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A Strategic Opening for a Basic Income Guarantee in the Global Crisis Being Created by AI, Robots, Desktop Manufacturing and BioMedicine

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Abstract

Robotics and artificial intelligence are beginning to fundamentally change the relative profitability and productivity of investments in capital versus human labor, creating technological unemployment at all levels of the workforce, from the North to the developing world. As robotics and expert systems become cheaper and more capable the percentage of the population that can find employment will also fall, stressing economies already trying to curtail "entitlements" and adopt austerity. Two additional technology-driven trends will exacerbate the structural unemployment crisis in the coming decades, desktop manufacturing and anti-aging medicine. Desktop manufacturing threatens to disintermediate the half of all workers involved in translating ideas into products in the hands of consumers, while anti-aging therapies will increase the old age dependency ratio of retirees to tax-paying workers. Policies that are being proposed to protect or create employment will have only a temporary moderating effect on job loss. Over time these policies, which will impose raise costs, lower the quality of goods and services, and lower competitiveness, will become fiscally impossible and lose political support. In order to enjoy the benefits of technological innovation and longer, healthier lives we will need to combine policies that control the pace of replacing paid human labor with a universal basic income guarantee (BIG) provided through taxation and the public ownership of wealth. The intensifying debate over the reform of "entitlements" will be the strategic opening for a campaign for BIG to replace disability and unemployment insurance, Social Security, and other elements of the welfare state.

Introduction

For two hundred years economists have occasionally come to the conclusion that advancing technologies would destroy more jobs than they created. For instance in his essay *Economic Possibilities for our Grandchildren* John Maynard Keynes (1930) predicted what he called "technological unemployment"

> We are being afflicted with a new disease of which some readers may not yet have heard the name, but of which they will hear a great deal in the years to come - namely, technological unemployment. This means unemployment due to our discovery of means of economizing the use of labor outrunning the pace at which we can find new uses for labor. (Keynes, 1930)

World War Two and the subsequent economic boom which began absorbing a growing percent of the population into the labor force soon convinced most economists that worries about technological unemployment were Luddite hand-wringing. By 1964, however, prospects for rapid industrial automation convinced three dozen intellectuals, including the economists Robert Heilbroner and Gunnar Myrdal, to form "The Ad Hoc Committee on the Triple Revolution" and send a long letter to U.S. President Lyndon B. Johnson. The three revolutions that the letter described were the revolution in armaments, which required new international arrangements to avoid apocalypse; the global human rights revolution, which required a commitment to the democratization of every country, starting with civil rights for Negroes; and the "cybernation" revolution, industrial automation, which would cause widespread unemployment and require the establishment of a universal basic income guarantee (Ad Hoc Committee on the Triple Revolution, 1964).

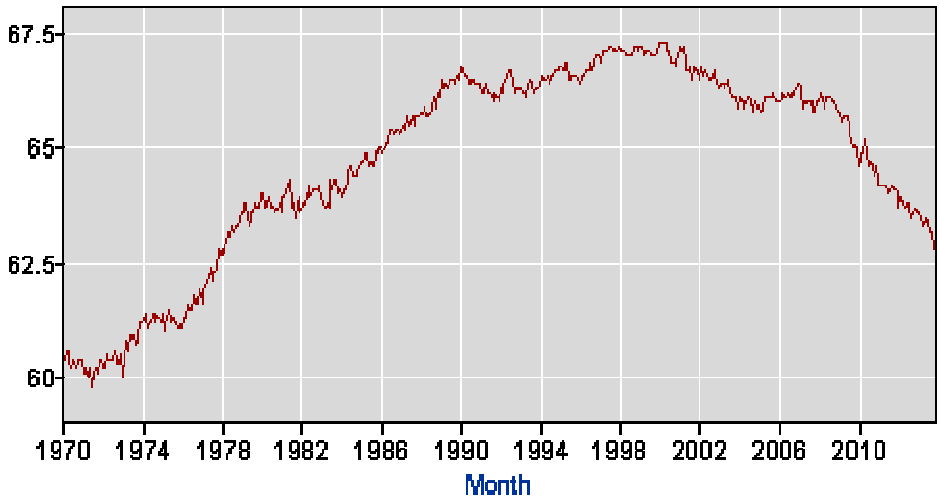
Again, the prediction of technological unemployment proved premature. The next decades did see a decline in employment in manufacturing facilitated by automation. But the growth of employment in the service sector and white collar occupations more than compensated for the displacement of industrial work, as the growth of industry had absorbed displaced farmers in the century before. In the twentieth century, professional, managerial, clerical, sales and service employment grew from one quarter of the U.S. labor force to three quarters (Wyatt and Hecker, 2006). As a result almost all economists and public policy analysts have continued to dismiss the idea of technological unemployment and embrace the "compensatory thesis" that all innovation will create new forms of employment that at least compensates for the jobs made redundant.

The mechanisms that economists propose drive this compensatory job creation were summarized in 2000 by the Italian economists Marco Vivarelli and Mario Pianta as:

- **Compensation via new machines and products**. New machines require new occupations to build and service them, and make possible the production of new goods and services.
- **Compensation via decrease in prices**. Each technological revolution reduces the cost of inputs and goods, stimulating greater demand, and therefore creating more employment.
- **Compensation via new investments**. Technological modernization increases the profit margins of the owning class, who then invest in the creation of more employment.
- **Compensation via decrease in wages**. If wages are allowed to find their equilibrium point, all unemployed workers can find new jobs at lower wages.
- **Compensation via increase in wages**. And, directly contrary to the prior model, Keynesian policies distribute some of the increased profitability to workers as wages, with a consequent demand stimulus on the economy and employment. (Vivarelli and Pianta, 2000)

The sluggish job growth since the 2008 global economic crisis has now begun to again call these presumptions into question. The labor force participation rate in the United States and other industrialized countries climbed from World War Two until the 2008 recession, but has declined since then. In the United States the employment-to-population ratio has now declined to a thirty-five year low. Part of this decline is due to the front edge of the Baby Boom reaching retirement age, and part is due to the outsourcing of jobs to developing countries. But a growing number of economists are acknowledging that there are also structural reasons for the rate of job growth since 2008 being too slow to keep up with population growth.

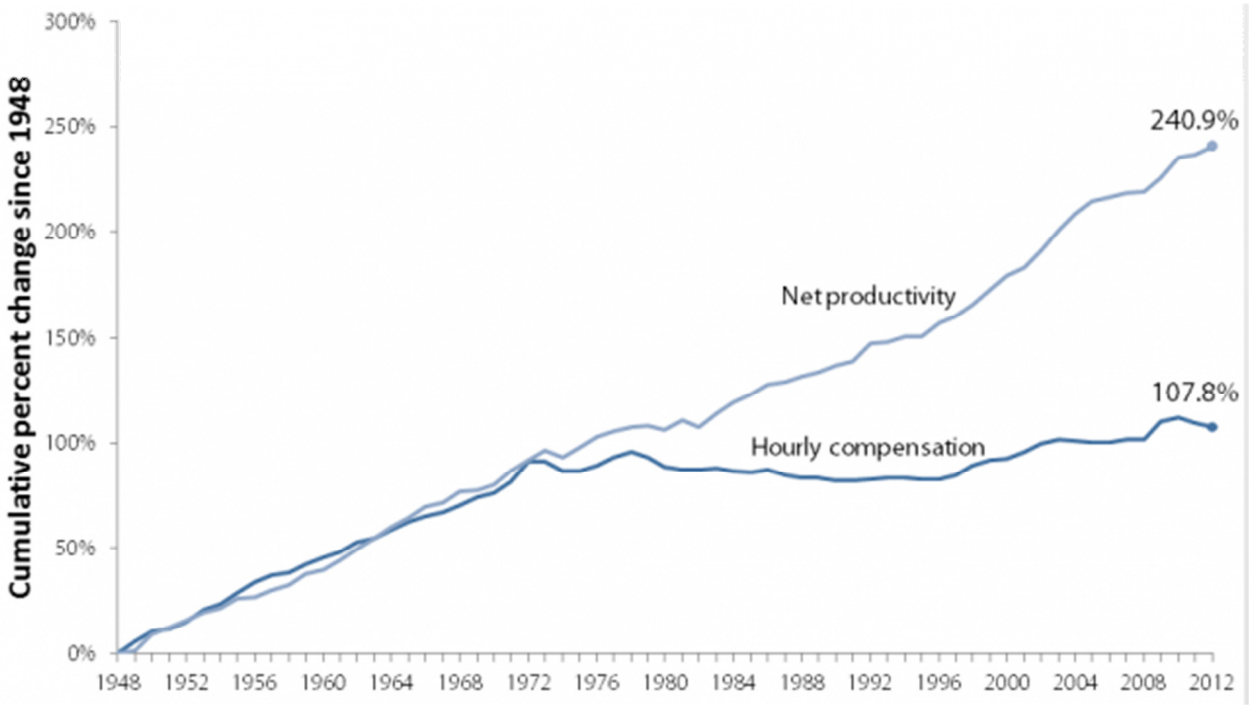
United States Civilian Labor Force Participation Rate, 16 Years and Older



(US Bureau of Labor Standards, 2014)

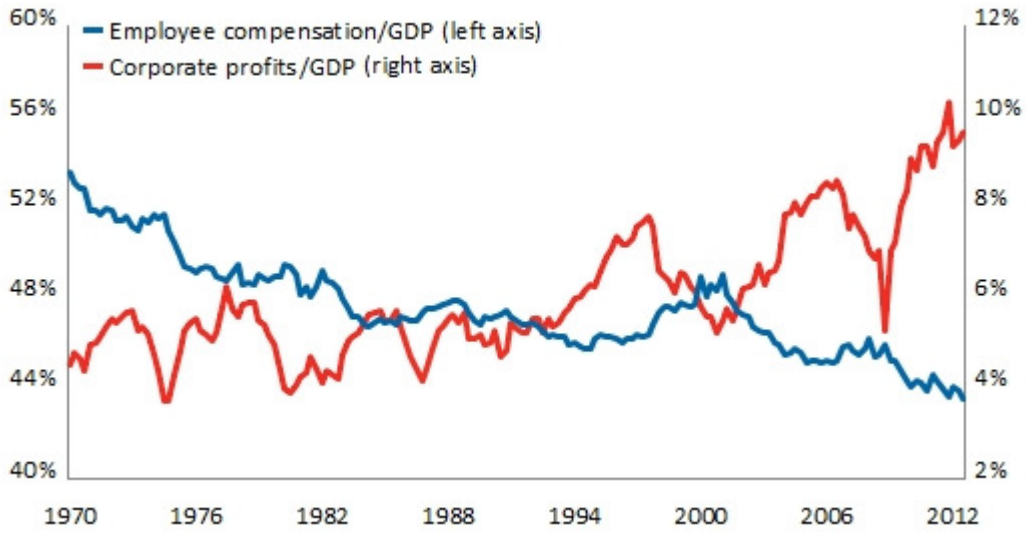
Contrary to the compensatory thesis, far fewer skilled workers are needed to maintain automated industries than are displaced by that automation. The postindustrial economy does create many new occupations, but in each case there is a calculus around the productivity that can be achieved by increasing investment in human labor versus automation, and this calculus has steadily shifted towards capital investment in machines. This capital investment drives the growth in productivity. Although increased productivity has also driven increased corporate profits, contrary to the compensatory expectation these profits have not been re-invested in wages or employment. In the United States in the last decade, productivity and corporate profits have grown while employment declined and wages remained flat (Mishel and Shierholz, 2013; Greenhouse, 2013).

Net Productivity and Real Hourly Compensation, 1948-2012



(EPI, 2013)

Corporate Profits and Employee Compensation as a Share of the US GDP



(Landy, 2012)

Increased profits have instead driven further capital investment, speculation and the dramatic increase of wealth among the "one percent." Nor does increased demand for increasingly inexpensive products, such as computers and other electronics, drive employment growth, as is evidenced by the investments in automation and downsizing in those industries. In the last two decades in the United States, as information technology exploded, employment in the manufacturing of computers and electronics has dropped by half (BLS, 2014). Employment in computer programming and other information technology support jobs has risen, but not enough to compensate for the jobs lost to automation. Again, part of the loss or slow growth in these high-tech jobs can be attributed to globalized production and outsourcing, but part is also due to advances in automation and enhanced productivity.

Although the recent decline in the employment-to-population ratio is one sign of technological unemployment, the effect can also be seen in a much longer trend in the decline in the number of hours of work and the stability of jobs. The number of hours t wore employedk per year has steadily declined in most industrialized countries from about 3,000 hours a year at the turn of the 20th century to about 1,500-1,900 hours per year in the 21st century (Pianta and Vivarelli, 2000; Huberman and Minns, 2007). In just the last decade, the hours worked per year by the employed in the OECD countries on average fell from 1844 hours in 2000 to 1765 hours in 2012 (OECDStats, 2014). At same time, there has been an increase in part-time and temporary employment. In the OECD the proportion of the work-force in permanent employment has fallen from 81% in 1980 to 74% in 2012 (OECDStats, 2014).

As a consequence of these signs that there are structural causes for the decline of employment a growing number of economists, including most notably Paul Krugman and the MIT authors of the 2011 *Race Against the Machine* Erik Brynjolfsson and Andrew McAfee, have begun to address whether we are seeing technological unemployment. In the next section I will begin to sketch out an argument for why emerging technologies, including desk-top manufacturing and anti-aging medicine, will exacerbate unemployment and the dependency ratio. Then I will turn to some of the policy proposals that are already being made to protect or create employment, and why these will only provide a temporary moderation of the pace of technological displacement. In the last section I will discuss why the demand for a universal basic income guarantee will have its strategic opening in an era of technological unemployment and intergenerational conflict over "entitlement reform."

Technological Unemployment and the Dependency Ratio

A. Automation, AI, Disintermediation and Desk-Top Manufacturing

In their 2013 study "The Future of Employment: How Susceptible are Jobs to Computerization?" Frey and Osborne analyzed the task and skill demands of 700 occupational categories, and the progress being made in computerizing routine tasks and decisions. They determined that half of all employment in the United States is at high risk of being automated within the next two decades, including most of the occupations in manufacturing, transportation and logistics, and office and administrative support. In addition they find that many service occupations are vulnerable to replacement with mobile and dexterous robots. Most of the jobs they see as at high risk are lower paying, but they also predict the automation of a variety of well-paid jobs requiring cognitive skills, such as medical diagnosis, legal analysis and financial services. However they discount the likelihood of artificial intelligence making much progress at replacing jobs that require human creativity and social intelligence, such as fashion design, public relations and scientific research. They hopefully conclude that "as technology races ahead, low-skill

workers will reallocate to tasks that are non-susceptible to computerisation – i.e., tasks requiring creative and social intelligence" (Frey and Osborne, 2013).

Probability of Computerisation

Recreational therapists	0.003
Dentists	0.004
Personal trainers	0.007
Clergy	0.008
Chemical engineers	0.02
Editors	0.06
Fire fighters	0.17
Actors	0.37
Health technologists	0.40
Economists	0.43
Commercial pilots	0.55
Machinists	0.65
Word processors/typists	0.81
Estate agents	0.86
Technical writers	0.89
Retail sales assistants	0.92
Accountants	0.94
Telemarketers	0.99

(Frey and Osborne, 2013)

Since it is unlikely that half the work force could retrain for these creative and social intelligence occupations, or that the economy could absorb that many graphic designers, lobbyists and social workers, Frey and Osborne's prediction still strongly supports a scenario of technological unemployment. But what if the capabilities of artificial intelligence, information technologies and robotics also encroach on creativity and social intelligence? Wearable health devices and distance consulting with fitness experts (e.g. FitOrbit and Optimized Fitness) is already encroaching of face-to-face personal training and therapy (Zolfagharifard 2013). Scientific research is already being impacted by automation, with automated lab processes and data analysis dramatically increasing research productivity, and progress even being made on automating hypothesis generation (Savage, 2012). In the era of Big Data, scientific progress will be increasingly dependent on the automation of scientific discovery.

Another profession that many have suggested would be immune to automation is sex work. In *Love and Sex with Robots*, however, David Levy (2008) makes a convincing case that advances in robotics and artificial intelligence are converging to enable the creation of cheap and flexible sex surrogates, with programming that would provide a passable simulacra of human sexual creativity and social intelligence. Even if progress along those lines is slower than Levy predicted, the Internet has already dramatically transformed the market for sexual gratification. Online advertising has displaced streetwalking and brothels (Cunnigham and Kendall, 2011; Vekshin, 2013). Online pornography and interactive video services have displaced the peepshow and adult video store. The most successful online sex stars can have many orders of magnitude more "clients" than any face-to-face stripper.

The impact of the Internet on employment illustrates another less often addressed source of technological unemployment, the disintermediation of producer and consumer. Information technologies not only enabled the outsourcing of call support and other services to the developing world, but the elimination of many intermediary services. ATMs displaced bank tellers. Online airline websites have displaced the travel agent, and online retailers such as Amazon have displaced the bookstore and an increasingly number of brick and mortar stores. Online news has displaced the newspaper, and online communication has displaced postal workers.

Another sector grappling with the possible disintermediating effects of information technology is education, where many believe that online education can dramatically boost teacher productivity and control the escalation of university tuition. Research is proceeding on computer-aided instruction and grading, to replace the twentieth century model of credit hour-based exposure to teachers in classrooms with a twenty first century model in which students proceed at a more rapid pace to skill certification through online readings, videos and tests.

The dislocating impacts of disintermediation are likely to be greatly exacerbated by progress in 3D printing and desktop manufacturing. Although consumer-accessible 3D printing has been focused on desktop manufacturing with materials like plastic, major investments are being made by firms in the United States, Europe and even China in industrial 3D printers that can make objects as big as automobiles (Wang, 2014; Gardner, 2014). As nanotechnology progresses eventually molecular manufacturing equipment capable of making a wide variety of objects will be accessible for consumers. Currently about half of all jobs in industrialized economies are involved in the manufacturing, transportation and sale of things. In a future in which increasing numbers of things can be made to order in the factory, store or home from electronic designs many of those jobs between the designer and the consumer will also be displaced (Copeland, 2012; Manners-Bell and Lyon, 2012).

B. Longevity, the old-age dependency ratio and the "entitlement debate"

A second major dynamic that will frame responses to technological unemployment will be the growing ratio of retirees to working age adults, known as the old-age dependency ratio. As fertility rates have fallen world-wide life expectancies have risen. As a consequence, even without technological unemployment, most industrialized countries are facing a decline in the ratio between the number of workers contributing to state health and pension systems and the seniors dependent on those systems. Japan, China and Europe will experience the most dramatic impacts of this shift, while the U.S., with a higher immigration and fertility rate, will see a slower impact. Nonetheless, just given current linear trends, the proportion of the U.S. population over 65 will rise from thirteen percent today to more than twenty percent by 2050. The ratio of workers to beneficiaries of Social Security dropped from 5-to-1 in 1960 to 3-to-1 in 2012, and based on linear trends will drop to 2-to-1 in 2030.

In response to rising life expectancy and associated pension and medical costs, governments around the world have been cutting benefits and attempting to raise the retirement age to encourage seniors to stay in the labor force. As a consequence of these policies, a low rate of savings, and declining rates of senior disability, older people are staying in the labor force at a higher rate. Indeed, in the United States labor force participation by people over 55 rose in the last decade while most of the employment impacts of the 2008 recession were seen in declines in employment for workers under 55. Contrary to the common assumption that younger workers will have the best chance at avoiding technological redundancy, in their 2012 "Smart Machines and Long-Term Misery," Jeffrey Sachs and Laurence Kotlikoff propose that the

impact of technological unemployment will likely be borne most heavily by younger workers with fewer accumulated skills, leading to an intensification of the current inequality between the relatively affluent seniors and the impoverished young and middle-aged. This will contribute to political demands for "generational equity" and "entitlement reform" to trim Social Security and Medicare.

Predictions of unsustainable old-age dependency ratios are currently based on the linear historical trends in improving life expectancy and declining fertility. But technological innovations are likely to have non-linear effects on the old-age dependency ratio as well. Pending advances in medical therapies, from pharmacological therapies that slow the aging process, to tissue engineering that regrows and repairs organs, to advances in therapies for dementias, cancers and heart disease, are all likely to increase healthy life expectancy more rapidly than even the impressive rate seen in the last century. The caveat of *healthy* life expectancy is important here, because an increase in the years seniors are sick and disabled would have an even more dramatic impact on the unsustainability of the dependency ratio. In a 2012 paper on "longevity risk" the IMF estimated that if projected average life spans were to increase just three years by 2050 aging-related costs would increase by 50 percent. But an increase in healthy life expectancy achieved through therapies which slow the aging process could instead create a net "longevity dividend," by reducing medical and nursing related burdens and increasing labor force participation to a degree that more than compensates for increased pension and Social Security costs (Olshanky, 2013).

If technological unemployment proceeds at the pace suggested above, however, it will have a dramatic impact not only on the capacity of the labor market to absorb seniors, but also on the fiscal stability of governments, squeezed between declining tax revenues and growing burdens on the social safety net. When this scenario is combined with that of rising life expectancy and a growing number of seniors attempting to remain in the labor force in order to supplement under-funded pensions and meager Social Security, the fight over reform of "entitlements" and the welfare state will be explosive in the coming decades.

Policy Responses to Technological Unemployment

Vivarelli and Pianta (2000) suggest that the last two pieces of the compensatory dogma - that technological unemployment is impossible - are that either (a) wages will be allowed to fall to a level where people find jobs, or that (b) redistribution and Keynesian stimulus will be used to buoy the economy. Although there will undoubtedly continue to be advocates for eliminating minimum wages and unemployment insurance to allow the market to "find equilibrium," the technological unemployment scenario is one in which the wage at which a human competes with a robot is below subsistence, if any. Attempts to stimulate job growth with redistribution and stimulus will also fail to generate employment, and will in fact merely accelerate unemployment, so long as the fundamental profitability of investment in automation is greater than the profitability of investment in humans.

Once there is a growing acceptance that we have entered a radically new economic paradigm, there will be a new set of policy options proposed and implemented in response to the dependency crisis and technological unemployment, including a basic income guarantee. In their paper in this issue of the *Journal of Evolution and Technology*, "Technology, Unemployment & Policy Options: Navigating the Transition to a Better World" Gary E. Marchant, Yvonne Stevens and James Hennessy do an excellent job of outlining many of these policy options. The options run the gamut from marginal tweaks to radical reforms of political economy to utopian hand-waving, and from unattractive to attractive. Let's consider them in the context of the scenario painted above.

A. Protecting Employment

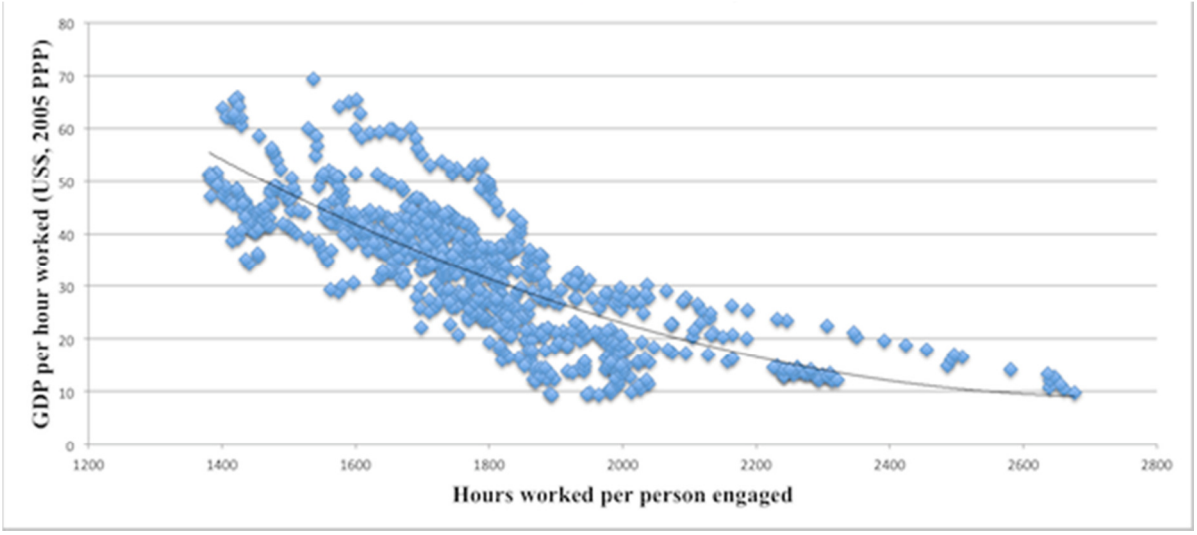
One long-standing policy approach to impending technological unemployment is to protect employment by mandating human workers, or imposing regulatory speed-bumps to innovation. Examples include agricultural tariffs and subsidies intended to protect small farms from agribusiness, or the ban on self-serve gasoline in New Jersey.

But these policies increase the cost of the goods and services for both domestic and international consumers, thereby reducing international competitiveness. They also often lower the quality and convenience of goods and services. As robotics and automation advance political support for policies that force humans to continue doing what can be better and more cheaply done by machines will weaken.

B. Redistributing Employment

Another common proposal has been to re-distribute employment with job-sharing, more vacations, or a shorter work week. This approach has a lot of merit, and the evidence from Europe is that industries can maintain a high level of productivity with shorter work-weeks and work-years.

Relationship Between Hours Worked Per Person per Year and Productivity (OECD, 1990-2012)



(Economist, 2012)

Clearly the quality of life of the American worker, who works about 400 hours more per year than European workers, would especially benefit from a shorter work-week or work-life.

But there is scant evidence that shortening the work-week, increasing vacation hours or encouraging job-sharing will increase employment (Crepon, Leclair, and Roux, 2005). These policies impose extra job training and administrative costs, and the loss of consistency and continuity of workers sharing jobs. If the policies mandate that workers' annual compensation remains the same for fewer hours this policy increases the cost of labor and further tips employers towards investment in automation. The 35 work week adopted by France in 2000 actually reduced overall employment (Estevão and Sá, 2007), and lack

of enthusiasm for the law led to relaxation of overtime regulations so that the average work week climbed back to almost 40 hours per week .

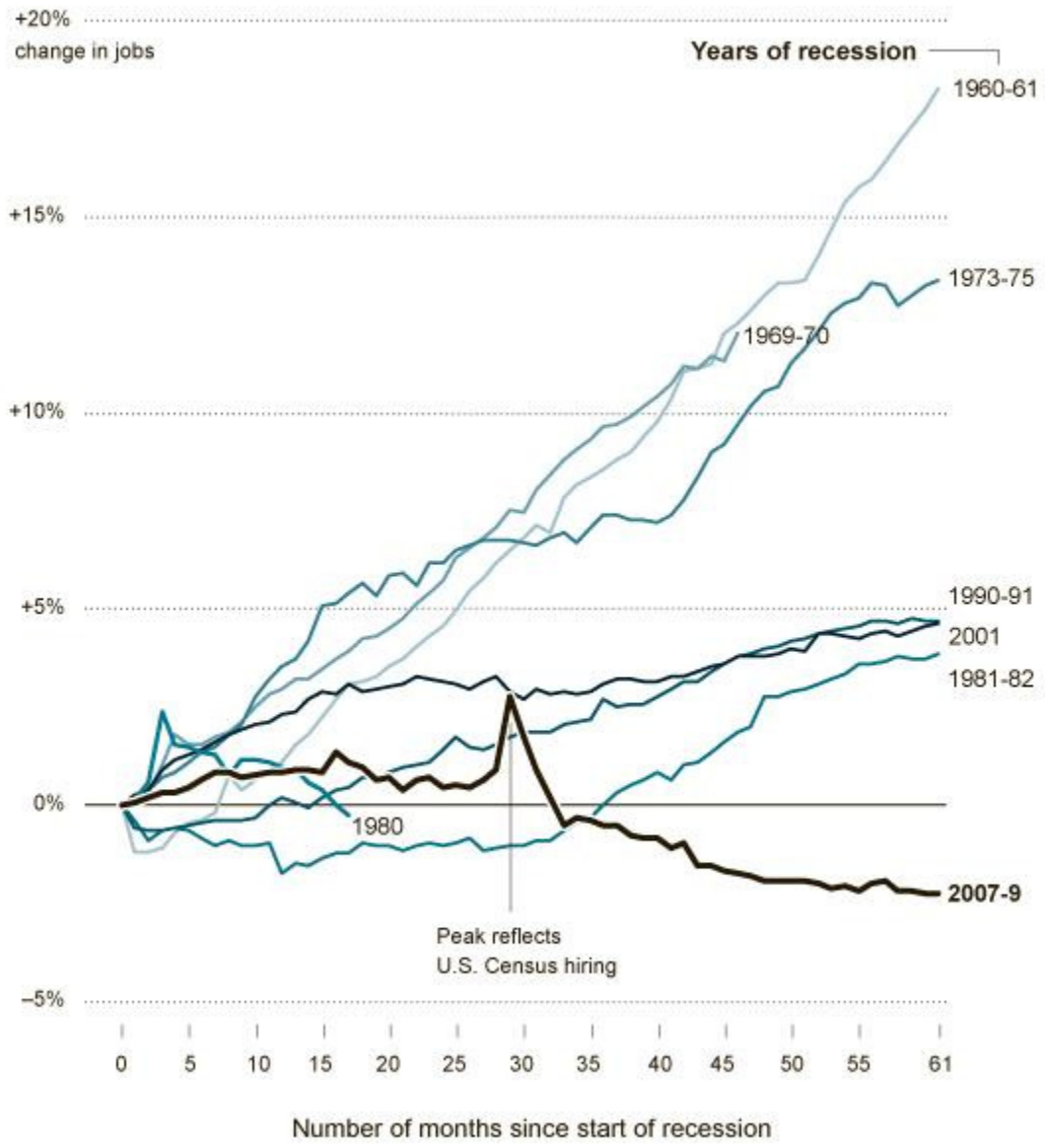
Another way to redistribute employment is to lower mandatory retirement ages, opening opportunities for younger workers. This approach would exacerbate the old-age dependency ratio, although with the goal of reducing the dependency of the younger unemployed. More importantly however it would force skilled workers out of the labor force in exchange for unskilled workers. Since all the current political pressure is towards raising the retirement age this seems like an unlikely policy.

There is almost unanimous policy support for the idea of increasing the education of the work force as a way to encourage high tech economic growth and shift workers from low wage jobs to higher wage jobs with more automation-resistant skills. In the era of austerity governments have been cutting support for higher education, but it is possible that support could be found for subsidies that encourage young people to stay in school longer, reducing their burden on labor market.

C. Creating Employment

Governments are also likely to respond to technological unemployment with attempts to expand public employment and/or national service for the young. Clearly there are many social and infrastructural needs that could be addressed with corps of road-builders, tree-planters, and care-givers for the elderly. A vigorous expansion of public employment is unlikely to be either fiscally or politically sustainable however. Public sector employment is far more expensive than simple cash transfers or educational subsidies for students. Politically, there is unlikely to be support for expanding public sector employment when the same technological trends that make workers redundant in private sector employment will also make human labor redundant in the public sector. We are likely already seeing the impacts of information technologies' impact on increased productivity and a declining need for workers in the public sector. While every previous post-WWII recession in the United States led to an increase in public sector employment as part of Keynesian stimulus, this one has seen a decline in public employment.

Public Sector Jobs Gained or Lost in Recessions



Note: Employment figures do not include active duty military personnel. Lines do not reach 61 months if another recession began less than 61 months after.

(New York Times, 2013)

Although the number of the non-military workers in the U.S. federal government, including postal workers, is the same two and a half million that it was in the 1960s, today that is only two percent of the population compared to 4.3 percent in 1966. Including state and local employees the proportion of public employees in the population has fallen from 10% in 2000 to a thirty year low of 9%. Likewise public

sector employment has fallen throughout the industrialized world in response to post-2008 austerity measures.

The size of militaries in the industrialized world has have also declined as militaries shifted to more capital-intensive military infrastructure. Since the 1950s the U.S. military has shrunk by half from 3 million active duty military personnel to 1.4 million today. The EU has seen a reduction of military personnel from 2.5 million in 1999 to 2 million today. The growing use of drones and robotics in the field also reduces the need for infantry. The U.S. Army projects that military robotics will displace a quarter of combat soldiers by 2030 (Atherton, 2014).

Short of public employment and national service, in the *National Review* Michael Strain (2013) lists other ways that governments might facilitate private sector employment, including a government relocation service and subsidy to serve areas or sectors that are experiencing a labor shortage, or a lump-sum payment to unemployed workers who secure employment. In *The Lights in the Tunnel* Martin Ford (2009) suggests that a way to address technological unemployment would be to have governments incentivize employers to hire part-time workers and then provide income subsidies to those part-time workers. These policies may slow the pace of technological displacement, but will not to have any impact on the long-term trend.

D. Enhancing Human Workers

Public investment in education for non-automatable skills is one way to enhance workers to better compete against machines. In *Race Against the Machine* McAfee and Brynjolfsson conclude that our best bet is to try "racing with the machines," and in their new book *The Second Machine Age* they attempt to spell that out. Like Frey and Osborne (2013), they suggest that humans can find employment if they focus on education for creative and social intelligence jobs.

> Which human skills will still be in demand? We have yet to see a truly creative computer, or an innovative or entrepreneurial one. Nor have we seen a piece of digital gear that could unite people behind a common cause, or comfort a sick child with a gentle caress and knowing smile. And robots are still nowhere near able to repair a bridge or furnace, or care for a frail or injured person. (McAfee and Brynjolfsson, 2014)

But some futurists have also proposed that new forms of cognitive and cybernetic enhancement could allow humans to continue to have an edge on computers in the competition for high skill jobs. For instance in his classic paper "The Coming Technological Singularity" Vernor Vinge (1993) proposed that the way for humans to attempt to avoid being made redundant by artificial intelligence was to engage in "intelligence amplification" (IA) through genetic engineering, brain-computer interfaces, and computer-facilitated networking. "It's very likely that IA is a much easier road to the achievement of superhumanity than pure AI. In humans, the hardest development problems have already been solved. Building up from within ourselves ought to be easier than figuring out first what we really are and then building machines that are all of that (Vinge, 1993)."

Computers are doubling in memory and speed every two years however. It is pretty unlikely that human beings will ever be able to keep up with the speed of automation without merging with it completely in ways that most people currently consider unattractive ("cyborgs"), and which would, in any case, make both politics and economics completely unpredictable ("the Singularity"). Human enhancement is also likely to exacerbate unemployment, since the most enhanced workers are likely to be capable of physical and cognitive labor that displaces greater numbers of less enhanced workers.

E. Techno-Utopian Proposals

Finally there are the proposals of techno-utopians, many of them libertarians, who believe that no political solutions for technological unemployment will be desirable or necessary since we are entering into a period of superabundance. In these scenarios the cost of goods and services will drop, the charitable super-rich will effortlessly subsidize the masses, and the unemployed with have access to 3D printers that will make whatever they need. One such optimist futurist is the economist Robin Hanson, who has for the last twenty years predicted widespread unemployment due to competition with machine intelligence or uploaded brain. In Hanson's (1998, 2008) scenario economic wealth will grow so rapidly and exponentially that any share of the bonanza in a citizen's stock portfolio will provide a comfortable income.

This of course elides how we are to ensure that all citizens have stock portfolios, and the dystopian consequences of the current trend toward inequality of wealth being radically worsened. But Hanson and the techno-utopians have half of the answer. If the tremendous wealth created by the coming acceleration of automation can be wrested from the current owners of capital through progressive taxation and expropriation, and there is a dramatic decline in the cost of living from automated industries, then it becomes much more fiscally feasible to provide everyone with a basic level of economic security.

Strategic Openings for a Basic Income Guarantee

The computer scientist Hans Moravec projected in 1995 that robots would eventually displace humans, and briefly proposed what he considered the obvious solution: "When industry is totally automated and hyper-efficient, it will create so much wealth that retirement can begin at birth. We'll levy a tax on corporations and distribute the money to everyone as lifetime social-security payments." Similarly, the labor economist Andre Gorz (1983, 1999) proposed in the 1980s that automation would lead to a basic income guarantee.

Today the growing signs of technological unemployment and the gathering old-age dependency crisis are creating the material preconditions for campaigns for a basic income guarantee. The BIG proposal offers a way to fundamentally renegotiate the Social Security and pension system, progressive taxation and the Earned Income tax credit, the retirement age, and disability and unemployment insurance in a way that is attractive, for different reasons, to progressives, libertarians and fiscal conservatives. Karl Widerquist has recently pointed out how basic income has become a Rorschach test for the divided American polity, as Left and Right respectively saluted the twinned articles "Five Economic Reforms Millennials Should Be Fighting For" (Myerson, 2014) and "Five conservative reforms millennials should be fighting for" (Matthews, 2014), each of which proposed a basic income guarantee. While Myerson framed BIG as "Social Security for all," in the conservative version BIG is pitched as a way to "tear down the welfare bureaucracy."

Subsequently, the Huffington Post sponsored a poll that asked "Would you favor or oppose expanding Social Security to every American, regardless of age, to guarantee a basic income to every American?" Although 54% were opposed, 35% were in favor, which is a startlingly large base of support for a policy framed from the Left. As Widerquist points out, if the policy was framed more favorably towards the center as a way to both reduce the cost and intrusiveness of the welfare state, and to ensure widespread economic security, even more support could be garnered. In the coming heated debates over

intergenerational equity, entitlement reform and amelioration of technological unemployment such a coalition could be built.

Even without discontinuous technological progress in artificial intelligence and longevity therapies a central political fact in the coming decades in the industrialized world will be the intergenerational conflict over the burden of senior healthcare and pensions. If there is a discontinuous acceleration in longevity due to new therapies the forces demanding the raising of the retirement age and the restriction of senior benefits will be strengthened. We prepare for those strategic openings today by having parties adopt BIG as a plank, promoting referenda like the pending one in Switzerland, and building the BIG policy debate among both the public and in academe.

Marchant, Stevens and Hennessy (2014) argue that a basic income guarantee would have a "corrosive effect on the social fabric, would not address the need for people to have a meaningful purpose to their lives, and would likely be politically infeasible in this era of government cut-backs and retrenchment." On the contrary, just as universal health care and the welfare state became a centerpiece of social solidarity in most of the industrialized world, the campaign for a BIG could be the way to bridge the corrosive effect of intergenerational conflict, and provide the only feasible political solution to the intractable dilemmas of technological unemployment and a radical longevity.

The major drawback of an attempt at a nonpartisan coalition for BIG, however, is that, in a future with a shrinking labor force and income tax base, state revenues will have to be expanded in order to provide a livable level of BIG. Putting all the current Social Security, unemployment and disability insurance, Earned Income tax credits, food stamps and other means-tested benefits into a BIG would only provide about $5000 per adult American. Steep increases in progressive taxation, consumption taxes and expansions of public ownership would be required to expand the level of BIG to a reasonable amount. These policies are likely to be fought vigorously by the conservative wing of a BIG coalition, and face an even steeper effort at winning public support. Two of the other proposals pitched by Myerson in Rolling Stone however were a land value tax and expansion of public ownership through the creation of a "sovereign wealth fund" to buy corporate stock. These were only supported by 25% and 31% respectively, which is still remarkable in a country in which "socialism" is anathema. But growing support for radical policies will grow in the wrenching decades ahead.

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