

# THE IMPACTS OF SCIENCE AND TECHNOLOGY ON PRODUCTION RELATIONS IN VIETNAM TODAY

Nguyen Thi Thuy

University of Economics & Business  
Administration, Thai Nguyen University  
Email: [thuytrietnv@gmail.com](mailto:thuytrietnv@gmail.com)

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*The decision to change the relationship of production in each country depends on the nature and level of development of its production forces. Among them, the development of science and technology as a special production force, direct production force, a decisive factor and profound impact on production relations. In this study, the author focuses on analyzing the role and impact of science and technology on the development of production forces. Science and technology is also an important agent to diversify the objects of ownership in Vietnam, making a profound change in organizational relations and production management; At the same time, along with the strong international integration process, distribution relations also have great changes. Therefore, grasping the outstanding achievements of science and technology in the world, especially the achievements of the fourth industrial revolution, from which applications to our country's production process are responsibilities of the entire Party and people in the process of speeding up the production process toward industrialization and modernization of the country.*

**Keywords:** Relations of production; Forces of production; Impact of science and technology; Fourth industrial revolution.

## 1. Introduction

Today, the rapid development of science and technology, especially the fourth industrial revolution, has gradually penetrated strongly into every small corner of social life. This is a big turning point, people are liberated from manual labor, playing a managerial and creative role in the development process. As one of the factors that make up the production force, science and technology with its strong development, has been and will become a key to transforming the production and business forces, which strongly impact the production relations in Vietnam nowadays and in the future.

## 2. Research overview

Facing the continuous development of science and technology, the forces of production has made significant progress, in the direction of modernization, which has led to changes in the relations of production. This is a matter of interest and research by many domestic and foreign scholars. However, in order to make it clear that science and technology are the factors leading to the transformation of production relations in Vietnam today, it is necessary to access documents related

to this content to obtain data research. Firstly, there is a group of documents related to the content of the transformation and explosion of science and technology such as: Research works as “The Third Wave” (Toffler, 2007); Schwab (2018) with the “Fourth Industrial Revolution”; L. Friedman (2007) with “The World is Flat”; Besides, there is a group of documents related to production relations, the transformation of production relations, namely: “K. Marx and F. Engels: Full volume” (Marx & Engels, 1993); “Change of production relations in Vietnam today - the situation and problems posed” (Vinh, 2019)... The above researches are in-depth analysis of the fourth industrial revolution, the change of production relations, but there has not been any research study to analyze the impact of science and technology on the change of production relations in Vietnam today. On that basis, the content research: “Science & technology - factors leading to the change of production relations in Vietnam today” is the necessary content to study in the current context.

## 3. Research methods

Research results on the transformation of production relations due to the development of science and technology are made on the basis of

applying dialectical materialism with methods such as scientific abstraction, historical - logical... In addition, the article also uses methods of analysis, synthesis, comparison, statistics... to explore the content.

#### 4. Research results

##### *4.1. The role of science and technology with the development of production forces*

The dialectical relationship between the forces of production and the relations of production is expressed as a basic law of the movement and development of human society - the law of the suitability of production relations with the level of development of production forces. This is the basic rule which impacts in the entire history of humanity and together with other laws make the history of mankind from low to high, from this socio-economic form to higher socio-economic form, regulating the development of socio-economic forms as a historical-natural process.

The force of production is the relationship between people and nature, showing the level of human conquering nature in certain historical periods. The relation of production is the relationship between people in the production process. This relationship is material and objective. According to Marx: "In the social production of one's life, people have certain, indispensable relationships, not depending on their wishes - that is, the relation of production, which is appropriate, consistent with a certain level of development of their physical production forces" (Marx & Engels, 1993, volume 13, pp. 14-15). Production relations are the social form of the productive force, which constitute the economic structure of society and serve as the profound basis of the social and spiritual life. The production relationship of a mode of production is a system including: ownership relations of means of production, relations of production management organizations and relations of product distribution. In particular, the ownership relation of means of production is considered the basic relationship and determines other social relations.

The forces of production and the relations of production are two components of the mode of production. When discussing the factors that constitute the production force, in addition to promoting the role of two factors of production materials and workers, K. Marx emphasized the role of science, considering it as one of the most important factors promoting the development of production forces.

According to K. Marx: The different economic eras are not in what they produce, but in how they are produced, with which labor material

(Marx & Engels, 1993, volume 23, p. 269). The increasing penetration of science and technology into production and life is the basic cause leading to the rapid development of production forces. Science and technology has gradually become a direct production force, a special production force like K. Marx predictions from more than half a century ago and that is also the characteristic of modern production forces. However, it is important to understand that science and technology cannot create any impact on their own, but it must be through the application and practical activities of human beings in order for science to be effective. In other words, science becomes a productive force provided that science exists in the form of labor materialized into machines.

Science and technology become the direct production force when penetrating all the components of the production force. Thanks to science and technology, labor tools are increasingly improved, human labor is released. People are increasingly creating many types of artificial workers, overcoming the limitation of working time and some other characteristics of natural workers. Along with that, the qualifications, skills and techniques of employees are improved. In many factories, the number of scientific workers involved in the manufacturing process accounts for an increasingly high proportion, exceeding the number of regular labors. The contingent of intellectual workers appears and tends to increase both in quantity and quality. As a result, the activities of leaders, managers and producers of production are more effective, contributing to improving labor productivity, quality and production efficiency.

Vietnam embarked on the construction of socialism under very difficult starting conditions, not only in terms of facilities but also limited human resources. Low and unequal qualifications among industries and regions of the productive force require appropriate production relations at different levels (Vinh, 2019, p. 19). However, before the renovation period, due to the hasty mentality and subjective will, the relation of production could go one step ahead of the development of production forces, making our country's production fall into a deadlock, economic crisis and difficulties in all aspects of social life. From 1986 to now, the production force of Vietnam has grown significantly, both in terms of workers and production materials, especially labor tools. According to the General Statistics Office of 2018, the number of working employees who have undergone continuous training increases. However, basically the current Vietnam market is still a source of low quality human resources, cheap and limited labor productivity.

In addition, the application of scientific and technological achievements to production has contributed significantly to the development of production materials, first of all, improving labor tools and expanding the working population. According to the Global Innovation Index 2014 of the World Intellectual Property Organization, Vietnam's technological innovation index ranked 71/143, ranked 4th among ASEAN countries. However, the research, development and application of science and technology in production are still limited. The level of mechanization, automation and computerization of many economic sectors in general is still limited, however, the infrastructure for production also has significant developments.

In general, the level of development of production forces in Vietnam is uneven across regions, regions and economic sectors. Therefore, the existence of production relations with many forms of ownership, multiple modes of organization, production management and diversified types of distribution in Vietnam is an objective necessity.

#### ***4.2. Science and technology with the current transformation of production relations in Vietnam***

The science and technology revolution is radically transforming the modern production force, one of the important factors promoting the socialization of production forces. The history of human society has experienced three great industrial revolutions, achieving great achievements in economic and social development. Mankind has entered the fourth industrial revolution (Industrial Revolution 4.0). The great impact of the industrial revolution 4.0 is one of the key factors, basically driving modern production forces to regularly mobilize and develop. The developed production force, in turn, requires a corresponding production relationship in line with the level of development of the production force on all three dimensions: ownership of means of production and organization, management of production and distribution of products. Along with the process of globalization, Vietnam is influenced and has many opportunities to access advanced scientific and technological achievements in the world. Therefore, the development of science and technology is one of the factors leading to the change of production relations in Vietnam today, besides domestic and world factors. The impact of science and technology transforming production relations in Vietnam is reflected in all three aspects of production relations.

##### ***4.2.1. The strong development of science and technology is an important agent in diversifying ownership objects in Vietnam***

In order to meet the requirements of domestic

socio-economic development and international integration, in recent years, Vietnam has admitted many new ownership objects such as intellectual products, brands, information ... and increasingly promote protection activities according to international practices. In particular, the emergence of intellectual property contributes to affirming the trend of separation of ownership and user rights and at the same time contributes to promoting the diversification of ownership forms in Vietnam (Vinh, 2019, p. 26).

Under the continuous development of production forces, especially in this day and age when science and technology are becoming direct production forces, special production forces, and subjects with many variables. change. In addition to traditional means of production such as land, resources, minerals, machinery, etc., there are new ownership objects such as products of science and technology, which are intellectual and information products, brands, internet domain, cyberspace, even development opportunities when seizing the opportunities, catching up with the achievements of science and technology. Today, with the penetration of the fourth industrial revolution, the new ownership objects are: 3D printing technology, sensors ... These ownership objects play an important role in the socio-economic development. Today, with the development of the knowledge economy, intellectual products are considered to be the most important ownership objects. Laws on intellectual property protection in the form of monopoly. So far, intellectual property rights protection activities are relatively strictly regulated by national and international legal systems and many intellectual property protection organizations. And intellectual property is increasingly playing an important role in the socio-economic development of each country. Protection of intellectual property rights is considered an essential condition to attract investment and promote international economic cooperation.

In Vietnam, the intellectual property objects are acknowledged more and more abundant, attract foreign investment, encourage technology transfer, promote creative research activities in many fields... Investment in scientific and technological development is a condition for the creation of more intellectual products, but the protection of intellectual property rights provides a strong motivation for creative labor. Thus, in parallel with the development of science and technology, the State needs to promote the completion and enforcement of the legal system of intellectual property, encourage creative labor, and limit the "brain drain," counterfeit goods. This is also a

problem for Vietnam to create many intellectual property products in the context of the rapid development of science and technology.

Besides intellectual property, businesses and countries are also interested in information ownership. Information today has become an important element of production in the context of the global economy. Especially, during the fourth industrial revolution, it is clear that information resources play an increasingly important role in the socio-economic development of every country. Therefore, the urgent need is to improve the information supply infrastructure system, enterprises need to actively seek information, and the information provision role of state agencies should be improved. It aims to boost production efficiency of enterprises as well as the country's economy.

#### *4.2.2. The strong development of science and technology has also led to profound changes in organizational relations and production management*

Firstly, the impact of science and technology leads to innovation of organizational model and production management

Currently, the fourth industrial revolution has posed many challenges with the organization and management of production from macro to micro. In other words, with strong impacts that change people's lives and production habits, new inventions in science, especially in information technology, require and facilitate innovation in the management mode with job management software, mobile office, e-government... This context requires a deep and intensive application of science and technology to the organization and management of production in both the macro and micro scale of all economic entities to adapt to the information society and knowledge economy (Vinh, 2019, p. 27).

Under the impact of the scientific-technological revolution and globalization, along with the rapid development of production forces, organizational relations and production management in Vietnam have been changing in many ways according general direction of the world. It is common sense that organizational relations and production management correspond to ownership relations, but this has begun to appear in some areas. In the past, the owner was also the direct manager, now with the strong impact of many factors, including science and technology, it has made social production with a series of new fields, expanding in both scale and depth, making the owners not enough knowledge and skills to organize and manage production effectively. This context is a condition for forming a new class, the management class. In Vietnam, with the trend of developing its economy, a number of

global manufacturing and trading economic groups have been formed. Therefore, with this general trend, the class of leaders and managers in Vietnam has an increasingly important role, especially in the production and business system.

The rapid development of science and technology has led to the emergence of a series of new management facilities associated with science and technology. The rise of cloud computing technology not only creates huge data space, but also facilitates the high level of information transparency. Internet system from central to local levels, modern monitoring and management equipment system... effectively supports the government in effectively implementing leadership, management, social organizations as well as organizations. production. At the same time, during the fourth industrial revolution, the internet system connecting all things, IoT technology has a great influence on human economic life. The application of IoT in manufacturing helps businesses optimize resources, carry out production activities more efficiently, and apply this technology in state management to make government activities more effective (Hoa, 2018, p. 78). IoT technology can effectively support the creation of smart factories, many other IoT applications such as smart parking, fuel consumption warning, water and liquid management in production systems ... In Vietnam, the application of this technology can be seen in smart car parks.

Secondly, the scientific and technological revolution contributes to transforming the entity of organization and production management.

In this day and age, the entity that organizes and manages social production is not only the state, but also businesses and every citizen as a wise consumer when the technological revolution has bring some extra work at home such as sales services, ordering, booking services, airline tickets or online delivery, online tutor... Development technology also creates some extra jobs for women, helping them to promote their own gender strengths.

The change in the organization and management entity of production in Vietnam since the renovation until now is due to the process of diversifying the ownership of the regulations, and is also a consequence of the scientific and technological revolution and globalization. Changes in the subject of production management organization as well as the current production management and organization method such as changes in the role of the State in the economic field, increasing the role of enterprises, increasing regulatory role of the market economy... is basically consistent with the general



development trend, making a positive contribution to the socio-economic development of Vietnam. However, there are still inadequacies that require raising the role of the State in the economic field, enhancing the position of enterprises and building a modern market economy.

*4.2.3. The development of science and technology makes the process of strong international integration and distribution relations have made great changes*

The development of science and technology in the context of international integration has led to the specialization of modern production, which has created an increasingly deep and detailed system of international labor division in the direction of “jobs transferred to where it can be done with the highest efficiency” (Friedman, 2007, p. 41), requiring countries to adjust their economic strategy with resource allocation based on advantage to integrate. In Vietnam, from the renovation to the present, the State has made many important adjustments in the distribution policy, from the distribution of input resources of the production process to the distribution of products, in order to create motivation for development economy in the new era. In particular, the role of market actors in distribution regulation is increasingly strengthened.

The results of the fourth industrial revolution include 3D printing technology. Thanks to 3D printing technology, the speed of sample production activities is done faster, the time to introduce products to the market will become faster. When innovation activities are carried out quickly, enterprises also have conditions to carry out more innovation activities. It means that production speed will become faster, delivery time will be significantly improved. When applying 3D printing technology, businesses will find better sources of raw materials and inputs. Storage activities also have many positive changes because the production is quite flexible and fast, there is no need for large reserves and the transport for customers also changes significantly. Instead of being able to produce in a remote location and shipping to customers, now businesses can bring customers closer to production. At the same time, using 3D printing technology also helps businesses reduce costs significantly. However, this technology also brings a number of inadequacies related to copyright, related to the rapid change of the 3D printing technology market, also making some businesses unable to meet the changes of the market and has many consequences.

The development of science and technology with its achievements has created an international specialization of labor that has deepened the freedom

of investment, creativity, and trade. The world market is increasingly expanding. This facilitates improvement of opportunities for beneficiaries of development achievements for the majority of people. However, the consequence of this development is that income inequality tends to increase rapidly. At the same time, the trend of rich and poor division has become more and more polarized, as the beneficiaries are the providers of knowledge capital, modern science and technology, and vice versa. Low-skilled labor, unskilled labor whose income is declining, even losing some occupations. This is a big challenge for developing countries, including Vietnam, requiring the State to promote its role in regulating distribution to ensure the goal of social justice. In recent years, the State of Vietnam has made many adjustments in the distribution of development resources and distribution of development opportunities in order to create conditions for groups of people in remote areas and people with low incomes to access to and use of public services as well as other development outcomes.

At the same time, the emergence of the intellectual property object is the basis of many commercial activities, thereby giving rise to many new manifestations in diversified distribution forms in Vietnam since 1986, most clearly. It is through the form of labor distribution and the form of distribution according to the level of capital contribution and other resources in production and business, in the direction that the income level must be closely linked to labor results and economic efficiency, and at the same time ensure a harmonious distribution of interests among stakeholders in order to motivate employees (Vinh, 2019, p. 28). This is one of the clearest manifestations of the impact of scientific and technological development on distribution relations in Vietnam today.

Along with the strong development of science and technology, the globalization process and international integration have been increasingly deepened. The process of globalization is the process of strongly increasing the relationships, impacts and interdependence of nations and peoples around the world, starting from the 80s of the twentieth century. Under the impact of the modern scientific and technological revolution, the process of globalization takes place at a fast pace, strong intensity and increasing scale. The process of globalization has a strong impact on production relations by contributing to the process of diversification and changing the position of the owner organization, management of production and distribution entities in Vietnam; At the same time, the process of globalization has accelerated the process of diversifying ownership forms, renewing the organization and management of production

methods, and diversifying distribution forms in Vietnam.

## 5. Discussion

### *5.1. Some issues arise from the transformation of ownership relations*

Due to the impact of the development of production forces, as well as the domestic and international context, the transformation of ownership relations in Vietnam during the renovation period has been very complicated. Here, we only discuss the change of ownership object, owner of ownership and structure of ownership forms. Regarding the change of ownership, we assert that the diversification of owners in Vietnam from 1986 to now is not only the result of the diversification of ownership objects and the expansion of the ownership concept, but also the direct effect of the Party's perceived innovation on the transition to socialism. In this context, we see most clearly the changes associated with private and mixed ownership entities. Regarding changes in the ownership structure of the economy, it is reflected in the scale and efficiency of contributions of all economic sectors as well as basic views of the Party and the State on the form of state ownership, collective ownership, private ownership and mixed ownership. One of the most prominent issues from the changing status of ownership relations in Vietnam over the past 30 years is the determination of the key economic sector. This is an important issue during the transition to socialism.

### *5.2. Some issues arise from the transformation of organization and management relations*

The changing situation of the organization of production management in Vietnam from 1986 to present is reflected in three aspects: innovations in organizational model and production management; changes in the organization and production management changes in the organization and management of production; thereby identifying a number of issues raised to solve. Firstly, studying the organizational model and macro-production management in Vietnam, we affirm that the most important innovation is that we have moved from centralized management, bureaucracy, subsidies to socialist-oriented market. In addition, some new points in the organization and production management relations such as the appearance of the management class (CEO), the formation of a network management system are also mentioned. Secondly, in terms of changes in the organization of organization and production management, we see the adjustment of the role of the State in the economic field, the increase in the role of enterprises and the increase in the role of economy of the

market. Thirdly, with the diversity of ownership and organizational entities managing production, the mode of organization and management of production in different types of enterprises is also very diverse; However, we see changes in the organization and management of social production of the State through basic regulatory tools, including laws, plans and economic instruments. From the changing situation of organizational relations and production management from 1986 up to now, we see the outstanding role of the State in the management of social production, because this is a fundamental issue for addressing issues that are emerging in Vietnam's economy today.

### *5.3. Some problems arise from the transformation of distribution relations*

The changing picture of distribution relations is expressed in three aspects: the variation on the distribution subject, the change in distribution object and the change in distribution form. Since the renovation till now, in Vietnam, there is no longer only a single distribution entity, the State, but more markets with many different economic entities taking part in regulating the distribution relations and in the new mechanism, the role of the distribution agency of the State has changed a lot. Regarding the distribution object, the Party and the State and other distributors not only pay attention to the first distribution but also redistribute; Besides income distribution, the distribution of development resources, distribution of development opportunities and distribution of development achievements are increasingly being valued. Regarding the distribution form, there has been diversification of the distribution form, including innovations in labor distribution, supplementing the distribution form according to the level of capital contribution and other resources in production, business (based on economic efficiency), distribution through social welfare, and distribution through the social security system (based on social efficiency). Although the changes in distribution relations have contributed positively to the socio-economic development, the current situation of changing distribution relations is posing many urgent problems, including the role of the State in ensuring fair distribution in Vietnam today. The polarization of the rich and the poor and its implications proves the importance of the issue.

## 6. Conclusion

Therefore, in Vietnam today, in addition to traditional means of production, there are many new ownership objects that are increasingly playing an important role in production, in particular, and in the socio-economic life in general. The transformation of production relations is the actual change of

relationships between people in the production process, including: ownership relations, production management relations and distribution relations. The change of production relations in Vietnam is influenced by many factors and decisions, in particular due to the crisis of the centralized planning and subsidizing economic model in Vietnam before reform; depends on the level of development of Vietnam's manufacturing force; the Party's perceived innovation in socialism and the transition to socialism, besides the stormy impact of science

and technology as an element of production force contributes to drastically changing the production relations in our country. Facing these factors, especially the development of the fourth industrial revolution, requires each country to have certain strategies, leapfrog scientific achievements and limit the risks, difficulties and challenges to create favorable conditions for production development, bringing the country's economy up. The change of production relations of each country is a problem causing many changes in the socio-economic life.

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## TÁC ĐỘNG CỦA KHOA HỌC VÀ CÔNG NGHỆ ĐỐI VỚI QUAN HỆ SẢN XUẤT Ở VIỆT NAM HIỆN NAY

Nguyễn Thị Thúy

Đại học Kinh tế và Quản trị kinh doanh,  
Đại học Thái Nguyên  
Email: [thuytrietmv@gmail.com](mailto:thuytrietmv@gmail.com)

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### Tóm tắt

Quyết định đến sự biến đổi của quan hệ sản xuất ở mỗi một quốc gia phụ thuộc vào tính chất và trình độ phát triển của lực lượng sản xuất của quốc gia đó. Trong đó phải kể đến sự phát triển của khoa học và công nghệ với tư cách là lực lượng sản xuất đặc biệt, lực lượng sản xuất trực tiếp, là nhân tố quyết định, tác động sâu sắc tới quan hệ sản xuất. Trong nghiên cứu này tác giả tập trung phân tích vai trò, tác động của khoa học - công nghệ đối với sự phát triển của lực lượng sản xuất. Khoa học - công nghệ cũng là tác nhân quan trọng làm đa dạng hóa đối tượng sở hữu ở Việt Nam, làm nên sự thay đổi sâu sắc trong quan hệ tổ chức, quản lý sản xuất; đồng thời, cùng với quá trình hội nhập quốc tế mạnh mẽ, quan hệ phân phối cũng có những biến đổi lớn. Vì vậy, nắm bắt được những thành tựu vượt bậc của khoa học - công nghệ trên thế giới, đặc biệt là những thành quả của cuộc cách mạng công nghiệp lần thứ tư, từ đó ứng dụng vào quá trình sản xuất của nước ta là trách nhiệm của toàn Đảng, toàn dân trong quá trình đẩy mạnh quá trình sản xuất theo hướng công nghiệp hóa, hiện đại hóa đất nước.

### Từ khóa

Quan hệ sản xuất; Lực lượng sản xuất; Tác động của khoa học và công nghệ; Cách mạng công nghiệp lần thứ tư.