

Is ict creating unemployment?



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Today there is a popular concern or debate that technological advancement may replace much of the industrialized and other work force, creating widespread unemployment. For example, in 1983 the Upjohn Institute for Employment Research predicted the existence of 50, 000 to 100, 000 industrial robots in the United States by 1990, resulting in a net loss of some 100, 000 jobs (Distress Inevitable as Robots Replace Low End of Workforce, July 1983), which means that the amount of advancing technology is directly related to the number of unemployment. Technological (ICT) advancement changes or introduces more efficient and effective ways in the production of more goods and services. It will be argued below that the workers affected by technological advancement are those who have no skills on how to adapt to the technological change and in part lose their jobs in a fully competitive labour market. ICT is simply the use of software and machines, robots, computers, and the like in production. However, any better, faster, or more efficient way of producing is a technological advancement; better knowledge will be enough, even without a new tool or machine. Finally, the negative effects of slow and rapid technological change on employment and economy as a whole will be discussed. Our results show the effect of ICT investment on unemployment and also how telecommunications investment positively affects the creation of new products and processes, but increase the demand for skilled workers.

Introduction

The most constructive definition of “ unemployment” is the shortage of supply to demand in the case of labour. It is the ability of someone who is willing and able to work at market wage rates but is denied the chance to do

so. Increase in technology can be a cause of increase in unemployment. Technological advancement or increase in ICT may be described as any change in a production process leading to higher standards of living through increased output from the same amounts of resources or through the use of fewer resources to produce the same level of output. The type of unemployment applicable to this discussion is structural unemployment due to the replacement of workers by machines. The flow of the Information and Communication Technologies (ICT) has risen, bringing up again the old classical debate about the relationship between technology and employment. Structural unemployment occurs when the jobs available in a certain area do not match the talents of those who wish to be employed. As we will read later in the research, some believe that this kind of unemployment may exist throughout the economy because of rapid technological advancement. The nature of the different long-term “technological path” can be of importance in explaining national and regional differences in employment and unemployment trends. Obviously, this does not mean that short-term views focusing on prices (wages and interest rates) or on labour market regulation are not important, but they are probably insufficient in providing a complete interpretation of employment evolution. The fear is that ICT technologies have damaged – or even eliminated – the positive correlation between growth and employment which was undoubtedly one of the main characteristics of the Fordist “golden age” (Rifkin, 1995).

The economics of technology and employment

Economic growth theories predict that economic growth is driven on investment in Information and Communication Technology (ICT). However, empirical studies of this prediction have produced mixed results, depending on the research methodology employed. Yet the macroeconomic models which economists use to analyse business cycles contain virtually no mention of technology. The one exception to this model is “real business cycle theory,” which suggested that variations in unemployment could be understood in terms of workers choosing between work and leisure, depending on how technology affected productivity (and thus wages) at any given time. Empirical support for this theory, which was important in the 1980s, has proven as weak as its theoretical basis.

Is there a link between technical change and the demand for labour (Ricardian unemployment)? Changes in technology have in history affected employment because some tasks are done more precisely and simply than people can do them. For example, Henry Ford set up one of the first assembly lines, which increased employment in Detroit in the early 1900s. Many of the employees worked there their whole lives. But, as the auto business changed (for one thing, they last longer), then the employees had to learn new technological skills or changed jobs, depending on the situation. More computer enabled devices on cars, different materials (steel vs. fibreglass), and so on make a big difference. Early studies of the effects of computer investment found little or no correlation between information technology investment and productivity. More recent studies, however, indicate that computers and information technology may indeed be affecting the productivity of non management workers.

Technological advancement allow for economic growth which is a necessity for an increased standards of living in an economy. This is a long-run effect, however, and in the short-term the introduction of new technology can result in unemployment. The impact on employment in different sectors is universal. There has been a noticeable change in the skills required for existing jobs and new jobs. There has been a shift in demand towards more skilled employment in manufacturing and in other industries. There is thus widening the gap between those who have appropriate skills and those who don't. This results in unemployment arising from mismatch.

Assume that current technological conditions imply full employment of both skilled and unskilled workers: for instance, 20 skilled workers and 100 unskilled workers are employed in a given economy. Then, a skill biased technical change occurs: the same output can now be produced with 10 skilled workers and 30 unskilled ones (the relative coefficient in the use of labour has increased from $1/5$ to $1/3$ because of the skill bias). Now, even if an unlimited demand expansion is assumed, the economic expansion can lead to the full utilisation of skilled labour (20) and to under-utilisation of the unskilled (60); as a consequence, 40 unskilled workers remain unemployed. In other words, a limited supply of skilled labour implies unemployment among unskilled workers (Bartel, 1987).

Effect of Technological change in Europe

The influence of technological change on employment is vague. If we compare the US with Europe it is difficult to see how technological change has directly caused rising unemployment. Unemployment in the US is at

around 6.5 per cent (as it was in the early 1960s) but there has been a vast investment in technology there. In Europe, however, a lower degree of investment in technology is matched by a much higher level of unemployment. Looking at the economy from a general balanced perspective, the unemployment generated by technological change may not surface in the economy as a whole; that is, even though less people will be employed in certain (mainly the manufacturing firm) jobs. The resulting increase in output will allow for improvements in other markets and will thus create more jobs. Thus while unemployment rises in some sectors there is the possibility that it will fall in other areas. This indicates that the direct impact of technological change on the level of employment is going to be minor compared to the impact of other factors.

Effect of Technological change in Africa

Even though, the creation and flow of ICT products and services plays a major role in social development, productivity and economic growth in general as seen in developed countries. The rate of relocation of displaced workers is very low in African countries. Evidence from recent studies shows that African countries are not lucky to have large amounts of educated skilled workers who can easily be relocated to other sectors when replaced by the automatic nature of ICT. The impact of the automation of ICT shows a decreased ability for poverty reduction related to an increase in unemployment rate due to limited job opportunities.

Technology advancement is a major factor for economic development in African countries. However, the crisis ICT has brought to African countries

cannot be understated. The way risk is seen in Africa in terms of unemployment is very high because job losses are on an increasing rate. A report released by the United Nations (UN) shows that African countries were growing at about 6% and reducing unemployment at about 1.5% before ICT. After ICT, the growth rate is projected at 1.5%. This reduction in the growth rate from 6% to 1.5% shows a direct interaction to how employment has been negatively affected by the introduction of ICT. The methodology of the analysis explains the indirect effects of technical change and the unpredictable job opportunities which can be opened by new ICT products. Since from its very beginning, in fact, the economic theory has pointed out the existence of economic forces which can spontaneously compensate for the reduction in employment due to technological progress.

Furthermore, a 2008 projection from the UN indicated a possible 2.6% growth in global IT spending in Africa (Annual Report, 2009). Although, this will lead to more opportunities in the ICT market, it will definitely cause an increase in unemployment in 2009. Moreover, it would result in lower investment in ICT human resource development in both public and private sectors and shifts from long-term cost saving ICT projects to short-term-cost saving measures.

African governments must take big steps such as adjusting ICT related rules and policies to deal with the impact of unemployment; developing capacity for converting ICT related outcomes into tangible social and economic benefits and working with academia and industry to develop more powerful and low cost ICT infrastructures, applications and services. Also, they should

offer non-stop hold up in the area of competent building but focus on best possible use of IT funds (how to get more for less).

Empirical evidence

Given the framework described in the previous sections, the net employment impact of ICT technologies may be different in different “ national systems of innovation”. For instance, in a study on the period 1960-1990 (Vivarelli, 1995) the U. S. economy turned out to be more product oriented (and so characterized by a positive bond between technology and employment) than the Italian economy where different reward mechanisms cannot counterbalance the labour-saving effect of prevailing process innovation.

Machines Are Taking Over The Work

There is no point of people cleaning cars in a car wash manually with their hands when machines could do it for them.

In every field of human attempt, intelligent machines are making advancements by reducing workers. Jet planes are flown by computer, there is no need for a guide, and the result is superior to any human attempt. The arms systems that defend warships need to respond so quickly that any human intrusion disables their efficiency. The whole system operates without the use of a single person.

No Industry is Safe

ICT is a threat to newspapers, the music industry, television broadcasting and even the movie industry. Immediate up to date news on many and

diverse subjects are available, along with pictures, at the touch of a keyboard via the internet.

Music can also be copied onto computer files and played without the need for records or compact discs, declining the CD creation and publication industries. Industries now share the same insecurity as workers as they do not know how long they will be required.

From an empirical point of view, the question is to see whether technology has implied a general tendency towards the saving of work. It is important to stress that this exercise has to be conducted in terms of total annual hours of work, since the focus of the analysis is the total need of work which is requested by a given economic system. Thus, for this aim, both unemployment and employment statistics are obviously misleading since the first is biased by the relative dynamics of labour supply and labour demand, while both of them do not take into account the general trend towards a continuous decrease of working time per employee. This general trend has nothing to do with the market compensation mechanisms which have been discussed so far and it obviously involves a bias: if, for instance, labour-saving technologies has implied a decrease of 20% in the labour coefficients and the annual per-capita working time has decreased by the same percentage, the comparison in terms of employment (number of employees) would erroneously lead to the conclusion of a neutral employment impact of innovation. Hence, for the purpose of assessing the impact of technological change on the total need of work, the total amount of hours of work in a given economic system has to be used as the proper employment indicator

(annual per-capita average working time times the number of full-time equivalents employees).

Conclusion

Yes, ICT can have adverse quantitative effects on employment, but it also has its qualitative effects. The idea is that new technologies imply a change in the relative ratio between skilled and unskilled workers with the demand for labour shifting in favour of the skilled, those who can adapt to change. Thereby causing the labour market to either imply lower wages for the unskilled or result in higher unemployment rates. Indeed, it is necessary to start from an “open minded” theoretical approach and from reliable data and then try to patiently discover, represent and estimate all the various direct and indirect effects of technological change. As far as the available evidences are concerned, contrasting results can emerge according to the different levels of analysis.