While the new world of digital technology is delivering intensive growth to certain companies and individuals, the question remains whether this growth will ‘trickle down’ or ‘spill over’ to other sectors of the economy rapidly enough to avoid the massive social disruptions seen in earlier historical periods of economic shifts. The rise of mobile communications, robotics, the internet of things and computer programs that provide services are transforming production, consumption and the labour market. As consumers, most individuals benefit from these changes, but as employees many have a hard time catching up. This goes especially for those not yet established on the labour market - youths. Jobs that are easy to outsource or can be automated by computers or robots are rapidly disappearing from mature economies. The combination of global markets and products that can be manufactured at practically zero marginal cost (e.g. software) means that the “superstar” effect first described by Rosen (1981) has become even more conspicuous. A small fraction of the labour market - for example consultants and engineers - is exhibiting increasingly rapid wage development. The “superstar” effect is also evident among companies, where today’s digital start-ups are able to grow rapidly in users and sales, and reach billions in market capitalisation in just a few years - yet still often creating few jobs. One example is Instagram, which quickly reached over 130 million customers. Yet only 15 people worked at the company when it was sold to Facebook for over USD 1 billion (Brynjolfsson and McAfee 2014, 126).

Concern over jobs disappearing is nothing new. It was always previously the case that when old jobs disappeared due to automation or foreign competition, they were replaced by new ones. The standard response from economists is that increased productivity leads to profits and lower prices, and therefore to a demand for more new types of products (Brynjolfsson and Hitt 2000). The jobs that disappear lead to new jobs somewhere else in the labour market; what society needs to do is to ease this process by not supporting stagnant sectors, but instead supporting workers’ training and transition to other parts of the labour market. What, if anything, is different this time around? Tasks that cannot be easily automated are those that require more creativity, social skills and human-to-human interaction (Levy and Murnane 2005). This leads to two interesting predictions for the future: (1) the wage rate for jobs that require more creativity, social skills and human-to-human interaction will go up; and (2) most types of jobs will rely more and more on computers to facilitate overviews of processes and tasks, or to provide decision-support, while individuals working in these jobs will rely more on creativity, social skills and human-to-human interaction to complement any tasks not handled as productively by computers.

A recent widely discussed paper by Frey and Osborne (2013) used data from the United States (US) on 700 types of occupations to forecast which types of jobs are most and least likely to be replaced by technology over the next two decades. They divided the tasks involved in these jobs into two dimensions: cognitive vs. manual and non-routine vs. routine. Drawing upon earlier work on the offshoring of jobs to low-wage
countries, Frey and Osborne identified three aspects of a job that would make it less likely for a computer to replicate the tasks of that job: firstly, “perception and manipulation” in unpredictable tasks such as handling emergencies, performing medical treatment, etc.; secondly, “creative intelligence” such as cooking, drawing or any other task involving creative values that rely on novel combinations of inspiration; thirdly, “social intelligence”, or the real-time recognition of human emotion. However, Frey and Osborne’s paper has been criticised for not taking into account changes in labour or capital prices, and for not considering political and social resistance to digitisation, or the work-leisure trade-off for workers who could use computers to free up time available for other tasks. This criticism notwithstanding, the core insights that some types of jobs are disappearing more rapidly than others and that the core tasks of jobs are likely to change are widely accepted. In particular, low-wage jobs requiring little or no training, as well as some high-wage jobs that can be standardised, are more likely to be replaced.

The role of entrepreneurship and new firm growth for youth employment

The increasing importance of new and small firms for economic vitality has gained increasing attention in academic and public debate in the last decades. Prominent researchers, such as David Audretsch, argue that this development is due to a move from “an industrially based economy” to “an entrepreneurial economy” (Audretsch 2008). Most reasons for this shift can be found in the economic and political developments of recent decades, such as increased decentralisation within industries, and a growing reliance on knowledge as a competitive resource. Small-scale production and knowledge as a competitive resource are common hallmarks of entrepreneurship. It has been suggested that the economic instability during the 1970s oil crises led to changed methods of production and increasing flexibility among larger firms, causing them either to rely on smaller subcontractors instead of producing ‘everything themselves’, or to rely on a complex grid of subcontractors working in networks. This development also led to a growing prevalence of entrepreneurship in the form of small and new firms.

It has, however, been noted in the empirical literature that much entrepreneurship does not take the form of growing productive firms, but rather takes the form of increasing rates of self-employment and new firm entry, as opposed to growing ventures (Van Praag and Versloot 2007). Modern production and information technology imply increasing economic divisions whereby most firms become smaller in terms of employment size, but are still able to raise their productivity (Brynjolfsson and McAffee 2011).
Political suggestions to counter youth unemployment in the digital economy

Several authors in the debate on digital economy and the labour market take into account basic income, negative income tax and other schemes providing everyone with a minimum standard of living. It needs to be highlighted that such a radical reform is somewhat premature: unemployment levels are still high after the financial and Euro crises, and we do not know what levels we will see in a few years. Unemployment levels in the US are now rapidly decreasing to pre-crisis levels. Second, ‘providing everyone with a minimum standard of living’ does not really provide a solution to the permanent exclusion problem. Not starving is not the same as being included. Therefore, we think the main challenge for governments in creating truly inclusive growth in the new economic landscape is the fight against structural unemployment. There are not really any new theories in the debate. We need education and training equipped with a different labour market, containing a greater focus on creativity, flexibility, social skills and general knowledge (where computers are not competitive, so far). A nice twist is that the very automation causing unemployment might revolutionise the education and training needed to alleviate the problem (Levy and Murnane 2005).

Active labour market programmes

One frequently heralded solution to the disappearance of jobs from digitisation is to considerably expand the set of active labour market programmes (ALMPs), for people who cannot find a job. ALMPs for unemployed workers and welfare recipients generally include programmes such as job search assistance, labour market training, wage subsidies, and direct job creation in the public sector. These are generally seen as important elements of European countries’ efforts to combat unemployment. For European Union (EU) Member States, ALMPs constitute a central part of the European Employment Strategy, which defines employment as a key objective of a joint economic policy in the EU. While such active programmes have been in use for many years in most countries, there is a growing awareness of the need to develop scientifically-justified measures for the effectiveness of different ALMPs, and that these measures are more rigorously developed and employed in the US than in Europe, where evaluation spending is scarce compared to programme spending (Kluve 2010). Some exceptions do exist: Carling and Richardson (2004) evaluated eight different Swedish ALMPs, one of which was for start-up subsidies. Their study showed that the most successful schemes were the ones which, similarly to start-up subsidies, offer on-the-job-training and work-life experience. Rodriguez-Planas and Benus (2007) investigated the impacts of four labour market programmes in Romania: training and retraining, employment and relocation services, small business assistance to facilitate business start-ups for displaced entrepreneurs, and public employment. Their analysis revealed that the first three programmes had positive effects on the labour market outcomes for participants. In contrast, temporary public employment was found to be detrimental for participants’ employment prospects. Consequently, one should be careful not to draw too general conclusions about the efficiency and effectiveness of ALMPs. The relative success of a specific self-employment programme is probably context specific and depends on several interacting factors (e.g. applicant screening, eligibility criteria, the type and amount of subsidies or transfers made, the extent to which training/quality of training is provided, and the current unemployment rate).

Subsidies and tax exemptions

One possible way is to stimulate a low-wage market through extremely low taxes on low incomes, or other solutions. Germany has experimented with this in terms of ‘the Hartz initiative’. This initiative is based on the concept of ‘marginal employment’ or ‘minor employment’ - i.e. providing a source of income at or above the subsistence level for workers currently out of the labour force. Minor employment is defined by German social security as ‘a low absolute level of earnings’ and can be seen as short-term salaried employment that can be combined with social security support in order to provide a foothold in the labour market for workers currently on the outside, but avoiding the problem of high reservation wages for those currently receiving social security benefits. In popular jargon and among the media, these types of jobs have been called ‘mini-jobs’ or ‘400-euro jobs’. The Hartz reforms in 2003-2005 have been among the most controversial labour market reforms in Germany; frequently criticised by both the media and the public as ‘the end of the welfare state’. At the same time, the unemployment rate in Germany has been drastically reduced. After the initiative was implemented, the German unemployment rate fell from almost 11% in 2005 to 5.5% by the end of 2012. There is still much debate on whether this reduction can be attributed to the Hartz reforms or to another factor.

While the German initiative provides some sort of inspiration for how to solve the permanent exclusion of certain parts of the labour force, it is hard to adopt any such system without increasing progressivity in the tax system. It is simply too expensive to let tax exemptions cover the whole labour market, and the income span where they are phased out will have a higher progressive tax. Highly progressive taxation often leads to distortion effects, such as people dropping out of...
Participant at the 1st ASEF Young Leaders Summit (ASEFYLS1) on "Entrepreneurship and Youth Employment, 1-4 November 2015, Luxembourg
Lower or no minimum wages

In economic theory, a minimum wage is expected to have a limited effect on total employment given that a relatively low proportion of employed workers have a salary near minimum wage. Earlier research focused on groups with weaker ties to the labour market, particularly young people and women (Neumark and Wascher 2008). Previous studies strongly support the notion that the existence of or increase in a minimum wage rate tends to decrease employment overall, especially for youths. In a recent report, Spector (2014) emphasises that higher starting salaries tend to inhibit the lifetime career opportunities for those not yet established on the labour market. She notes that if minimum wages are lowered, unemployment for young people tends to increase both for the low-wage sector and the high-wage sector. Furthermore, an older generation is often replaced by a younger one. Given the uneven distribution of unemployment across the young and the middle aged, this could be an indication that wage floors exclude certain groups from the labour market. Long-term studies suggest that high minimum wages complicate labour market entry and have an impact on employment and wages later in life as well.

Negative income tax

One popular idea to counter the unemployment created by digitisation is to provide a guaranteed income or a negative income tax. A citizen salary, which is non-significant but still too low for individual subsistence, is currently in place in, among other places, Alaska (derived from oil exports). Norway and other countries with significant natural resources could easily introduce similar provisions, and theoretically any state or region could introduce a negative income tax or guaranteed income. However, the effects of this have not been extensively studied. A guaranteed income is a radical reform for at least three reasons. Firstly, it requires significant adjustments to current social and economic systems, especially in European economies. Secondly, it will require a lot of funding to work in practice. Thirdly, a negative income tax may have unproductive consequences on the incentive to work among individuals currently positioned in the middle and at the top of income distribution. Certainly, many people with high incomes may think negative income taxes to be an unacceptable political suggestion.

Educational advancement

In a series of articles, Andrei Shleifer and his colleagues investigated productivity and growth across countries, regions and sectors of the modern world. Their general stylised findings show that to an increasing extent, it is primarily societies’ investment in human capital, and secondly the ability to foster entrepreneurship, that drives productivity and consequently growth (Gennaioli et al. 2013). A natural conclusion to combat the labour market disruptions of skill-biased technological changes and increasing youth unemployment would therefore be for governments to invest more in education and training. However, one problem would be that many education systems in the developed world are under severe stress from different stakeholder requirements, institutional changes, underfunding or inefficient organisation, etc.

Another possibility could be to educate people in new ways, with more focus on creativity and less on rote learning, for example by using massive open online courses (so-called MOOCs). This part of the technology-driven change in the education system is part of a movement where education is moving towards the development of a greater recognition of practical knowledge; including informal learning channels where self-learning, peer-learning, and coaching and tutorship seem to becoming more prevalent. To some extent, this represents a return to the renowned Oxford/Cambridge tutorship system, but with greater flexibility and higher resource efficiency.

It remains to be seen whether new innovative types of education may contribute to enhancing ‘non-cognitive abilities’, such as self-motivation, persistence and creativity, which are the skills seen as most important on the future labour market (Heckman and Krueger 2005). One hope is that automation can make excellent education accessible to many more people in the future (Levy and Murnane 2004, 99-148). This could free up resources needed to spend on enhancing non-cognitive abilities, such as good kindergartens. As Frey and Osborne (2013) emphasised in their paper on the disappearance of jobs, certain features related to non-cognitive skills, such as creative intelligence and social intelligence, make it less likely that a computer would be able to replicate the tasks of that job. The future of education may therefore lie in the combination of technology and human-to-human interaction in problem solving. So for the computer literate part of the workforce, technological change comes with a potential for increased productivity and earnings. On the other hand, for the non-computer literature part of the workforce, individuals may be increasingly confined to non-repetitive service jobs such as janitors, waiters and cleaners, or they will require training and education. At this stage, these dire forecasts for the future are too early to be readily understood or dealt with by policy makers. The high unemployment we see in Europe and many other regions today is not primarily the result of digitisation. It is the result of the same old reasons: global competition, rigid wage structures and labour markets, over-regulated product markets, generally complicated conditions for starting and running businesses, misguided public support, etc. So while researchers and long-term political planners are and should be thinking about future labour markets and how they will be affected by digitisation, today’s problems are more like yesterday’s than tomorrow’s.

The role of entrepreneurship education for youth employment

Following the realisation that entrepreneurship is important for economic development, it has become a goal of educational efforts around the globe. Courses and programmes in...
entrepreneurship are prevalent at the tertiary level in the educational systems of most countries. Yet prior research on entrepreneurship education indicates a knowledge gap concerning the effect and outcome from different education and training efforts (O’Connor 2013). In particular, little attention has been paid to efforts that target primary or secondary education. This lack of knowledge may have both theoretical and empirical consequences. For example, uncertainty about the relative costs and benefits of various types of entrepreneurial education can cause errors in resource allocation at national, state, and local levels.

A third possibility could be to expand the scope of entrepreneurship education in high-schools and universities worldwide. Can entrepreneurship then be taught? In an early paper, Robert Ronstadt’s (1985) answer to that question was ‘yes’. He believed that “we are entering the early phase of a new era of entrepreneurship and education”, and that there were strong indications that entrepreneurial education would “produce more and better entrepreneurs than were produced in the past”.

Several studies have noted that entrepreneurship education can indeed foster entrepreneurship among students but effects tend to differ across groups of participants and across programmes with different designs and foci. Detienne and Chandler (2004) showed that specific skills training among university entrepreneurship students can improve individuals’ opportunity identification; notably their ability to generate more ideas and improve the innovativeness of those ideas. Friedrich et al. (2006) studied the effects of a South African programme addressing skills and techniques relating to personal initiative, planning, goal setting and innovation, and found this to affect students’ entrepreneurial skills positively. Souitaris et al. (2007) tested the effects of entrepreneurship education among science and engineering students, finding that participation raised entrepreneurial attitudes and intentions. Few studies, however, attend to the long-term impact of entrepreneurship education on students. A recent study by (Elert et al. 2015) compare three Swedish cohorts from Junior Achievement Company Programme (JACP) alumni with a matched sample of similar individuals and follow these for up to 16 years after graduation. They found that while JACP participation increases the long-term probability of starting a firm as well as entrepreneurial incomes, there was no effect on firm survival. In sum, more investments in education, different types of education, and more rigorous evaluation of educational programmes’ success can be a fruitful path to combat youth employment.

Conclusions

The exponential development of mobile communications, robotics, the internet of things and computer programs is increasingly transforming production, consumption and the labour market. There are no easy solutions or ‘quick fixes’ to the challenges of any modern labour markets affected by digitisation. Attempts to radically change income taxation, such as regulated minimum wages, may provide negative rather than positive outcomes, since individuals with lower productivity than a computer will be permanently excluded from the labour market. Subsidised wages or less taxation on lower income levels have received more positive support in the economic literature, but there is little support for the benefits of negative income taxes. A potentially more productive way for governments to support the future labour market may be to shift taxes from income to other bases.

Will there be room on the labour market for workers who do not have these skills?

As computers and robots take over even the most advanced tasks, the demand for human labour will be more and more geared towards tasks that require advanced dexterity, leadership, social skills and creativity. Will there be room on the labour market for workers who do not have these skills? Without government investment in training and education, and a social safety net facilitating the transition from the loss of jobs and sectors to the creation of new emerging sectors, we may see significant social and economic inequality in the years to come.
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