical production processes.

Thirdly, the financial mechanism is still inflexible, capital sources are limited, and support efficiency is not high, enterprises often encounter difficulties in implementing research or implementing ideas to innovate technological processes and create new products. Total social investment in science and technology is still low, not commensurate with potential.

Fourth, investment in science and technology projects and plans is risky, risky, investment in R&D is too expensive, and the payback period is long. However, the legal framework for venture investment activities does not have clear regulations on management mechanisms, incentives, and development support.

Fifth, the science and technology market develops slowly, still has many shortcomings, lacks stages, units, organizations, and professional intermediary services in the supply-demand connection; the ability to commercialize R&D results is limited.

Sixth, the team does not meet the requirements, there is a lack of experts, leading scientists, and large scientific centers; there is a lack of dedicated and capable human resources in R&D, improvement, and innovation.

Chapter 3 assesses the current situation over the past 10 years, with many results and achievements, many laws, mechanisms and policies reflecting the institution in the relationship with enterprises and science and technology issued with a system of documents and related legal regulations, creating an institutional environment to promote enterprises to invest in science and technology development. However, the impact of science and technology on economic restructuring, improving competitiveness, and the level of participation in the global value chain still has limitations; the overall development indicators show that the socio-economic situation still depends on many factors in breadth.

Based on the research to clarify the current situation of building and operating institutions to promote enterprises to invest in science and technology development, remove obstacles and obstacles, find fundamental solutions to promote enterprises to innovate, apply technology, develop markets...

Chapter 4

ORIENTATIONS AND SOLUTIONS TO IMPROVE INSTITUTIONS TO PROMOTE ENTERPRISE INVESTMENT IN SCIENCE TECHNOLOGY DEVELOPMENT IN VIETNAM BY 2030

4.1. DIRECTIONS, PERSPECTIVE FOR IMPROVING INSTITUTIONS TO PROMOTE ENTERPRISES' INVESTMENT IN SCIENCE TECHNOLOGY DEVELOPMENT BY 2030

4.1.1. Direction

Globalization, the process of internationalization of production, and internationalization of the division of labor are taking place more and more

strongly. Actively participating in the global value chain has become a mandatory requirement for economies to avoid falling behind.

In order to survive and develop in the current context, businesses must not only be able to effectively utilize resources, but also be pioneers in applying scientific and technological advances, closely linking their business careers with the activities of the intellectual community.

* Requirement for rapid and sustainable development.

* The urgency of productivity growth to achieve the aspiration for rapid and sustainable development requires the State to quickly improve the effectiveness of institutions. The number one priority for reform is to create a good administrative, legal and social environment for enterprises to actively invest in R&D activities, improve technology, and increase production and business productivity.

* Requirements from enterprises: Basically, the rise to raise the level, increase the scale, promote the potential and internal strength of enterprises and economic entities themselves are the decisive factors for not only survival and development but also sustainable standing in the domestic market and international interaction.

4.1.2. Perspective

4.1.2.1. Strong, comprehensive and synchronous institutional innovation to promote enterprises to invest in science and technology development

4.1.2.2. Viewpoint on institutional development to create motivation to promote enterprises to invest in science and technology development

4.1.2.3. Viewpoint on building and developing institutions in the direction of harmonizing interests, creating an environment to promote enterprises to invest in science and technology development.

4.2. SOME MAIN SOLUTIONS

4.2.1. Raising awareness of the urgency of building and perfecting institutions to promote business investment in science and technology development

4.2.1.1. Party committees and authorities at all levels need to have a deeper understanding of creating an institutional environment for businesses to actively invest in science and technology development.

4.2.1.2. Raising awareness and promoting the central role of businesses in NIS.

4.2.1.3. Finance for research, development and innovation.

4.2.1.4. Investing in developing human resources for innovation.

4.2.1.5. Developing links between institutes - schools and businesses.

4.2.2. Improve institutional capacity to promote business investment in science technology development

4.2.2.1. Complete regulations and policies to improve the investment environment.

4.2.2.2. Pilot preferential policies on finance and credit for investment projects, incubation, and high-tech development that can bring high value when applied in production and business development activities and processes, serving key export industries.

4.2.2.3. Develop a highly qualified workforce.

4.2.3. Building a favorable environment for enterprises to invest in science and technology development

4.2.3.1. Supporting environment for enterprises to invest in science and technology development.

4.2.3.2. Supporting enterprises to overcome barriers to investment in science and technology development.

4.2.4. Improve the effectiveness of operations and institutional implementation to promote enterprises to invest in science and technology development

First, develop mechanisms and policies to encourage the establishment and use of funds for research and technological innovation; at the same time, empower economic entities to proactively use the funds.

Second, develop policies and mechanisms for State - Institute, school - Enterprise cooperation; commercialize and quickly bring products and intellectual property into production and business practices.

Third, improve the quality of human resources.

4.2.5. Promoting the positive impact of the market to encourage enterprises to invest in science and technology development

4.2.5.1. Developing a synchronous, modern and integrated market

4.2.5.2. Strengthening institutions linking resources and markets.

4.2.6. Implementing social equity in investment in science technology development.

- On the basis of socializing R&D and improving technology, it is necessary to continue diversifying financial sources for investment in science and technology.

- Innovating the allocation mechanism, enhancing the effective use of financial resources for science and technology.

- Supporting and creating an institutional environment to promote credit funds and financial institutions.

CONCLUSION

In recent years, the business sector investing in science, technology and innovation in Vietnam has become increasingly diverse and effective in an institutional environment with remarkable developments. However, although Vietnam has achieved many results in building a legal corridor and an environment that encourages businesses to invest in science and technology development, in reality, many investors and businesses still face difficulties in implementing plans and projects to invest in scientific research, development and application of technology; there are still many obstacles in trading science and technology products in the market.

To resolve current difficulties, it is necessary to promote investment participation and increase the innovation index of economic entities, the pillar of which is the business sector. Strengthening the institutional improvement of

"promoting enterprises to invest in science and technology development", innovation, improving business capacity as well as the competitiveness of the economy is of vital significance to develop the economic restructuring in depth and modernity.

Accordingly, it is necessary to have synchronous solutions to perfect the institution to promote the comprehensive resources from the budget and social and environmental resources to promote enterprises to invest in R&D, develop technology, and innovate, in order to multiply new growth drivers for the economy. These are: Deeply aware of the urgency to perfect the "institution to promote enterprises to invest in science and technology development"; improve the capacity to promulgate institutions; the effectiveness of operating and implementing those institutions; valuing and promoting the positive impact of the market; taking advantage of the positive features of informal institutions, arousing the desire to get rich, national self-reliance to stimulate enterprises to invest in R&D, develop technology, etc.

The State needs to build a system of policies and incentive mechanisms to promote the role, capabilities and resources of economic sectors, entrepreneurs, enterprises, social organizations and individuals to increase investment in scientific research, technology transfer and application. Promote reform, improve efficiency, improve the overall business investment environment, increase fair competition, create access to financial and credit resources. At the same time, strengthen the connection and cooperation between research facilities and units and enterprises.

With effective institutions, it is necessary to help enterprises improve their production and business capacity on the basis of science and technology, promote all potentials of economic sectors, thereby contributing significantly to improving the resilience and competitiveness of the economy, developing the country quickly and sustainably.../.

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BY THE AUTHOR RELATED TO THE THESIS TOPIC

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