



**LABOUR IN MANUFACTURING ENTERPRISES  
IN THE INDUSTRY 4.0: THE CASE IN THAI  
NGUYEN PROVINCE, VIETNAM**

**Phung Tran My Hanh** 

Thai Nguyen University of Economics and Business Administration, Vietnam  
phungtranmyhanh.tueba@tueba.edu.vn

**Ma Thi Huyen Nga**

Thai Nguyen University of Economics and Business Administration, Vietnam

**Nguyen Thi Oanh**

Thai Nguyen University of Economics and Business Administration, Vietnam

**Abstract**

*The number of employees working in Manufacturing enterprises in Thai Nguyen province in the period 2016 - 2019 tends to increase. Secondary data in the period between 2016 and 2019 was collected from Thai Nguyen statistics office. Data was analyzed with descriptive and inferential statistics. The results of the article have shown that, average labour income and labor productivity are increasingly improved. Although the labour income of Manufacturing enterprises compared to enterprises in other economic sectors is still high. But compared to other localities across the country, the labor income of Manufacturing enterprises in Thai Nguyen province was still low during the Industry 4.0. In the digital revolution, Vietnam is not really ready for future production with technology changes and low quality of human resources.*

*Keywords: Labour, Manufacturing enterprises, labour productivity, Industry 4.0, Thai Nguyen province*



## INTRODUCTION

Industry 4.0 is based on the main fields of digital technology, biotechnology, robotics, etc that are the foundation for the economy to transform from using natural resources and human resources, low cost to knowledge economy; creating a breakthrough in science, technology and equipment in production. From there, it will create enormous changes in labour supply and demand. Industry 4.0 is requiring changes in human resources due to its extremely important role for the existence and development of each country, each enterprise.

Vietnam is a developing country and human resources Vietnam is in the period of "golden population" - this is a great opportunity for every business in general and for industrial enterprises in particularly knowing how to effectively utilize this abundant human resource. It will also create a strong pressure in securing jobs, meeting the needs of learning, training, and improving the quality of human resources.

According Thai Nguyen Statistics Office (2020) Thai Nguyen is a northern midland and mountainous province in Viet Nam, about 25% of Manufacturing enterprises playing an important role in the socio-economic development of the province creating jobs for human resources as well as other Northern midland and mountainous province. In addition, Thai Nguyen province has the 3rd largest number of professional and vocational training institutions in the country, so the training of human resources is a favourable condition for learning activities, improving quality human resources in the Industrial Revolution 4.0.

Industrial revolution 4.0 also poses many challenges, especially which will dramatically change the structure of labours and the labours market. Automation systems will gradually replace manual labours in the economy as a whole. This will affect the income of simple workers and increase unemployment. The high proportion of high-quality labours increases, resulting in an increasingly fragmented employment market into high-skill, low-skill markets that will lead to increased fragmentation or creation. The demand for employment is totally new compared with the past but it is necessary to actively prepare and regulate appropriate policies.

From secondary data sources, the study was conducted to analyze the reality of labour in Manufacturing enterprises in Thai Nguyen province. Thereby, the research has shown that the effecting of the Industry 4.0 on labours in Manufacturing enterprise in Thai Nguyen province, Vietnam.

## RESEARCH METHODOLOGY

### Research site

Thai Nguyen province is one of the political, economic and educational centres of the northern mountainous midland in Vietnam. Thai Nguyen province is a gateway for socio-

economic exchanges between mountainous midland and northern delta and exchanges were made through the road system and railway that Thai Nguyen city is the central node for.

Along with trending of economic development and the Industrial revolution 4.0 in Vietnam as well as the northern mountainous midland, Thai Nguyen province; with favourable conditions on geographic location, socio-economic characteristics; has created favourable conditions for the enterprise's development. In addition, with the policies about investment and enterprise development of Thai Nguyen's provincial leaders, many industrial zones and enterprises have established and attracted thousands labours from others provinces to work; especially with the number of non-state enterprises and employees who worked in this area increasing annually per year. (Source: Thai Nguyen statistics office, 2020).

To conduct the research, the secondary data sources were used and collected from research articles on labour and the Industrial revolution 4.0 from 2016 to 2019, the period had many changing in science and technology in Thai Nguyen province. In addition, some statistical data was collected from the annual reports of the Thai Nguyen Statistics Office, the Vietnam Productivity Institute, the World Economic Forum and several other international organizations. For the collected data, the author analyzed and synthesized through tables and graphs to illustrate the reality of labor.

## **ANALYSIS**

### **The number of labours in Manufacturing enterprises in Thai Nguyen province, Viet Nam**

In the period from 2016 to 2019, there was a steady increase in the number of labours in manufacturing enterprises in Thai Nguyen province, Viet Nam. In the year 2016, the number of labours was 137,613 people; whereas the number of labours in 2019 was 163,066 people. Average growing rate in this period was about 6% per year.

Manufacturing enterprises by type of enterprise has included Mining and quarrying; Manufacturing (Manufacture of food products and manufacture of beverages, Manufacture of textiles, Manufacture of leather and related products...); Electricity, gas, steam and air conditioning supply and Water supply, sewerage, waste management and remediation activities. The Manufacturing enterprise had the highest number of employees, while labours' working in others Manufacturing enterprise had low.

The information about the number of labours in manufacturing enterprises in Thai Nguyen province has illustrated as table 1:

Table 1. Number of labours in Manufacturing enterprises in Thai Nguyen province, Vietnam

Unit: person

No.	enterprises	2016	2017	2018	2019
1	Mining and quarrying	3.379	3.296	2.921	3.214
2	Manufacturing ( <i>Manufacture of food products and manufacture of beverages, Manufacture of textiles, Manufacture of leather and related products...</i> )	130.779	140.303	155.413	156.325
3	Electricity, gas, steam and air conditioning supply	1.844	1.932	1.900	1.844
4	Water supply, sewerage, waste management and remediation activities	1.611	2.082	1.834	1.683
	<b>Total</b>	<b>137.613</b>	<b>147.613</b>	<b>162.068</b>	<b>163.066</b>

Source: Thai Nguyen statistics office, 2020

### Average labour's income per month of Manufacturing enterprises

Labour income in manufacturing enterprises was at a high level compared to enterprises in other economic sectors. Employee's income of Manufacturing enterprise (Manufacture of food products and manufacture of beverages, Manufacture of textiles, Manufacture of leather and related products) was the most compared to other businesses. In the year 2016, this income level reached 10,531 thousand dong and fell to 9,843 thousand dong in 2018. There was a dramatic increase employee's income of Mining and quarrying enterprises; from 6,820 thousand dong to 10,364 thousand dong; increased by about 1,5 times between 2016 and 2018.

The table 2 has shown the labour's income per month of Manufacturing enterprises and the others type's enterprises by kind of economic in Thai Nguyen province as follow:

Table 2. Average labour's income per month of Manufacturing enterprises  
in Thai Nguyen province, Vietnam Unit: thousand dong

No.	Kind of economic enterprise	2016	2017	2018
<b>1</b>	<b>Agriculture, forestry and fishing</b>	5,349	5,484	4,316
<b>2</b>	<b>Manufacturing</b>			
-	Mining and quarrying	6,820	7,585	10,364
-	Manufacturing ( <i>Manufacture of food products and manufacture of beverages, Manufacture of textiles, Manufacture of leather and related products...</i> )	10,531	9,591	9,843
-	Electricity, gas, steam and air conditioning supply	7.712	7.017	8,523
-	Water supply, sewerage, waste management and remediation activities	6,822	7.028	7,843
<b>3</b>	<b>Construction</b>	5,346	7,424	6,556
<b>4</b>	<b>Whole sale and retail trade; repair of motor vehicles and motorcycles</b>	5,887	6,008	6,940
<b>5</b>	<b>Transportation and storage</b>	5,694	5,799	5,488
<b>6</b>	<b>Financial, banking and insurance activities</b>	6,252	8,676	8,139

Source: Thai Nguyen statistics office, 2020

Average income per month of employees in Electricity, gas, steam and air conditioning supply enterprise had a fluctuation compared to Water supply, sewerage, waste management and remediation activities enterprises over a 3 year-period. In the year 2016, average compensation per month of employees in Electricity, gas, steam and air conditioning supply enterprises was at 7,712 thousand dongs per month; whereas the average compensation per month of employees in Water supply, sewerage, waste management and remediation activities enterprise was at 6,822 thousand dong per month. In the year 2018, the average employee's income per month, (of employees in Electricity, gas, steam and air conditioning supply enterprises), was 8,523 thousand dongs per month compared to average employee's income per month of employees in Water supply, sewerage, waste management and remediation activities enterprises was 7,843 thousand dongs per month.

**Labour productivity in Manufacturing enterprises**

Labour productivity is one of the labour market indicators, reflecting the economic growth and development of a country, along with the competitiveness of each enterprise, each country. Labour productivity growth plays a huge role in Manufacturing enterprises, especially in the Industrial revolution 4.0 with the changes in new production methods.

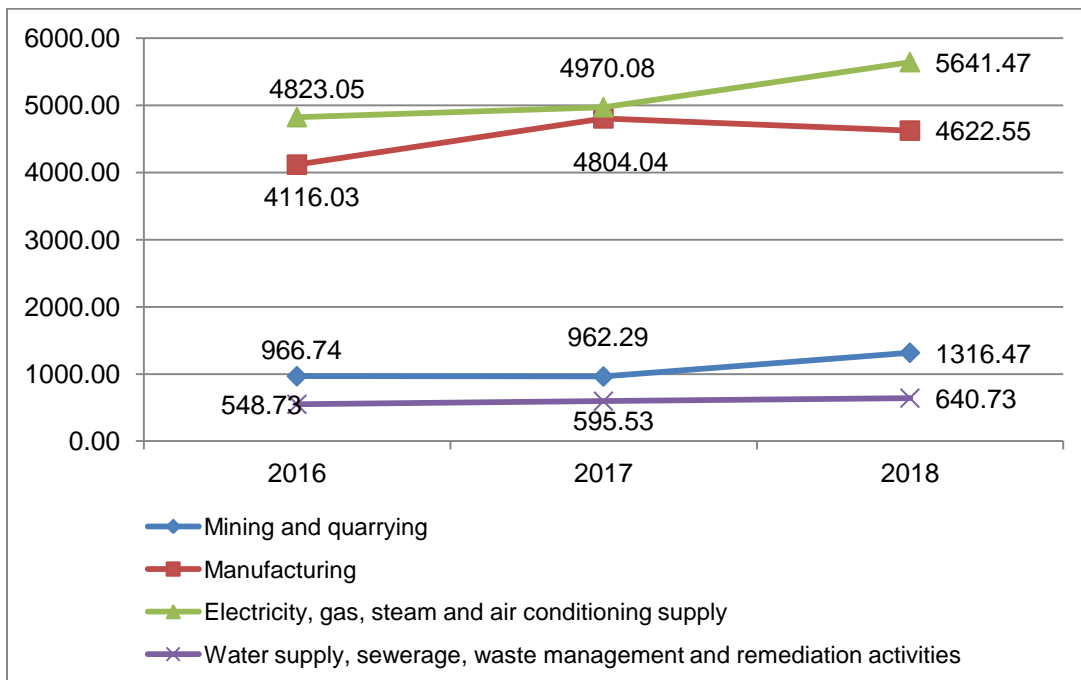


Figure 1. Labour productivity of Manufacturing enterprises in Thai Nguyen province, Vietnam (Unit: Million dongs/person)

Source: Thai Nguyen statistics office, 2020

The information about labour productivity in manufacturing enterprises in Thai Nguyen province has illustrated as figure 1.

Labour productivity in manufacturing enterprises tends to increase in the periods from 2016 to 2018. In Mining and quarrying enterprise, labour productivity was highest, compared to labour productivity of Water supply, sewerage, waste management and remediation activities enterprise was the lowest in the period from 2016 to 2018. The labour productivity in Mining and quarrying enterprise was 4823,05 million dong/person in 2016, while this index in 2018 was 5641,47 million dong/person. In the period 2016 – 2018, labour productivity in Water supply, sewerage, waste management and remediation activities enterprise rose from 548,73 million dong/person to 640,73 million dong/person.

### **The effecting of the Industry 4.0 on labours in Manufacturing enterprise in Thai Nguyen province, Vietnam**

Industrial Revolution 4.0 with automated machinery systems will gradually replace manual labor in the economy of each country, the increase in the proportion of high-quality workers causing low-skilled workers or untrained will be eliminated. Vietnamese workers do not have dynamism and creativity in the working process as well as lack many skills and initiative in the process of receiving the "high technology wave". According to ManpowerGroup Solutions' Global Manpower Index 2017 (2018), Vietnam's human resource index ranks 62 in the world and 14th in the Asia-Pacific region; Of which, only 5% of the employees are fluent in English and only 10.4% are skilled workers.

Industrial Revolution 4.0 brought great breakthroughs but also posed many challenges. In the digital revolution, Manufacturing enterprises in Vietnam is not really ready for the Industry 4.0.. According to the World Economic Forum (2018) in the report "Readiness for a future production", measures the factors and conditions necessary to transform the production system and assess the readiness for future production of 100 countries around the world; Vietnam is in the group of countries that are not ready for Industry 4.0 and only got 4.9 / 10 points for the level of readiness. Regarding technology and innovation, Vietnam ranked 90/100, of which creative capacity ranked 77/100; quality of human resources in Vietnam ranked 70/100, with university quality ranked 75/100, quality of vocational training ranked 80/100.

The positive and negative impacts on employment as well as labour productivity from the Industry 4.0 to labours in Thai Nguyen province, especially the strong challenges brought by the "wave of technology"; in order to keep pace with the development of Industry 4.0, Thai Nguyen province needs to have appropriate plans, policies and solutions to orient and improve the

quality of labor resources, support workers to learn jobs, expand career opportunities and improve labour productivity in a digital age.

## CONCLUSION

In the process of industrialization and modernization along with the "technology wave" of the industrial revolution 4.0, productivity and labour income in industrial enterprises in Thai Nguyen province has been increasingly improved and increased. Although the labour productivity of industrial enterprises in Thai Nguyen province is higher than that of other sectors in the economy, it is still low compared to the whole country. Low labour productivity greatly affects the growth and development of the economy, so Industry 4.0 is the "key" for workers in Thai Nguyen industrial enterprises to be improved and enhanced. In addition to the opportunities brought by the digital revolution, the negative impacts brought on by the "technology wave" also create significant impacts on workers in industrial enterprises in Thai Nguyen province when they are not yet real readiness for changes in technology and strong impacts on the Vietnamese labour market. Furthermore, the author gives the implementation of which can contribute to improving the quality of labour in manufacturing enterprises, which should ultimately lead to the development of labour as one of the key competitive advantages in the Industry 4.0 in Thai Nguyen province, Viet Nam.

## ACKNOWLEDGEMENT

This study was funded by Thai Nguyen University of Economics and Business Administration, Vietnam, title name: "*Factors affecting labour quality of Manufacturing enterprises in Thai Nguyen province in the Industrial revolution 4.0*", code number ĐH2021-TN08-05.

## REFERENCES

- ManpowerGroup Solutions (2018). Total Workforce Index™ 2017 Global Analysis
- Thai Nguyen statistics office. (2020). Thai Nguyen Statistical Yearbook 2019
- World Economic Forum. (2018). The Global Competitiveness Report 2017 - 2018
- World Economic Forum. (2018). Readiness for the Future of Production Report 2018