

It's Good Jobs, Stupid

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Progressive policy proposals that would have appeared radical just a few years ago, including high marginal tax rates, wealth taxes, universal basic income, single-payer health insurance, and free college for all, are now on the agenda.¹ The recognition that we can do more to create shared prosperity — that is, economic growth benefiting society at large, not just corporations and the very well-educated — is a welcome development. But are we targeting the right policies? We are at a critical juncture both economically and politically. We do not have much time left to reverse the trend towards greater inequality and worsening economic prospects for less educated Americans before its social consequences become more deeply ingrained. And the 2020 presidential election may provide a unique opportunity to adopt fundamentally different economic policies. Failing to identify the right policy priorities would not only squander this critical juncture; it could also deepen the rift between the different wings of US politics.

The Path to Shared Prosperity

One view, implicit in some policy initiatives and popular with many economists, is that the market is broadly efficient but unfair, meaning that the invisible hand is quite good at allocating resources where they are most productive, creating new technologies, and fanning the flames of entrepreneurship. But in the process, it rewards success, leaving behind the unsuccessful and the unskilled. If this view is correct, the way to improve upon this efficient-but-unfair process is to let the market do its job and then use redistributive taxation and transfers to share the gains of economic prosperity more equitably (and of course, invest in the skills of the less fortunate).² The situation may even be worse than that: the inequities implied by the market process may be self-reinforcing, because of winner-take-all phenomena,³ or because the rich get richer since they

enjoy a greater return on their capital.⁴ For proponents of the efficient-but-unfair market, the solution is even more robust redistribution.

There are at least two problems with this view. First, there are many reasons why markets may not function efficiently, so the inequality generated by the market process may be a consequence of these systematic inefficiencies.

Second, even though inequality, unfair privileges for some, and growth benefiting just the politically or economically connected have been the norm in history, no society has achieved shared prosperity by just redistributing income from the rich to the less fortunate. Rather, shared prosperity typically results from the ability of societies to forge "inclusive markets" that devise a level playing field for people and furnish the conditions for broadly shared growth.⁵ Recognizing that markets often work imperfectly and do not distribute economic opportunities equally does not immediately support policies to go after every market failure. Government activism comes with its own costs, and identifying the most important roadblocks on the path to inclusive prosperity is key.

Policymakers' first priority should be creating "good", high-wage jobs. "Good" jobs are those that provide not only a wage consistent with a comfortable (sometimes referred to as "middle-class") living standard but also some amount of stability and protection against harsh and dangerous working conditions and excessive power of employers. A bountiful supply of good jobs is the best way to generate shared prosperity and also to cultivate civic and political participation from the broad crosssection of society. When the economy has a shortage of work or many jobs pay a pittance, a natural inequality emerges between those that are able, or fortunate enough, to get good jobs and the rest. Once it takes root, this inequality is very hard to undo, with or without enthusiastic fiscal redistribution. Furthermore, when good jobs are scarce, civic engagement becomes more difficult and political participation, if any, becomes more likely to be underpinned by grievances and economic hardships, opening the door to both populism and patronage politics.

The market has a natural tendency to undersupply good jobs. Good jobs often come with more upfront investments and costs for firms, but the gains they create are shared with workers through the higher wages and better working conditions. Because firms do not take these worker gains into account, they naturally shy away from such jobs in favor of lower-paying jobs with lower upfront costs. This undersupply is exacerbated when good jobs generate other social benefits, such as promoting civic engagement. This tendency for underprovision is one of the reasons why labor market institutions play an important role in bolstering good job creation. For instance, minimum wages and union wage bargaining, though often blamed for choking off employment and entrepreneurship, can be vital for encouraging the creation of good jobs. Without a floor under wages, firms might find it beneficial to forgo new technologies and productivity-enhancing activities, instead opting to pay very low wages to low-productivity Minimum wages, when set at moderate workers. levels, and wage pressure from effective bargaining can therefore induce firms to invest in workers and new technologies, and to create high-wage jobs.1

There may also be too little technological investment directed at high-wage jobs. This is particularly likely when high-wage jobs require technological breakthroughs, or as we'll see later, when they necessitate a change in the paradigm of ongoing innovation. Even in a well-functioning market economy, there is typically underinvestment in innovation because the benefits from knowledge and new technologies spread much more widely than the firm undertaking the investment.¹³ By the same token, there should be no presumption that the market process will direct research to the right types of technological capabilities, especially when some technologies generate more broad-based benefits by contributing to the supply of high-wage jobs.¹⁴

A plentiful supply of high-wage jobs may be selfreinforcing. When high-wage jobs are available (say in manufacturing or in specialized services), workers are less willing to take a job that pays much less, putting upward pressure on the pay of low-wage workers. This wage pressure both improves the pay of these jobs and makes them less attractive for firms (compared to highwage jobs). Higher wages may also encourage firms to invest in technologies and training to support good jobs. This is because once firms are weaned off low-wage jobs, they will have an incentive to invest more in the general and specific human capital of their employees (when they have to pay higher wages, their incentives to increase worker productivity are greater).¹⁵ Higher wages may also trigger more innovation that aims to partially substitute for labor, while still increasing economy-wide productivity.16

The creation of high-wage jobs does more than ensure shared prosperity; good jobs are also necessary for society to enable a meaningful, fulfilling life for its citizens. It is unlikely that individuals could find a similar meaning or purpose from pure redistribution, no matter the scale. Most individuals define their worth largely through their jobs and form their social networks and support groups during their careers. Though society and our preferences may adapt to a world of part-time jobs and non-professional past times, the social costs of transitioning to such a system, even if such a transition were feasible, seem large. The prospect of a society in which few work (and enjoy the prestige and challenges of work) while many stay at home does not look enticing.

The Nordic model with its strong social safety net is sometimes viewed as an example of shared prosperity founded on redistribution. Though redistribution (via taxes, transfers, and state-funded education) plays an important role in Nordic economies, the model's success lies not in fiscal redistribution but in its ability to generate high-wage jobs. How, then, do the Nordic countries do this? Primarily via the market process, but crucially guided by regulations and the active role of trade unions. For example, one of the most iconic features of the post-war Swedish labor market was the industry-level agreements, which set a fixed (but not excessively high) wage for the same job throughout the industry. This arrangement contributed to shared prosperity through three channels. First, it precluded the possibility that some firms would pay significantly lower wages for the same jobs because of their greater bargaining power or lower resources. Second, it compressed pay differences between more and less productive workers doing the same job. These first two mechanisms directly contributed to a more equitable distribution of income and spread around good jobs more evenly in the population. But the third advantage of the system may have been the most essential: the fixed industry wage level meant that more productive firms would not have to pay (much) higher wages, and thus there was an attractive profit opportunity for firms that could increase their productivity via investment, reorganization and innovation. Swedish firms took advantage of this profit opportunity with gusto, and in fact, the benefit for high-productivity firms was one of

the main reasons why Swedish business signed up to the corporatist model in the historic meeting between business leaders, trade unionists, and the Swedish Workers Party in 1938.¹⁷

Growth in the US Labor Market: The Past and the Present

Even if much of Europe and the United States look very different from the Nordic countries, their economic systems show many parallels, and the shared prosperity that they achieved in the decades following World War II has common roots. This broad-based growth was forged by a robust institutional architecture, which may be called "a social democratic compact" (even if many of the governments implementing it, not least in the United States, did not see themselves as social democrats). This architecture, underpinned by democratic politics, provided a social safety net, protections for workers, government-funded education, support for research and development in new technologies, and promoted the creation of high-wage jobs. Many countries, not just the United States, generated a huge growth in labor demand during this era based on this compact.

Let's turn to the US experience to see how this worked. Though US society was far from idyllic in the 1950s



Figure 1 The growth of US real wage bill relative to population. The left panel shows 1947-1987 and the right panel 1987-2017.

and 1960s (not least because of the overt and covert discrimination against African-Americans and women; or the shockingly unequal distribution of education and health resources), the economy did achieve a certain amount of shared prosperity.

Notably, real wages for many different demographic groups, including workers of all educational backgrounds, grew in tandem with productivity.¹⁸ Figure 1 provides one snapshot of US labor market performance by plotting the per capita real wage bill (total employment multiplied by average wage, deflated by the consumer price indexed, and divided by population).¹⁹ This measure is informative about the changes in overall labor demand since it captures both increases in employment and growth in average wages. The left panel shows that between 1947 and 1987 the per capita real wage bill grew by 2.4% per year. This growth was driven principally by rising average wages, underpinned by improvements in the job prospects for most workers in the US economy.

The picture between 1987 and 2017, depicted on the right panel, is very different. During this period, the per capita real wage bill grew by only 1.33% per year and all but stopped growing since the late 1990s. Though some of this growth slowdown is accounted for by the declining labor force participation of men, the bulk of the contrast with the previous 40 years is due to stagnant average wages and the scarcity of good jobs. Indeed, there has been little growth in average real wages since the 1980s, and many groups, including men with less than a college degree, have seen their real wages decline sharply over this period.²⁰

Why doesn't the US economy produce good jobs anymore? To answer this question, let's look at how such jobs flourished in the four decades following World War II.

The Foundations of Good Jobs

Three pillars underpinned shared prosperity and highwage job creation in Western Europe and North America during the postwar era.

First, technology. Businesses found ways to increase labor productivity, which fueled greater labor demand. This was based first and foremost on technology adoption, innovation, and efficiency gains. Yet technology was not a gift from the heavens raining down on firms. It was the result of hard work, the fruit of firms' efforts develop, employ and perfect these technologies. Government support was equally critical. Indeed, many of the key technologies of the postwar era haven't blossomed just because of unregulated market forces. The government has provided indirect support to innovation by funding research, for example, with the National Science Foundation, the National Institutes of Health, and generous R&D tax credits. Further, government agencies and the public sector, especially the military, have directly demanded certain types of technologies. It is not only the Internet where the government played a leading role. The rapid advances in nanotechnology, biotech, sensors and aviation technologies in the second half of the 20th century would not have been feasible without the US government's involvement.²¹

Second, labor and product market institutions. Businesses eagerly increased their demand for workers in a broadly competitive product market, which propelled innovations and prevented ballooning of profits at the expense of labor. Labor market institutions, such as minimum wages, trade unions, and worker safety regulations, helped too buy pushing firms towards creating better jobs.

Third, education. Of course, firms would not have been willing to hire millions of well-paid workers if these workers lacked useful skills. Though we live in an education-obsessed society and some parents will go to great lengths to provide a head start for their children, the buck stops with the government. So the federal government supported for university education through G.I. bills, Pell grants and generous research support, and local governments increased spending on primary and secondary education.

All of the support for technology and education meant a vital need for tax revenues, which were provided by economic growth and moderately higher tax rates. For example, (total) government tax revenues as a percentage of GDP increased from less than 5% in the first quarter of the 20th century to 20% in 1950, and then to about 28% in the 1990s.²²

What Has Changed?

Why don't we create (many) high-wage jobs anymore? The cessation of high-wage job creation is mostly about the changing nature of labor demand, itself a consequence of advances in automation and globalization, but aggravated by the changing institutional architecture of the United States and several other Western nations. The central role of automation and globalization does not mean that these changes were inevitable, however.

Automation and globalization can generate broad productivity gains and greater profits for businesses. But their effects on labor demand are more mixed. Both of these phenomena are motivated by a desire to save on labor costs. Automation is the process of substituting machines for human labor. It is the same impulse that initiated the British Industrial Revolution in the middle of the 18th century with breakthroughs in spinning and weaving technologies and powered the mechanization of agriculture starting in the late 19th century.²³ It is also the same impulse that has propelled the introduction of numerically controlled machines, computerized control, robotics and more recently artificial intelligence.

The motivation for globalization is similar. By importing goods from China or other countries with lower wages, businesses are able to increase profits and the economy could in principle benefit by reallocating workers to more productive activities.

Yet automation and globalization create winners and losers. The losers often include the workers who are seeing their jobs disappear.²⁴ Economic policies for shared prosperity dampen the blow to these workers and help generate new opportunities for them. For example, a strong and well-designed social safety net can protect the "losers", and policies encouraging the creation of high-wage jobs can aid those experiencing job losses transition into other good jobs.

But the already weak US labor market protections for workers became even feebler, and the social democratic compact crumbled, just as automation and globalization gained momentum. The social safety net did not keep up with the growing need for helping dislocated workers. The almost complete erosion of the real value of the federal minimum wage and the weakening of trade unions in much of the private sector removed the inducements to firms to invest in good jobs. The huge concentration of economic activity in the hands of big businesses in every sector of the economy not only led to a more lopsided distribution of economic gains but also allowed businesses to exert greater power in the product and labor markets.²⁵ Greater product market power of businesses meant more profits and less of the pie going to labor, and their greater labor market power reduced labor demand and the willingness of firms to pay high wages even more directly (how much bargaining power can you have if your employer is the only one in town?).

These institutional changes meant that automation and globalization accelerated without safety rails — no protection for workers losing their jobs or unable to find good ones; no encouragement to firms to develop new economic opportunities for shared prosperity. The result has been not just fewer good jobs, but also a failure to maximize the productivity gains from these economic opportunities.

The productivity gains from both automation and globalization originate in the ability to substitute away from labor towards cheaper alternatives (machines in the case of automation, foreign labor in the case of globalization). The cost savings translate into greater effective productivity for firms and fuel investment and job creation. When labor is relatively well-paid, this is exactly what happens, because the gains from substituting away from labor are sizable. Paradoxically, however, when labor is already cheap, the gains from substitution are more limited, and thus there is not much impetus for further investment and job creation.²⁶

Meanwhile, government commitment to education and science has wavered since the Sputnik era (spawned by fears of Soviet supremacy in science and technology) ended, and government leadership in research and innovation has evaporated. Federally-funded research and development declined from about 1.9% of GDP in the 1960s to about 0.7% of GDP in 2015.²⁷

So why did the social democratic compact underpinning shared prosperity disintegrate over the last several decades? We do not know for sure, but there are some plausible explanations. First, the collapse of the Soviet Union and its communist state-planning ideology gave unfettered markets a certain luster. Once we know that state-planning is unsuccessful, why not double down on free markets? But, as I have argued, shared prosperity was driven not by unfettered markets, but by regulated markets that generated strong incentives for the creation of high-wage jobs. As many of these regulations were dismantled, the social democratic compact came apart at the seams.

Second, an intellectual movement of the late 1970s and early 1980s started calling for the maximization of shareholder returns at the expense of all else.²⁸ The thinking was that as companies become better at maximizing their shareholders' wealth, they would also generate greater investment and the benefits would trickle down to everyone. Yet once Wall Street got into the game, the opposite happened. Unregulated finance provided to large shareholders the means to cut out other stakeholders via leveraged buyouts and mergers and acquisitions. It motivated managers with big payouts and stock options to increase dividends and improve stock market performance, if necessary by downsizing and reducing wages. In the meantime, the intellectual arguments on the primacy of shareholders motivated regulators to sit passively on the sidelines. The scene was set for sacrificing everything else, especially the workers, at the altar of shareholder value. Ignoring other stakeholders, including workers, became one more nail in the coffin of the social democratic compact.

Third, automation and globalization themselves may have contributed to these trends. As corporations began to depend less on their workforces (because machines and imports could substitute for them), they found it natural to fight against protections for labor. Automation and globalization also increased inequality and vested growing political power in the hands of the very rich and the corporations, making it more and more difficult for the less well-off to voice their concerns in the political public sphere.²⁹

Finally, in an arena left lopsided by the weakening of trade unions and absence of civil society organizations speaking for workers, big business became better organized and politically more powerful, well before the Citizens United ruling lifted essentially all limits on money in politics.

Can Anything Be Done?

The short answer is yes, but this requires a change of priorities and a new approach.

Let me first dispense with the claim that not much can be done because growing inequalities and the disappearance of old-style good jobs are inexorable consequences of the age of artificial intelligence and robots. They aren't. We choose how to use technology and many options, with potentially much better outcomes for labor, are feasible.³⁰ In fact, automation is nothing new. It's been ongoing for the last two and a half centuries. Demand for labor grew vigorously in the four decades following World War II (and wages for all groups rose more or less in tandem) because the forces of automation were counterbalanced by firms using their technologies in other ways that increased the demand for different types of labor. This included new technologies complementing labor and most importantly new tasks in which workers could be productively employed. The rupture with the past arose not just because robotics and artificial intelligence have increased the pace of automation. It is in equal measure a consequence of firms no longer seeking new ways to productively employ labor.³¹

Perhaps it is in the nature of artificial intelligence that automation will be the order of the day and nothing can counterbalance its march. Yet there is no evidence that supports this presumption either. Artificial intelligence is a general technological platform and can be used in many different ways, including to create new tasks and reinstate labor into the production process.³² For example, artificial intelligence can be used to create a new, more flexible and more interactive education system (with more, better trained and better paid teachers to go with it), it can empower skilled nurses to provide better diagnosis, treatment and care, and it can reinvigorate parts of manufacturing. But instead, the current focus in the tech industry is almost entirely on using artificial intelligence for automation, for instance in facial recognition, language processing and various algorithmic replacements for human cognition.

If there are ways of developing new technologies that will help labor and contribute to the creation of good jobs, why doesn't the market process by itself get us there? It doesn't, for the same reasons that we cannot count on unfettered markets to get the level and direction of innovation right. First, there is a tendency for the research process to build on existing advances, and the last several decades have seen those advances take place in the area of automation. A change in paradigm is always hard. Second, the current direction of innovation is shaped not so much by an anonymous, free market, but by the investments, know-how, and priorities of big tech companies dominating the field. These companies have succeeded based on a business model emphasizing automation and algorithms replacing the tasks of fallible humans. It is neither realistic nor easy for them to turn around and channel their energies to using this new technology platform for creating good jobs.

Third, the same factors I have stressed above imply that the market, innovators included, will undervalue good jobs (especially when a low-wage strategy or a worker-less strategy can be quite profitable). This is all the more so when part of the social benefit from highwage jobs does not accrue to the firms supplying those jobs. Workers benefit from the opportunity to build a meaningful life for themselves and become active citizens, but this doesn't show up on firms' balance sheets.

Finally, our tax policies have made matters worse. The current tax code heavily favors capital income and capital investments. When a firm hires a machine instead of a worker, it receives tax breaks, amortized allowances and various tax credits, while employing workers comes with additional payroll taxes and fringe benefits (including those related to healthcare in the United States, which are provided by governments in most other countries). This tilted playing field encourages excessive automation, even when people are more productive than machines.

In this landscape of distorted incentives biased against good jobs, there is much that well-designed government policy can do. To start with, protection for workers and moderate minimum wages can promote high-wage job creation. A stronger social safety net will also encourage workers to seek jobs that are higher-paying and a better match for them (and thus more productive for society), without fear that they will go hungry while looking.³³

The role of the government in supporting education is perhaps even more critical today than in the past. In this age of rapidly evolving technologies, the types of skills demanded by employers are changing. Upgrading our education system means more than removing the very deep inequities that already exist; effective reforms require a proactive approach to update curricula to emphasize the numeracy, social and communication skills and the flexibility that the labor market of the future will demand.

Equally essential is for the government to resume its leadership in innovation. The future of good jobs depends in large part on our ability to harness new technology platforms such as artificial intelligence to create meaningful, well-paying jobs for humans, rather than just seeking to replace workers in every part of the production process. Government policy to redress these issues should start by removing the distorted incentives favoring capital and encouraging employers to invest more in their workers. But removing perverse incentives isn't enough. The government also needs to redirect technological change towards activities that are more likely to reinstate labor into the heart of the production process.

We can understand why direct government involvement is critical by revisiting efforts to combat climate change. Though a carbon tax has to be the backbone of any climate policy, it needs to be supplemented with measures to encourage companies to develop cleaner technologies.34 The success in limiting climate change, such as it is, has been achieved largely because alternative, low-emission energy sources have made huge gains over the last three decades, and this has been in no small measure because of government efforts around the world to redirect technological change towards cleaner technologies. The same redirection is necessary in the area of job creation, even if determining what types of technological investments are likely to contribute to the creation of good jobs is even harder than deciding which types of clean technologies will succeed.

Support for research and innovation, investment in education and a better social safety net require greater tax revenues, especially starting from the low baseline in the United States (tax revenues relative to GDP of about 27% compared to the OECD average of over 34%).³⁵ Yet, the purpose of tax reform shouldn't be to punish the wealthy or the successful businesses. Instead, taxes are for raising revenues and removing distortions. That means broadening the tax base (especially by bringing a lot of untaxed capital income into the base) and modestly increasing tax rates without discouraging investment and technological innovation. It also means fixing the tax code to remove the push towards excessive automation and incentivize firms to invest in their workers and in good jobs.

An economy powered by shared prosperity is not out of

reach. But we need to abandon the fantasy of building a better society just by redistributing income and we must take urgent action to support higher employment and more vigorous wage growth. A successful policy must focus on using our technological capabilities to enhance productivity and generate good jobs. Shared prosperity requires revitalized labor market institutions to counteract the bias towards lower-paying, lower-quality jobs. And the government must refocus on building a better social safety net, providing worker protection, investing in the skills of all citizens, and implementing robust regulations to prevent monopolies from choking off high-wage job creation. A return to the era of shared prosperity is not out of reach, but it calls for a new approach to government policy, not just tinkering at the edges.

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Endnotes

- 1 See, for example, https://www.nytimes.com/2019/06/02/opinion/bernie-sanders-trump.html
- 2 One version of this is the celebrated Diamond-Mirrlees theorem (Diamond, Peter A., and James A. Mirrlees. "Optimal taxation and public production I: Production efficiency." *The American Economic Review* 61.1 (1971): 8-27). See also the standard discussion of these issues in Atkinson, Anthony B., and Joseph Stiglitz. *Lectures on Public Economics*, McGraw-Hill, New York, 1980.
- 3 For a general discussion of winner-take-all phenomena through technological and social mechanisms, see Frank, Robert H., and Philip J. Cook. *The Winner Take All Society: Why the Few at the Top Get so Much More Than the Rest of Us*. Random House, 2010.
- 4 See Piketty, Thomas. Capital in the 21st Century, Harvard University Press, Cambridge, 2014.
- 5 See Acemoglu, Daron, and James A. Robinson. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. Crown, New York, 2012.
- 6 See the discussion in Chapter 15 of Acemoglu, Daron, and James A. Robinson. *The Narrow Corridor: States, Societies, and the Fate of Liberty*. Penguin, New York, September 2019.
- 7 The emphasis on preventing excessive power of employers over workers draws on Philip Pettit's notion of non-dominance (from Pettit, Philip. *Republicanism: A Theory of Freedom and Government*. Oxford University Press, New York, 1999. See the discussion in Acemoglu and Robinson, *The Narrow Corridor: States, Societies, and the Fate of Liberty*.
- 8 See also Rodrik, Dani and Charles Sabel. "Building a Good Jobs Economy". Mimeo, 2019, https://drodrik.scholar.harvard.edu/ publications/building-good-jobs-economy.
- 9 On the role of economic grievances in the rise of populism, see Judis, John B. *The Populist Explosion: How the Great Recession Transformed American and European Politics*, Columbia University Press, New York, 2016, and on how lack of access to good jobs fuels patronage-based, clientelistic politics, see Schefter, Martin. "Party and Patronage: Germany, England, and Italy." *Politics & Society*, volume 7(4), 403-53, 1977.

10 This point is theoretically argued in the context of a model of search and bargaining in Acemoglu, Daron "Good Versus Bad Jobs" *Journal of Labor Economics*, volume 19, 1-21, 2001.

11 The underprovision of good jobs is rooted in rent-sharing, which most naturally results from individual-level or collective bargaining, but other sources of rent-sharing, for example, efficiency wage or fairness considerations, also lead to the same tendency for creating too few good jobs.

12 See again Acemoglu "Good Jobs versus Bad Jobs".

13 See, for example, Romer, Paul. "Endogenous Technological Change". *Journal of Political Economy*, volume 98, S71-102, 1990. See Acemoglu, Daron. *Introduction to Modern Economic Growth*. Princeton University Press, Princeton, 2009, for a general discussion.

14 See Acemoglu, Daron, and Pascual Restrepo. "The Race between Machine and Man: Implications of Technology for Growth, Factor Sh said most important ares, and Employment." *American Economic Review*, volume 108, 1488-1542 2018.

15 See Acemoglu, Daron, and Jorn-Steffen Pischke. "Beyond Becker: Training in Imperfect Labor Markets". *Economic Journal*, volume 109, 112-142, 1999.

16 See Acemoglu, Daron. "Does Labor Scarcity Encourage Innovation?" *Journal of Political Economy*, volume 118, 1037-1078, 2010.

17 See Moene, Karl Ove, and Michael Wallerstein. "How Social Democracy Worked: Labor Market Institutions." *Politics & Society*, volume 23, 185-211, 1995.

18 See, for example, Acemoglu, Daron and David Autor. "Skills, Tasks and Technologies: Implications for Employment and Earnings." *Handbook of Labor Economics*, volume 4: 1043--1171, 2011.

19 This figure and the associated discussion are from Acemoglu, Daron, and Pascual Restrepo. "Automation and New Tasks: How Technology Displaces and Reinstates Labor." *Journal of Economic Perspectives*, volume 33, 3-30, 2019.

20 See again Acemoglu and Autor "Skills, Tasks and Technologies: Implications for Employment and Earnings".

21 See Lerner, Josh. Boulevard of Broken Dreams: Why Public Efforts to Boost Entrepreneurship and Venture Capital Have Failed and What to Do about It. Princeton University Press, New York, 2009, and Mazzucato, Mariana. The Entrepreneurial State: Debunking Public Versus Private Sector Myths. Public Affairs, New York, 2015.

22 See https://www.whitehouse.gov/omb/historical-tables/

23 See Mantoux, Paul. The Industrial Revolution in the Eighteenth Century: An Outline of the Beginnings of the Modern Factory System in England. New York: Harcourt, 1928.

On the effects of globalization on jobs, see Autor, David, David Dorn, and Gordon Hanson. "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." *American Economic Review* volume 103, 2121-68, 2013, and Acemoglu, Daron, David Autor, David Dorn, Gordon H. Hanson, and Brendan Price. "Import Competition and the Great US Employment Sag of the 2000s." *Journal of Labor Economics* volume 34, S141-S198, 2015, and on the effects of one type of automation technology, industrial robots, see Acemoglu, Daron, and Pascual Restrepo. "Robots and Jobs: Evidence from Local Labor Markets." Forthcoming *Journal of Political Economy*, 2019.

25 See Autor, David H., David Dorn, Lawrence F. Katz, Christina H. Patterson, and John M. Van Reenen. "The Fall of the Labor Share and the Rise of Superstar Firms." NBER Working Paper, 2017.

26 See again Acemoglu and Restrepo "Automation and New Tasks: How Technology Displaces and Reinstates Labor".

27 See Gruber, Johnson, and Simon Johnson. *Jump-Starting America: How Breakthrough Science Can Revive Economic Growth and the American Dream*. Public affairs, New York, 2019.

28 The intellectual roots of shareholder value idea lie in Jensen, Michael C., and William H. Meckling. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics*, volume 3, 305-360, 1976, and Fama, Eugene F. "Agency Problems and the Theory of the Firm." *Journal of Political Economy*, volume 88, 288-307, 1980, though the idea was popularized by the former General Electric CEO Jack Welch.

29 See Bartels, Larry M. Unequal Democracy: The Political Economy of the New Gilded Age. Princeton University Press, New York, 2018.

30 See again Acemoglu and Restrepo "The Race between Machine and Man: Implications of Technology for Growth, Factor Shares, and Employment."

31 See again "Automation and New Tasks: How Technology Displaces and Reinstates Labor".

32 See Acemoglu, Daron, and Pascual Restrepo. "The Wrong Kind of AI? Artificial Intelligence in the Future of Labor Demand." NBER Working Paper, 2019.

33 See Acemoglu, Daron and Robert Shimer. "Productivity Gains from Unemployment Insurance" *European Economic Review*, volume 44(7), 1195-1224, 2000, and see also Rodrik and Sabel "Building a Good Jobs Economy".

34 See Acemoglu, Daron, Philippe Aghion, Leonardo Bursztyn, and David Hemous. "The Environment and Directed Technical Change" *American Economic Review*, volume 102, 131-66, 2012.

35 See https://www.oecd.org/tax/tax-policy/revenue-statistics-highlights-brochure.pdf.