Green transition, digitalisation in a circular economy to improve the total factor productivity in Quang Ninh

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Abstract:
Total factor productivity (TFP), also known as Solow's residual, is a measure of the share of production growth that cannot be explained by increases in inputs like capital and labor. It captures the impact of technical development, increases in production, and other unnoticed elements. To improve the productivity of total factors, Quang Ninh needs to innovate its growth model, fully exploit favorable natural conditions and natural resources, and implement green transformation and digital transformation to a circular economy, mobilizing maximum domestic and foreign capital, improving the quality of human resources, enhancing scientific applications and expanding international cooperation.

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1. Green transition and digitalisation in the global context

Productivity represents advances in better use of inputs of production (resources, capital and labor) to produce higher outputs with higher quality. In economics, productivity is the efficient use of economic resources. Productivity is also associated with the quality of growth. Productivity increases thanks to scientific and technological advances that constantly improve qualifications, management techniques, skills, and labor experience to ensure optimal and effective use of scarce input resources to produce the maximum amount of output with fair distribution to ensure social efficiency, along with environmental protection to ensure efficient sustainable use of natural capital. Nobel Prize-winning economist Paul Krugman said: "Productivity is not everything, but in the long run, it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise output per worker" (Krugman 1994). Therefore, improving labor productivity is the key to improve living standards over time.

TFP reflects the combined contribution of factors to the effective use of all input resources through the optimal choice of economic decisions in the use of capital and labor. TFP is not directly due to the partial productivity of each input factor of production. TFP reflects progress in science, engineering and technology, education and training, through which increasing output depends not only on increasing the quantity of inputs but also on the quality of inputs. Input factors are capital and labor. Increasing TFP is associated with applying technical advances, technological innovation, improving management methods and improving skills and qualifications of workers... With the same amount of input, the amount of output can be larger thanks to improving the quality of labor and capital and using these resources more effectively (Solow, 1994).

The Chinese Communist Party's "ecological civilization" stance since 2007 was reinforced in the 2022 Political Report of the Communist Party of China, which affirmed that "nature is the basic condition for existence and development of human beings. Respecting nature, obeying nature and protecting nature are internal requirements to comprehensively build a modern socialist state. The cradle of all living things, humans and nature is a living community (Yong, R. 2007). Ecological and environmental security is an important part of national security, an important guarantee for sustainable and healthy economic and social development" (Kennedy and Johnson, 2015).

Global investment in the green transition will triple by 2030 from US$ 1 trillion in 2022 (European Commission, 2020). The 2019 Labor Party Manifesto set out a plan to transform UK society and the economy to tackle climate change through a Green Industrial Revolution based on investment in the circular economy, energy renewables and low-carbon infrastructure to radically transform the way public transport services are owned

and operated, and to review agricultural subsidies to prioritize natural habitat conservation and ecosystem restoration. The European Commission has announced the focus of its strategy to lead the green industrial revolution through a circular economy to compete with the United States and China in creating clean technology products and access the raw materials needed for the green transition to ensure Europe is not only at the forefront of cutting carbon emissions but also ahead of the technology needed.

2. To implement the strategy and policy towards improving TFP in Quang Ninh

Vietnam's Communist Party's viewpoints and policies from the 6th Congress (1986) to the 13th Congress (2021) have determined that environmental protection and response to climate change are vital issues for the country and people, has an interactive impact on the country's sustainable socio-economic development. Responding to climate change and building a harmonious and friendly ecological environment requires the cooperation and contribution of the entire world community. Managing, exploiting, and using natural resources economically and effectively, protecting the environment and responding to climate change are both goals and basic contents towards sustainable development. The 13th Party Congress has determined the viewpoint on innovating the growth model and restructuring the economy: Rapid and sustainable development relies mainly on science and technology, innovation and digital transformation. Vietnam must innovate thinking and action, proactively grasp promptly and effectively take advantage of the opportunities of the Fourth Industrial Revolution associated with the process of international integration to restructure the economy and develop a digital economy, a digital society to improve productivity, quality, efficiency and competitiveness of the country. The market plays a key role in mobilizing, allocating and effectively using production resources, especially land. The legal system must promote innovation, digital transformation and the development of new products, services and economic models.

Resolution No. 230/NQ-HDND dated December 7th, 2020 of the 13th People's Council of Quang Ninh affirmed the goal of improving the quality of economic growth. Restructuring the economy is associated with innovating growth models, improving productivity, quality, efficiency and competitiveness, promoting administrative reform, improve an open and favorable investment and business environment, and unleash all resources. Quang Ninh Province promotes sustainable development of the tourism industry, focusing on in-depth development, effectively implementing Resolution No. 08-NQ/TW dated January 16th 2017, of the Politburo, Resolution No. 07-NQ/TU dated May 24th 2013, Resolution No. 02-NQ/TU dated February 5th 2016, of the Provincial Party Committee on service and tourism development. Quang Ninh needs to strengthen the application of science and technology in management and development of goods, services and tourism; ensuring a secure, safe, clean, beautiful, friendly and sustainable environment for long term growth.

In the economic and social development strategy to 2030, with vision 2045, the Province needs to focus on comprehensively implementing the goal of improving the quality of economic growth; restructuring the economy towards developing services and tourism associated with innovating growth models; Developing Quang Ninh culture and people and high-quality human resources, associated with promoting the application of science and technology and innovation; Strengthening resource management, protect the environment, preventing natural disasters, and proactively responding to climate change. Improving the TFP is the basis for Quang Ninh to successfully implement the Resolutions of the Party, People's Council on strategy and development planning of the Province until 2030.

3. Green transition and digitalisation in a circular economy are keys to improve TFP in Quang Ninh

Quang Ninh is the province with the highest investment efficiency compared to provinces/cities in the Northern key economic region and the whole country, based on the incremental capital-output ratio (ICOR). During the period 2011 - 2020, the ICOR of Quang Ninh decreased from 6.3 in 2011 to 5.414 in 2020, showing that the efficiency of investment capital has increased over time. Quang Ninh has the highest labor productivity (GRDP/worker) compared to other localities in the Northern key economic region and compared to the whole country in 2019, reaching 270.7 million VND/worker, and increased up to 325.7 million/employee in 2020, three times higher than in 2011. Labor productivity is due to the mining industry, specifically coal mining, which contributes a significant part to Quang Ninh's economy. In 2020, among economic sectors, the labor productivity of the agriculture-forestry-fishery industry reached 75.9 million VND/employee, much lower than the labor productivity of the service industry group estimated at 305,000 VND/worker. Quang Ninh's labor productivity growth rate in the entire period 2011-2020 reached 8.3%, ranking 8th/63 localities in the country and 4th/11 localities in the Red River Delta Region (after Hai Phong, Ha Nam and Bac Ninh). Similar to the GRDP growth rate, Quang Ninh's labor productivity growth rate in the period 2016 - 2020 (11.1%/year) is superior to the period 2011 - 2015 (5.6%/year).

At the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP26), Vietnam committed to bringing net emissions to "zero" by 2050. In the Nationally Determined Contributions updated in 2022 submitted to the United Nations, Vietnam aims to reduce total greenhouse gas emissions by 43.5% by 2030 if there is international support, a remarkable increase compared to 27% of 2020 NDC. At the 15th Conference of Parties to the United Nations Convention on Biological Diversity (COP15), Vietnam and 190 countries approved the "Kunming - Montreal Global Biodiversity Framework". After South Africa and Indonesia, Vietnam is the third country to reach an agreement to establish the Just Energy Transition Partnership (JETP).

Quang Ninh Province considers environmental protection a condition, foundation, and prerequisite to promote sustainable socio-economic development. Quang Ninh must combine pollution prevention with environmental improvement while preventing and repelling the trend of increasing pollution and environmental degradation, solving urgent environmental problems, and restoring environmental quality. Quang Ninh needs to prevent the loss of biodiversity, to improve capacity and awareness of environmental protection, gradually proactively respond to climate change; ensuring environmental security, building and developing a circular green low carbon economy towards the goal of sustainable development. Environmental protection is the responsibility of the entire political system and the entire society, in which local authorities, businesses, communities and people play important roles.

On average each year, the volume of waste dumped at coal mining sites in Quang Ninh is about 150 million m^3. Current reserves of landfills are about over 1.3 billion m^3 of soil and rock. To minimize the risk of landslides and affect the living environment of people around the area, Quang Ninh and the coal corporations have agreed to take advantage of this mine waste soil and rock source for leveling infrastructure projects. This is considered a new direction that brings high efficiency in circular economic development. Increase the use of mine waste soil and rock as filling material. Using soil and reused mine waste rock as backfilling materials for projects in Quang Ninh addresses the urgent need for backfilling materials while also reducing resource exploitation and waste treatment costs, minimizing environmental pollution and significantly reducing business costs. Quang Ninh needs to propose the Ministry of Natural Resources and Environment to develop mechanisms and policies and complete procedures for licensing mining waste dump areas.

Quang Ninh currently has 176 lakes and dams operating to provide water for irrigation and daily life for the people. The useful capacity of the reservoirs is over 315 million m^3. Quang Ninh needs to take advantage of post-mining mines to renovate them into reservoirs. Specifically, for the mining pit area, it is necessary to renovate the mining pit into a water reservoir; to build sewers to drain water into the sea. Renovating coal mines into freshwater reservoirs not only helps save recovery costs but also opens up new opportunities for many other coal mines to be converted into freshwater reservoirs after mining in consistent with the circular economy development trend that Quang Ninh is encouraging to replicate. Quang Ninh needs to update the environmental protection project to have effective solutions to protect water sources.

Quang Ninh needs to apply digital transformation and digital technology to reduce transaction costs, trace the origin and composition of products, materials, waste streams of plastic, metal, lubricants, rubber, glass, wood, paper and other biomass (National Science Agency of Australia, 2021). The quality of secondary materials, reusability and recycling of goods and materials in the value chain is important. Quang Ninh needs to expand and accelerate the application of scientific and technological achievements, especially information technology, promoting smart production, tourism, healthcare, education, information and communication, and political construction towards digital Government and building smart cities. The contribution of TFP to the Province's economic growth should reach over 50% ▪

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