



Analysis of the Relationship between Economic Growth and the Employment Rate

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Abstract. As the global economy is starting to recover, the employment rate is becoming stable, and the unemployment rate is gradually decreasing while some research claims that the new technology such as Artificial Intelligence (AI) is replacing human labour and decreasing the employment rate. Employment rate is a significant topic these days, but this topic is still a research gap. Therefore, this paper will discuss the relationship between economic growth and the employment rate. The research method for this paper is reviewing the literature and analyzing. The finding is that economic growth may affect the employment rate in the short term in a negative way, as economic growth is changing the structure of employment and high technology is replacing humans while it is also creating new employment, but the trend of economic growth and employment rate is stable in the long term. According to the research findings, the advice is that the government should use the jobs-to-people strategies, and the government should provide a better social security system for the workers.

Keywords: Employment Rate, Unemployment, Economic Growth, Artificial Intelligence, Gross Domestic Product.

1 Introduction

Over the previous years, the employment rate in different countries has changed a lot, and it is believed that employment rate is closely linked to economic growth and development. Investigating the relationship between economic growth and the employment rate is becoming a crucial question for all people, especially for the recent graduate students and employers who are looking for employees and can influence the next policy governments make on employment. A large number of the seniors and recent graduate students are anxious about their employment as they are confused about the economic growth and outlook which make this topic more significant. This topic has been demonstrated by numerous researchers. Some studies claim that in European countries, a 1% rise in gross domestic product will lead to a 0.5% rise in the employment rate and now the relationship leans towards steady and will not be influenced by different economic cycles such as depression or recession [1]. However, this stable trend may be immediately destroyed by different kinds of shocks, for instance, “great recession” give rise to a temporary change in the relationship but will quickly finish and become normal [1]. This conclusion is vital because it offers a specific figure that companies may use

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to decide how much they can hire in accordance with the Gross Domestic Product (GDP) growth in their country. Other studies argue that the technological progress driven by economic growth does not benefit the public as the proportion of labour income in the wealth declined over the past 50 years and this can be attributed to the technological progress [2]. For example, Apple moved their production line to China as China has comparatively cheaper labour, but now these jobs are being replaced by robots which can be paid less and have a higher productivity [2]. However, it is not an individual case as enterprises now tend to choose robots instead of labour and trigger a decrease in the employment rate in some developing countries. Moreover, this makes the skills of workers depreciate and can be easily substituted by automobile robots, while the premium for advanced skills and perpetuates inequalities in society [2]. These two views have conflicts about the relationship between economic growth and the employment rate, so it is vitally essential to discuss their relationship more deeply. This research aims to take up the slack of this topic, applying multilayered and comprehensive perspectives for this topic and provide support for the future development in related areas. This research mainly introduces the relationship between economic growth and employment rate. This research first discusses how the improving economic scale, structure and technology can affect the employment quality and quantity by industrial transformation, the offers advice for improving methods. The objective of this research is to figure out the direct and indirect effects of the scale of economic growth to the employment rate, the impacts of improving technology such as AI to the employment rate, the methods professionals can use to deal with problems and challenges they may meet when solving problems.

2 The Effects of the Scale of Economic Development on the Employment Rate

As the economy is developing, there are some mechanisms of economic growth that affect the employment rate which include direct effects and indirect effects.

2.1 Direct Effects

The direct effects are revenue growth and investment in infrastructure. Firstly, as the revenue for an enterprise is growing, the demand for labour will grow and lead to an increase in the employment rate. For instance, expanding in the manufacturing sector will lead to an increase in the employment rate of blue-collar workers. Secondly, investment in infrastructure can create jobs for the upstream and downstream of the industrial chain. To be specific, it was calculated that in the U.S., \$1 billion spent in infrastructure in the core region can create 18000 jobs which can increase the employment rate effectively [3]. It was then estimated that by investing in infrastructure, at least 1.6 million new jobs can be created, and 2.6 million new jobs can be created if the program for investing is high-classed [3]. The decline in infrastructure is becoming a crucial factor of preventing economic growth, and investing the infrastructure can in-

crease productivity and economic growth. Therefore, the employment rate can be increased. However, investing in infrastructure should balance the short-term job creation and the sustainability of the industry in the long-term to avoid difficult conversions in the future [3]. In conclusion, these two impacts are the direct effects that influence employment rate.

2.2 Indirect Effects

The indirect effects are labour employment structure moving from primary sector and secondary sector to the tertiary sector, labour transferring to different areas and companies in developed countries move their factories to the developing countries. Firstly, the proportion of tertiary sector (services) keep growing and the proportion of primary sector and secondary sector keep decreasing in most countries. This is mainly due to economic growth, and many developing countries have become developed countries. In Baumol's model, it is believed that the households increase their expenditure in education and medical services when their income rises, which leads to the change from primary and secondary sector to the tertiary sector [4]. However, it is now assumed that the proportion of service will keep growing despite the change in prices [4]. Therefore, the employment rate in tertiary sector will keep increasing and the employment rate in primary and secondary sector will decrease. Secondly, the labour in the global South is moving to the global North [5]. This is because the wages in the Southern area are 83-98% lower than the wages in Northern area even with the same kind of work [5]. Though Southern workers provide 90-91% labour, they only capture 21% of the total world GDP [5]. Thirdly, as the workers in global South have average salary of €1.62 while the average salary in global Northern is €24.95, many companies tend to move their factories to the Southern area which has relatively cheap labour [5]. Moreover, companies like Apple admitted that they rely on the high-skilled labour in Southern area such as China, and the remuneration for the labour in Southern area is much cheaper than in Northern areas [5]. This causes a significant rise in the employment rate in the global South. In general, these three impacts are the indirect effects to influence employment rate.

3 The Two Impacts of Advancing Technology on Employment

Because of the economic growth, the advancing technology such as artificial intelligence is growing more rapidly than ever. The advancing technology has two impacts to employment.

3.1 AI Replacing Professions and Leading to Technological Unemployment

As AI is becoming more intelligent through updating and upgrading technology, there is doubt that AI is replacing the jobs that used to be human, and this may lead to technological unemployment. Technological unemployment can be divided into three parts to discuss. Firstly, for the primary sector, there is little use of AI compared with secondary sector and tertiary sector, but it can still give some examples. The use of AI can

decrease the probability of accidents in mining as it can examine the environment, and it can set plans for farmers for irrigation, and the utilities of water can be maximized [6]. This may lead to a decrease in employment rate in mining industry as the job is not as dangerous as it used to be and the workload decreases; the employers do not need much labour. Secondly, for secondary industry, AI can be used in multiple ways. For instance, it can be used in designing multiple arrangements when producing and figuring out the best choice for manufacturing [6]. Moreover, AI can examine the products and deduce whether the products have defects and teach machines to assemble and finish the products [6]. In the architecture industry, it can be used in choosing and preparing the material in order to avoid wasting [6]. The infiltration of AI will change the employment of secondary industry, according to the study, the employees in the secondary industry will have to transfer into more complicated and innovative vocations instead of the monotonous manual works [6]. However, it is still believed that many jobs in the secondary industry cannot be replaced by AI. Lastly, for the tertiary sector, AI is also used in various industries. AI applications such as ChatGPT are used in education, designing photographs and even solving medical problems for the users [6]. Websites such as YouTube are adjusting algorithms by AI to optimize their apps. All the situations mentioned above lead to structural change. As AI is being used more often than ever, the demand for the soft skilled jobs such as waitresses and shop assistants is decreasing and these jobs are gradually replacing by AI [6]. In the future, more jobs may be replaced by AI, for example, accountants and lawyers.

3.2 New Technology Creating More Jobs

However, according to research, the real situation is that from 2012 to 2019, almost all the employment under examination has increased [7]. This proves that the adoption rate of AI does not have a direct relationship with employment [7]. In addition, the new technology is creating more jobs for humans and leading to an increase in the employment rate. From the research, it is obvious that AI technology has a pervasive positive impact on employment [8]. As technology is developing rapidly, the demand for highly skilled workers is growing day by day, especially in areas like Internet, financial and computer science. This may lead to significant growth in the employment rate in the future. Furthermore, the development of AI is generating some new professions such as AI engineers and trainers [6]. For example, in the future, though automatic drive may replace taxi drivers, it will create jobs such as development engineers and security guards. Additionally, as the AI is promoting employment, it brings women and workers greater welfare while decreasing the rate of male workers in the secondary industry [9].

4 The Challenges and the Improving Methods

4.1 Challenges

As the global economy is growing, there are some crucial challenges that need to receive great attention. Firstly, in the past 20 years, many areas have shown differentiated trends in employment [10]. The employment rates of some industries like financial and

computer systems rise as the value of industries increase, while the employment rates of electronics and some manufacturing industries decrease as the value of industries increase [10]. This may lead to a continuous decrease in the employment rate as the tradable sector is contributing less to the employment rate compared to past [10]. At present, the increase in the employment rate is mainly due to the tertiary sector and the medical industry contribute significantly [10]. However, this trend is hard to persist according to research as the cost of healthcare, and the excess consumption keep adjusting and there may be a long-term structural unemployment [10]. Secondly, as the economy is developing, the standards for labour are also rising but this leads to a mismatch between job requirements and labour quality. For example, many high technology industries lack talented workers and desire to hire high quality labour even if the corporations have to pay high wages for the workers. Thirdly, employment polarization is becoming more serious as the demand for high-skilled workers and the demand for low-skilled workers are increasing but the demand for middle-skilled workers is decreasing. In conclusion, there are many challenges that the world is facing as the economy is developing.

4.2 Adjusting Policies

From the above, economic growth generates many new jobs but also leads to many disadvantages and there are some policies to improve these disadvantages. Firstly, the government can use the jobs-to-people strategies as it has significant benefits [11]. According to the statistics, a 10% growth in the local employment rate can lead to a 2-3% increase in the long-term employment rate, and this figure can be 3% in the poverty areas [11]. For example, from 2014 to 2018, the 573 areas which have employment rates lower than the average in America, only need to maintain a 1% increase in the annual employment growth rate and the employment rate after 10 years can be increased by 2% [11]. Overall, the job-to-people strategies have been proved to be a effective method to increase the long-term employment rate. Secondly, the government should provide a comprehensive social security system for the workers, especially the unemployment benefits for the unemployed workers, and improve the service system for re-employment. Thirdly, the government can provide training for vocational skills to ensure more people have the basic working ability to be employed so that the employment rate may be increased sharply. Moreover, the government can link the training with industrial upgrading, and this may lead to a more significant growth in the employment rate.

5 Conclusion

Through the research, this paper mainly discussed the relationship between economic growth and employment rate in three aspects. To be more specific, this paper demonstrated the direct impacts and indirect impacts of the scale of economic growth to the employment rate, the effects of high technology to the employment which contains advantages and disadvantages, the employment challenges people are facing as the econ-

omy is developing and the improving methods. Therefore, this paper finds out that economic growth can affect the employment rate in different sectors in the short term negatively, but there is a stable and positive relationship between economic growth and the employment rate in the long-term considering in the big picture. Due to this result, government should increase the investment in infrastructure in the short term to increase the employment rate and use the jobs-to-people strategies, provide training, increase revenue and increase GDP in the long term to increase the employment rate. The findings in this paper provide more evidence for future studies in this area and make contributions to the theoretical aspect in this field. The findings also fill in the gap in this field and help the researchers in their further studies. However, there are some limitations for this research as the research period is comparatively short, the analyses and discussions about the relationships between the economic growth and employment rate may not be comprehensive. In addition, the literature this paper reviewed was not sufficient enough due to the short research period. In the future, this problem can be solved by leaving sufficient time for research and reading more relevant literature. More research has to be done in the future in this field which can discuss the particular problems that people meet as the employment rate is changing with economic growth and the changes of employment rate in different industries with the development of high technology such as AI.

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