



Sustainable Industrial Development in Vietnam

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Abstract

Vietnam is one of the countries with the highest industrial growth rate in the world. However, growing in the industry is based on the width factor and labour - intensive industries and assembly. The goal set out to 2030 is to turn Vietnam into a Middle-Income Country (MIC) with a modern industry that poses many challenges, requiring the industry to need stronger restructuring to improve competitiveness, competition and deeper participation in global value chains. From the analysis of the current situation of industrial development in Vietnam, the article identifies the limitations in the sustainable development of Vietnam's industry and gives orientations and solutions to promote the sustainable development of Vietnam's industry in the context of Industrial Revolution 4.0 and the digital economy.

Keywords: industry, sustainable industrial development, the 4th industrial revolution, restructuring, industrial competitiveness, CIP

1. Introduction

The development of Vietnam's industry has achieved significant achievements over the past 30 years, contributing to Vietnam's industrialization and modernization process. Despite being heavily affected by the global economic crisis since 2008 and the Covid-19 pandemic, Vietnam's industry has maintained a relatively high growth rate. The average growth rate reached 7.6% per year from 2010 to 2021. The increased industrial growth has contributed to the economy's structural transformation towards industrialization, promoting exports, indirectly driving the growth of service sectors serving production, addressing employment issues, improving workers' income, and stimulating consumption. However, the high industrial development in Vietnam during this period has also revealed specific weaknesses, leading to unavoidable inconsistencies in the economic structure, inefficient resource exploitation, weak competitiveness, and leaving negative environmental consequences, among others.

The growth of the new industrial sector has only been achieved in terms of quantity. However, there are still many shortcomings in the quality of this growth, particularly in terms of labour productivity, industry efficiency, and weak competitiveness. To develop a sustainable industry, enhancing the quality of industrial development is one of the urgent tasks that the industrial sector must undertake in the context of globalization and the Fourth Industrial Revolution.

The current problem facing the Vietnamese industry today is that without appropriate direction, the underlying causes of the decline in growth cannot be addressed, and the quality and effectiveness of the industry's growth process cannot be improved. Therefore, sustaining a high growth rate for both the industry and the overall economy will be challenging to achieve.

To measure the sustainable development of the industrial sector, the author presents three groups of criteria: (i) growth and the growth structure of the industry. The structure of industrial growth is also evaluated based on the contribution

of different industries to the overall industry growth in order to assess the level of industrial production; (ii) efficiency of industrial growth. This group of criteria is manifested in the output efficiency of growth, reflected in labour productivity, exports, and energy utilization efficiency; and (iii) the spillover effects brought about by industrial growth. This reflects the role and nature of industry spillover, as industrial growth stimulates the development of other fields and industries through the pull and push forces of the industry, as well as environmental pollution issues within the industrial sector.

2. The situation of sustainable industrial development in Vietnam

2.1. Industry growth rate

The value-added growth rate in the post-crisis industrial sector (2010–2021) reached approximately 7.66% per year, surpassing the average economic growth rate of 5.9%. During this period, the processing and manufacturing industry experienced the highest growth rate at 10.82%, while the mining sector had a growth rate of -2.7% (refer to Figure 1).

Despite being considered a rapidly growing sector during 2010–2021 (achieving a growth rate of 7.6% per year), the processing and manufacturing industry primarily remains an outsourcing activity. The lower index of intermediate product output compared to the index of final product output indicates a significant reliance on imported intermediate products in Vietnam's industrial production.

The private industrial sector and the foreign-invested industrial sector have shown considerable growth, indicating a positive shift in the direction of attracting industrial investments by the private sector.

2.2. Industry Growth Structure

The processing and manufacturing industry occupies the highest proportion of the industrial sector structure. From 2010 to 2021, the share of this industry increased rapidly and reached 91.3% in 2017. The reason for this is the increase in

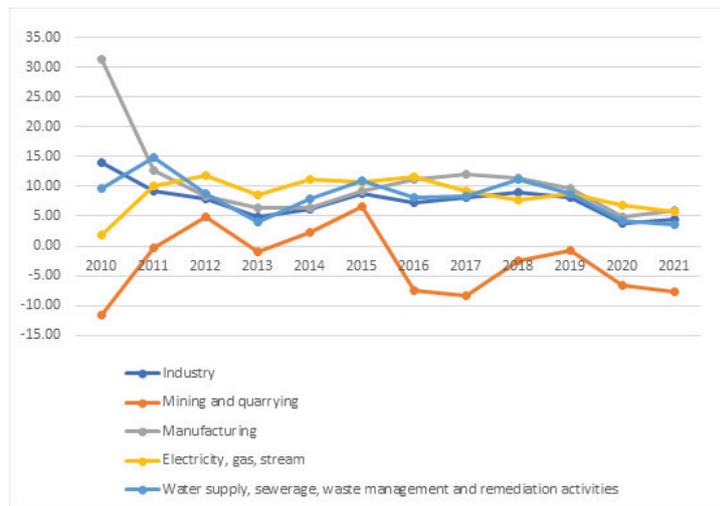


Fig. 1. Growth rate of industry and sectors. Source: Compiled by the author from the data of the General Statistics Office of Vietnam

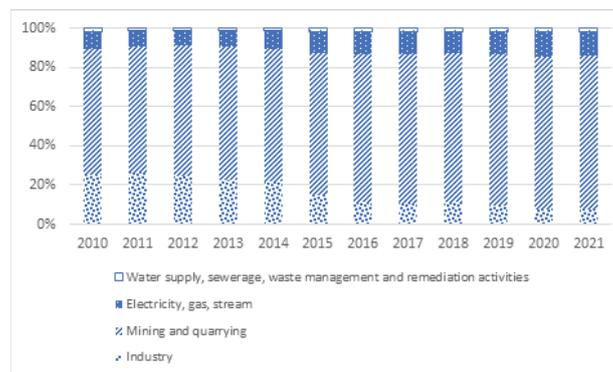


Fig. 2. Industry structure in Vietnam. Source: Compiled by the author from the data of the General Statistics Office of Vietnam

foreign direct investment (FDI) in the processing and manufacturing industry, particularly the contribution of major FDI corporations such as Samsung, Foxcom, Intel, and Canon.

The Industrial Processing and Manufacturing Industry has been making an increasingly significant contribution to the overall value added (VA) of the entire industrial sector, aligning with the industry's development trends. However, an analysis of the structural growth of the manufacturing industry's value-added reveals that from 2011 to 2021, the production structure transformation primarily revolved around the assembly industry, particularly the electronics sector. The supporting industries have not yet fully developed or have shown slower growth trends.

The intermediate cost ratio in the total production value of the continuously growing industrial sector has been increasing, from 57.5% in 1995 to 70.4% in 2005, 81.8% in 2015, and 81.7% in 2021. Examining the subsectors of industrial production also reveals a similar trend, particularly with a noticeable increase in this ratio within the processing and manufacturing industries. The rising proportion of intermediate costs in this sector indicates that Vietnam's overall growth model and the industrial sector still rely heavily on outsourcing. The supporting industry is underdeveloped, especially in sectors such as automotive and electronics.

Structural transformation in some industrial sectors is not truly sustainable. The value added to products in certain industries, such as textiles, footwear, and electronics, has been increasing but slowly. The competitiveness of industrial

products is still limited. Industrial production has yet to participate extensively in global production networks and value chains.

The level of interconnection and business collaboration among enterprises within the same industry and across different industries is still limited, failing to establish a development linkage between sectors. Many businesses operate in isolation, without leveraging the existing capacities of other enterprises to enhance the industry's internal strength and achieve higher production and business efficiency. On the one hand, this increases investment costs for production, and on the other hand, it leads to a waste of shared resources within the industry and unnecessary competition among businesses.

Investment in production still focuses on breadth, with limited investment in depth for existing facilities, and does not fully utilize available resources. Most investment capital in the industrial sector is concentrated in industries with short payback periods, such as consumer goods manufacturing and food processing. At the same time, the number of high-tech projects invested in remains low.

Industry structure by technology level

From 2001 to the present, the level of technology in Vietnam's industrial sector has changed very slowly. According to the classification of industrial sectors by UNIDO (UNIDO, 2014), the proportion of low-technology industries in Vietnam has shown a decreasing trend from 41.5% in 2010 to 34.5% in 2021 (textiles, garments, leather shoes, toys, plas-

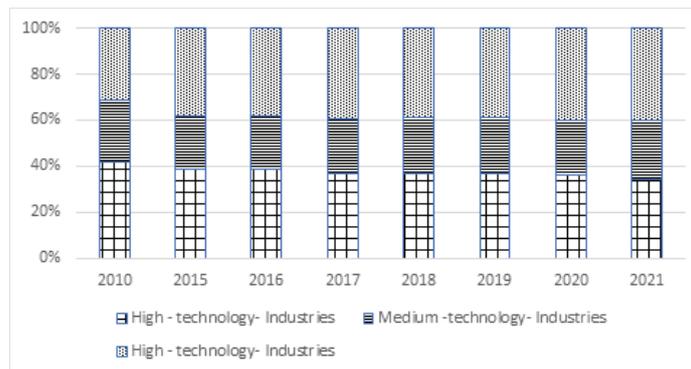


Fig. 3. Structure of Vietnam's industrial production value by technology level. Source: Compiled by the author from the data of the General Statistics Office of Vietnam

Tab. 1. Labor Productivity in the Industrial Sector and its Industry Groups. Unit: million VND. Source: General Statistics Office of Vietnam

	2018	2019	2020	2021	2022
Industries	205.608	201.408	209.383	228.266	248.23
Mining and quarrying	1239.23	1167.44	1108.26	1179.45	1367.8
Manufacturing	163.785	162.416	170.445	186.23	200.158
Electricity, gas, steam and air conditioning supply	1450.91	1462.04	1827.08	2215.11	2722.02
Water supply, sewerage, waste management and remediation activities	238.01	237.544	244.688	250.876	252.829

Tab. 2. Change in CIP rankings of Vietnam and Asian countries over the years. Source: Author compiled from data of UNIDO

TT	Quốc gia	1990	1995	2000	2005	2010	2015	2020	2022
1	Japan	2	1	1	2	2	5	6	8
2	South Korea	17	13	12	6	4	4	4	4
3	China	32	27	22	19	7	2	2	2
4	Singapore	13	11	10	10	6	9	9	9
5	Taipei (China)	13	12	14	13	13	8	8	6
6	Malaysia	39	20	21	23	23	22	21	20
7	Thailand	38	26	26	25	25	24	24	25
8	Indonesia	52	41	39	41	41	40	38	39
9	India	64	54	56	56	45	41	40	41
11	Vietnam	94	91	80	69	58	37	30	30
11	Philippines	50	51	38	46	56	46	43	44
12	Laos	134	126	122	126	124	111	108	109
13	Cambodia	121	119	103	97	94	92	82	83

tic products, wood products, glass, etc.). The proportion of medium-technology industries has decreased from 27.5% in 2010 to about 25.3% in 2021. The ratio of high-technology sectors has increased from 31% to 40.3%. However, this proportion is still lower than the 50-60% range observed in Thailand, China, and Malaysia. The policies and strategies to enhance technology, a knowledge-based economy, and structural transformation of production have been implemented for many years but have not been effective in raising the technological level of the economy. As a result, Vietnam is increasingly lagging behind other countries in the region, particularly those that have been proactive in developing their mid-to-high-tech industrial value chains to transform their production structures.

2.3. Industrial labour productivity

The labour productivity of the industrial sector in 2021 was 195.58 million Vietnamese dong, compared to 113.53 million in 2011. Analyzing labour productivity by industry groups reveals that the productivity of the entire industrial sector surpasses that of the overall economy. This is mainly due to the labour productivity of the extractive industries and the production of electricity and distribution of gas, water, steam, and air conditioning. On the other hand, the labour productivity of the manufacturing industry remains low, even

lower than that of the entire economy. This situation is because the manufacturing industry is still labour-intensive (textiles, leather, etc.) and the processing industry (electronics, automobiles, etc.), resulting in very low value-added. While the overall labour productivity of the economy is increasing, the labour productivity of the industrial sector has shown a decreasing trend in 2015, 2016, and 2017.

There are several reasons for Vietnam's low labour productivity and the significant gap compared to other ASEAN countries. The slow transition in economic structure and the high proportion of agricultural labour contribute to the agricultural sector's low labour productivity. Machinery, equipment, and technological processes are outdated. The quality, structure, and efficiency of labour utilization do not meet the requirements. Other important factors include the low starting point of the economy, deficiencies in organization, management, and efficient use of resources, the low contribution of total factor productivity (TFP) to growth, and institutional and administrative reform bottlenecks.

2.4. Industry competitiveness

In the industrial competitiveness ranking of 2022, Vietnam ranked 30th out of 151 countries, marking an increase of 64 places compared to the 1990 ranking. Vietnam is the country with the highest improvement in industrial competi-

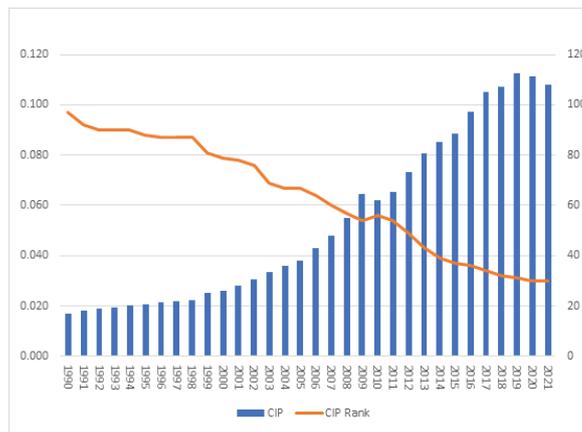


Fig. 4. CIP value and CIP ranking of Vietnam. Source: Author compiled from data of UNIDO

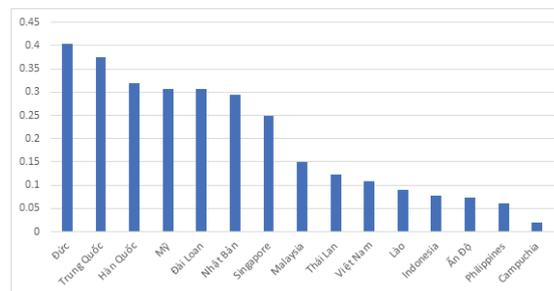


Fig. 5. CIP value and CIP ranking of Vietnam and other countries in 2021. Source: Author compiled from data of UNIDO

tiveness worldwide. This achievement is considered quite significant for the development of Vietnam's industry.

Among the Asian countries, both China and Vietnam have experienced rapid improvement in the CIP index. On the other hand, countries like Malaysia and the Philippines have shown a tendency to decline, while Thailand and Indonesia have generally maintained their positions.

The CIP value of Vietnam compared to other countries

The CIP value of Vietnam has improved over the years, increasing from 0.062 in 2010 to 0.108 in 2021. Vietnam's CIP index ranks only behind Singapore, Malaysia, and Thailand among ASEAN countries. However, Vietnam's CIP index is still very low compared to the maximum value of 1 or the 0.404 value of Germany (the country with the highest CIP).

The average value added of manufacturing industry per capita (MVA per capita)

Vietnam's MVA per capita has increased sharply from 52 USD in 1990 to 380 USD in 2010 and 872 USD in 2021. Vietnam ranks 85th out of 148 countries in terms of per capita GVA. Among Asian countries, Singapore has the highest ranking (2nd out of 148), followed by Japan (3rd out of 148), South Korea (6th out of 143), Taiwan (17th out of 143), Malaysia (41st out of 143), and Thailand (49th out of 143). According to the UNIDO classification, Vietnam's industrial value-added is still much lower than the global average of 1661 USD and the average of 1000 USD for newly industrialized countries. Vietnam will take about ten more years to reach an average per capita GVA of 1000 USD. The low per capita GVA is attributed to Vietnam's heavy reliance on processing industries, lacking supporting and labour-intensive industries such as textiles, garments, leather, and footwear,

which still account for a significant proportion of Vietnam's industrial structure.

From the analysis of the sustainable industrial development based on the criteria mentioned above, the sustainable industrial development in Vietnam can be described as follows:

Firstly, there is high growth, but the effectiveness in achieving growth targets is low, as evidenced by low labor productivity compared to the industrial labour productivity of other countries in the region and worldwide. Additionally, the growth rate of labor productivity is lower than the average growth rate of the overall economy.

Secondly, the low efficiency in achieving the target growth of the industrial sector is reflected in the increasing intermediate costs in industrial production. To obtain a unit of value-added, the scale of production must be expanded, and more input factors must be consumed. The reason for this situation is the inappropriate structure of Vietnam's industrial production, as evidenced by the fact that key industries in Vietnam are still processing, assembling, and largely dominated by foreign direct investment (FDI) enterprises. The assembly process is considered the stage with the lowest value-added in the value chain. The effectiveness of achieving the growth target of the industrial sector can be improved if the industrial structure becomes more reasonable by developing supporting industries and participating more deeply in the global value chain.

Thirdly, the industrial growth structure is not rational. Consider the structure of industrial growth in terms of production value and value added. It is easy to observe a trend where the extractive industries are increasingly being overshadowed by the processing and manufacturing industries. However, a deeper examination of the growth structure reveals that the downstream industries still account for a signif-

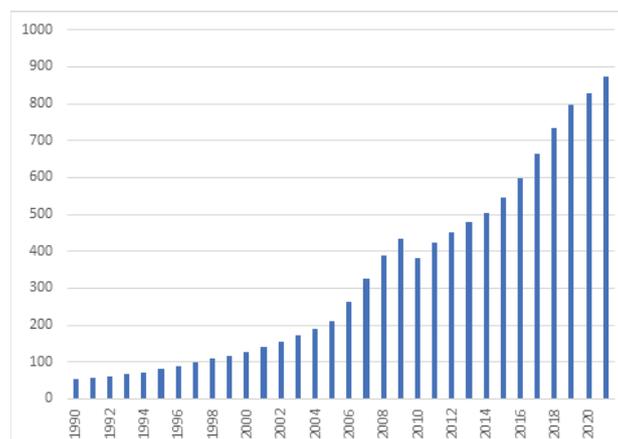


Fig. 6. Vietnam's MVA per capita 1990-2021

icant proportion, while the upstream industries only hold a relatively modest share.

The fourth, The level of linkage and business cooperation among enterprises in the same industry and between industries is still limited, failing to create a development linkage between industries in a specialized and market-oriented cooperation manner. Many enterprises operate independently without leveraging the existing capacities of other businesses to enhance the industry's internal strength and achieve higher production and business efficiency. On the one hand, this increases the investment costs for production, and on the other hand, it wastes the shared capabilities of the entire industry, creating unnecessary competition among businesses in the industry.

The fifth, The growth of the industry still primarily relies on expanding in breadth, by continually expanding input factors to achieve growth. The contribution of technical improvement and technological innovation to the industry's growth in recent times has been insignificant.

3. Solutions for sustainable development of Vietnam's industry

From the analysis of the current state of Vietnam's industrial competitiveness, it can be concluded that the core focus of Vietnam's industrial development lies in the creation of new value through industrial activities (MVA). To achieve this adjustment, attention needs to be directed towards the following issues:

Firstly, transforming the industry growth model

Transforming from an import-oriented industrialization model to a comprehensive export-oriented industrialization, particularly in the fields of mechanical engineering, metallurgy, construction materials, steel, food processing, and agriculture, aims to achieve holistic industrial growth. Shifting towards an industrial growth model that encompasses industries with medium and high technology will facilitate the enhancement of labor productivity and industrial value added (MVA).

Second, Improve the quality of industrial development planning

To improve the quality of the master plan for industrial development, attention should be paid to the following contents:

- In terms of cognition, the development planning of the industry must be understood as a process of argumentation, selecting development options, and rational sectoral

distribution nationwide and across territories. It differs from comprehensive socio-economic development planning and construction planning. The industry development planning should be long-term, coherent, and in line with the country's and its territories' overall development strategy. It must be intersectoral coordinated with relevant sectors, identifying interdependencies, avoiding overlaps, and minimizing conflicts among sectors.

- In terms of the quality of industrial development planning: The development planning of the industry must be based on scientific grounds, avoiding subjectivity, and must have a long-term vision suitable for the industry's developmental characteristics. At the same time, it must be specific for each phase. When constructing the planning, emphasis should be placed on forecasting, particularly in terms of market forecasts for products and the impacts of external factors, the global market, the process of globalization, international economic integration, and their influences on the industry's development during the planning phase."

Third, Improve the quality of human resources

The competitive advantage of a nation, its businesses, and the prerequisites for sustainable development in the coming decades depends greatly on each country's level of human development. Therefore, there is a need for solutions to enhance the quality of education and training as follows:

A key solution is to innovate and enhance the capacity of state management in education and training; comprehensively reform education to align the education system with the development requirements of various industries; promote innovation in content, curriculum, and teaching methods to modernize and adapt to the practical needs of Vietnam, along with innovative educational management mechanisms; resolutely reduce the curriculum content to be suitable for the psychological well-being of students at the primary and secondary levels and establish standards for quality assessment of education.

Urgent implementation of the development plan and improvement of the quality of teachers and education management personnel; restructuring the training system and enhancing practical vocational training. Encourage healthy competition, and create mechanisms and conditions for universities and vocational schools to transition towards autonomous and accountable operations. Innovate mechanisms

and policies to allocate funds for education and training; determine transparency and appropriate contributions from learners, and vigorously address the negatives in teaching and learning. At the same time, have policies in place to ensure that economically disadvantaged individuals have access to education.

Urgent implementation of the project to develop and enhance the quality of the teaching staff and educational management official; restructuring the training system and improving the practical vocational training system. Encouraging healthy competition, creating mechanisms and conditions for universities and vocational schools to transition to autonomous and responsible operations. Innovating mechanisms and policies to allocate funding for education and training; determining transparent and appropriate contributions from learners, vigorously combating negatives in teaching and learning; while also having policies to ensure that children from poor backgrounds have opportunities for education.

Strengthening investment in vocational education, including vocational retraining, to help laborers of working age easily adapt to the frequent changes in the labor market. In order to gradually narrow the gap between training outputs and the current needs of the labor market, the following measures need to be implemented promptly: (i) clearly identifying the fields and industries currently lacking labor, lacking skilled workers, in order to enhance investment and support; (ii) standardizing training institutions, vocational skill development, with clearly defined quality criteria; (iii) closer coordination among stakeholders in the labor market (enterprises in need of labor, training institutions, vocational skill development agencies) in the process of planning policies for training and developing human resources.

Enhancing cooperation with foreign countries and attracting foreign investment in postgraduate and vocational training; encouraging and creating conditions for students to study abroad, accompanied by strengthened management of student mobility.

Increasing investment in education from various sources, with a particular need for increased investment from the state budget; simultaneously mobilizing more and better resources from the public through the promotion of socialization of education and the construction of a learning society.

Fourth, promote industrial restructuring, especially state-owned enterprises

Urgent and proactive restructuring of state-owned enterprises, especially conglomerates in key sectors of the economy, is crucial for mobilizing resources and improving the efficiency of production and business in critical industries of the nation. This approach serves as an immediate solution to reduce administrative costs and enhance operational efficiency while also serving as a long-term strategy to promote restructuring and ensure sustainable growth of the economy in the coming years.

Fifth, continue to improve the investment environment

Building a transformative government aimed at creating a competitive and equitable environment while protecting the interests of domestic industries. Enhancing the implementation of cutting unnecessary business conditions to support

enterprises in increasing production, unleashing production forces closely linked to economic restructuring and enhancing competitiveness. Focusing on reviewing, monitoring, and addressing economic concentration cases, restraining unhealthy competition through effective and practical legal tools. Continuing to closely supervise the construction, improvement, and implementation of consumer protection work, moving towards socializing consumer protection efforts; managing and developing a healthy domestic market for goods and services; promptly resolving difficulties and obstacles in production and business.

Strengthening the administrative reform plan, with a focus on reviewing and simplifying administrative procedures, abolishing unnecessary procedures, or decentralizing administrative procedures to local authorities when possible, modernizing administration, and applying information technology management systems.

Sixth, Strengthening industry technological innovation

Technology and innovation are closely related to ensure sustainable development. Sustainable and comprehensive industrialization can be rapidly achieved when policymakers formulate appropriate policies for the industrialization process, avoiding the mistakes other countries have encountered. Technology can promote all three aspects of sustainable development: economic, social, and environmental. The first aspect refers to a country's ability to change its structure to maintain high growth rates over a long period to catch up with more advanced developed countries. The second aspect relates to the inclusiveness of this structural transformation process in terms of poverty reduction, improving the quality of life, creating jobs, and achieving a more equitable distribution of income, assets, and social welfare. The third aspect is environmental sustainability, which includes the use of resources and environmental impacts that do not harm the interests of future generations.

Although technological innovation is considered a driving force for growth, rapid development through technology remains a phenomenon that is not yet widespread. For Vietnam, the application of technology to economic development, industry, addressing social issues, and protecting the environment still faces many limitations. Vietnam needs to transition through each stage of technological development swiftly. This can be achieved by accumulating capital and investment to move up the technology ladder and high-tech industries.

Conclusions:

Vietnam's industrial sector has achieved impressive achievements in terms of both quantity and quality. It is increasingly gaining a significant position globally. Vietnam's industrial manufacturing products are becoming more diverse and are present in many countries worldwide. However, the quality of industrial growth remains low, as evidenced by the relatively low proportion of medium- and high-tech industries, low industrial value-added (MVA), and Vietnam's small share of global MVA. Vietnam's industrial competitiveness is still low and predominantly led by FDI in the region. Sustainable industrial development is the best way for Vietnam to become a modern industrialized country and overcome the middle-income trap.

Literatura – References

1. Vietnam's Industrial Development Strategy until 2020, vision towards 2030. Hanoi.
2. The Ministry of Industry and Trade, UNIDO (2011), Vietnam Industrial Competitiveness Report 2011.
3. The Ministry of Industry and Trade (2014), Report on the Program on Synchronous Development and Upgrading of Clusters and Value Chains for the production of products with competitive advantages: electronics and information technology, textiles and garments, agricultural machinery, food processing, tourism and related services. Hanoi, June 2014.
4. Ministry of Planning and Investment (2013), Project of Vietnam's industrialization strategy within the framework of Vietnam - Japan cooperation towards 2020, vision to 2030. Hanoi.
5. Nguyen Ngoc Son (2014), Industry development and restructuring in the process of industrialization. Journal of Economics and Development, May 20, 2014 issue.
6. Kenichi Ohno (2014), Approaching the middle income trap some policy suggestions for Vietnam, Vietnam Education Publishing House. Hanoi.
7. UNIDO (2009), Industrial development Report 2009. UNIDO 2009.
8. UNIDO (2014), Industrial development Report 2014. UNIDO 2014.
9. UNIDO (2016), Industrial development Report 2016. UNIDO 2016.
10. UNIDO (2020), Industrial development Report 2020. UNIDO 2020.
11. UNIDO (2021), Industrial development Report 2021. UNIDO 2021.
12. UNIDO (2022), Industrial development Report 2022. UNIDO 2022.
13. Sambor A, Szymanek A Analysis of the migration of chemical compounds from fly ash exposed the weather condition, Chemical and Process Engineering. 2014, ISSN:0208-6425