

The impact of technology on the relationship between labour and unemployment

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ABSTRACT

The notion of unemployment can have different meanings depending on the context in which it is used. It can describe a legal and administrative status, that is, registration at the employment office or the right to receive unemployment benefits. At the same time, it can indicate an attitude, that is, preparedness to accept a job offer under certain conditions. It can also be related to social difficulties within an economic system, as well as the imbalance between the labour supply and demand in certain parts or the entire labour market, and the lack of technological development in a specific society. This paper deals with the impact of new technologies on unemployment.

Keywords: unemployment, technology, positions

Introduction

According to the guidelines of the *International Labour Organisation (ILO)*, the standard international definition of unemployment encompasses all persons older than the age limit determined for measuring the economically active population who were (1.) without work during the reference period, (2.) at any time, available for employment during the reference period, and (3.) seeking work (had taken specific steps with the goal to seek employment). Therefore, the criteria upon which the standard definition of unemployment is based on only relate to the individual's activity during the reference period. All three criteria have to be met simultaneously. The only exception is related to people who have an employment contract to commence work after the reference period and no longer seek employment, but satisfy the other two criteria. Nevertheless, such people shall be classified as unemployed since they are now available for work, but they do not work, that is, they are a part of the unutilised labour resource in the economy.¹

Unemployment as a Macroeconomic Notion in the Age of Developed Technologies

Unemployment is a condition where a proportion of the working-age members of society cannot *get employment according to their competences and qualifications, and with a standard salary*.

The unemployed include all members of a society who are partially employed, but their labour is not fully utilised, they do not have full-time jobs and sufficient income for normal subsistence. Unemployment represents one of the greatest economic issues of the contemporary world. It affects both the developed countries with a high standard of living and a developed economy, and the least

¹ <http://mjesec.ffzg.hr/>

developed, poor countries, as well as developing countries.

In societies in which most people manage to survive by working for others, losing a job and being unemployed for a longer period of time represents a serious issue. Underutilisation of human resources in a country directly affects its economy and national income which, among other things, results in a low standard of living and ultimately, poverty.²

In January 2009, the number of unemployed people in the world reached a record high amounting to 200 million which represents 7% of the total working-age population on the planet, and it will likely grow. A deceleration of economic activities, which has been noted in the last two years, has brought about a 20-million increase in unemployment and helped it reach a record level. Today, the industrialised countries in Latin America are the worst affected ones, and the economic crisis raised their unemployment rate by 10%. This trend has also affected Europe where unemployment, after a minor fall recorded in 2003, rose again, amounting to 8.8% of the working-age population in 2009³.

The aforementioned facts go in favour of the previously stated thesis that unemployment is taking on alarming proportions and becoming one of the major global issues, and the International Labour Organisation believes that, in the next ten years, it will be necessary to provide a billion new positions if the goal of the United Nations in halving the number of those who live in poverty is to be achieved.

Each modern economy has had, and it will have unemployment, more or less. In fact, a certain level of unemployment is inevitable since people change careers and companies change their production in order to achieve new goals and employ new technology. If the government would guarantee steady employment for all, companies would have difficulties in finding new employees for new ventures and the employees would not have sufficient incentives to adapt to economic changes. Nevertheless, unemployment represents an issue for the unemployed and their families. The actual political problem is the question of how much unemployment can be tolerated in order to enable economic growth, how would that unemployment be distributed among the population, etc.

We actually strive to ensure vacancies for all who want to work. This requires that we differentiate the total population from the smaller number of those who are prepared and willing to work, that is, those who belong to the labour force. The labour force encompasses people over 16, people who actually work and those who do not work, but actively seek employment⁴.

The unemployment rate represents the ratio between the unemployed and the size of the labour force. The unemployment rate is affected by both the number of unemployed people and the total labour force. If there is an increase in the number of unemployed people during several months, the unemployment rate increases too. If the unemployment increase happens during those months when the size of the labour force grows significantly, the unemployment rate will decrease. This leads to the following measure of employment: labour force participation rate. It represents the labour force as the percentage of the entire working-age population called "non-institutional population" or "adult population".

In the economies of the world, each one has only half of the total population participating in the labour force. The rest of the population is either too young, of school age, studying, at home, retired or otherwise unable to work. Outside the labour force, the unemployed are those who are not employed on a full-time basis and those who do not actively seek employment.

Unemployment was, is, and will be one of the most severe and frequently hardest issues related to the labour market. Why is the unemployment rate such an important indicator of a country's economic stability? There are several reasons.

The unemployment rate is an indicator of the cyclic performance of an economy. This rate indicates which part of the total labour force does not have a job and seeks employment. On the other hand, the growth of the unemployment rate represents a precursor of recession since companies decrease the wages, begin dismissing employees or force annual leave as a response to the decreased demand. It sounds somewhat paradoxical, but it is nevertheless true, that employment and unemployment cannot grow at the same time.

² Veselinović, P., Ekonomija, Univerzitet Singipedium, Belgrade, 2010, p. 224.

³ Ibid.

⁴ Jedinak, J., Osnovi ekonomije, PA, Belgrade, 2000, pp. 270-274.

The explanation lies in the fact that a contingent of new employment seekers who are entering the labour force surpasses the number of the newly-established positions. Therefore, the total employment increases but, in relative terms, unemployment further increases.

The main goal of each economic system is to use a limited amount of land, labour and capital, as efficiently as possible, maximising the production of goods and services. When unemployment emerges, some labour inputs available to the economy are left unused, resulting in production loss.

Unemployment gains such significant attention which, as a phenomenon, costs certain employees and members of their families a great deal.

This burden is manifested in at least three forms ⁵:

- loss of income which goes hand in hand with unemployment,
- fear that the loss of employment will have negative consequences on finding a new job, career growth, contacts, or training and developing at work,
- unemployment brings about significant psychological and emotional consequences for the workers and members of their families which are further manifested in increasing crime frequency, mental illnesses, suicides and divorce.

For some, unemployment is relatively short and related to the normal process of transitioning from one job, or school, to the next. For others, unemployment may last for months or years due to the inability to find employment.

In order to understand why unemployment and the lack of labour force exist, it is very important to perceive economy as a dynamic and changing variable. The labour force market is not simply a market. It is composed of the market comprising people who continuously transfer from one market to another. At any time, people determine their alternatives and change their employment status. The labour force market is very busy, having great dynamics of people and positions.

⁵ Veselinović, P., Ekonomija, Univerzitet Singipedium, Belgrade, 2010, p. 227.

Each month, millions of working-age people change their employment status - around 5-6% in developed countries. In order to function, the economy also has to keep up with the changes of taste and technology. The old mode of operation has to be replaced with new technologies. Millions of positions are being created and destroyed each year. Fortunately, changes in technology have, historically, created more positions, rather than eliminating them. This does not imply that changes in the labour force market bring good luck to everyone. When new technologies replace the production process or the economy manufactures different goods, many workers have to make a career change or improve their abilities.

The Impact of Technology

The concept of technological unemployment is regaining momentum in the discourse of economists and economic sociologists. However, when analysing the debate, what is most surprising is the substantial absence of agreement on the very existence of technological unemployment as a phenomenon⁶. Carl Benedikt Frey, an economist, and Michael A. Osborne, an engineer, have researched how the development of technology and employing automation and robotics impacts job reductions and how it affects the need for certain qualifications. Some observers present technological unemployment as a sprawling monster that is completely subverting the global economy, while others conclude that this picture is just a mirage of doomsayers⁷. The authors consider that new technologies will affect vocations and employment, and recognising these trends will provide guidelines, especially a change of education, as well as the socio-economic relations⁸. The Oxford Dictionary of Economics defines technological unemployment as follows: "Unemployment due to technical progress. This applies to particular types of worker whose skill is made redundant because of changes in methods of production, usually by substituting machines for their services. Technical progress does not necessarily lead to a rise in overall unemployment."⁹

⁶ Campa, R., Technological unemployment: A Brief History of an Idea. ISA eSymposium for Sociology, 2017, 7.1.

⁷ Nikolić, G., Nove tehnologije donose promjene, Andragoški glasnik, Vol. 18, No. 2, 2014, p. 27.

⁸ Nikolić G., Cjeloživotno učenje, potrebne promjene u obrazovanju odraslih; predavanje na IV. Susretu ustanova zaobrazovanje odraslih, Opatija, April 15-16, 2013.

However, throughout history, certain other data have shown an opposite viewpoint. Namely, wiping out jobs in the primary industry of the United States of America shows impressive numbers: in 1900, 41% of the workforce was employed in agriculture, and a century later, in 2000, only 2% of Americans were still employed in the same sector.¹⁰

Popular opinions on technological progress often differ significantly. Since the dawn of the Industrial Revolution, workers have been afraid that technological progress will make their jobs obsolete, resulting in unemployment. At the beginning of the 19th century, a group of English textile workers known as the Luddites destroyed new machinery which was seen as a direct threat to their positions. Similar events occurred in other countries. The word "sabotage" derives from one of the ways French workers destroyed machines: they put their sabots (heavy wooden shoes) into the machines.

The topic of technological unemployment often emerges whenever unemployment is high. During the Great Depression, supporters of the movement called technocracy movement claimed that unemployment is the result of machine introduction and the situation will only get worse if further technological progress is allowed. In Europe today - with high unemployment - in many countries, there is widespread support for a shorter 35-hour, or even 30-hour working week. Due to technological process, there is insufficient work so as to enable full-time employment for all employees. The proposed solution hypothesises that each worker has fewer working hours (with the same hourly wage) in order to hire more workers. In its crudest form, the argument that technological progress causes unemployment is definitely not valid. Very large improvements in the standard of living accomplished by the developed countries during the 20th century have brought forth a major increase in employment and a non-systematic increase in the unemployment rate. In the USA, the gross domestic product per capita has increased 6 times following the year 1900, and, far from a decrease, employment increased 5 times (reflecting the simultaneous increase in the USA population).

By observing different countries, there is no evidence of a systematic, positive relationship between the

unemployment rate and the level of productivity. Japan and the USA, the countries with the highest levels of productivity, have the lowest unemployment rates among the OECD member countries.

In order to better understand this issue, it is necessary to differentiate between the two related, but separate dimensions of technological progress:

- Technological progress enables the production of a larger quantity of goods with the same number of workers. This can be stated in two ways. Optimistically: technological progress enables the economy to produce even more domestic product with the same number of workers. Pessimistically: technological progress means that the economy can produce the same amount of domestic product with even less workers. Those who consider technological progress as the process which increases the domestic product and the standard of living are being optimistic. Those who worry about technological unemployment are being pessimistic.
- Technological progress leads to producing new goods and the disappearance of the old ones.
- Alongside the technological progress, there is a complex process of creating and wiping out positions. This topic was central in the work of a Harvard economist Joseph Schumpeter who, in the 1930s, emphasised that growth is basically a process of creative destruction. For those who have lost a job and have to find new employment, or those who possess the skills which are no longer sought after, technological progress can represent a curse, not a blessing. And when it comes to consumers, they benefit from the availability of new products.
- Workers will be at a disadvantage due to extended unemployment and will accept lower wages when they find a new job. The concern that technological changes can negatively affect certain groups of workers is, nowadays, especially present in the USA. The last 20 years have been characterised by a decrease in relative wages for low-skilled labour force. Most signs indicate that technological development is the main cause.

⁹ Black, J., Hashimzade, N., Myles, G., A Dictionary of Economics, Oxford: Oxford University Press, 2012, p. 405.

¹⁰ Wladawsky-Berger, I., Technological Unemployment and the Future of Work, Wall Street Journal, November 6, 2015.

Technological Progress & the Impact on Distribution

Technological progress is the process of structural change. New products are being developed, making the old ones obsolete. New production methods are being presented, requiring new skills and making some old ones less useful. This process is called churning.

For those in the expanding sectors, or the ones possessing the right skills, technological progress leads to new options and higher wages.

For those in the declining sectors, or the ones possessing the skills which are no longer sought after, technological progress can signify the loss of employment, a period of unemployment and, most likely, much lower wages.

There is popular opinion that the main wage increase factor for the highly-skilled in relation to the wages of the low-skilled workers is a constant increase in demand for highly-qualified workers in relation to the demand for the low-qualified ones.

This trend in relative demand is not new; it was present to a degree even in the 1960s and 1970s.

However, it was subsequently mitigated by a continual growth in the relative supply of highly educated workers: an increasing proportion of children who graduated from high school, enrolled in studies, completed their studies, etc. Since the early 1980s, the relative supply continued to grow, but not fast enough for it to be equated with the continual growth in relative demand. This resulted in a steady growth of relative wages for highly educated workers as opposed to the low-qualified ones.

Conclusion

For workers who have lost their jobs due to the introduction of new technology or owing to the closure of obsolete facilities, opportunities for employment in the same profession and in the local area are few, so that their unemployment can last for months, or even years. One of the solutions is a government intervention or assistance in organising and implementing retraining programmes. Another solution is to stimulate geographical mobility of the unemployed workers outside the local area. The third option for the government is to offer former employers, who have previously dismissed employees, to create new service industry positions for the workers who have lost their jobs.

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Uticaj tehnologije na odnos između rada i nezaposlenosti

SAŽETAK

Pojam nezaposlenosti može imati različita značenja ovisno o kontekstu u kojemu se koristi. Može opisivati pravno-administrativno stanje odnosno evidentiranost na listi zavoda za zapošljavanje ili pravo na novčanu naknadu za nezaposlene. Ujedno, može označavati stav odnosno spremnost na prihvatanje posla pod određenim uslovima.

Može se odnositi i na socijalne teškoće unutar određenog privrednog sistema, kao i na neravnotežu ponude i potražnje rada na pojedinim dijelovima ili na cjelokupnom tržištu rada, kao i ne tehnološki razvoj konkretnog društva. U radu se govori o uticaju novih tehnologija na nezaposlenost.

Ključne riječi: nezaposlenost, tehnologija, radna mjesta

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