



THE IMPACT OF INDUSTRY 4.0 ON VIETNAMESE LABOR

***Phung Tran My Hanh and Vu Thi Tra Mi**

Thai Nguyen University of Economic and Business Administration, Vietnam

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ABSTRACT

The article investigates the impact of the Industry 4.0 on workforce productivity and labor market in Vietnam. This is illustrated that Vietnam has been in the period known as "Golden Population Structure" but the manufacturing depending on the low-skilled labors. Labor productivity in Vietnam has increased considerably in recent years but it is still very low in comparison with countries in Southeast Asia as well as in other Asian countries. Secondary data in the period from 2013 to 2017 was collected from General statistics office of Vietnam. Data was analyzed with descriptive and inferential statistics. The results of the research have shown that Industry 4.0 had both positive and negative effects on Vietnamese labors. Finding from the research call for more attention on labors in order to enhance Vietnamese labor productivity in the Industry 4.0.

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INTRODUCTION

Industry 4.0 is a term given to refer to the current trend of automation and developmental process in manufacturing and chain production. Industry 4.0 is commonly referred to as "The Fourth Industrial Revolution" (Bernard Marr, 2016). The term was first used in 2011 at the Hannover Fair in Germany. According to Klaus Schwab (2016): "*The fourth industrial revolution, however, is not only about smart and connected machines and systems. Its scope is much wider. Occurring simultaneously are waves of further breakthroughs in areas ranging from gene sequencing to nanotechnology, from renewables to quantum computing. It is the fusion of these technologies and their interaction across the physical, digital and biological domains that make the fourth industrial revolution fundamentally different from previous revolutions*" "The wave of technology" of the Industrial revolution 4.0 is increasing dramatically around the world. The fourth industrial revolution, with the development of artificial intelligence, robotics, Internet connection, is fundamentally changing the world's production, impacting on all areas of social life, with changing in jobs, labors and labor market. Automation systems, machines, robots, and artificial intelligence will replace simple labor, physic labor, decreasing low skilled labors.

*Corresponding author: Phung Tran My Hanh,
Thai Nguyen University of Economic and Business Administration,
Vietnam

Cheap labor is no longer a competitive advantage; countries will face surplus labor and rising unemployment. This is not only the challenge for low-skilled workers but also the challenge for medium-skilled workers if the workers themselves have not changed thinking and lack of new skills to adapt the changing of the Industry 4.0. Vietnam is experiencing a period known as the "Golden Population Structure" with more than 50% of the working-age population, a period that occurs only once in the demographic history of each nation. The economy is mainly dependent on the use of cheap labor in many occupations such as apparel, footwear, mining natural resources, ... with the level of workers is not high, labor productivity compared with many countries in Southeast Asia, has a long gap. Following the estimating by the International Labor Organization, the machine in the Industry 4.0 can be replaced 65% of Indonesian textile and garment workers, 86% of Vietnam, 88% of Cambodia in the next decade. The other industries are effected, such as factory workers, cashiers, taxi drivers, etc. "The Wave of Technology" is affecting to the labor market in Vietnam, with major changing in the supply and demand of labor, the risk of losing jobs in the future, etc. The main purpose of the paper is to analyze the Vietnam labor productivity, average employee's income and the impact of the fourth industrial revolution on Vietnam's labor via secondary data through the Vietnam's General Statistics Office in the period from 2013 to 2017. It also analyzes comparatively investigating Vietnam's labor level and few other Asian countries. The results of the study

indicate that the Industry 4.0 brings more opportunities as well as challenges for Vietnamese labor market.

DATA AND METHODS

Data collection: The research has collected quantitative data from 2013 to 2017 in Vietnam released on annual year was used in order to analyze for this research. Secondary data of General Statistics Office of Vietnam, regarding Vietnamese labor productivity, professional qualification of employment and unemployment, average employee’s income per month in Vietnam, etc.

Descriptive and Inferential Statistics: The descriptive correlational research design was utilized in gathering, analysing, interpreting, classifying and presenting the data in the study, to summarize the information it reveals and to present that information in a meaningful way. Inferential statistics used the data to make estimates, decisions, predictions, or other generalizations about Vietnamese labors in the fourth industrial revolution from which the data was obtained.

development. From 2013 to 2017, the population of Viet Nam aged 15 and over tended to rise regularly and accounted for over 76% of the population in Vietnam. The number of labors who’s working aged increased from 53,246 thousand people (accounted for about 77.52% of the population aged 15 and over) to 55,163 thousand people (accounted for around 76.41% of the population aged 15 and over) from 2013 to 2017. The increasing in the number of the labor force in the period "Golden Population Structure" gives many opportunities for growth and development in Vietnam, especially “The Wave of Technology” are occurring all around the world. In the year 2017, about 52.05% of labor forces were in urban, compared to about 47,95% of labors force in rural. Although labor forces were distributed equally in both urban and rural areas but the rate of labor force participating in urban and rural areas had different levels. The labors in urban participation rate was higher than labors in rural participation rate, which accounted for around 70.7% and 80.3%, respectively, with a difference of 9.6%. The information about the number of population and labor force in Vietnam has shown as Figure 1. Vietnam is one of the countries with low professional qualification and the unskilled labor force rate occupies the majority of the labor

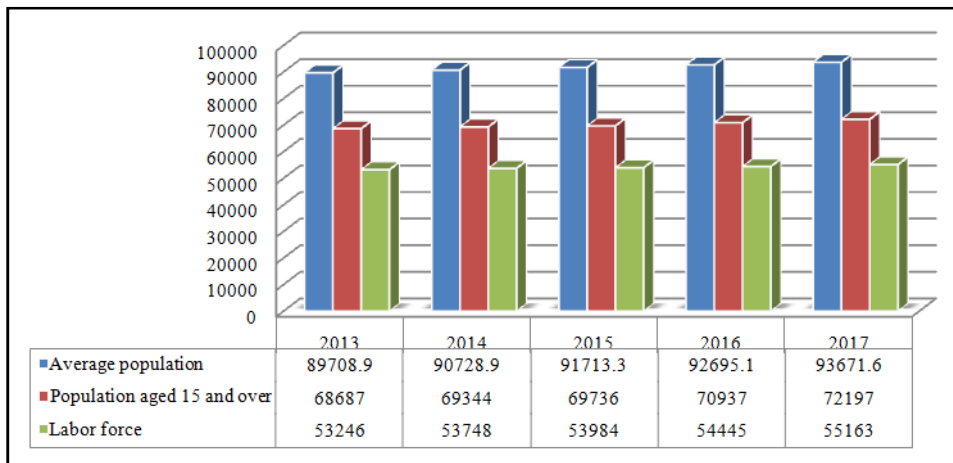


Figure 1. Average population and labor force in Viet Nam (unit: thousand people) Source: Vietnam’s General Statistics Office (2016, 2017)

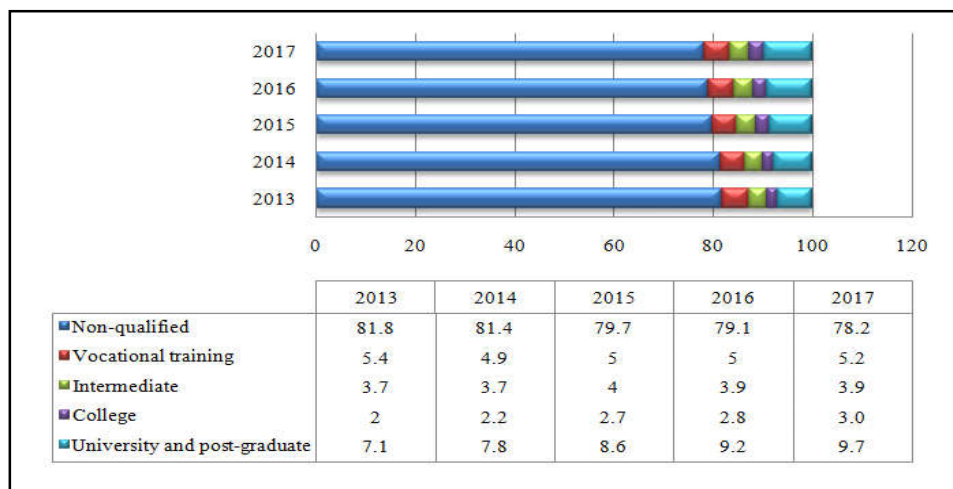


Figure 2. The structure of professional qualification of Vietnamese labor force Source: Vietnam’s General Statistics Office (2016, 2017)

RESULTS

Current features of Vietnam’s labor in Industry 4.0: Vietnam is in the period as "Golden Population Structure" since 2007 with abundant young labors force, especially young creative workers who had many advantages for socio-society

force. In the period from 2013 to 2016, the percentage of non-qualified workers tended to decrease slowly. In 2013, the proportion of non-qualified labors was over 81.8% and this proportion dropped to 78.2% in the year 2016. The rate of vocational training and intermediate tended stably in the same period. There was a gradual increase in the percentage of

laborers who graduated college, university and post-graduate from 7.1% to 9.7% between 2013 and 2017, a rise of about 2.6% in 5 years. The percentage of professional qualification of Vietnamese labor force has illustrated as follow:

The proportion of non-qualified employments were about 78.5%, while the figure for unemployments were lower, at around 63.96%. Vietnamese unemployment who had trained were higher than the proportion of employment. Specially, unemployment who graduated university and post-graduate had a significantly higher proportion of employment, which accounted for 19.38% and 9.54%, respectively. This rate shown that a large number of Vietnamese highly qualified workforce had not found suitable job, which is the paradox of the Vietnamese labor market in the process of industrialization and modernization. Especially, in the fourth industrial revolution, Vietnam nation needs more and more skilled workers.

school, college, university and post-graduate tended to increase slightly. The main reason for the graduates' unemployment is the high proportion because employees who could not meet the needs of employers, lack of skills to meet job requirements, especially multidisciplinary skills in the new technological revolution. The adaptability of employees to the working environment is limited, the ability to apply and creativity in the workplace is low. The core of Vietnam's economic strategy has been rapid integration into the world economy, with the breakthrough in technology in the fourth industrial revolution. Although the growth and development along with the development trend of the world, Vietnam is still a heavy country in agriculture and rural areas, so agriculture is an important economic. The labor in agriculture sector is the highest proportion compared with other economic sectors in Vietnam. Along with the restructuring of the labor workers in urban areas is increasing, the economic restructuring between

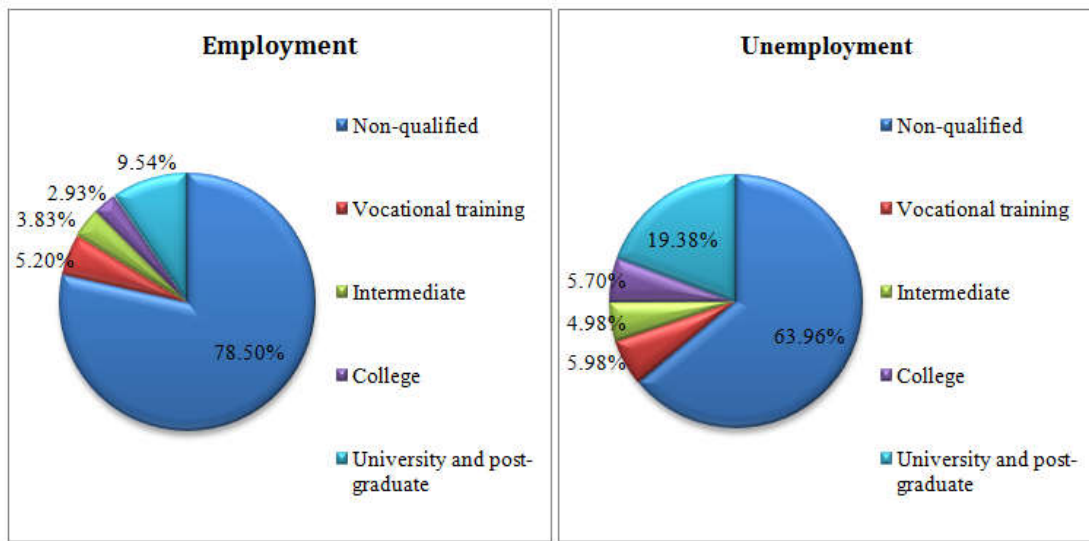


Figure 3. The structure of professional qualification of employment and unemployment in Vietnam in 2017, Source: Author's calculation based on Vietnam's General Statistics Office (2016, 2017)

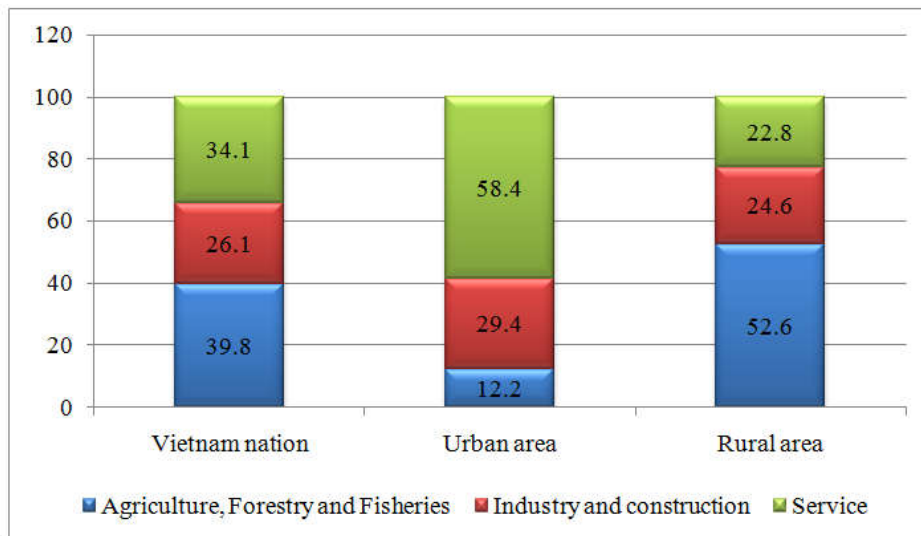


Figure 4. The structure of allocation laborers in economic sectors, Source: Vietnam's General Statistics Office (2017)

Despite Vietnam has young human resources and abundant labor force, but Vietnamese workforces are low-qualified; high quality human resources have a shortage in quantity. Unskilled laborers tended to decrease but still accounted for nearly 80% of the labor force in the country. At the same time, those who are trained in vocational training, professional secondary

economic sectors may also change. Specifically, in urban areas, the percentage of employees working in agriculture, forestry and fisheries was lowest, accounted for around 12.2%; whereas the proportion of laborers who worked in rural areas accounted about 52.6% and reached the highest rate.

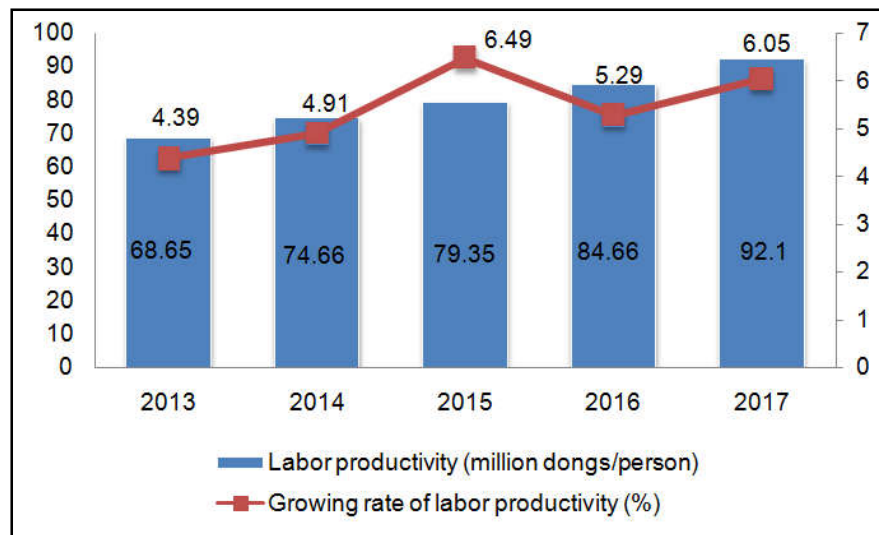


Figure 5. Labor productivity and the growing rate of labor productivity in Vietnam Source: Author's calculation based on Vietnam's General Statistics Office (2016, 2017)

Table 1. Vietnamese labor productivity compared with some Asia Pacific countries (according to PPP 2011)

Year 2010			Year 2016			
Nation	Labor productivity (1000USD)	Compared with Vietnam (VN = 1)	Nation	Labor productivity (1000USD)	Compared with Vietnam (VN = 1)	Productivity 2016 vs. 2000
Singapore	127,6	15,2	Singapore	132,8	12,1	1,9
Taiwan	92,4	11,0	Taiwan	99,2	9,0	2,3
Japan	72,6	8,7	Japan	74,2	6,7	1,2
Korea	67,1	8,0	Korea	72,7	6,6	2,4
Malaysia	53,0	6,3	Malaysia	59,1	5,4	2,0
Thailand	25,3	3,0	Thailand	29,9	2,7	2,3
Indonesia	20,1	2,4	Indonesia	25,7	2,3	2,3
China	17,6	2,1	China	26,8	2,4	9,5
Phillippine	15,3	1,8	Phillippine	19,4	1,8	1,7
Vietnam	8,4	1,0	Vietnam	11,0	1,0	3,2
Myanmar	6,8	0,8	Myanmar	9,7	0,6	3,0
Cambodia	4,5	0,5	Cambodia	6,2	0,9	6,0

Source: Vietnam national productivity Institute (2018)

Compared with previous years, agricultural workers has decreased, but the difference in labor force in the economic sectors are still big gap. Due to the characteristics of rural and the dependence on agriculture of the economy had shown that Vietnamese labor market is still facing with the risk of a lack of decent work, caused by farmers are often seasonal, the proportion of workers unemployed always at a high level. In the industry and construction, labors in urban and rural areas have not much difference. About 29.4% of labors in urban area compared to 24.6% labors who worked in rural area. With the strong development in the service sector, the percentage of labor force accounted for 58.4% in urban areas, while labors in rural areas accounted for the lowest proportion with 28.4%.

Productivity of Vietnamese Labor: Vietnamese labor productivity increased significantly in annual year from 2013 to 2017, a rise of about 23.45 million dong in 5 years. In 2013, the workforce productivity was 68.65 million dong and the figure in 2017 was higher, at 92.1 million dong. Along with the increasing of labor productivity, there was a sharp increase in the growing rate of labor productivity from about 4.39% to around 6.05%. Especially, in the year 2015, the growing rate of labor productivity reached to the highest at 6.49%. In the process of growth and development, Vietnam's labor productivity has changed positively, causing narrowed gap in labor productivity with other countries in the Asia Pacific. Vietnam economy is still dependent on economic sectors using cheap labors and exploitation of resources, with low-qualified employees.

However, labor productivity in Vietnam has increased considerably in recent years but it is still very low in comparison with countries in Southeast Asia as well as in Asian countries. Even though there has been a rise in labor productivity in the period from 2013 to 2017, Vietnam's labor productivity is still lower than the other countries in Asian region. The gap is getting wider between Vietnamese labor productivity and many countries in Southeast Asia and Asia Pacific. Table 1 has shown that the labor productivity of Vietnam and some Asian countries. Labor productivity in Vietnam has significantly increased over three times from 2010 to 2016, and this gap had been narrowed with Asia countries but Vietnam's labor productivity is still very low. Compared with Singapore, with the highest labor productivity in Asia, especially in ASEAN, the productivity gap has decreased from 15.2 times to 12.1 times. In South East Asia, labor productivity in Vietnam is lower than in Indonesia and Malaysia; Vietnam's labor productivity is only higher than Cambodia and Myanmar. Recently, along with the improvement of labor productivity, the average monthly salary of Vietnamese workers also increased significantly, compared to previous periods. However, the monthly salary of Vietnamese workers is much lower than that of some countries in Asia. The average monthly wage of Vietnamese workers is \$ 220, lower than the average wages of labor force in the world about 9 times, lower than the Asia-Pacific labor force around 12 times. In particular, the average salary of Singaporean workers is 18 times higher than the average salary of Vietnamese workers,

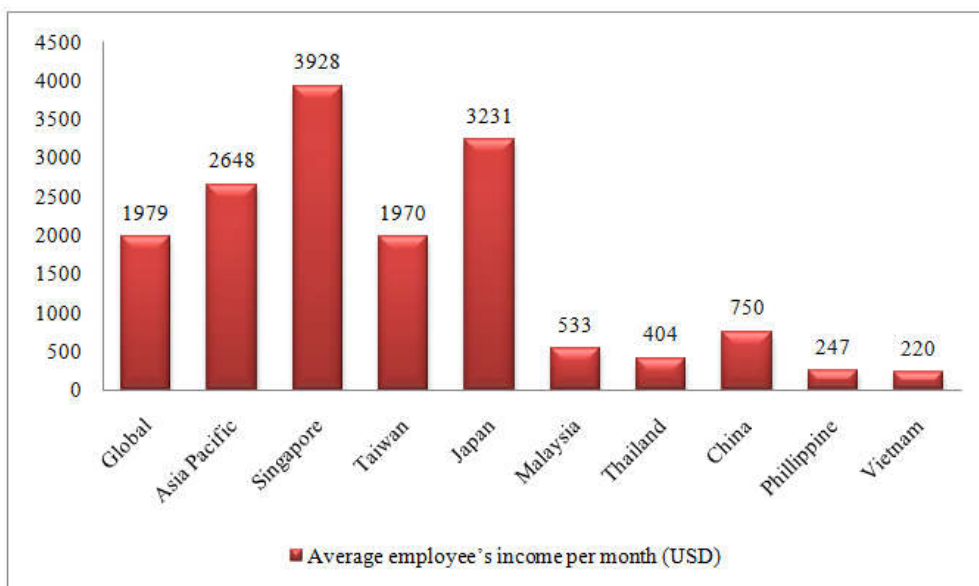


Figure 6. Average employee's income per month in Vietnam and some Asia Pacific countries Source: Manpower Group Solutions (2018)

Table 2. Vietnam's labor ranking in the Industrial Revolution 4.0 (Rank/100)

	Vietnam	Singapore	Malaysia	Thailand	Phillipine	Cambodia
Current labor force						
Knowledge-intensive employment	81	1	45	78	50	87
Availability of scientists and engineer	70	9	7	51	66	96
Digital skills among population	66	6	14	51	42	89
Future Labor Force						
Country capacity to attract and retain talent	44	4	12	35	50	38
Quality of universitie	75	50	23	28	47	75
Quality of math and science education	68	1	16	66	60	86
Quality of vocational training	80	9	11	59	40	92
Critical thinking in teaching	63	18	14	78	35	49
Active labor policies	50	2	9	44	65	68
On-the-job training	74	3	12	56	34	86
Hiring and firing practice	39	3	10	25	55	27

Source: World Economic Forum (2018)

whereas the monthly salary of Thailand labor is 1.8 times higher than the average wage of Vietnam labor. In South East Asia, the average wage of Vietnamese labors is lower than its for Philippines labor's and Malaysian labor's. The Industry 4.0 is based on digital technology and integrating technology to optimize processes and production methods. Simple work and repetitive tasks will be replaced by robots, automation in manufacturing, replacing the simple labor. Therefore, Vietnamese laborers are mainly workers without qualification and skills, whois easily replaced by machinery and robot systems in the digital revolution.

The impact of industry 4.0 on Vietnam's labor: The industrial revolution 4.0 will make a dramatic change in manufacturing, digital applications in production, real world and virtual connection through the system of machines and the Internet. So people can run the production process everywhere with more safety, reducing transportation and transaction costs. The integration of Vietnam in the global economy and accessing to advanced technology are the opportunities to improve and increase labor productivity. Viet Nam is a late comer so with lessons learned from other nations in order to take a short cut. In addition, the industrial revolution 4.0 also bringsmore challenges for Vietnam labor market. Vietnam is in a period of "Golden PopulationStructure" with low-skilled laborsthat are mostly working in agriculture area. With new modern technologies, laborers have not learned how to use and

the majority of them are still foreigners control. Therefore, Vietnamese workers will be easily replaced by machines and robots. According to the International Labor Organization (ILO), 86% of workers in Vietnam's garment and footwear sectors are at high risk of losing their jobs; other sectors will also be affected such as agriculture, accounting, assembly and repair of equipment, etc. Vietnamese laborers are not active and creative in their work as well as lack of skills and initiative in the process of receiving "The Wave of Technology". According to ManpowerGroup Solutions (2018) in Total Workforce Index™ 2017 Global Analysis indicates that Vietnam's human resources index ranks the 62nd in the world and the 14th in the Asia Pacific region; only 5% of the laborers are proficient in English and only 10.4% are skilled workers. After the effects of industrial revolution 4.0, Vietnam has faced with many challenges, especially the ability to compete to maintain and seek job of low-qualified labors. In the "Readiness for the Future of Production Report 2018" report was released by the World Economic Forum (2018), in a total of 100 countries, Vietnam fell in the group of countries where are not ready for the 4th industrial revolution; the quality of human resources ranked No. 70 and the indicators related to innovation and the quality of human resources at a very low level. Table 2 has illustrated that Vietnam's labor ranks are much lower than those in some Southeast Asian countries. The majority of indicators assess the quality of human resources readiness for the Industry 4.0, Vietnam ranks behind

Singapore, Thailand, Malaysia and the Philippines, and just stands before or nearly the same as Cambodia. From the strong challenges that "The Wave of Technology" brings, Vietnam government needs to have the appropriate plans, policies and solutions to guide and improve the quality of human resources, vocational training, expanding career opportunities in the digital age in order to catch up with the pace of development of the Industrial revolution 4.0.

Conclusions

This study examined secondary data covering the years, from 2013 to 2017. The research focused on Vietnamese labor productivity and the impact of the Industrial revolution 4.0 on Vietnam's labors. Vietnam is in the period "golden population structure" with young labors and more than 50% of the working-age population, but most of Vietnamese labors are restricted in professional experience, the proportion of Vietnam's labors who has been untrained and lack of soft skills such as solving problem, leadership skill, communicative skills,... are still at the high rate. In the process of growth and development, Vietnam's labor productivity has changed positively, causing narrowed gap in labor productivity with other countries in the Asia Pacific. Although there has been a dramatic improve in labor productivity in the period from 2013 to 2017, but Vietnam's labor productivity is still lower than the other countries in Asian region. Along with the changes in labor productivity, the average employee's income per month in Vietnam also has increased significantly, compared to previous periods.

Vietnamese labours have no choice but to adapt "The Wave of Technology" by actively learning, training, anticipating the skills needed for a smart economy and industrialization. The result of the article have shown that Industry 4.0 had both positive and negative effects on Vietnamese labors and the Industrial Revolution 4.0 is an indispensable trend, that is happening and nothing can be resisted.

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