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The Human-Capital Economy: Automation & Income Stagnation

Introduction

The October 2016 Google Self-Driving Car Project Monthly Report boasts that the project has mastered the three-point turn and claims over two million autonomous driving hours. The technology already works better than most humans do in many ways. Ever since Google announced the Self-Driving Car Project in 2010, several news reporters have written articles speculating that these autonomous vehicles will replace truck-driving jobs, with estimates now ranging from 3.5 million to 7 million jobs. In the past few months, over 90 articles were published in the *Wall Street Journal* alone about self-driving vehicles taking over jobs, with opinions ranging from fear to excitement. But this is just the beginning.

By reducing the human labor necessary to create and distribute goods, we increase the potential productivity of mankind. The recent investment of mass automation by large corporations will lead to high unemployment and increased inequality. We can and should continue to automate in order to improve our quality of life and maintain a competitive edge in the global market. However, we should prepare for mass automation and reduce the negative impacts of such technological innovation by researching and implementing a flexible support system for human workers. We can and should reduce inequality by distributing the productivity gains which come from automation.

Automation Leads to Increased Underemployment and Natural Unemployment

Productivity and unemployment have a very close but complicated relationship. If human labor is significant to a job, then high productivity signals a low unemployment. In contrast, if human labor is not significant to a job then high productivity is only attainable with a higher unemployment in that given industry. It all depends how much human labor a process requires. Automation in this paper refers to any

innovation that reduces the amount of human labor required.

Technological unemployment (i.e. unemployment due to automation) is not anything new and has, even in recent years, largely been misunderstood by the public. Automation usually results in a net loss of employment. A 2013 analysis conducted at Oxford University found that nearly 47 percent of total employment in the United States is at risk of computerisation most likely to occur within the next two decades (Frey 44). This analysis was conducted by comparing the difficulty of computerisation to the substitution effect of human labor. Substitution effect means that employers will substitute human labor for an alternative (e.g. machines). This substitution effect of human labor becomes more acute as employers increase the incentive to work in a given market. For example, if many new retail businesses open and there is a shortage of workers available and willing to provide the labor of a cashier, these new businesses will have an incentive to both raise the wage and look for alternatives to human cashiers. Raising the wage increases the incentive for workers to apply to a specific job, but it also carries with it the additional effect of a higher incentive for innovators to develop labor alternatives in that particular field. The increased wage creates an incentive for both the employer (who is willing to pay more now in order to save costs in the long-run) and the innovator (who thinks of the employer's increased willingness to pay) to invest in automation. This phenomenon can also be found during times of minimum wage increase and recessions. In these two instances businesses have a high incentive to cut costs–and they do.

During the last recession in 2008, job loss peaked at 11%, the highest level since the Bureau of Labor Statistics started collecting data through Displaced Workers Surveys in the 1980s. Of those that lost jobs and were re-employed, one in five had to start working part-time (Belsie). Why is this so? Recessions create an incentive for employers to cut costs and so they look specifically for cheaper labor alternatives. These can lead to increases in mass automation and potential for mass unemployment.

Investment in Automation Increases Standards of Living

Automation helps us increase production output and changes the cost structure of labor. Increased output in traditional competitive market economics means a decrease in price for all consumers. Because

of increased productivity and reduced prices, the poor and rich alike will be able to buy more. Agriculture is a great example for showing the effects of automation where an increase in technology has increased our standard of living in many ways, including increased food security, increased food production and increased time workers could spend on non-agricultural tasks.

The Job Preservation Perspective

Some people suggest that the ideal of job preservation is more important than the ideal of high productivity. Of course, the unemployed may not be able to enjoy a higher standard of living, but this is a very short-sighted perspective. Automation allows us to increase our standard of living and reduce the human labor required. The most significant consequence of this decrease in labor time is that workers have to find new jobs. Automation has led human labor in agriculture to drop from 41% total employment to 2% in the last century. Some automation engineers even predict completely automated farming in the near future. Such jobs will not likely come back to humans–moreover, to force job creation in industries which already have a high level of automation would only reduce productivity. Automation is a major benefit to productivity, but it does have consequences like high unemployment.

While it is true that automation decreases the number of available jobs for human workers, automation has the potential to inspire new jobs. It's easy to think of jobs that don't exist anymore due to automation (e.g. the Typesetter, the Switchboard Operator, the Bowling Alley Pinsetter), but it's equally easy to think of jobs that weren't realistically possible before automation (e.g. the App Developer, the Social Media Manager, the Wellbeing Coach). Due to an increase in quality of life (an effect of automation) people are becoming more aware and concerned with their own quality of life.

The competitive global market escalates the importance of both getting rid of jobs that are not productive and redirecting the unemployed to productive jobs in order to help each nation maintain a high level of productivity. Countries which protect unproductive jobs or discourage automation quickly lose to the productivity of countries which do automate.

Problems of Automation: Displacing Human Labor

Automation takes over whole industries by replacing human labor. This is a substitution effect where human workers are effectively replaced by machines and computers. But this substitution effect could be devastating if we do not create new industries where human labor is valuable and non-replaceable.

Entering the workforce will grow exponentially harder as automation raises the barrier to entry. Unemployment doesn't have to be a bad thing. Many of the low-paying jobs we have today are not fulfilling and while automation will take over their jobs in the future, we have to wonder: Where will the people go? How will these people earn a living? How will the poor survive? As the skill of machines raises and as the costs lower it is easy to see many companies will choose machines over human labor. The National Institute of Standards and Technology estimates this cost reduction as $40.4 billion in traditional manufacturing settings alone. (Link 4-12) But the question remains: where will the people go?

Where will the workers go when they are replaced by machines? Many will go to school to gain skills that machines cannot then perform, but eventually machines will catch up. IBM Watson already knows more about combinations of medication than any pharmacist could ever know.

If we don’t create new economies and job markets it is likely that a significant portion of the working class will not be fully employed. The rate of college graduates that are considered underemployed is 60% and those unemployed is 25% across the nation. Unemployment does not only affect the unemployed—it affects everyone who is a part of the economy.

> The economic problems from unemployment do not just affect those who are unemployed and their families. If a significant (and growing) proportion of the working-age population is unable to find adequate work to sustain themselves [this would] represent a major burden on the overall economy if the unemployed cannot actively participate as consumers of products and purchasers of services. (Marchant 29)

If we reach a point where a significant number of consumers are not able to buy goods and services,

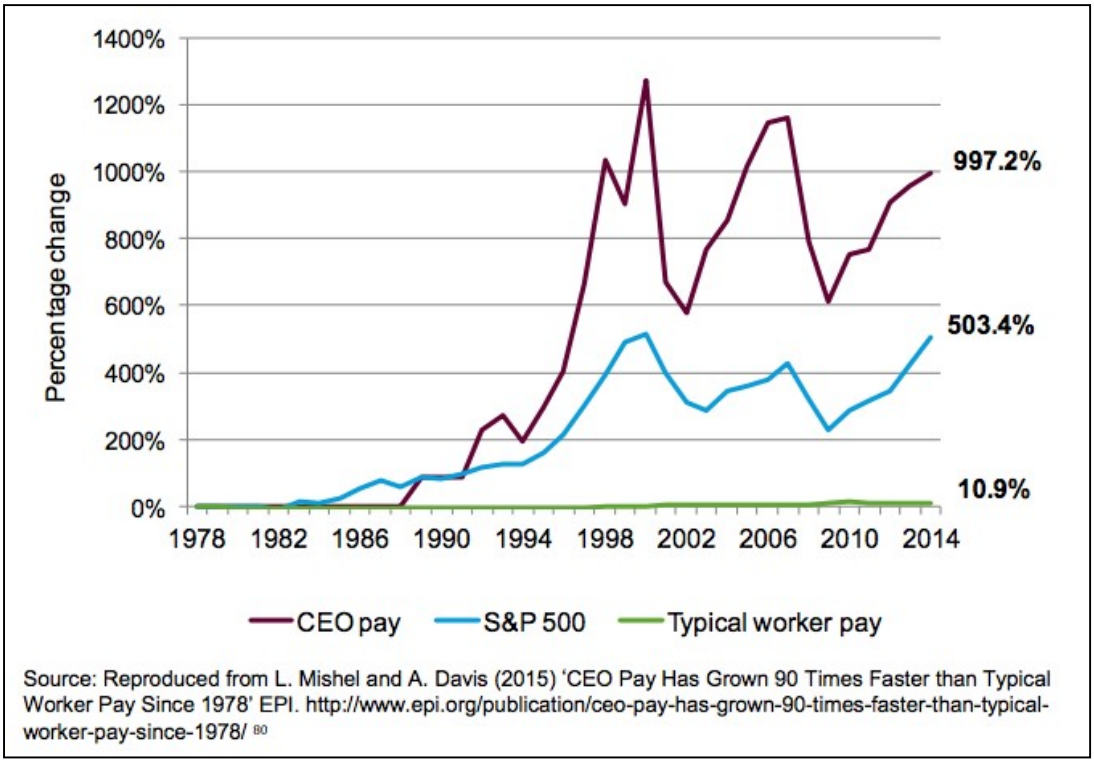
business will not be able to sustain operation. While not the only cause of the Great Depression, during the great depression total unemployment was around 25%. Almost every economist agrees that any unemployment above the natural rate hurts the economy.

Problems of Automation: Inequality & Unfair Advantage

There will always be humans available to work, but who will hire them? It can be near impossible to compete with machines when no one is hiring. In a paper arguing that automatization is responsible for the disappearance of many middle class jobs Michele Loi states that, "A job may lose its prestige once we develop a machine to do it better, faster and more cheaply. As society adapts to technological changes, it rewards humans in positions where machines cannot [yet] substitute them, not only in economic terms, but also in terms of prestige" (Loi 205). The paper goes on to claim that it is likely that automation will do more harm than good as it takes away high paying jobs and leaves us with more difficult low paying jobs. Automation may very well be harmful if we don't create flexible programs to promote and incentivize social wellbeing through automation of the worst jobs first.

Automation creates an unfair advantage for individuals and companies which use it. The advantage creates an inequality which grows more extreme with each iteration of innovation. It may be more accurate to say that people need money than it is to say that they need to be employed. People don't apply to work at McDonald's because they love frying burgers, they do it because they need money. Problems of automation and inequality are closely associated because automation enables an increase in productivity for the owners. "[W]orkers are capturing less and less of the gains from growth. In contrast, the owners … have seen their capital consistently grow … faster than the rate the economy has been growing" (Hardoon 4). The growing problem of automation is an inequality wherein those who own the machines are get richer and richer while those who own no machines are worse off because they face a more productive competition (see figure 1).

Figure 1. Growth in typical worker pay compared to growth of the stock market (Hardoon 12)



We can compensate for these negative consequences of automation–but only if we are willing. The problem of inequality will need to be solved in the next decade to reduce the increasingly negative effects of automated prosperity. By appropriately reducing inequality, more will benefit from the exponential increase in productivity that automation allows us.

Potential Solutions to Reduce Inequality

Automation in a capitalistic society causes many people to be subjected to a relative poverty. Those who live in poverty today certainly are better off than those in poverty 100 or even 50 years ago, because automation has made products cheaper. But as inequality and unemployment reach unsustainable levels it is not likely that current welfare systems will be an effective solution. We may need to re-asses the relationship between labor and salary to get at the heart of the problem. Further research should be done to identify adequate and appropriate flexible support systems. A new digital currency which requires a ratio of human labor to be spent could be a potential solution.

Conclusion

Economic theory was created when the main problem was shortage. Today, we face a problem of prosperity, inequality, and unemployment. While automation is good for society as a whole, it is bad for the individual who does not hold a stake in the market. Individuals and small businesses are worse off by automation because they compete with big businesses that have unparalleled productivity. The same principle applies on a macro scale: countries which automate less will be worse off due to the increased capacity of countries which choose to aggressively automate.

Automation may increase unemployment, but it also increases our overall prosperity through reducing costs. Lower costs increase the buying power of all classes. But the problem of inequality remains and flexible solutions should be sought and implemented as public policy within the next five years to prevent increased inequality and predict structural changes in labor. We live in a world of prosperity. The extreme equality gap that is pervasive in the markets will only grow wider as efficiency increases without changes in current public policy.

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