

WILL ROBOTS AUTOMATE
YOUR JOB AWAY? FULL
EMPLOYMENT, BASIC INCOME,
AND ECONOMIC DEMOCRACY

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Abstract

Will the internet, robotics and artificial intelligence mean a ‘jobless future’? A recent narrative says tomorrow’s technology will fundamentally differ from cotton mills, steam engines, or washing machines. Automation will be less like post-WW2 demobilisation for soldiers, and more like the car for horses. Driverless vehicles will oust truckers and taxi drivers. Hyper-intelligent clouds will oust financial advisers, doctors, and journalists. We face more ‘natural’ or ‘technological’ unemployment than ever. Government, it is said, must enact a basic income, because so many jobs will vanish. Also, maybe robots should become ‘electronic persons’, the subjects of rights and duties, so they can be taxed. This narrative is endorsed by prominent tech-billionaires, but it is flawed. Everything depends on social policy. Instead of mass unemployment and a basic income, the law can achieve full employment and fair incomes. This article explains three views of the causes of unemployment: as ‘natural’, as stemming from irrationality or technology, or as caused by laws that let people restrict the supply of capital to the job market. Only the third view has any credible evidence to support it. After WW2, 42% of UK jobs were redundant (actually, not hypothetically) but social policy maintained full employment, and it can be done again. Unemployment is driven by inequality of wealth and of votes in the economy. Democratic governments should reprogramme the law: for full employment and universal fair incomes. The owners of the robots will not automate your job away, if we defend economic democracy.

Key words: Robots, automation, inequality, democracy, unemployment, basic income, NAIRU, sheep, Luddites, washing machines, flying skateboards

JEL Codes: E62, E6, E52, E51, E50, E32, E12, E00, E02, D6, J01, K1, J20, K31, J23, J32, K22, J41, J51, J58, J6

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1.Introduction

Tomorrow's technology will let us make a paradise on earth, where scarcity and poverty will be forgotten, and yet we remain consumed by visions of dystopia. As inequality has become more extreme, a busload of billionaires own more wealth than half the planet,¹ and many of them are saying new technology (that they aim to own) will mean mass unemployment. The solution they propose is a basic income. Facebook owner, Mark Zuckerberg said 'technology and automation are eliminating many jobs' and we 'should explore ideas like universal basic income to give everyone a cushion to try new things.'² Tesla owner, Elon Musk said 'Twenty years is a short period of time to have something like 12-15 percent of the workforce be unemployed' and a basic income is 'going to be necessary' because there 'will be fewer and fewer jobs that a robot cannot do better.'³ The foundation of eBay's Pierre Omidyar, says 'automation is replacing traditional jobs,' and the gig economy 'may make employment far less stable and reliable for supporting a livelihood.'⁴ Advocates of this narrative respond sharply to criticism: a contributor to the Washington Post, owned by Amazon billionaire Jeff Bezos, wrote 'Sorry, but the jobless future isn't a luddite fallacy'.⁵

There is intellectual support in economics and sociology for the narrative.⁶ A basic income (if not its tax source) enjoys cross-ideological support from Milton Friedman to Guy Standing.⁷ Basic income can be seen as a way to decrease welfare cost, or social stigma. Some think it could eliminate the collective welfare state, others that it completes the welfare state. But once the shape of a basic income plan is agreed, we still must ask is 'automation' the right reason for it? In 2013, Frey and Osborne dramatically stated '47 per cent of total US employment' is 'potentially' at risk from automation 'over some unspecified number of years'.⁸ They developed this argument with Citibank Research.⁹ Another paper in 2017 (part-funded by a Facebook billionaire) says robots will replace most human functions and write a best-selling book by 2049. Like Frey and Osborne, its method was surveying 352 'AI experts'.¹⁰ These figures (if not the reasoning) have reached viral proportions in social media, and academia, with citations mounting as if 'likes' or 'retweets'. The problem is predictions of the future, 'over some unspecified number of years', are unfalsifiable. Like saying there is an 'end of history',¹¹ or 'skateboards might fly',¹² this 'technological forecasting' has all the shiny appeal, but also the intellectual integrity, of a crystal ball.

This article explores how legal policy can create full employment and fair incomes, not just mass unemployment and basic incomes. Part 2 discusses three

main views of the causes of unemployment. One says unemployment is ‘natural’, and full employment will accelerate inflation. A second says human irrationality drives unemployment, and if not technology may. A third view, less discussed outside times of crisis,¹³ says unemployment is a policy choice. Law can prevent or enable restrictions on the supply of capital to the job market. The law of contracts, property, corporations, labour and more, determines employment. Law can guarantee full employment, and advance social welfare for everyone. In its simplest dimensions, and as the owners of *Animal Farm* eventually knew,¹⁴ technology will mean social prosperity, if the gains are not trottered away by a few.

We cannot know the future, but we can learn from the past. Part 3 explores five periods of history where technology was changing fast. First, enclosures for sheep (maybe the first disruptive ‘app’¹⁵) and the textile industry drove Luddite and Swing riots in Britain. If people are excluded from technology’s benefits, paid for by their labour, they revolt. Second, after WW2, demobilisation in the UK meant 42 per cent of all workers, from armies to munitions factories, moved to civilian production. The change was immediate, huge, and far more complex than automation. Chaos after WW1 encouraged careful thought in WW2, for *Full Employment in a Free Society*.¹⁶ Third, mass produced motors did mean mass redundancies: of horses. In the US, a staggering 88 per cent of horses lost their jobs, over 45 years. But human beings will not share the fate of horses. Horses do not write law. People do. Fourth, the humble washing machine was a revolutionary technology, saving labour, improving gender equality. If people internalise the gains of automation, human development advances rapidly. Fifth, while artificial intelligence is remarkable, the evidence suggests computers will not develop cognitive functions.¹⁷ While the basis of a computer’s ‘intelligence’ is ‘0’s and ‘1’s, Cartesian self-awareness seems far away. As most teachers know, rote-learning is not critical thinking. Data is not knowledge. Doing is not understanding. Until science fiction becomes fact, and AI hype moves beyond clickbait, technology’s value will remain what it always has been: a way both to empower and accentuate the uniqueness of the human mind.

History is clear that change can mean redundancies. So part 4 asks, does the law enable everyone to share fairly in technology’s gains? The answer is ‘not yet’. We can and should ‘reprogramme’ the law. First, full employment must be guaranteed by law, while regional investment and training must advance. The votes in the economy must be distributed fairly, to prevent artificial restriction of the supply of capital to the job market. Regular investment, regardless of conflicting interests of private or public actors, must be maintained by funds where contributors have a vote. Second, social security must be universal. A

‘universal basic income’ is a powerful idea, but it must not, like the disastrous Speenhamland system in the 19th century, subsidise poverty-pay employers. Third, people who benefit from robot ownership must bear all the risks of their enterprise. Robots are products, not persons. The notion of ‘electronic personality’ could frustrate stricter enterprise liability. To advance universal fair incomes, asset owners must pay their fair share of tax. ‘Taxing the robots’ is fine as a metaphor for taxing robot owners, alongside all corporate profits. Part 5 concludes: robots will not automate your job away, if we defend economic democracy.

2. Three views on unemployment’s causes

Before discussing technology’s impact on jobs and how to respond to automation, it makes sense to engage the contest of ideas on unemployment’s causes in the 20th century. The breadth of policy charges the debate. Labour law, banking, corporations, property, contracts, tax and constitutional law all interact with administrative discretion in employment policy. Political discourse often does the subject little credit. In one corner it is common to hear the unemployed are responsible for unemployment, because they are lazy.¹⁸ In another, it is often said there is a *conscious* plan to manufacture a reserve army of the unemployed, to press wages down.¹⁹ Credible theories tend to focus on objective factors: how social institutions and behaviour affect employment. They also acknowledge the desirability of full employment, and social security, as in the Universal Declaration of Human Rights of 1948.²⁰ Three main theories are that (1) unemployment has a ‘natural’ rate, and attempts to go below accelerate inflation, (2) unemployment results from irrational human behaviour or maybe technology, and (3) law determines employment by altering the supply of capital to the job market. Only the third view has any credible evidential support.

2.1 A ‘natural’ rate of unemployment

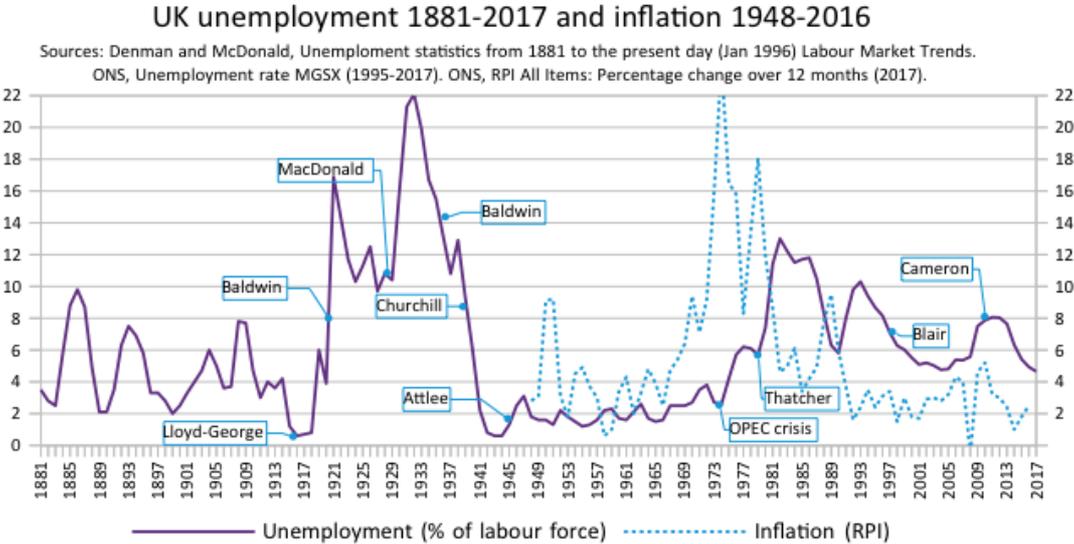
A first main view, popular from the late 20th century, is unemployment has a ‘natural’ rate, worsened by labour or social rights. In 1967, as President of the American Economic Association, Milton Friedman argued the ‘natural’ rate was something that no government’s monetary or fiscal policy could sustainably reduce. Apparently unemployment ‘can be kept below the “natural” rate only by accelerating inflation.’²¹ If monetary authorities tried to reduce unemployment below ‘3 per cent as the target rate’, but ‘the “natural” rate is higher than 3 per cent they will trigger inflation.’²² We ‘cannot know what the “natural” rate is’,²³ said Friedman. But apparently it came from ‘legal minimum wage rates’, pro-

labour public procurement and ‘the strength of labor unions’, which made ‘the natural rate of unemployment higher than it would otherwise be.’²⁴ Friedman argued that his theory was similar A.W. Phillips’ work from 1958. Phillips showed between 1861 and 1957, UK wages tended to rise when unemployment was low, and wages fell when unemployment was high.²⁵ This confirmed an old logic, starting with Adam Smith: fuller employment raises worker bargaining power.²⁶ Higher unemployment reduces worker power. When bargaining power is less unequal, wages increase. But without any evidence, Friedman argued *all* inflation (not just wage rises) accelerates with full employment. This justified using monetary policy only to concentrate on price stability, apparently unconnected to full employment, and to undo all labour rights.²⁷

Friedman’s theory was not new.²⁸ In 1950, Friedrich von Hayek had already argued that governments risked inflation if they create full employment. In Hayek’s words, if monetary policy or fiscal stimulus were used to boost enough demand to pay for ‘the kind of services... the unemployed offer’, it would have to be ‘of such a magnitude as to produce major inflationary effects.’²⁹ That is, a government could not choose lower unemployment at the cost of slightly higher inflation: if unemployment was suppressed below the natural rate, the acceleration of inflation would be out of control. Then, said Hayek, governments would be driven ‘to control ever increasing parts of the economy.’ Hayek did not feel the need to provide evidence for this ostensible phenomenon because, with his bestselling *Road to Serfdom* in mind,³⁰ it was ‘by now too well known to need elaboration.’³¹ This was the start of trying to find a supposed natural rate of unemployment which would not ‘accelerate’ inflation. The unknowable ‘natural’ unemployment rate became ‘NAIRU’ - the ‘Non-Accelerating Inflation Rate of Unemployment.’

Among their followers, Friedman and Hayek seemed vindicated when the Organization of the Petroleum Exporting Countries unilaterally raised oil prices in 1973. This OPEC crisis had many causes, but the immediate trigger was the Yom Kippur War, in the long and desperately sad Arab-Israeli conflict. Arab countries had attacked Israel in retaliation for Israel’s Six Day War in 1967. The US government sided with Israel. Arab oil producers raised their prices. As oil cost more, oil-dependant economies had less money to invest. As the costs were distributed through the market, there was stagnation, and few ways to avoid inflation: ‘stagflation’. Government practice had been to offset volatility in private and international investment with more spending. But now this policy had a price tag nobody could avoid. Despite being inflicted by despots,³² stagflation said to NAIRU disciples that full employment in a free society was impossible, without accelerating inflation. Certainly it was true that

unemployment rose after OPEC. From 1945 to 1971, the UK had between 1.2 and 2.7 per cent. Inflation from 1952 to 1967 averaged 3.12 per cent.³³ After OPEC, inflation surpassed 24 per cent, and bad became the norm.

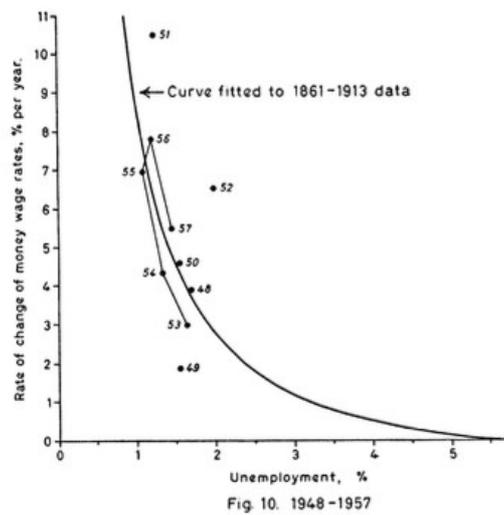
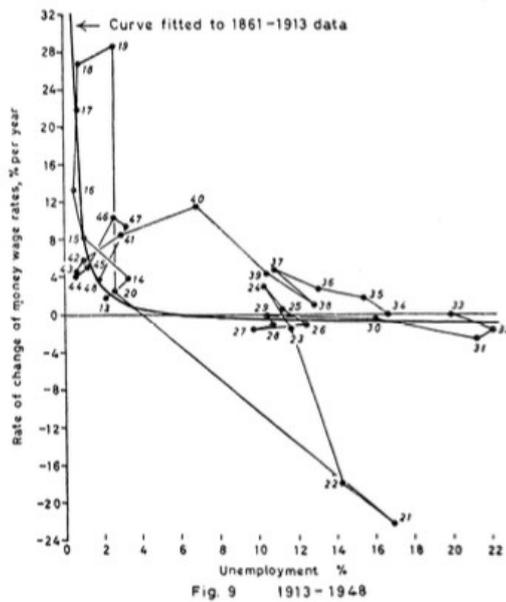


But why when employment began to recover in 1977, did it stay so high in the 1980s and 90s? Unemployment in the UK reached 12.9 per cent in 1983, and by 2017 still never went lower than 4 per cent. The days of 1 to 2 per cent, and full employment (and without underemployment) seemed to be lost.

In 1977, Friedman advanced more thoughts at his Bank of Sweden prize lecture,³⁴ still without evidence. Why were unemployment and inflation rising together? He said squarely ‘there is no stable trade-off between inflation and unemployment’. But supposedly a natural rate of unemployment still existed, consistent with real prices and ‘perceptions’.³⁵ The natural rate had ‘clearly been rising’ because ‘women, teenagers and part-time workers’ were working, but moved jobs more, and unemployment insurance was ‘more generous’.³⁶ Supposedly before the OPEC crisis ‘in 1973, most countries show a clearly marked association of rising inflation and rising unemployment’.³⁷ If inflation and unemployment now rose together (not an inverse, but a positive correlation) only a ‘modest elaboration of the natural-rate hypothesis’ was needed. This was ‘a temporary phenomenon that will disappear as economic agents adjust their expectations to reality’, though ‘we do not know what a complete adjustment will consist of.’³⁸

The ‘reality’ was that Friedman and Hayek’s theory was always evidence-free: a theory that held unless it did not. Clear in 1977,³⁹ and clear now, the charts below show the logical correlation between fuller employment and higher wages in the Phillips curves. But despite the assertions of NAIRU theorists that ‘wage inflation is a crucial component of price inflation’,⁴⁰ no correlation between fuller employment and inflation exists in the UK, US, or elsewhere. Full employment, rising wages, and zero inflation will co-exist when production expands. Prices do not rise if people produce more: everyone’s welfare improves.

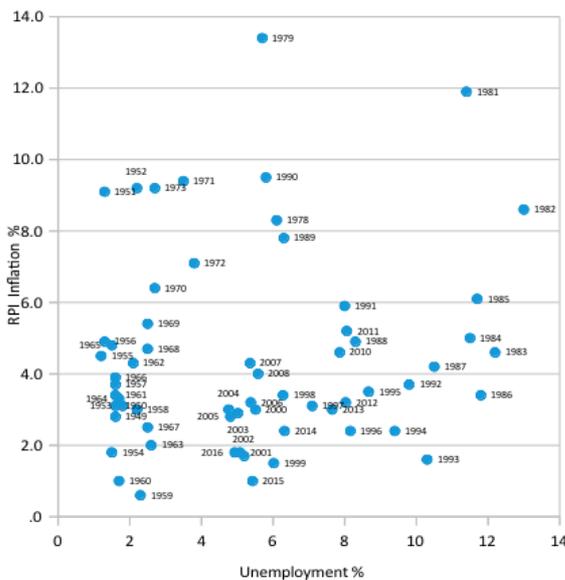
The curve of unemployment and wage rates from A. W. Phillips’ original charts:



The random non-correlation of UK and US unemployment and inflation:

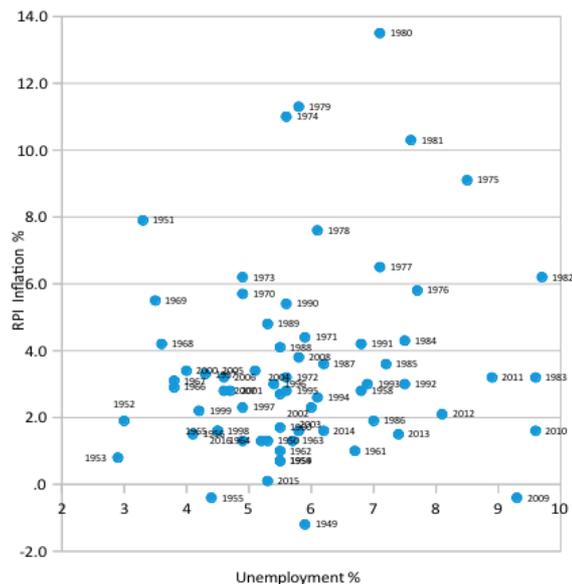
UK unemployment and inflation 1949-2015

Sources: ONS



US unemployment and inflation 1949-2015

Sources: Bureau of Labor Statistics



Many economists opposed natural rate theory. In 1980, Shaun Hargreaves Heap explained that on its own logic the greater danger was to overshoot the (unknowable) natural unemployment rate: this would entrench higher unemployment, because people who are out of a job for a long time find it increasingly difficult to get back into work.⁴¹ Like a magnetic field lingers after the charge is switched off, this became known as ‘hysteresis’.⁴² In 1982, Kim Clark and Lawrence Summers, also rejecting a natural rate’s existence, explained how during WW2 in the US, an unprecedented number of women entered the workforce whilst full employment was maintained. Instead of blaming women or young people, the tendency to find entering work harder after being out of work partly explained unemployment.⁴³

But evidence did not stop NAIRU economics,⁴⁴ and nor did better theory. In a ‘special’ issue of the Review of Economic Studies introduced by Richard Layard,⁴⁵ it was said natural unemployment was rising because ‘people are trying to achieve too high real wages.’⁴⁶ The ‘rise in secular unemployment in Britain’, said Martyn Andrews and Stephen Nickell, was caused by benefits, moving workers, ‘the introduction of employment protection legislation and the rise in union power’.⁴⁷ Backed by some formidable linear equations, they asserted the oil shocks caused but one third of 1973-1977 inflation.⁴⁸ By 1990, Samuel Bentolila and Giuseppe Bertola composed a table of employment protection laws in four countries (wholly unreferenced⁴⁹) and were confident that these ‘costs’ were the cause of ‘Eurosclerosis’.⁵⁰ Meanwhile, the Organization for Economic Cooperation and Development had begun regular reports to encourage cuts to job security.⁵¹ In 1994, Paul Krugman wrote that the ‘disincentive effects of welfare state policies’ and the lack of ‘flexibility of the labor market’ causing unemployment was ‘conventional wisdom’.⁵² Eliminating social and job security might be ‘harsh’ and ‘some people end up on the scrap-heap’, but the ‘wisdom’ was clear: ‘Any tax or transfer payment distorts incentives.’⁵³ In just 30 years, it seemed a generation of economists had been turned against the Universal Declaration of Human Rights.⁵⁴

NAIRU economics was close to manifesting itself in law. At work, the US remained a relatively rights-free jurisdiction,⁵⁵ but it did have the Social Security Act of 1935, and a statutory commitment to ‘maximum employment’ in the Federal Reserve Act of 1913.⁵⁶ In other OECD countries, labour rights and social security were robust, and countries like the UK, Japan and Australia had maintained full employment for over 25 years, while Germany did for 15. But written into the Bank of England Act 1998, and the Treaties underpinning the European Central Bank, was the goal of ‘price stability’ (not exactly ‘zero’ or ‘low inflation’), which seemed to be interpreted by bankers as more important

than ‘full employment’.⁵⁷ In 1996, Janet Yellen, future Federal Reserve chair, wrote that NAIRU reflected ‘structural aspects of the economy’,⁵⁸ while Bill Clinton’s economic advisers were calculating the unknowable natural unemployment rate: an endeavour in which they conspicuously failed.⁵⁹ More than this, US and EU governments had started to place more duties and sanctions on unemployed people to search for jobs that did not exist. Everyone had to be ‘activated’ to get full employment, it seemed, except government itself.

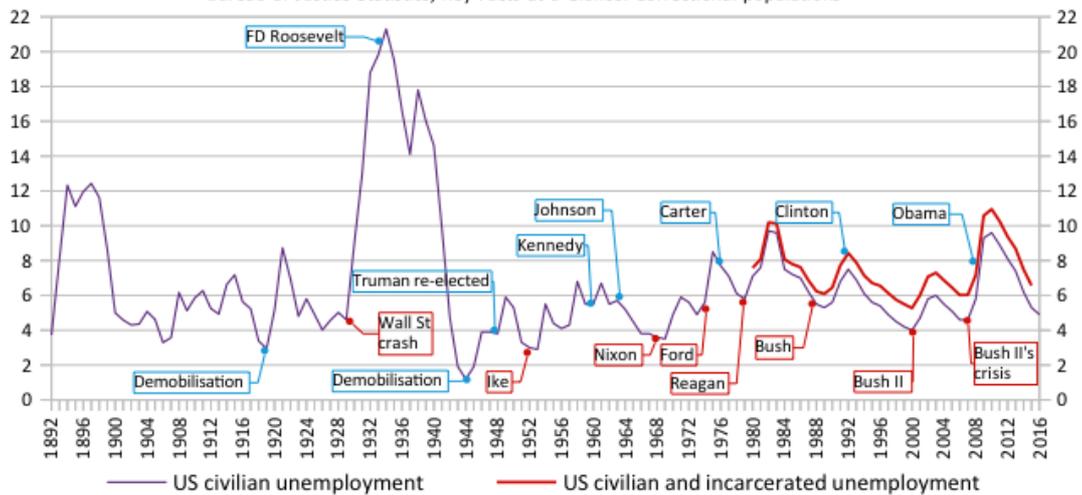
Meanwhile, in 1997, Stephen Nickell had admitted ‘there is no evidence in our data that high labor standards overall have any impact on unemployment whatever’.⁶⁰ But many colleagues still preferred Nickell’s more confident position from 1982. That was, said Richard Layard, cutting labour rights for ‘a flexible system of wage differentials. Nothing else will do the trick.’⁶¹ Economics papers were now written arguing simply that labour rights kill jobs.⁶² But even then, the better side of the evidence (and overwhelming evidence today) does not merely refute the notion that labour rights, especially employment protection, harm the economy. From the best legal database of 117 countries, using econometric analysis at Cambridge’s Centre for Business Research, it appears that labour rights advance productivity, economic growth, equality, and therefore human development.⁶³ Labour rights also spur innovation.⁶⁴

Critically, the original NAIRU argument (governments seeking full employment would accelerate inflation) was quietly segregated or forgotten.⁶⁵ So were some hard facts. Even ignoring chronic under-employment and wage insecurity,⁶⁶ unemployment was always a political choice, nowhere less than the US.

The chart below shows that from 1952-2016, Democrats always left the White House with unemployment lower: down 12% overall. Republicans always left the White House worse: up 14% overall. The chart also calculates that, by including mass incarceration, the effective unemployment rate was around 1.3 per cent higher than the recorded rate in recent decades. Putting people in prison is not a way to get employment in a free society.⁶⁷ Is the abysmal Republican record on jobs an accident? Probably not. At the very least, a natural rate of unemployment was a set of evidence-free conjectures, propped up by a chimerical hand.

US unemployment with incarceration 1892-2016

Sources: Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey
Bureau of Justice Statistics, Key Facts at a Glance: Correctional populations



2.2 Irrationality + technology

A second view of unemployment is it results from 'irrational psychology', or possibly from technology, both central to John Maynard Keynes' theory.⁶⁸ In the Great (and unnatural) Depression, Keynes argued the idea that unemployment was voluntary must be wrong.⁶⁹ If total spending or effective 'aggregate demand' for goods, services and labour dropped away, involuntary unemployment results.⁷⁰ Poorer people have a higher 'propensity to consume' their income, because they need to spend everything as they get it. Wealthier people save, or invest in the financial sector.⁷¹ Before the Wall Street Crash, more and more affluent Americans invested in the stock market for retirement and, said Keynes, the 'mass psychology of a large number of... individuals is liable to change violently'.⁷² Even skilled business people have an 'extreme precariousness' in their 'basis of knowledge' to calculate investment returns in future.⁷³ Triggered by speculative swings, cycles of boom and bust result when business over-invests in productive capacity, stock piles up, production is cut back, and business makes people redundant.⁷⁴ This slows the 'velocity of money' flowing through the economy,⁷⁵ and with it aggregate demand. Asset owners cannot be relied upon to boost aggregate demand in a depression, because they have a lower propensity to consume. So, active government should balance business volatility and irrational thrift.

Keynes was careful to say we 'should not conclude... everything depends on waves of irrational psychology', but human irrationality was at the fore of his analysis. Law was almost absent.⁷⁶ Even post-Keynesian economists have not

stressed legal reform, rather than focusing on mystic and supposedly inevitable business ‘cycles’ and market ‘forces’.⁷⁷ But legal reform has always been central to ensure social institutions became more rational, despite our individual irrational behaviour. First, from the world’s first stock market crash, caused by speculation on South Sea Company shares,⁷⁸ the courts of equity prohibited any possibility of a conflict of interest by people (like stock brokers, asset managers, trustees, or Chancellors) who manage ‘other people’s money’.⁷⁹ Second, the common law from 1766 required a positive duty of disclosure about material facts in any ‘contract based upon speculation’.⁸⁰ This general principle of ‘utmost good faith’ was confined to insurance contracts by more regressive courts,⁸¹ but expanded once more in 1878 to all contracts for the sale of company shares.⁸² Commercial goods contracts might not require positive disclosure,⁸³ but most contracts on financial markets did.

The trouble was, US contract, trust, and corporate law branched into 50 new systems from 1776,⁸⁴ and in every jurisdiction, the law was under-enforced.⁸⁵ Meanwhile, around WW1 the US Supreme Court had declared public pensions or social insurance would be unconstitutional: they violated an ostensible principle of ‘freedom of contract’.⁸⁶ Americans still sought dignity in old age, but now there was little choice except bank savings, and stocks on Wall Street, to build up a retirement fund. This was the start of a great stock market expansion, a mass separation of ownership and control, as company shares came to be held by many millions of individual investors.⁸⁷ Unprepared, US law had few adequate duties of disclosure on companies, brokers or promoters.⁸⁸ People thought they were sold old age dignity in the boom, but found they bought a patch of Florida swamp after the bust. The strangling of social security, consumer and investor protection (not just problems with money supply⁸⁹) caused the Wall Street crash.

So when the New Deal was formulated, the Securities Act of 1933 and the Securities and Exchange Act of 1934 mandated disclosure for all securities contracts, forbid conflicts of interest, and required public enforcement. The author of those laws and President Roosevelt’s historic speech on a new economic constitution, A.A. Berle, provided a model that was rolled out around the world.⁹⁰ The Social Security Act of 1935, with the US Supreme Court shamed into reversing its ‘freedom of contract’ dogma,⁹¹ ensured everyone had the right to an old age pension and unemployment insurance.⁹² But if law reform worked back then, why was there a global financial crisis from 2007? The answers are much the same. Instead of retirement, the social right speculators monetised was the right to a home.⁹³ Instead of company shares, the contracts that evaded disclosure rules were derivatives on sub-prime mortgage debt.⁹⁴ As

the Bush II administration eviscerated federal regulators,⁹⁵ conflicts of interest among rating agencies and banks became rife once more.⁹⁶ Law was able to eliminate irrational business cycles: in Europe and the Commonwealth there was no stock market or bank (rather than political) crisis since WW2. But global banks traded US securities. Keynes was right that individual human behaviour could be irrational. The idea that social institutions must be irrational, that this is ‘human nature’, is evidently wrong.

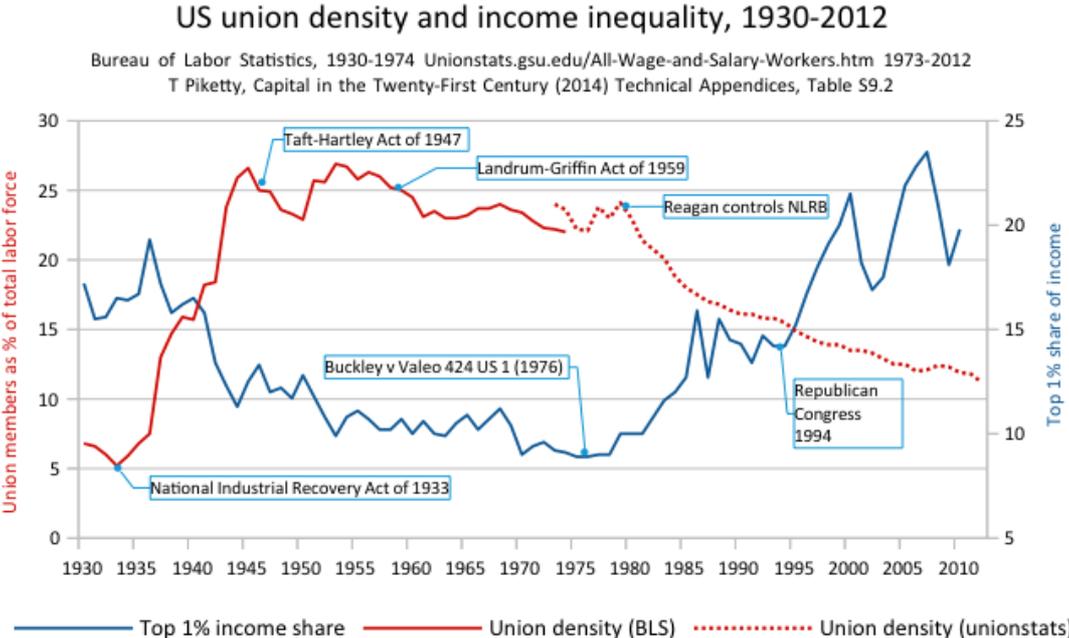
What about technology? In 1930, in *The Economic Possibilities of our Grandchildren*, Keynes argued society was being afflicted by ‘technological unemployment... due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour.’⁹⁷ Keynes himself quickly added that any unemployment from technology was ‘only a temporary phase of maladjustment’ and ‘mankind is solving its economic problem.’ As technology continued to save labour, thought Keynes, society could be 4 to 8 times richer by 2030, and we could endeavour to ‘make what work there is still to be done to be as widely shared as possible’ by having a 15 hour working week.⁹⁸

Keynes was certainly not alone, seeing technology as a problem but also an opportunity. Joseph Schumpeter wrote in 1942 that new technologies were like a ‘perennial gale of creative destruction’.⁹⁹ A ‘rapid change’ could disorganise industry and ‘create avoidable unemployment’. Yet we could, said Schumpeter, ‘avoid coming down with a crash’, and make an ‘orderly retreat’ instead.¹⁰⁰ Most popularly, George Orwell in 1945 wrote in *Animal Farm* how the animals ‘listened in astonishment’ to how ‘fantastic machines... would do their work for them while they grazed at their ease in the fields or improved their minds with reading and conversation.’¹⁰¹ Once their human oppressors had been evicted, a future of leisure, a 3 day week, was possible through technology, and collective endeavour. In this way, Orwell, Schumpeter and Keynes all believed that technological change could have an impact upon jobs. Did technology mean more work, or more freedom? The answer, they said, depends on social policy.

In stark contrast, a view spread recently that ‘technological unemployment’ could be permanent. In 1995, in *The End of Work*, Jeremy Rifkin argued one of the great, unspoken tragedies of the American labour force had been mechanisation in agriculture.¹⁰² This (not absence of labour rights) led to mass post-war redundancy of farm workers in the south,¹⁰³ and was central in triggering Martin Luther King Jr’s ‘March on Washington for Jobs and Freedom’ in 1963.¹⁰⁴ And by the 1990s, computers and robots had become like a terminator, ‘steadily moving up the office hierarchy, subsuming not only routine

clerical tasks but even work traditionally performed by management.’¹⁰⁵ The solution to mass unemployment, argued Rifkin, is that a new value added tax in the US should fund a ‘social wage’ for people to do volunteer work.¹⁰⁶ Much like Rifkin, in 2013 Erik Brynjolfsson and Andrew McAfee argued that US unemployment, and workers’ stagnating incomes, result from ‘losing the race against the machine.’¹⁰⁷ They argued government should educate and invest more, but continue ‘resisting efforts to regulate hiring and firing.’¹⁰⁸ In their next book, drawing on Friedman, they advocated a ‘negative income tax’ where people out of work, and in work, receive a basic income up to a limit to act as a ‘subsidy on labor’.¹⁰⁹

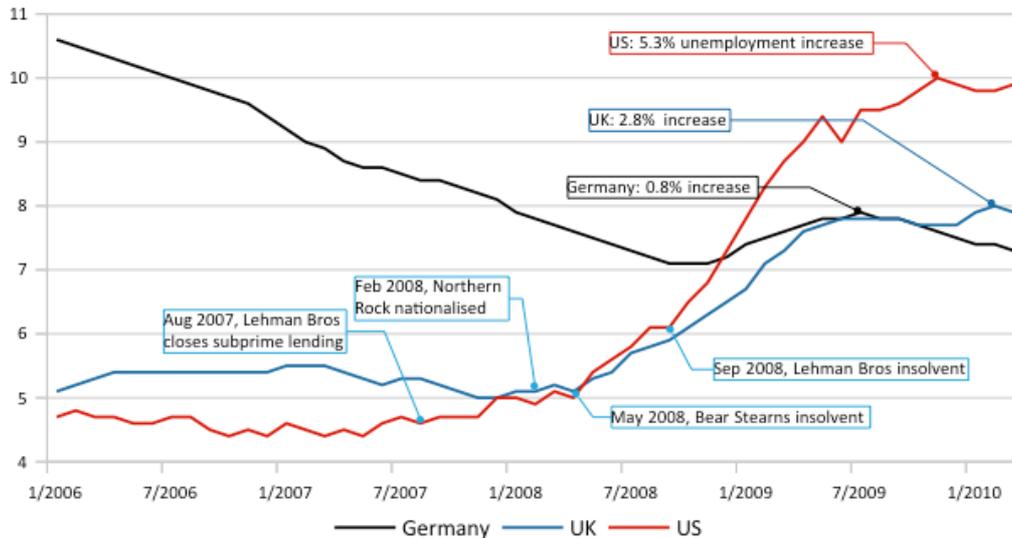
What is truly surprising, especially given the authors’ social democratic views,¹¹⁰ is that the ‘ossification of American labor law’ is missing to explain US unemployment and inequality.¹¹¹ In essence, since 1976, when a disastrous US Supreme Court case held the rich could spend unlimited money on political campaigns as part of ‘free speech’, there was an almost total halt in American social progress.¹¹²



This chart shows, as labour was attacked, and trade union density fell, inequality measured by income share of the top 1% of US earners soared. The same pattern holds in all developed systems where unions are the main channel for voice at work.¹¹³ In the US, collective agreements made by unions are critical to regulate hiring and firing because there is just one federal Act to protect job security.¹¹⁴ This worsens unemployment. The easier it is for a conflicted, irrational authority figure to point a little finger and bark “you’re fired”, the worse is an economic crash:

Unemployment and the global financial crisis

Source: Eurostat, Unemployment rate monthly average %



This chart shows the post-financial crisis peaks in unemployment under three legal alternatives. In the US, with employment ‘at will’, unemployment soared by 5.3 per cent from May 2008. In the UK employees must have reasonable notice, before a fair dismissal, and redundancy pay enforceable in a Tribunal.¹¹⁵ Unemployment rose 2.8 per cent. In Germany, there is better notice and redundancy pay, but also employee elected work councils may veto or defer dismissals.¹¹⁶ Unemployment rose just 0.8 per cent, because German work councils negotiated working time reductions and pay restraint, including executives, to stop job losses.¹¹⁷ Again, if it is easy for conflicted, irrational managers to make people unemployed, there will probably be more, not less, unemployment.¹¹⁸ Cutting edge econometric analysis at the Centre for Business Research’s shows this is right. Job security improves employment, equality and prosperity.¹¹⁹

But the narratives of Rifkin, Brynjolfsson and McAfee are less troubling than the most recent tech predictions. In 2013, Carl Frey and Michael Osborne argued ‘47 per cent of total US employment’ was ‘potentially’ at risk from automation in a working paper abstract.¹²⁰ They also said inequality was due to technology, without mentioning changes in labour law.¹²¹ Their paper was not accepted into a peer reviewed journal until 2017, but by then the ‘47 per cent’ claim was cited across the media, and soon in academia: over 900 citations on Google Scholar by April 2017, over 1600 citations by January 2018. Only 20 of these citations, however, appeared to read past the abstract: that change would be ‘over some unspecified number of years’.¹²² Moreover their ‘method’ was that ‘with a group of [machine learning] researchers, we subjectively hand-labelled 70 occupations, assigning 1 if automatable, and 0 if not’ by ‘eyeballing’

different tasks.¹²³ In 2015, Frey and Osborne secured funding from Citibank ‘Research’,¹²⁴ and similar predictions went viral. These were not based on any defensible academic method, but rather ‘research’ papers from McKinsey,¹²⁵ PwC,¹²⁶ Deloitte (working ‘with researchers at Oxford University’),¹²⁷ and other consultancy businesses trying to boost demand for themselves by stoking social anxiety. More academics have learned the game. The Oxford ‘Future of Humanity Institute’ released a 2017 paper (part-funded by a Facebook billionaire) saying robots will replace most human functions, and write a best-selling book by 2049. It reached this conclusion by surveying 352 ‘AI experts’.¹²⁸

It is questionable whether technology predictions can be classed as academic enquiry. They have certainly received withering criticism by academic economists without corporate funding,¹²⁹ and even the Obama White House.¹³⁰ If the job of making predictions about future employment could be automated, what would the robots say? Would they reject the ‘research’ by McKinsey, PwC, or Deloitte as little better than a crystal ball, tarot, or tea leaves? Given the involvement of corporate finance, all such predictions are highly vulnerable to conflicts of interest. But also, if mass job loss is predicted ‘over some unspecified number of years’, how can this really mean anything? For instance, from *The Canterbury Tales* in 1387, it would appear there has been a mere 46 per cent redundancy rate for Geoffrey Chaucer’s characters. That is, in 631 years, a rate one per cent under Frey and Osborne’s prediction. Now, it might be objected this *Canterbury Tales* study has an unscientific method, uses a questionable categorisation of jobs, with lazy application of statistics. But if all this is true, it has one thing which the new methods of ‘research’ do not: evidence.

Employed (1 point)	Redundant (0)	Part employed (0.5)
Chaucer (playwright)	Knight	Friar
Host (hotel owner)	Miller	Ploughman
Wife of Bath	Reeve	Prioress
Cook	Summoner	Monk
Sergeant of Law	Squire	Nun’s priest
Clerk	Franklin	Second Nun
Merchant	Pardoner	Parson
Physician	Canon Yeoman	
Shipman		
Manciple (caterer)	13.5 of 25 employed or 46% redundant	

2.3 Law + capital supply

A third main view is that, far from being natural, irrational or technological, unemployment results when law enables the restriction of capital supplied to the job market. Capital, said Adam Smith, is the part of one’s stock that is used to make ‘revenue’, but is not for ‘immediate consumption’.¹³¹ That is, capital is property used for production.¹³² The distinction was central to New Deal and post-war UK government policy. First, in 1951 according to M.S. Eccles, Chair

of the Federal Reserve, Wall Street crashed and depression had ensued because wealth accumulated as 'idle or hoarded funds'. Speculation and consumer debt maintained production and jobs for a while. But like 'a poker game where the chips were concentrated in fewer and fewer hands', when most people's 'credit ran out, the game stopped.'¹³³ If there had 'been a better distribution of the current income' with 'lower prices or higher wages and with less profits to the corporations and the well-to-do, it would have prevented or greatly moderated the economic collapse.'¹³⁴ Property carries responsibility,¹³⁵ and people holding productive property had more.

Second, the 1944 UK White Paper, *Employment Policy* saw swings in investment as the barrier to full employment. Consumer spending is relatively stable, and government could rationalise its spending. But private and international investment were volatile. Government should balance both, shifting projected spending forward or back in five year terms.¹³⁶ At the same time, large employers acquired duties to hire disabled people up to a quota,¹³⁷ and government ensured investment into under-developed regions, so the country did not languish behind cities.¹³⁸ The Board of Trade would create development areas if 'there is or is likely to be a special danger of unemployment in that area'.¹³⁹ John Wardlaw-Milne, a backbench MP, proclaimed this was the 'very antithesis of private enterprise... bureaucracy and Socialism carried to the last limit.'¹⁴⁰ And with Conservative, Labour and Liberal consensus, it worked for 30 years.

The theory behind full employment was not all that new. In 1912, Sidney Webb had advocated government spending to counteract shifts in foreign trade and private consumption. He also argued for public labour exchanges to match workers to job vacancies efficiently, for people to be guaranteed a minimum number of hours a week instead of being 'on call' (with 'zero hour contracts'), and for progressive reduction of everyone's hours of labour over the long term.¹⁴¹ For the relatively few "won't works", those people should be given training, support and discipline, but not crime and punishment.¹⁴² By contrast, in 1943 Michal Kalecki argued that discipline was in fact the very reason unemployment existed. If there were full employment, 'workers would 'get out of hand' and the 'captains of industry' would be anxious to 'teach them a lesson'.¹⁴³ Conscious or not, Kalecki was saying, employers have an incentive to restrict the supply of capital for jobs, to reduce the bargaining power of workers. If unemployment is high, employers as a group have few reasons to do anything to reduce it.¹⁴⁴

But after World War Two, full employment *was* maintained by political consensus in the UK, as it was in Australia, Japan and Germany.¹⁴⁵ In 1962,

A.A. Berle added that a legal duty for full employment could extend to corporations. Just as government would be responsible to maintain spending, companies ‘ought not to hoard when expenditure is needed’ and they might need ‘to slow down under some conditions.’¹⁴⁶ The most fascinating fact was full employment cost government very little. According to Robin Matthews, far from a ‘Keynesian revolution’ with persistently or cyclically high government spending, the UK government post-war had a constant current account surplus. This indicated spending restraint.¹⁴⁷ In other words, once government had made the initial investments, and then committed to do ‘whatever it takes’, this maintained business confidence, economic stability, and full employment.¹⁴⁸ After the OPEC price hikes, once confidence resumed, full employment would have been possible again.

The weakness in theories that have emphasised law’s role in the supply of capital for jobs is the prominence given to government to guarantee investment. Indeed, Kalecki already feared a government hostile to the effect of full employment on labour relations would scrap it all.¹⁴⁹ Why should democratic society expose its prosperity to interest groups that would undermine its very basis? After OPEC, full employment was abandoned. An era of recurrent crisis took hold. The financial sector inflated. Corporations began hoarding more assets.¹⁵⁰ Economic theories were chosen to justify it. The return of corporate cash hoarding since the 1990s has been nothing less than extraordinary,¹⁵¹ and nowhere more than among tech-corporations. By 2016, US non-financial firms held \$1.68 trillion in cash, \$1.2 trillion overseas. Apple, Microsoft, Alphabet, Cisco and Oracle alone held \$504 billion in cash.¹⁵² That money, \$504 billion hoarded in just five tech companies, was enough in 2017 to give every unemployed person in the US a full-time job on \$12 an hour for a four year presidential term.¹⁵³ This cannot be regarded as an outcome that tech corporations desire: it is the socially irrational product of what seem to be individually rational firm decisions to save. This concentration of wealth, withdrawn from economic production, challenges the very legitimacy of the modern corporation and private property.¹⁵⁴ The law is enabling an artificial restriction of the supply of capital to the job market, and damaging human development. Unemployment is caused by law, not individuals or their technology. History affirms more this is true.

3. Technology and jobs: five lessons from history

We cannot know the future of technology’s impact on jobs, but we can learn from the past. The best guides for what to do (not best guesses of what might ensue) are times of significant historical change. Five are instructive: (1) the

shifts from agriculture to wool and mechanised textiles, (2) the massive post-war demobilisations, (3) the impact of motor vehicles on horses, (4) the washing machine, (5) computerisation and AI. History's syllabus shows technology improves lives, if people are organised.

3.2 Sheep + Luddites

A first lesson starts with the displacement of agricultural labour in Reformation England. It shows how people react if they cannot share in technology's gains. By 1516, a disruptive, even devastating 'technology' had multiplied the value of land as never seen before. 'Sheep,' wrote Sir Thomas More,¹⁵⁵

have now apparently developed a raging appetite, and turned into man-eaters.... Each greedy individual preys on his native land like a malignant growth, absorbing field after field, and enclosing thousands of acres with a single fence. Result - hundreds of farmers are evicted. They're either cheated or bullied into giving up their property, or systematically ill-treated until they're finally forced to sell... men and women, husbands and wives, widows and orphans, mothers and tiny children.... you can't run a farm without plenty of manpower.

The sheep – or more specifically, wool – market, wrote More, was 'almost entirely under the control of a few rich men, who don't need to sell unless they feel like it, and never do feel like it until they can get the price they want.' Worse, this led to a 'great army of unemployed', and turned people 'into beggars or thieves.'¹⁵⁶ More recommended reviving employment for 'plenty of honest and useful work'.¹⁵⁷ But the response of the state was ever stiffer penalties. Under the Vagabonds Act 1530, it was decided that unjustified begging should be punished with a good whipping. This did not seem to work, and meanwhile in 1535 More was executed. So, the Vagrancy Act 1547 placed beggars in servitude, or slavery for a second 'offence'. Kett's Rebellion in 1549 led to a repeal,¹⁵⁸ but criminalisation of the poor and enclosure went on.

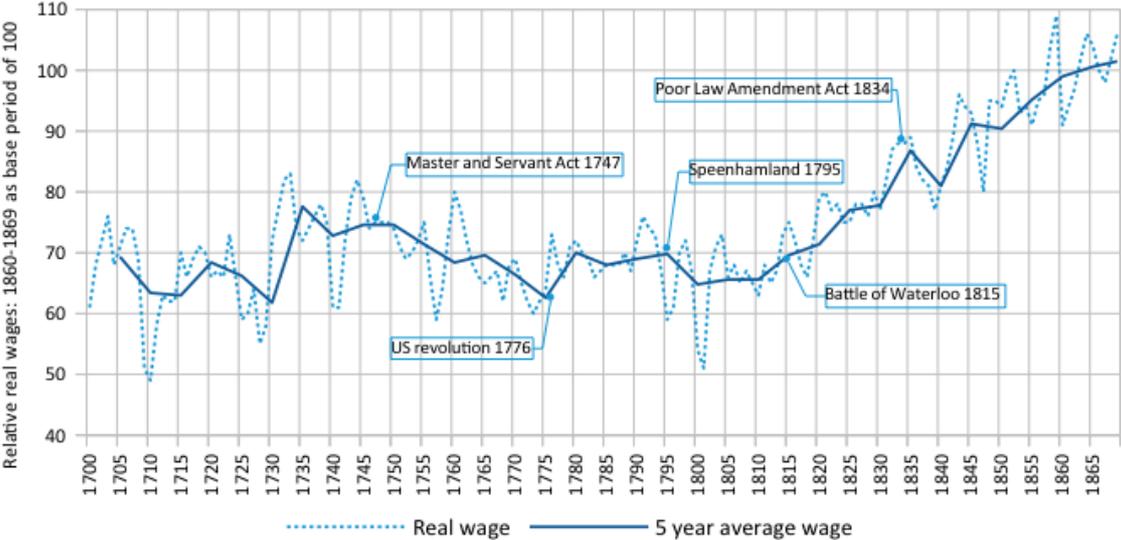
With wool market expansion, in 1589 an inventor named William Lee created the first mechanical knitting machine. Queen Elizabeth I refused Lee a patent, fearing stocking workers would become redundant. She asked him to invent something for silk instead.¹⁵⁹ Whether this slowed mechanisation or not, steam power sped development up. In 1769 Samuel Wise, a clockmaker, attached a cog to stocking machines that turned with steam.¹⁶⁰ Steam and machine meant unprecedented speed. Workers were made redundant, and in 1779 an apprentice named Ned Ludd was said to have smashed machines in Leicester after being

whipped for vagrancy. Even if this was a myth, Ludd became legend, as sporadic ‘Luddite’ and ‘swing’ riots broke out. The Protection of Stocking Frames, etc. Act 1788 section 4 required 7 to 14 years’ transportation for destroying machines, just as the ‘First’ Fleet of Arthur Phillips anchored in Australia. The Destruction of Stocking Frames, etc. Act 1812 imposed a death penalty.¹⁶¹ Lord Byron opposed it in his maiden speech.¹⁶² The machines ‘superseded the necessity of employing’ workmen, said Byron, ‘who were left in consequence to starve’. ‘It is the mob that labour in your fields, and serve in your houses... and can also deny you, when neglect and calamity have driven them to despair.’¹⁶³

Unrest continued for decades, as real wages stalled and fell. It was not merely that people’s incomes convulsed with the wild paroxysms of agricultural prices. Especially from 1747, and again from 1795, long-term down-swings in wages were punishing, recurring until the labour movement formed.¹⁶⁴

Real wages in England 1700-1869

Source: G Clark, 'The long march of history' (2005) WP UC Davis No 05,40



Did wages decline because of technology in the Industrial Revolution? No. Law caused the decline. First, the Master and Servant Act 1747 wrought a massive extension to all classes of workers of punishments for leaving employment, and for ‘justices of the peace’ to cap, fix and repress wages.¹⁶⁵ There was also no right to unionise and strike,¹⁶⁶ but employers could form partnerships, corporations, and dismiss workers regardless of the social cost.¹⁶⁷ Second, on 6 May 1795, a meeting of poor law magistrates at a ‘Pelican Inn’, in Speenhamland, Berkshire, decided unemployed people, *and* the working poor, should get relief because grain prices had risen (again).¹⁶⁸ They rejected a minimum wage.¹⁶⁹ This reckless, paternalist act was a cue for employers to use

parish subsidies as an excuse to cut employment wages. It was not merely that people in work became dependent on poor law relief, whatever the Malthusian moralising.¹⁷⁰ Nor is it relevant that Speenhamland was replaced by an even ghastlier system of workhouses, based on concocted evidence, in the Poor Law Amendment Act 1834.¹⁷¹ As working people had no vote in politics,¹⁷² this ‘basic income’ only lined landlord pockets, the very ‘definition of a rentier’ system.¹⁷³ It made, wrote Eric Hobsbawm, ‘universal pauperism of demoralised men who could not fall below the relief scale whatever they did, who could not rise above it... reduced to as little as the village rich thought fit for a labourer.’¹⁷⁴

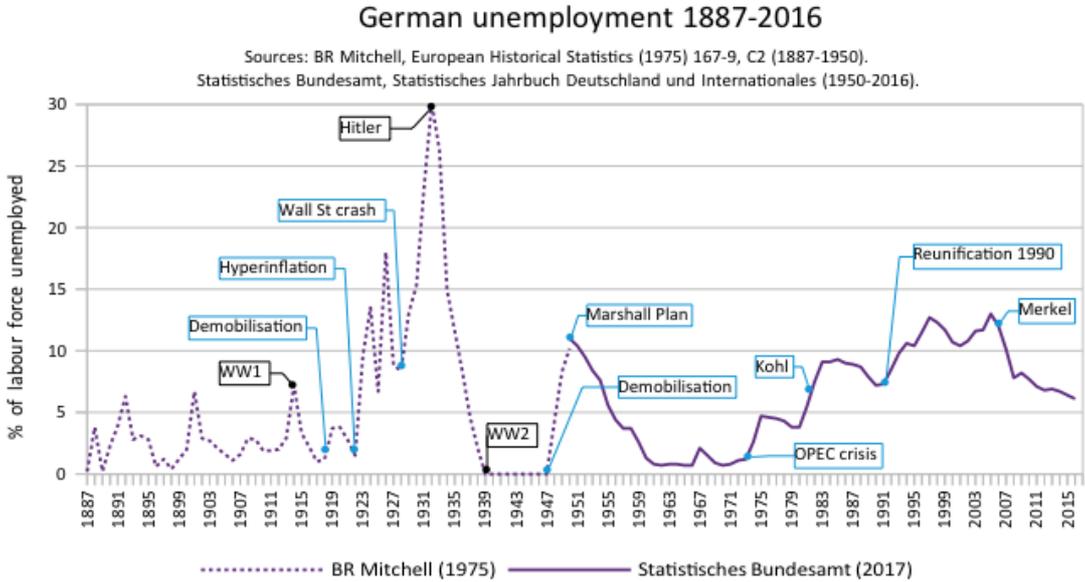
Slow change began in 1834, when a group of agricultural labourers in Tolpuddle, Dorset, were sentenced to transportation for making ‘unlawful oaths’. They had formed a union.¹⁷⁵ They did not break machinery, but according to Sidney and Beatrice Webb their trial followed the ‘specially hard times of 1829... outbursts of machine-breaking, rick-burning and hunger riots... put down in 1830 by the movement of troops... 1000 prisoners, several of whom were hung and hundreds transported.’¹⁷⁶ As the labour movement rallied in their support, they became the ‘Tolpuddle martyrs’, all because the government insisted on making an example of them. Far more than Luddites, this became the real legend of the labour movement. It was not until the Trade Union Act 1871 that unions finally became lawful, and not till the *Taff Vale* case, the formation and electoral success of the Labour Party, and the Trade Disputes Act 1906, that the right to collective action was secure. But this episode of history shows, when they do not share in the benefits of technology, people revolt and resist. Eventually, they organise.

3.2 War + demobilisation

A second lesson of history comes from demobilisation on the First and Second World Wars. Unlike most wars of the 18th and 19th centuries, total war, with conscription, employed a large minority of the population directly, and indirectly almost everyone. As the chart in part 2(1) showed, demobilisation in the UK after World War One led to soaring unemployment, near 18 per cent by 1922. The norm lurched above 10 per cent until the rearmament for World War Two. It was chaos, with all the ‘dimensions of a calamity’ and British labour fought before it accepted ‘a reduction of its standard of living’.¹⁷⁷ While David Lloyd George had promised ‘homes fit for heroes’, his post-war coalition had no credible plan for jobs.¹⁷⁸ Directly after Armistice, 30,000 workers on Tyneside marched against unemployment, 3,000 protested rapid demobilisation on New Year’s Day of 1919 in the Rhondda Valley, and 50,000 iron workers and engineers struck in the autumn. Between 1920 and 1931, over twenty Acts were

introduced to Parliament to tinker with unemployment policy.¹⁷⁹ But even after the Great Strike of 1926, when coal miner wages had been cut by 43 per cent, none bit the bullet: the need for law to guarantee full employment.

The United States fared better, partly because of its sheer size and shorter involvement in the war, partly because a million men were employed on public works in 1919. But as the chart on US unemployment in part 2(1) shows, it did not save the Democratic Party's hold on the White House.¹⁸⁰ One might expect that Germany fared worse: 6 million soldiers redundant upon the Reich's collapse, 800 thousand people returning from captured territory,¹⁸¹ its economy in ruins, its political class in infamy. Yet against the UK and US, the immediate rise in post-WW1 unemployment was the least.



This was because Social Democrats passed laws preventing dismissal without good reason, involving unions and elected work councils, and organised labour exchanges.¹⁸² It all changed, of course, with the erection of tariff barriers by US President Harding,¹⁸³ with the malevolent terms of the Versailles Treaty,¹⁸⁴ the resulting inflation, and then the government's crackpot policy of hyperinflation that wrecked the German mark.¹⁸⁵ The Germans' roaring twenties meant endless humiliation, until a sociopath with a silly moustache promised respect. By 1939, as the Nazi state launched its campaign to enslave Europe it was financially bankrupt. Nothing could have been further from full employment in a free society.¹⁸⁶

After WW2, both UK and US governments would not allow a repeat. As part 2(3) explained, the UK government's White Paper, *Employment Policy* of 1944 committed to full employment. In June 1945, the UK had total available manpower of 21.5 million men and women, with 5.219 million in the military,

and 3.837 million producing for the military.¹⁸⁷ That is, over 42 per cent of the total labour force produced directly for war, and so were redundant on war's end. The need to redeploy people was obvious: for 'houses to be built, shops to be filled, factories to be transformed, plant and rolling-stock to be replaced and export trade to be renewed and extended.'¹⁸⁸ Even if it was 'vain to imagine that patches of unemployment can be eliminated altogether in the transition' the White Paper said they 'should not be so widespread or so persistent'. Government would switch capacity, arrange civilian work and products, and dispose of surplus government stock to avoid disrupting trade.¹⁸⁹ This was the basis of economic recovery.

The counterpart plan in the US involved three major Acts. First, the Servicemen's Readjustment Act of 1944, or the 'GI Bill', funded retraining and education fees for veterans.¹⁹⁰ Second, Congress passed the Employment Act of 1946, although far more watered down than its original draft, to 'promote maximum employment, production, and purchasing power.'¹⁹¹ Once it was passed, it enabled the Truman government to use its influence in fiscal and monetary policy to grow employment, even if Eisenhower would refuse to follow. Third, the Foreign Assistance Act of 1948 led to \$12.7 billion in grants and loans for Western Europe. According to this 'Marshall Plan', the assistance was to 'provide a cure rather than a mere palliative' for 'restoring the confidence of the people of Europe in the economic future'.¹⁹² The results were indeed tremendous: it was a new era of European and American prosperity.

The real lesson from demobilisation is that, with concerted action, even the massive shock of 42 per cent unemployment in the UK, and similar figures elsewhere, could be swiftly contained. Demobilisation was an infinitely greater challenge, in size and social complexity, than any credible prediction about the effect of automation. Hundreds of thousands of people were disabled as a result of war, both physically and psychologically. Entire economies had to shift, not over decades as technology was rolled out, but at the instant of armistice, to 'win the peace'. This is not to say military expeditions did not continue: they certainly did. But there was nothing that labour law, dismissal protection, redeployment rights, and full employment, could not accomplish. As the Universal Declaration said, this was the true meaning of the 'right to work'.¹⁹³

3.3. Smoke + horses

Although social policy can ensure massive shocks to employment are contained, a third lesson of history is that technology's replacement of labour, even if total, can be exceedingly slow. In 1885, as professional football first became legal in

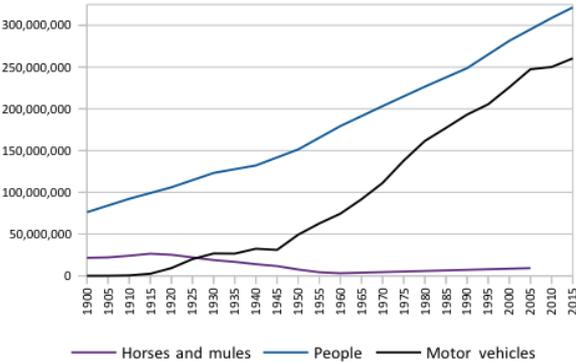
Britain, and the Statue of Liberty arrived in New York, Gottlieb Daimler patented an internal combustion engine for a motorbike. A few months later Karl Benz patented the first motor car in Germany. Their engines ran on petroleum gasoline, refined from oil, a resource whose mass extraction was equally recent.¹⁹⁴ Mass motor production only began in 1908, with the Model T Ford. Motor vehicles, cars and trucks, did not merely compete with steam engines and rail: those could not reach specific delivery points. No, this technology meant the horses of the world were soon out of a job.

Many could not accept the inevitable. In 1908, Mr H.B. Brown wrote in the Yale Law Journal that for ‘park and other pleasure driving’ when cars ‘cease to be a fashionable fad, the public will probably return to carriage and horses.’¹⁹⁵ This was, said Brown, because cars were ‘attended by a cloud of dust and smoke’, ‘the emission of a noisome odor’ and the ‘cold and heartless mechanism of the automobile’ was to many a ‘veritable terror’. Indeed, the ‘automobile lacks one of the most attractive concomitants of pleasure driving in the companionship of the horse.’¹⁹⁶ Brown urged his readers to ‘pray’ against ‘the extinction or dethronement of the noblest of all domestic animals’. But his prayers would be brutally run down. Relentless, unforgiving, the car stomped the US population of horses from 26 million in 1915, down to 19 million by 1930 and 3 million by 1960. Mass horse unemployment became a reality: 88 per cent of horse jobs were slaughtered.¹⁹⁷

Yet the lesson this gives us is that, even though a new technology made an old one obsolete in every respect, the transition (at least with matters left mainly to the market) took at least 45 years. Factors slowing transition include the lifespan of horses, the costs of switching once horses were bought, the costs of upgrading related infrastructure networks (e.g. stables to petrol stations), and no doubt elements of romantic attachment. What could this mean for drivers of cars and trucks? If driverless technology becomes real and safe for commercial use (at whatever date that may be), redundancies may be very slow.

US horse, motor and people populations, 1900-2015

Sources: ER Kilby (2007). Department of Transportation. Census.



Driverless vehicles and jobless drivers have become a central image in automation discourse. So it is worth asking, will people be as jobless with

robots, as horses were jobless with cars? The answer is almost certainly ‘no’. First, as the chart below shows, the actual proportion of driving jobs is relatively modest: taxis, public transport, delivery and on-site motors. In 2016, it was near 4 per cent of the UK workforce, just under 1.3 million people. Second, many commercial aeroplanes are computerised, and there is still a need for a pilot, not merely to supervise the robot, but to change course, take-off and land most of the time. Much the same is true for trains. Even in supermarkets, which have partly ‘automated’ checkouts (and quietly turned customers into workers¹⁹⁸), staff monitor the machines’ constant malfunctions. But third, even if all computing and robotic problems can be overcome, it is doubtful that human beings will become redundant like horses. It is not merely that human beings enjoy the ‘companionship’ of other humans, although this is certainly true: it is the point of ‘customer service’. It is that humans, not horses, write the law, and will protect their own welfare. Unless some people manage to treat others as disposable commodities or beasts, jobs can be improved.

This is not to suggest rapid transition to automation is not both desirable and necessary. First, in 2015 the deaths from avoidable traffic collisions totalled 84,589 in Europe, 34,064 in the USA, 238,562 in India, 261,367 in China, and 1.25 million across the world.¹⁹⁹ Vehicles driven solely by humans cannot be seen as safe at any speed. Everything must be done to end the misery, and secure everyone’s freedom from harm on the roads. Second, many drivers suffer from stress, loneliness and monotony.²⁰⁰ Automation is an opportunity to humanise work, if drivers are fully compensated and redeployed. Third, if driverless vehicles can be introduced, with no salaries to pay it will radically reduce the cost of production. The gains can be made green: every ‘no driver’ vehicle could be a ‘no smoking’ vehicle too. But the transition to a safe, zero carbon transport system will only happen with foresight and smart regulation, not by ‘spontaneous order’.



3.4. Washing machines

History’s fourth lesson is technology drives human development most when people internalise the gains. If motor vehicles were the most significant technology rolling out near WW1, the washing machine was the equivalent rolling around near WW2. In 2010, Hans Rosling famously described the washing machine as being like ‘magic’, a ‘miracle’ for human development.²⁰¹ Before the washing machine, all laundry had to be done by hand, labour usually without pay, and it was mostly seen as the job of women. A look back in washing history reveals just how all-consuming the issue was, and how strong the desire for a solution. In 1841, Catharine Beecher and Harriet Beecher Stowe exclaimed: ‘How would it simplify the burdens of the American housekeeper to have washing and ironing day expunged from her calendar!’²⁰² Without the technology there, they called for a common system of laundries, to save on individual labour.

Even though washing machines began to be mass produced in the 1940s, distribution took time, and remains a question of development. From the 1950s, Katharine French-Fuller recorded a woman in Chile saying ‘every week all year long—every week without fail—there was washday.... The clothes would be scrubbed ... by a woman bending over the tub.’²⁰³ In 1985, Jean Robinson recorded a Chinese woman as saying: ‘It’s really a pain not to have plumbing. Every day we need about 4 or 5 buckets of water ... every day it takes more than hour just to get the water, and once we’ve used it, I have to get rid of it.’²⁰⁴ In other words, women from Chile to China, with access to plumbing and automated washing, were able to save a whole day’s worth of work each week. The washing machine was almost as powerful as collective bargaining from the 1920s and 1930s, which not only spread ‘childhood’ and ‘retirement’ for most people,²⁰⁵ but (as the chart shows²⁰⁶) actually created the word of a two day ‘weekend’.²⁰⁷ By 2010 Rosling estimated that 2 billion people had access to a washing machine, though 5 billion people still did not.²⁰⁸



To save labour and advance gender equality, washing machines need public infrastructure: a piped water network, and an electricity grid.²⁰⁹ In 2015, the World Bank recorded that just 71 per cent of the world’s population used ‘safely managed drinking water services’, a figure stagnant since 2010, and one which does not necessarily mean that water is piped and pumped. In 2014, 85 per cent of people had access to electricity. Public investment in roads and fuel stations are essential for the existence of private transport, just as public communication

networks enable even the most giant websites to function.²¹⁰ Water and electricity networks are the same for washing machines. When everyone can share in technology's gains, when people can internalise their gains through distributed benefits, human development will be rapid. But social organisation is essential for it to happen.

3.5 Artificial 'intelligence'

A fifth lesson of history is also one of the future. Science fiction is filled with optimistic and apocalyptic predictions. In 1989, *Back to the Future: Part II* said we would see a flying skateboard by 21 October 2015. Of course, this was fiction. But how different is the marketing hype on driverless cars, hyperloops, or 'personal air vehicles'? Similarly, in 1991, a James Cameron film projected on 29 August 1997 computers would become self-aware, launch a nuclear war against human beings, and develop a robot army to eradicate the rest.²¹¹ Again, this is fiction. But how different was Rifkin's apocalyptic *End of Work*? Indeed, the net effect of computers appears to have been an increase in employment, not an 'end'.²¹² The lesson is, while the only limit of imagination is itself, the limits of physical science follow another script.

When it comes to artificial intelligence, computational power exceeds human beings in strength and speed. But 'intelligence' means 'knowledge'.²¹³ Data is not knowledge. Human beings have cognitive power, and that means 'understanding'.²¹⁴ Doing is not understanding. Human beings can interpret rules because they understand their meaning and purpose. Following rules is not interpreting them. Computers might process regulations, but is it possible to programme a sense of equity, let alone justice?²¹⁵ In a democratic society, justice cannot be reduced to an arithmetic or geometric equation,²¹⁶ because the parameters of society's norms are recreated by the very act of interpretation. Can that be programmed? Computers might play and win games like chess or go.²¹⁷ But as every teacher knows, rote learning is not critical thinking. Human intelligence derives from at least five organic senses. It is not clear that a set of '0's and '1's, or even quantum computing, could logically be a basis for Cartesian self-awareness.²¹⁸

While it is both fascinating and desirable that 'machine learning' is developing, the philosophy of language shows why AI may not achieve the unique qualities of the human mind. With Bertrand Russell, one of the greatest philosophers of the 20th century, Ludwig Wittgenstein, believed language could be reduced to its 'atomic' components. Once the underlying logical form of any sentence or statement was analysed, they thought, its truth or falsehood could be

ascertained.²¹⁹ This logical positivism was heralded as an end of philosophy, because most philosophical problems were merely terminological misunderstandings that could be positively analysed, clarified and resolved. After WW1, Wittgenstein returned to teach maths to primary school children, and later became the fiercest critic of his earlier theory. Language had no underlying, logical structure because the meaning of a word is its use.²²⁰ Words never have a literal or ‘original’ meaning because meaning exists only through its context.²²¹ Anyone who has found their irony, double-meanings, or humour fall flat over an email knows this to be true. Human intelligence is, in every sense, a social phenomenon. ‘Artificial’ intelligence is literally that: fake intelligence, not real. This is not a cause for pessimism, but instead should focus attention on what really matters. This is that technology’s true value is to accentuate and empower the uniqueness of the human mind.

4. How to reprogramme the law

While history shows that technology can improve jobs and people’s lives with the right social policy, ‘technological displacement’ does exist. This leads to the essential question: does the law do enough to guarantee full employment on fair incomes in a free society (not mass unemployment on a basic income in a billionaire’s dystopia)? Though legal systems differ, it cannot yet be said the law lets everyone share fairly in technology’s gains. But as technology develops, we can ‘reprogramme’ the law, and prepare for the future of work and leisure. We can (1) guarantee full employment with economic democracy, (2) ensure universal social security for fair incomes, and (3) ensure strict enterprise liability for robots, like the products (not persons) they are.

4.1 Economic democracy

First, to make mass unemployment from robots impossible, government must reprogramme the law for full employment: revitalising fiscal, monetary, financial securities, working time, and job security policy. Full employment means everyone has the hours they need ‘at fair wages’.²²² It does not mean underemployment, minimal wages, or soaring inequality, because all undermine aggregate demand and investment in jobs. Part 2(3) showed full employment’s cost is low if business is confident government will do ‘whatever it takes’. But corporations and asset owners must still pay their fair share of tax, to stop capital being hoarded and withheld from the job market.²²³ Every central bank’s objective must be crystal clear: full employment, with real wage growth, and zero price inflation. Two per cent inflation, permanent wage attrition, and

soaring inequality is not ‘price stability’.²²⁴ Securities law must ensure full disclosure and eliminate conflicts of interest. Good faith must become the organising principle of contract law, to uphold the reasonable expectations of honest people.²²⁵ Working time must be progressively reduced: next with a three day weekend.²²⁶ Job security must mean a right to notice, a fair hearing, redundancy pay, and rights of elected work councils to defer dismissals, to stop the conflicts of interest in management decisions.²²⁷

But full employment needs more than mid-20th century strategies, however successful they were. Government did give up its commitment to balance private and international investment volatility. Even when commitment is re-established, that could happen again. The sources of volatility and inequality must be uprooted: the unaccountable concentration of votes in the economy into the hands of an irrational few. In 2015, Richard Freeman, one of the most important economists in recent history, wrote that if we ‘own the robots’ we could live in a more equal society, and the risk of mass unemployment would go. His central proposal was to advance ‘employee ownership’ through trusts, stock options and profit sharing schemes, apparently like John Lewis, Mondragon, or Google.²²⁸ Freeman mentioned pension and mutual funds in which people diversify their investments, but advocated share schemes where firm employees do not. The problem is, all employee share schemes break the cardinal rule of prudent investment: to diversify.²²⁹ Successful cooperatives like John Lewis or Mondragon do not allow trading with shares: and so are accurately described as employee partnerships, not ownership. What makes them successful is not property, but the vote. In any case, the whole point of automation is there may be very few employees left in a firm to own its shares: this is true of Alphabet (which controls Google). But most of all, there is no justification for concentrating employees’ risks into shares: widespread share schemes would produce an ‘Enron economy’.²³⁰ This is why the great architect of economic constitutionalism in the 20th century, A.A. Berle, moved from being an advocate of share schemes,²³¹ to seeking diversification by pensions.²³² The problem has always been, not merely to spread individual ownership, but to democratise social power.

Democracy in the economy must be defended, as much as it is in politics. People must have votes at work. People’s retirement savings, controlled by democratic pension funds (not asset managers or banks), must become a progressively larger share in global capital. The most successful, long-term corporations are usually ones that embrace democratic voice. It is no accident that in UK universities, staff and students have rights to vote.²³³ Investment of capital in enterprise justifies votes in business much of the time: this money is usually

employees' retirement savings. This is why countries with large occupational pension systems (not income linked public pensions) have the largest stock markets. The ultimate investors should have a voice. Investment of labour in enterprise always justifies the vote.²³⁴ In network enterprises or 'natural monopolies', long-term investment of custom does too. There is no one size fits all theory of enterprise,²³⁵ but a corporation can be seen as a commons where different people stake different claims, to basic rights, standards of service, and the all-important right to vote.²³⁶

The progressive democratisation of the economy will mean both a reduction in the extremes of income inequality, and an end to investment volatility. With votes at work,²³⁷ staff will no longer tolerate directors who keep paying themselves more,²³⁸ as everyone else's income declines. With votes on capital, through democratic (and diversified) pension funds, it will no longer be possible for asset managers and banks to use their conflicted positions to inflate their salaries on 'other people's money'.²³⁹ With votes as a citizen, the long-term customers of networked services will no longer be exploited for their private data or held like hostages with no other train to catch. Most crucially, as the votes in the economy come to reflect people's real preferences (not what a tiny handful of billionaires, board members and banks prefer) the patterns of investment will reflect long-term sustainable objectives (not quarterly profits and a golden parachute before a slump). People will want to see their savings used to maintain full employment, social justice and a living planet. The private sector's short-term volatility will disappear. As countries around the world develop their own models of economic democracy, trade will become regular, stable and just.

4.2 Universal fair incomes

Second, universal social security must be the basis for fair incomes. 'Social security', as enshrined in the Universal Declaration of Human Rights, is a collective term that includes replacing income when people are not in employment, especially by unemployment insurance, old age pensions, disability and child care.²⁴⁰ It opposes the idea that mass unemployment is acceptable. First, its purpose is to internalise unemployment's social cost. It impels government to create jobs, educate and retrain, not to allow dispossession.²⁴¹ Second, it mitigates workers' inequality of bargaining power against employing entities, to get fair (not basic) wages. Countries range from income replacement models like in Germany's Social Code,²⁴² to minimum floor systems like the US Social Security Act of 1935, to hybrids like in Sweden.

A 'basic income' is such a powerful idea because it promises to universalise social security, which underpinned full employment. It is also capable of being hijacked: it means different things to different people, if tax plans are unspoken. Most proposals are correct to eliminate bureaucracy and stigma, to get rid of means testing. Social security is not charity we should beg for, but a right we pay for. But no universal income plan must act, as the Speenhamland disaster was shown to in part 3(1), to subsidise exploitative employers. It cannot be necessary for universality to make transfer payments to people who already pay income tax. To be taxed only to receive a sum back makes no sense. But more than this, anything like Speenhamland that subsidises poverty-paying employers diminishes bargaining power, and pay, of all workers. The minimum wage, collective bargaining, and votes at work are fundamental for human autonomy. Particularly in countries, like the US, where political democracy is under sustained attack,²⁴³ handing power over incomes to a captured government is a morbid threat to human development. 'Basic income' programmes, like in Alaska, which sell commodities outside the system, not funded by internal redistribution, differ fundamentally.²⁴⁴ Any basic income model that could subsidise employers is an attack on universal human rights. So are proposals to replace social housing, health, or care, with money. For this reason, the debate has been shifting towards universal basic services.²⁴⁵

The credible forms of basic income proposal (indeed, the *only* credible proposals) understand in detail behavioural psychology, tax and welfare law.²⁴⁶ In fact, introducing a 'personal allowance' in social security taxes (so that contributions are only made after a threshold) has the same economic effect as a basic income transfer for an employed person, but without the subsidy effect for employers.²⁴⁷ It also negates the bureaucracy. An essential principle, which upholds the universal right to 'just and favourable remuneration',²⁴⁸ is that tax is levied proportionately to the means to pay. For everyone not paying income tax the legal right to income replacement, by auto-enrolment, would mean a tremendous advance in social prosperity. Most importantly, it would help ensure incomes are not just basic, but fair.

4.3 Robots as products

Third, as automation and artificial intelligence become more advanced, the people or entities that benefit from robot ownership must be fully responsible for them. This points to speculation in a European Parliament paper about creating ‘electronic personality’ for robots, and partly related to this, the idea of Microsoft’s Bill Gates of ‘taxing the robots’ to pay for more human social services. Both uphold the idea, which must be right, that robot enterprises bear more responsibility. But the reasons why need to be clear.

First, enterprises must bear all costs of their production. This principle is fundamental for a sound economy. If businesses can harm others without paying, this ‘negative externality’ creates an artificial economic subsidy: it distorts every market price. Tort victims,²⁴⁹ and people with unequal bargaining power (or ‘non-adjusting creditors’²⁵⁰) have no genuine ability to contract for compensation. So the law’s role is to internalise those social costs.²⁵¹ But more ‘personalities’ in law complicates liability. In 1966, in *Walkovszky v Carlton*, Carlton created ten corporations to separately own ten taxis.²⁵² Each of these had separate legal personality, and limited liability for Carlton. A taxi hit a pedestrian, Walkovszky, who tried to hold Carlton personally liable, because the corporation did not have enough money for his medical fees.²⁵³ Over a powerful dissent by Keating J, the majority held that even though the taxi corporation was undercapitalised, it was a separate legal person, and alone was liable for the injuries. This was a bad judgment, because tort victims have no ability to contract around limited liability as a secured creditor might.²⁵⁴ But it merely illustrates the point that more electronic personalities (e.g. for a robot or driverless car) could lead robot enterprises to argue they have no liability for accidents. Unlike the risks, there are no benefits in creating electronic personality.²⁵⁵ Fortunately, the EU proposals seem to have dropped electronic personality, to strengthen the law holding enterprises as strictly liable for their robot products.²⁵⁶

Second, in an interview with Quartz in 2017, Bill Gates stated that if a human job, where income tax and social security had been paid, were suddenly replaced by a robot, ‘you’d think that we’d tax the robot at a similar level.’²⁵⁷ Gates argued revenue is needed to care for ‘the elderly, having smaller class sizes, helping kids with special needs... where human empathy and understanding are still very, very unique.’ If taxing ‘the robots’ is used as a metaphor, this is a powerful argument. Social services, especially in old age and early childhood care, are chronically underfunded or non-existent in even the richest countries. Though personifying robots is tempting, this should be seen as a call for

corporations and the rich to pay a fair share of tax. If a future Bill or Melinda Gates profits from labour displacing technology, they should pay more in income and capital gains tax. A future Microsoft should pay more in corporate tax, because their profits bear some relation to their work, more to luck, and most to legal support.²⁵⁸ A basic principle of tax policy is to pay tax on wealth in whatever form that wealth is held. So taxes should not be hypothecated to specific computers or robots, instead of all asset owners paying their fair share. If everyone contributes proportionately to their means, there will be a truly ‘sharing economy.’

5. Conclusion

The promises of technology are astounding, and deliver humankind the capacity to live in a way that nobody could have once imagined. The industrial revolution of the 19th century brought people past subsistence agriculture. It became possible to live, not just from hand to mouth, bonded to lords and masters, but to win freedom from servitude through solidarity. The corporate revolution of the 20th century enabled mass production and social distribution of wealth, for human and democratic development across the globe. A third economic revolution has often been pronounced or predicted, but it will not only be one of technology. The next revolution will be social. It must be universal. Universal prosperity with democracy and social justice, on a living planet, is achievable not in centuries, but in years and decades. It did not begin with technology, but with education. Once people can see and understand the institutions that shape their lives, and vote in shaping them too, the robots will not automate your job away. There will be full employment, fair incomes, and a thriving economy democracy.

Notes

Oxfam, *An Economy for the 1%* (2016) suggested 62 people own more assets than half the globe's population, but studies vary.

2 M Zuckerberg, 'Commencement address at Harvard' (25 March 2017) at the opening of his speech, Zuckerberg points out, perhaps self-deprecating, perhaps patronising, that his audience had graduated while he did not.

3 D Galeon, 'Elon Musk: Automation Will Force Governments to Introduce Universal Basic Income' (14 Feb 2017) [Futurism](#)

4 M Kubanzky and T Williams, 'Why We Invested: GiveDirectly' (7 February 2017) [omidyar.com](#)

5 V Wadhwa, 'Sorry, but the jobless future isn't a luddite fallacy' (7 July 2015) [Washington Post](#), adding 'most people can't adapt to such dramatic change.' Presumably the owner of Amazon, but maybe not the article's author, can 'adapt'.

6 The literature rejecting the 'jobless future' narrative is vast: see for example, DH Autor, 'Why Are There Still So Many Jobs? The History and Future of Workplace Automation' (2015) 29(3) *Journal of Economic Perspectives* 3, 23.

7 See part 4(3) below and M Friedman, 'The Case for a Negative Income Tax: A View from the Right' in JH Bunzel, *Issues in American Public Policy* (1968) ch 2. G Standing, *The precariat: The new dangerous class* (2016) 199-212

8 CB Frey and MA Osborne, 'The future of employment: How susceptible are jobs to computerisation?' (2017) [114 Technological Forecasting and Social Change 254](#).

9 CB Frey, M Osborne, With Contributions from Citi Research, 'Technology at Work: The Future of Innovation and Employment' (February 2015) [Citi GPS](#)

10 K Grace et al, 'When Will AI Exceed Human Performance? Evidence from AI Experts' (30 May 2017) [Working Paper](#).

11 See F Fukuyama, *The End of History and the Last Man* (1992). H Hansmann and R Kraakman, 'The End of History for Corporate Law' (2000) [89 Georgetown Law Journal 439](#). Contrast D Kershaw, 'No end in sight for the history of corporate law: the case of employee participation in corporate governance' (2002) [2\(1\) JCLS 34](#) and E McGaughey, 'Votes at work in Britain' (2017) [46\(4\) ILJ](#), summarised on the [LSE BPP blog](#).

12 See *Back to the Future Part II* (1989) starring MJ Fox and C Lloyd.

13 e.g. T More, *Utopia* (1516) Book I. H Sinzheimer, *Grundzüge des Arbeitsrechts* or *Foundations of Labour Law* (1920) ch 2, 22-27 (in German). AA Berle and GC Means, *The Modern Corporation and Private Property* (1932) Part III.

14 G Orwell, *Animal Farm* (1945) [ch 5](#)

15 n.b. 'App' can be short for both an 'application' and in the US, according to the Oxford English Dictionary, an 'appetizer'.

16 W Beveridge, *Full Employment in a Free Society* (1944) see below at part 4(1)

17 n.b. 'Cognition' means the 'process of acquiring knowledge and understanding through thought, experience, and the senses.'

18 e.g. 'Octuplets' Mom On Welfare, Spokesman Confirms' (10 February 2009) [Fox News](#). A Crick and K Cain, 'Benefit Mum Rap: 'Queen of Benefits'' (21 February 2017) [The Sun](#). S Markson, 'Taxpayer works for 14 years to pay welfare bill of just ONE dole bludger' (22 June 2017) [Daily Telegraph](#). Each 'news' outlet is controlled by Victorian mogul, Rupert Murdoch.

19 cf Alan Budd, Chief Economic Advisor to HM Treasury under Margaret

Thatcher: ‘The nightmare I sometimes have... there may have been people making the actual policy decisions or people behind them or people behind them who never believed for a moment that this was the correct way to bring down inflation. They did however see that it would be a very, very good way to raise unemployment, and raising unemployment was an extremely desirable way of, of reducing the strength of the working classes, if you like. That what was engineered there – in Marxist terms – was a crisis of capitalism which re-created reserve army of labour, and has allowed the capitalist to make high profits ever since. Now again, I’d not say I believe that story, but when I really worry about all this I worry whether indeed that was really what was going on.’ *Pandora’s Box, Episode 3: The League of Gentlemen* (Thursday, 18 June 1992) [BBC2 at 42:55](#). Note, the reserve army of labour is not originally a Marxist concept, but from Sir or Saint Thomas More, the Lord Chancellor executed by Henry VIII in 1530. See part 3(1) below.

20 UDHR 1948 [arts 22-23](#), ‘Everyone, as a member of society, has the right to social security’. ‘Everyone has the right to work, to free choice of employment’ and ‘the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity’.

21 M Friedman, ‘The Role of Monetary Policy’ (1968) 58(1) AER 1, 10.

22 Friedman (1968) 58(1) AER 1, 9. Note, inflation typically diminishes real wages, but enriches owners and sellers of assets.

23 Friedman (1968) 58(1) AER 1, 11

24 Friedman (1968) 58(1) AER 1, 9

25 AW Phillips, ‘The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom 1861–1957’ (1958) [25 *Economica* 283](#), referring to unemployment and the ‘change of money wage rates’.

26 Unequal bargaining power is consequent on three main factors: (1) inequality in resources or wealth: A Smith, *The Wealth of Nations* (1776) [Book I, ch 8, §12](#), (2) collective organisation: JS Mill, *Principles of Political Economy* (1848) [Book V, ch XI, §12](#), and (3) asymmetry of information: WS Jevons, *Theory of Political Economy* (3rd edn 1888) [ch 4, §74](#).

27 See also M Friedman, ‘The Methodology of Positive Economics’ in *Essays in Positive Economics* (1953) ch 1, 4-7

28 n.b. D Hume, *Essays Moral, Political, Literary* (1777) Part II, Essay III, [*Of Money*](#), describes an inflation process after gold returns from Cadiz, which he suggested temporarily increases productivity. This story has doubtful application to anything today.

29 FA Hayek, 'Full Employment, Planning and Inflation' (1950) 4(6) Institute of Public Affairs Review 174

30 FA Hayek, *The Road to Serfdom* (1944) described in the 1950 tract as 'the first comprehensive top-level intellectual assault on the socialist position and perhaps created more stir than any politico-economic publication of the day.'

31 Hayek (1950) 4(6) IPAR 174, 181

32 See BP, *Statistical Review of World Energy* ([June 2017](#)) 20, roughly tripling of oil prices in 1973-74, and again by 1979-80.

33 The only better 16 years in recent UK history was 1991-2006, at 2.76%. For 1968-1972, around the Industrial Relations Act 1971, inflation ranged from 6.4-9.4%. P Davies and M Freedland, *Labour Legislation and Public Policy* (1992) chs 6 and 7, 365.

34 Friedman won the 'Bank of Sweden Prize in Memorial of Alfred Nobel'. Though administered now by the Nobel Committee, Alfred Nobel never consented to an economics prize or bank funding. Nobel's name therefore seems to be misrepresented.

35 M Friedman, 'Inflation and Unemployment' (1977) 85 Journal of Political Economy 451, 458

36 Friedman (1977) 85 JPE 451, 458

37 They do not: inflation was falling from 1970-1973 in 5 out of 7 countries in Friedman's own charts (1977) 85 JPE 451, 462-3

38 Friedman (1977) 85 JPE 451, 464-5

39 See shortly after, JA Tatom, 'What ever happened to the Phillips Curve?' (1981) [Federal Reserve Bank of St Louis Working Paper 1981-008A](#), 3, 'experience in the past decade makes the NAIRU corollary highly doubtful.'

40 DT Coe, 'Nominal Wages. The NAIRU and Wage Flexibility' (1985) [5 OECD Economic Studies 87](#), 88

41 SP Hargreaves Heap, 'Choosing the Wrong 'Natural' Rate: Accelerating Inflation or Decelerating Employment and Growth?' (1980) [90\(359\) Economic Journal 611](#). Or, if government keeps unemployment below the 'natural' rate, the tendency to cause inflation would reduce with less long-term unemployment, meaning a lower (and eventually zero) natural rate over time.

42 See DJ Burningham 'Economics for Technical Students' (1960) 2(1) *Education + Training* 11, 12-13 (saying many economic lags are analogous to hysteresis in magnetics). ES Phelps, *Inflation Policy and Unemployment Theory: The Cost-Benefit Approach to Monetary Planning* (1972) xxiii (applying the analogy, but sadly accepting a 'natural' rate) and Hargreaves Heap (1980) [90\(359\) Economic Journal 611](#) (probably the first author to use the analogy without accepting the idea of a natural rate).

43 K Clark and L Summers, 'Labour Force Participation: Timing and Persistence' (1982) [49\(5\) Review of Economic Studies 825](#). See also the better known OJ Blanchard and LH Summers, 'Hysteresis and the European Unemployment Problem' (1986) [1 NBER Macroeconomics Annual 16](#). Further, 'Hysteresis in Unemployment' (1987) [31 European Economic Review 288](#). 'Beyond the Natural Rate Hypothesis' (1988) [78\(2\) American Economic Review 182](#), 186, 'the longer unemployment stays away from equilibrium, the more slowly it will eventually-if ever-return to it.' But this should not be viewed as a 'natural' law.

44 e.g. RM Solow, 'On Theories of Unemployment' (1980) 70(1) AER 1, 'Ever since Adam Smith, economists have been distinguished from lesser mortals by their understanding of... decentralized competitive markets... The profession's reservations about rent control, interest rate ceilings, and minimum wage laws [...reflect...] a feeling that nonprofessionals simply do not understand fully the consequences, often unexpected and undesired, of messing around with the market mechanism.' Note that (1) Adam Smith was a lawyer and moral philosopher, (2) Smith argued rents were exploitative, (3) Smith approved caps on extortionate interest for loans, and (4) he acknowledged the basis for the minimum wage, namely unequal bargaining power: see *The Wealth of Nations* (1776) [Bk I, ch 11](#) (rents), [Bk II, ch 4, §14](#) (interest caps), [Bk I, ch 8, §12](#) (bargaining power). But why would 'higher mortals' like Solow actually bother to read this carefully? Solow's investigation into 'history' in the same article meant going 'back to reread' Pigou, from 1933, a full 47 years old.

45 R Layard et al, 'Special Issue on Unemployment' (1982) 49(5) RES 675

46 D Grubb, R Jackman and R Layard, 'Causes of the Current Stagflation' (1982) 49(5) RES 707

47 M Andrews and S Nickell, 'Unemployment in the United Kingdom Since the War' (1982) 49(5) RES 731, 751

48 Andrews and Nickell (1982) 49(5) RES 731, 741. Further, on a theory of shocks, see DT Mortensen and CA Pissarides, 'Job Creation and Job Destruction in the Theory of Unemployment' (1994) 61(3) *Review of Economic Studies* 397.

49 S Bentolila and G Bertola, 'Firing Costs and Labour Demand: How Bad Is Euroclerosis?' (1990) [57 *Review of Economic Studies* 381](#), 395-6 and 400, with an Appendix showing five categories of laws, where notice, dismissal and redundancy compensation are averaged, and remarkably they state 'We do not have data on the actual rise of [firing costs] in the seventies; we set the increase to 33% when solving the model.'

50 Bentolila and Bertola (1990) [57 Review of Economic Studies 381](#), 394, while the authors talk about ‘costs’ to an employer if an unfairly dismissed employee goes to or succeeds at a Tribunal, they make no mention of the enterprise costs of unfair dismissal: the damage where managers fire good workers irrationally, where exuberant redundancies damage long-term good will, or downward spirals in depression. This makes the authors’ conclusions on ‘costs’ very difficult to defend.

51 See the ambitiously entitled two part OECD, *Jobs Study, Evidence and Explanations* (1994). See also the brilliant dissection in D Ashiagbor, *The European Employment Strategy: Labour Market Regulation and New Governance* (2005) ch 2, 38-48

52 P Krugman, ‘Past and prospective causes of high unemployment’ (1994) [79\(4\) Economic Review - Federal Reserve Bank of Kansas City 23](#), 50, 57 and 74

53 Krugman (1994) 79(4) Economic Review 23, 74. Also at 76, ‘the apparent unraveling of that model makes it difficult to argue for implementation of Swedish-style labor market policies.’ It is not entirely apparent what Krugman means.

54 UDHR 1948 [arts 22-23](#), ‘the right to social security’ and the ‘right to work’. The ‘30 years’ starts at Friedman’s 1967 address.

55 Although state law can improve, a typical common law position is that irrational employer dismissals are not reviewed, unless the Civil Rights Act of 1964 is violated, or a similar statute, or there is a collective dismissal which requires a mere 90 days’ notice under the WARN Act of 1988. This has long, in effect, been the ‘Donald Trump model of workplace relations’.

56 Federal Reserve Act of 1913, [12 USC §225a](#).

57 Bank of England Act 1998 [s 11](#). Treaty on the Functioning of the European Union 2007 [art 127](#), ex TEC 1996 art 105. M Roth, ‘Employment as a Goal of Monetary Policy of the European Central Bank’ (2015) [ssrn.com](#) makes a convincing argument that the ECB is bound to prioritise full employment, given TEU art 3.

58 JL Yellen, 'Monetary policy: goals and strategy' (13 March 1996) NABE Policy Seminar, Washington, DC, a euphemism which appears to refer to labour and social rights, as one supposes Yellen is implying they adversely affect 'the efficiency of the labor market in matching workers to job vacancies, the geographic mobility... quality of skills... [and] demographics of the labor force, and the extent of structural mismatch between job vacancies and unemployed workers.'

59 D Staiger, JH Stock and MW Watson, 'The NAIRU, Unemployment and Monetary Policy' (1997) 11(1) *Journal of Economic Perspectives* 33, the CBO estimated 5.8% and Council of Economic Advisers 5.7%. On the actual rate, see below.

60 S Nickell, 'Unemployment and Labor Market Rigidities: Europe versus North America' (1997) 11 *Journal of Economic Perspectives* 55, 66. Nickell, drawing upon flawed OECD protection indexes also said 'unions are bad for jobs, but these bad effects can be nullified' by coordinated bargaining. Benefits are 'bad', unless coupled with activation policies. Minimum wages are 'bad' for young people. None of these conclusions have a credible basis, as they derive from flawed OECD data.

61 R Layard, 'Getting people back to work' (1998) Autumn, *CentrePiece* 24, 27

62 e.g. O Blanchard and J Wolfers, 'The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence' (2000) 110 *Economic Journal* 1. DH Autor, JJ Donohue III and SJ Schwab, 'The Costs of Wrongful-Discharge Laws' (2006) [88\(2\) RES 211](#). LH Summers, 'Unemployment' in *The Concise Encyclopedia of Economics* (2nd edn 2007) econlib.org, 'Another cause of long-term unemployment is unionization.... Between 1970 and 1985, for example, a state with a 20 percent unionization rate, approximately the average for the fifty states and the District of Columbia, experienced an unemployment rate that was 1.2 percentage points higher than that of a hypothetical state that had no unions.' As explained above, based on the CBR data the evidence suggests this idea is flatly mistaken, but is also outweighed by 1.3% of the US workers in prison.

63 Z Adams, L Bishop, S Deakin, C Fenwick, S Martinsson and G Rusconi, ‘The Economic Effects of Laws Relating to Employment Protection and Different Forms of Employment: Analysis of a Panel of 117 Countries, 1990-2013’ (2018) CBR Working Paper, forthcoming. This is based on the CBR, Labour Regulation Index ([2016](#))

64 VV Acharya, RP Baghai and KV Subramanian, ‘Labor Laws and Innovation’ (2013) [56\(4\) Journal of Law and Economics 997](#)

65 But contrast L Ball and NG Mankiw, ‘The NAIRU in Theory and Practice’ (2002) [16\(4\) Journal of Economic Perspectives 115](#) and JK Galbraith, ‘Time to Ditch the NAIRU’ (1997) [11\(1\) JEP 93](#)

66 JP Morgan, *Paychecks, Paydays, and the Online Platform Economy* ([2016](#)) 55% of 6m customers had 30% volatility in monthly wages

67 See Ashiagbor ([2005](#)) ch 2, 65-66. The answer to R Shimer, ‘Why Is the U.S. Unemployment Rate So Much Lower?’ (1998) 13 NBER Macroeconomics Annual 11, is ‘it is not’. Unemployment is not reduced by putting potential workers in jail.

68 JM Keynes, *The General Theory of Employment, Interest and Money* (1936) ch 12 and *The Economic Possibilities of our Grandchildren* (1930). Keynes became textbook in a post-WW2 consensus. cf M Friedman (4 February 1966) [Time](#), ‘In one sense, we are all Keynesians now; in another, nobody is any longer a Keynesian.’ cf B Bernanke, ‘On Milton Friedman’s Ninetieth Birthday’ ([8 November 2002](#)) ‘You’re right, we did it. We’re very sorry. But thanks to you, we won’t do it again.’ This proved unwise.

69 e.g. C Pigou, *The Theory of Unemployment* (1933) or JS Mill, *Principles of Political Economy* (1848) [Book II, ch XII, §1](#). The latter emerged on Massachusetts Supreme Court in *Plant v Woods*, 57 NE 1011 (1900) per Holmes J, ‘Organization and strikes may get a larger share for the members of an organization, but, if they do, they get it at the expense of the less organized and less powerful portion of the laboring mass. They do not create something out of nothing.’ This is false. Holmes J was complicit in *Loewe v Lawlor*, 208 US 274 (1908) imposing antitrust damages on unions, reversed by the Clayton Act of 1914 §§6 and 20.

70 Keynes (1936) [chs 2 and 3](#), arguing workers cannot bargain for higher *real* wages because this also depended on price levels.

71 Keynes (1936) [ch 9](#)

72 Keynes (1936) [ch 12](#), V, 149

73 Keynes (1936) ch 12, III, 145

74 Keynes (1936) [ch 22](#), quietly adding ‘social practices and... a distribution of wealth... result in a propensity to consume which is unduly low’. This discloses a concern (if somewhat suppressed) that unjustified inequality harms economic development.

75 Keynes (1936) [ch 15](#)

76 cf Keynes (1936) ch 12, [VI](#) where Keynes did highlight the ‘high brokerage charges and the heavy transfer tax’ to access London Stock Exchange trading, which ensured fewer ‘sins’ than at the New York Stock Exchange. This is reductive at best.

77 e.g. N Kaldor, ‘A Model of the Trade Cycle’ (1940) [50\(197\) Economic Journal 78](#), and ‘What is Wrong With Economic Theory’ (1975) [89\(3\) Quarterly Journal of Economics 347](#). This is footed on variations on the notion that ‘economic activity always tends towards a level where Savings and Investment are equal’. This is wrong because law creates every ‘tendency’.

78 See R Dale, *The First Crash: Lessons from the South Sea Bubble* (2004) ch 6

79 *Keech v Sandford* (1726) 25 ER 223, Lord King LC holding that even a trustee of a marketplace had to avoid any possibility of a conflict of interest. See J Getzler, ‘Rumford Market and the Genesis of Fiduciary Obligations’ in A Burrows and Lord Rodger of Earlsferry (eds) *Mapping the Law: Essays in Honour of Peter Birks* (OUP 2006) 586.

80 *Carter v Boehm* (1766) 3 Burr 1905, per Lord Mansfield. For background, see S Watterson, ‘*Carter v Boehm* (1766)’ in C Mitchell and P Mitchell, *Landmark Cases in the Law of Contract* (Hart 2008) ch 3.

81 Affirmed in *Pawson v Watson* (1778) 2 Cowp 786, but see *Manifest Shipping Co Ltd v Uni-Polaris Shipping Co Ltd* [2001] UKHL 1.

82 *Erlanger v New Sombrero Phosphate Co* (1878) 3 App Cas 1218, per Lord Blackburn held that the sale of shares in a phosphate mining company,

when the company owners did not disclose the price they paid (exactly half) for the land, meant the share purchasers could rescind the contract and get their money back.

83 See *Smith v Hughes* (1871) LR 6 QB 597, per Blackburn J on the sale of (green not old) oats, for horse food.

84 One of the most significant, under-appreciated causes was another of Lord Mansfield's decisions: see AW Blumrosen, 'The Profound Influence in America of Lord Mansfield's Decision in *Somerset v Stuart*' (2007) 13 Texas Wesleyan Law Review 645.

85 Berle and Means (1932) Part III

86 See *Lochner v New York* [198 US 45](#) (1905) applied in *State Board of Control v Buckstegge*, 158 Pac 837, 842 (1916), *Busser v Snyder*, 282 Pa 440 (1925) and *Railroad Retirement Board v Alton Railroad Co* [295 US 330](#) (1935).

87 See GC Means, 'The separation of ownership and control in American industry' (1931) [46\(1\) QJE 68](#)

88 Explained by AA Berle and GC Means, *The Modern Corporation and Private Property* (1932) Part III

89 cf M Friedman and AJ Schwarz, *A Monetary History of the United States, 1867–1960* (1963) arguing the Great Depression's cause was that government allowed the monetary supply to shrink, and should have kept all banks going as the lender of last resort.

90 e.g. Financial Services and Markets Act 2000 ([c 8](#)) or Markets in Financial Instruments Directive [2014/65/EC](#)

91 See *Steward Machine Company v Davis* [301 US 548](#) (1937) following shortly after *West Coast Hotel Co v Parrish* [300 US 379](#) (1937)

92 Social Security Act of 1935, 42 USC [§402](#)

93 UDHR 1948 [art 25](#), 'Everyone has the right to... housing... and the right to security in the event of... old age...'

94 cf the notorious Opinion of Robin Potts QC to the International Swaps and Derivatives Association, Inc (24 June 1997)

95 e.g. S Labaton, ‘Bush S.E.C. Pick Is Seen as Friend to Corporations’ (3 June 2005) [NY Times](#)

96 See JC Coffee, ‘What Went Wrong? An Initial Inquiry into the Causes of the 2008 Financial Crisis’ (2009) [9\(1\) Journal of Corporate Law Studies 1](#). The third major cause was no effective consumer regulation in the US. See E Warren, ‘Product Safety Regulation as a Model for Financial Services Regulation’ (2008) 43(2) *Journal of Consumer Affairs* 452, and contrast the Consumer Credit Act 1974 or the Unfair Terms in Consumer Contracts Directive [93/13/EEC](#) arts 3-6.

97 JM Keynes, *The Economic Possibilities of our Grandchildren* ([1930](#))

98 See also E Skidelsky and R Skidelsky, *How Much is Enough?: Money and the Good Life* (2013) Preface and ch 1

99 J Schumpeter, *Capitalism, Socialism and Democracy* (1942) chs VII and VIII

100 Schumpeter (1942) ch VIII, 90

101 G Orwell, *Animal Farm* (1945) [ch 5](#)

102 J Rifkin, *The End of Work: The Decline of the Global Labor Force and the Dawn of the Post-Market Era* (1995)

103 Rifkin (1995) ch 5, 71-73, charting mechanical harvester use going from 6% to 78% in 15 years.

104 Contrast King's own views, seeing absence of labour rights as the central problem: ML King, *Speech to the Fourth Constitutional Convention AFL-CIO, Miami, Florida (11 December 1961)* 'the Wagner Act... tended merely to declare rights but did not deliver them. Labor had to bring the law to life... we shall bring into full realization the American dream—a dream yet unfilled. A dream of equality of opportunity, of privilege and property widely distributed; a dream of a land where men will not take necessities from the many to give luxuries to the few; a dream of a land where men will not argue that the color of a man's skin determines the content of his character...'

105 Rifkin (1995) ch 10, 149

106 Rifkin (1995) ch 7, 257-265. See further B Dorini, Review (1996) 9(1) *Harvard Journal of Law & Technology* 231.

107 E Brynjolfsson and A McAfee, *Race Against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy* (2011) ch 1, on unemployment. This erroneously suggests Keynes believed that technology produces unemployment. Ch 3, on median income decline, says nothing about labour law.

108 Brynjolfsson and McAfee (2011) ch 5. They also call Friedrich von Hayek 'the greatest theorist of markets'. This is debatable.

109 E Brynjolfsson and A McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (2014) ch 14.

110 See campaignmoney.org, on [Brynjolfsson contributing to ActBlue and Bernie 2016](#) and [McAfee to the Hillary Victory Fund](#).

111 See CL Estlund, 'The ossification of American labor law' (2002) [102\(6\) Columbia Law Review 1527](#)

112 See E McGaughey, 'Fascism-lite in America (or the social ideal of Donald Trump)' (2018) [BJALS \(forthcoming\)](#)

113 See E McGaughey, ‘Votes at work in Britain: shareholder monopolisation and the ‘single channel’’ (2017) [46\(4\) Industrial Law Journal](#), summarised on the [LSE BPP blog](#). [Germany](#) or the Netherlands, with strong codetermination rights, differ.

114 The Worker Adjustment and Retraining Notification Act of 1988 (29 USC §§ 2101-9) requires just 60 days notice for collective redundancies of more than 50 employees, or over 33% of the workforce, whichever is lower.

115 Employment Rights Act 1996 ss 86 (notice), 94 (right to a fair dismissal) and 135 (redundancy pay).

116 Work Constitution Act 1972 (*Betriebsverfassungsgesetz*) [§§111-113](#). Dismissal Protection Act 1965 (*Kündigungsschutzgesetz*) [§1](#).

117 e.g. ‘Buying Itself Out of a Recession’ (4 November 2009) [Spiegel](#)

118 On employers’ potential conflicts of interest see *Braganza v BP Shipping Ltd* [2015] [UKSC 17](#), [18] per Lady Hale

119 Z Adams, L Bishop, S Deakin, C Fenwick, S Martinsson and G Rusconi, ‘The Economic Effects of Laws Relating to Employment Protection and Different Forms of Employment: Analysis of a Panel of 117 Countries, 1990-2013’ (2018) CBR Working Paper, forthcoming. This is based on the CBR, Labour Regulation Index ([2016](#))

120 CB Frey and MA Osborne, ‘The future of employment: How susceptible are jobs to computerisation?’ (2017) [114 Technological Forecasting and Social Change 254](#).

121 Frey and Osborne (2017) [114 TFSC 254](#), 257

122 Frey and Osborne (2017) [114 TFSC 254](#), 268

123 Frey and Osborne (2017) [114 TFSC 254](#), 263

124 CB Frey, M Osborne, With Contributions from Citi Research, ‘Technology at Work: The Future of Innovation and Employment’ (February 2015) [Citi GPS](#)

125 McKinsey Global Institute, *A Future That Works: Automation,*

Employment, and Productivity ([2017](#)). This ‘predicts’ 46 per cent of time spent working ‘is technically automatable’. The authors may include partners in the Preface who ‘led’ the ‘research’.

126 PwC, *UK Economic Outlook March 2017* ([2017](#)) ch 4, ‘based on our own preferred methodology’ (which is not disclosed) the authors (also not disclosed) say ‘around 30% of jobs in the UK are at potential high risk of automation’.

127 Deloitte, *Citizens, government and business: The State of the State 2017-18* ([2017](#)) 10, with a ‘forecast’ that ‘35 per cent of jobs in the UK are highly susceptible to automation’. The authors are unknown, but a ‘leader’ and ‘director’ at Deloitte feature themselves on page 1, and may or may not have made a contribution.

128 K Grace et al, ‘When Will AI Exceed Human Performance? Evidence from AI Experts’ (30 May 2017) [Working Paper](#).

129 e.g. DH Autor, ‘Why Are There Still So Many Jobs? The History and Future of Workplace Automation’ (2015) [29\(3\) Journal of Economic Perspectives 3](#)

130 Executive Office of the President, *Artificial Intelligence, Automation and the Economy* ([December 2016](#)) 2 and 13-19.

131 A Smith, *The Wealth of Nations* (1776) [Book II, ch 1](#).

132 See AA Berle and GC Means, *The Modern Corporation and Private Property* (1932) Book I, ch 1. AA Berle, ‘Property, Production and Revolution’ (1965) [65 Columbia Law Review 1](#). O Kahn-Freund, ‘Hugo Sinzheimer’ in *Labour Law and Politics in the Weimar Republic* (1981) 103. H Sinzheimer, *Grundzüge des Arbeitsrechts* (1920) ch 2, 22-27 (in English, *Foundations of Labour Law*).

133 MS Eccles, *Beckoning Frontiers: Public and Personal Recollections* (1951) 75-76

134 Eccles (1951) 77

135 See the German Constitution 1949 (*Grundgesetz 1949*) §14(2) ‘Eigentum verpflichtet.’

136 White Paper, *Employment Policy* (May 1944) Cmd 6527, [43]-[45] and [57]-[63]

137 Disabled Persons (Employment) Act 1944 [s 9](#), a duty of ‘substantial’ employers to hire disabled people up to a quota.

138 Distribution of Industry Act 1945

139 *Distribution of Industry* (1948) Cmd 7540, 26.

140 Hansard HC Debs (21 March 1945) [vol 409, col 859](#). John Wardlaw-Milne MP was never very popular in his party.

141 S Webb, *How the Government Can Prevent Unemployment* (1912) 6-9. See also A Briggs, *Social Thought and Social Action: A Study of the Work of Seebohm Rowntree 1871– 1954* (1961)

142 Webb (1912) 12. See part 3(1) below.

143 M Kalecki, ‘Political aspects of full employment’ (1943) [14\(4\) Political Quarterly 322](#)

144 C Shapiro and JE Stiglitz, ‘Equilibrium Unemployment as a Worker Discipline Device’ (1984) [74\(3\) American Economic Review 433](#) formulated a similar idea: ‘equilibrium unemployment’ at a rate ‘sufficiently large that it pays workers to work rather than to take the risk of being caught shirking’ can occur because employers want to maintain fear. An employee who is dismissed, but can find a job without any cost, ‘pays no penalty for his misdemeanor’. So rational firms might restrict the number of people they hire to ensure a penalty does result. At 435-440, the ‘market failure’ is ‘information asymmetries’ (employers do not know when workers will ‘shirk’ or not). With six pages of linear equations this ‘can explain’ unemployment.

145 This is not to suggest there were no major problems: the worst aspect was a sexist assumption of men being entitled to jobs.

146 AA Berle, 'A New look at management responsibility' (1962) 2 Human Resource Management 3

147 RCO Matthews, 'Why has Britain had Full Employment since the War?' (1968) 78(311) Economic Journal 555

148 See also B Hansen, WW Snyder and OECD, 'Fiscal policy in seven countries 1955-1965: Belgium, France, Germany, Italy, Sweden, United Kingdom, United States' (1969) 0501/QL 200 H249

149 Kalecki (1943) [14\(4\) Political Quarterly 322](#), 330.

150 T Opler, L Pinkowitz, R Stulz and R Williamson, 'The determinants and implications of corporate cash holdings' (1999) 52 Journal of Financial Economics 3, 18 (showing decline in corporate hoarding from the 1950s till the 1990s).

151 X Gao, 'Corporate Cash Hoarding: The Role of Just-in-Time Adoption' (2018) [Management Science \(forthcoming\)](#), 6

152 P Seitz, 'Apple Has Largest Cash Stockpile, Twice That Of Microsoft's' (20 May 2016) [Investor's Business Daily](#)

153 In November 2017, the number of unemployed was 6.6m. A \$10 an hour job, for 38 hours a week, for 50 weeks in a year means [\\$22,914](#) in pre-tax (\$19,090.90 post-tax) annual income. That means 26.4m jobs could be created with \$504bn. This calculation vastly *overestimates* the expense of full employment: the multiplier effect of such investment would be colossal.

154 cf AA Berle and GC Means, *The Modern Corporation and Private Property* (1932) Book I, ch 1.

155 T More, *Utopia* (1516, translated by P Turner, 2004) Book I, 25. More's own views were probably those of Raphael Nonsenso.

156 More (1516) Book I, 27

157 The Vagabond Act 1495 (11 Hen VII c 2) said vagabonds must be 'sette

in stokkes, ther to remayne by the space of 3 daies and 3 nyghtes and ther to have noon other sustenaunce but brede and water'. R Pashley, *Pauperism and Poor Laws* (2011) ch 5.

158 See further EH Shagan, 'Protector Somerset and the 1549 Rebellions: New Sources and New Perspectives' (1999) [114\(455\) English Historical Review 34](#). D MacCulloch, 'Kett's Rebellion in Context' (1979) [84 Past & Present 36](#).

159 See PJ Federico, 'Origin and Early History of Patents' (1929) 11 *Journal of the Patent Office Society* 292, 298 and M Grass and A Grass, *Stockings for a Queen: the life of the Rev. William Lee, the Elizabethan inventor* (1967) 122.

160 SD Chapman, 'Enterprise and Innovation in the British Hosiery Industry, 1750–1850' (1974) 5(1) *Textile History* 14, 24.

161 See S Webb and B Webb, *The History of Trade Unionism* (1920) [ch II, 88 ff](#)

162 Lord Byron, Hansard HL Debs (27 February 1812) [vol 21, col 966](#). See also C Brontë, *Shirley* ([1849](#))

163 Hansard HL Debs (27 February 1812) [vol 21, col 969](#), 'the sword is the worst argument... so should it be the last: in this instance it has been the first, but... as yet, only in the scabbard. The present measure will... pluck it from the sheath...'

164 See G Clark, 'The long march of history: farm wages, population and economic growth, England 1209 – 1869' (2007) [60\(1\) Economic History Review 97](#). NFR Crafts and TC Mills, 'Trends in Real Wages in Britain, 1750-1913' (1994) [31\(2\) Explorations in Economic History 176](#). Wage declines did recur after TUA 1871, but were less prolonged and severe, until 2010. See TUC, 'UK workers suffering the most severe squeeze in real earnings since Victorian times' ([12 October 2014](#)).

165 See S Deakin and F Wilkinson, *The law of the labour market: Industrialization, employment and legal evolution* (2005) 63-67

166 See *R v Journeymen-Taylors of Cambridge* (1721) 88 ER 9.

167 A Smith, *The Wealth of Nations* (1776) [Book I, ch 8, §12](#)

- 168 K Polanyi, *The Great Transformation* (1944) chs 7-9, especially 82
- 169 S Deakin and F Wilkinson, *The law of the labour market: Industrialization, employment and legal evolution* (2005) ch 3, 125-7
- 170 cf TR Malthus, *An Essay on the Principle of Population* (1798)
- 171 cf R Bregman, *Utopia for Realists: How We Can Build the Ideal World* (2017) arguing without evidence that technology caused wage decline, and that Speenhamland was a success because the Royal Commission Reports misrepresented its operation. This does not follow. Just because the Royal Commission was a farce, it does not mean Speenhamland was not a disaster.
- 172 The Great Reform Act 1832 extended the vote in Parliament, yet still to a tiny percentage of the male population.
- 173 cf R Bregman, ‘No, wealth isn’t created at the top. It is merely devoured there’ ([30 March 2017](#)) Guardian
- 174 E Hobsbawm and G Rudé, *Captain Swing* (1969) 50-51
- 175 *R v Lovelass* (1834) 172 ER 1380
- 176 S Webb and B Webb, *The History of Trade Unionism* (1920) [ch III, 144-153](#)
- 177 H Feis, ‘The Industrial Situation in Great Britain: From the Armistice to the Beginning of 1921’ (1921) 11(2) *American Economic Review* 265-6, predicted exactly this would happen.
- 178 T Wilson, ‘Notes on Labour Unrest’ (1919) [29\(115\) Economic Journal 367](#), 372
- 179 S Ward, *Unemployment and the State in Britain: The Means Test and Protest in 1930s* (2013) ch 1, 34-36, and *The Times* (2 January 1919) page 3 on the Rhondda Valley strike. On interwar legislation, see Deakin and Wilkinson (2005) ch 3, 160-3
- 180 OT Mallery, ‘Preventing periods of unemployment by expanding public works’ (1921) *American Labor Legislation Review* 47

181 See N Ferguson, 'Germany after the First World War by Richard Bessel' (1995) 110(439) *English Historical Review* 1224

182 R Bessel, *Germany After the First World War* (1993) ch 5.

183 The Emergency Tariff of 1921 and the Fordney–McCumber Tariff of 1922 probably improved US employment, but significantly less than it cost everyone else.

184 JM Keynes, *The Economic Consequences of the Peace* (1919)

185 AR Seipp, *The Ordeal of Peace: Demobilization and the Urban Experience in Britain and Germany, 1917-1921* (2nd edn 2016) ch 7

186 E McGaughey, 'The codetermination bargains: the history of German corporate and labor law' (2016) 23(1) *Columbia Journal of European Law* 135, 163-4, citing K Robert, *Hitler's Counterfeit Reich* (1941) 121 and F Neumann, 'Labor Mobilization in the National Socialist New Order' (1942) [9 Law & Contemporary Problems](#) 544, 546.

187 G Miller, 'The Economic Policy of British Labor' (1946) [6\(2\) Antioch Review](#) 179, 183

188 White Paper, *Employment Policy* (1944) Cmd 6527, 7, §11

189 (1944) Cmd 6527, 7-8, §14. Also the Reinstatement in Civil Employment Act 1944 placed a duty on a last employer before the war began to reinstate a soldier.

190 Servicemen's Readjustment Act of 1944. See also the Veterans' Preference Act of 1944, updating the government's commitment to prefer veterans in its own hiring policies.

191 Employment Act of 1946, [15 USC §1021](#). See KVV Stone, 'A Right to Work in the United States' in V Mantouvalou (ed) *The Right to Work* (2015) ch 15. A commitment to 'continuing full employment' was scrapped by the opposition of people like Robert Taft, who soon succeeded in the passing the disastrous Taft-Hartley Act of 1947.

192 G Marshall, *The Marshall Plan Speech* ([5 June 1947](#)) Harvard

193 UDHR 1948 [art 23\(1\)](#) 'Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against

unemployment.’

194 T Wheelwright, *Oil and World Politics* (1991) ch 1

195 HB Brown, ‘The Status of the Automobile’ (1908) [17\(4\) Yale Law Journal 223](#), 227

196 Brown (1908) [17\(4\) Yale Law Journal 223](#), 225-227

197 ER Kilby, ‘The Demographics of the U.S. Equine Population’ in *The State of America’s Animals IV* (2007) ch 10, 176, drawing data from EM Ensminger, *Horses and Horsemanship* (1969)

198 E Albin, ‘Labour Law in a Service World’ (2010) [73\(6\) MLR 959](#)

199 World Health Organization, *Global Status Report on Road Safety 2015* (2015) [Table A2](#)

200 J Langan-Fox et al (ed), *Handbook of Stress in the Occupations* (2011) ch 21

201 H Rosling, *The Magic Washing Machine* (2010) [youtube.com](#)

202 CE Beecher and H Beecher Stowe, *American Woman’s Home: Or, Principles of Domestic Science* (1842) ch XXV

203 K French-Fuller, ‘Gendered Invisibility, Respectable Cleanliness: The Impact of the Washing Machine on Daily Living in Post-1950 Santiago, Chile’ (2006) [18\(4\) Journal of Women’s History 79](#)

204 JC Robinson, ‘Of women and washing machines’ (1985) [101 China Quarterly 32](#)

205 L Hannah, *Inventing Retirement: The development of occupational pensions in Britain* (CUP 1986) 13

206 Chart from [Google’s ngram](#), showing the incidence of words in books.

207 e.g. ILO Hours of Work (Industry) Convention 1919 ([c 1](#)) and then FT Vyver, ‘Regulation of Wages and Hours Prior to 1938’ (1939) [6\(3\) Law and Contemporary Problems 323](#), or M Seidman, ‘The Birth of the Weekend and the

Revolts against Work: The Workers of the Paris Region during the Popular Front' (1981) [12\(2\) French Historical Studies 249](#).

208 H Rosling, *The Magic Washing Machine* (2010) [youtube.com](#)

209 S Strasser, *Never Done: A History of American Housework* (1982) ch 5, on piped water in Philadelphia, increasing consumption x 4

210 One might also point to public education and health, which are the basis of ideas for all technology.

211 *Terminator 2: Judgment Day* (1991) starring L Hamilton and A Schwarzenegger

212 J Bessen, 'How Computer Automation Affects Occupations: Technology, jobs, and skills' (2016) Boston University, Law & Economics WP [No. 15-49](#)

213 n.b. 'Intelligence' means 'the ability to acquire and apply knowledge and skills.'

214 n.b. 'Cognition' means the 'process of acquiring knowledge and understanding through thought, experience, and the senses.'

215 See Q Skinner, *Visions of Politics* (2002) vol 1, ch 2, 'The practice of history and the cult of fact'

216 cf Aristotle, *Nicomachean Ethics*, Book V, [Pts 3-4](#), who argued 'corrective' justice is arithmetic; 'distributive' justice is geometric.

217 See D Silver, 'Mastering the game of Go without human knowledge' (19 October 2017) [550 Nature 354](#) and cf G Kasparov and M Greengard, *Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins* (2017)

218 See R Descartes, *Discourse on the Method* (1637) [Part 4](#). It is likely his famous 'eureka' moment was simmering for some time.

219 L Wittgenstein, *Tractatus Logico-Philosophicus* (1921)

220 L Wittgenstein, *Philosophical Investigations* (1953) §43. cf G Kitching, *Wittgenstein and Society: Essays in Conceptual Puzzlement* (2003)

- 221 See also E Durkheim, *Division of Labour in Society* (1893) 165-6
- 222 W Beveridge, *Full Employment in a Free Society* (1944) 18
- 223 For clarity, nobody has an inalienable right to demand society funds courts to protect productive property rights when those rights are not being utilised, and instead squandered: JS Mill, *On Liberty* (1859) [ch 5](#), ‘trade is a social act’.
- 224 TFEU arts 9, [119-150](#) and TEU [art 3\(3\)](#), ‘aiming at full employment’. Bank of England Act 1998 ss 1, [11-13](#) and 19. Central banks which pay no regard to rising inequality in monetary policy, cannot be seen as complying with duties for price stability.
- 225 *Bhasin v Hrynew* 2014 [SCC 71](#) and J Steyn, ‘Contract Law: Fulfilling the Reasonable Expectations of Honest Men’ (1997) 113 LQR 443
- 226 European Social Charter 1961 [art 2\(1\)](#) requires ‘the working week to be progressively reduced’ with ‘increase of productivity’
- 227 See further E McGaughey, ‘A Twelve Point Plan for Labour, and A Manifesto for Labour Law’ (2017) [46\(1\) ILJ 169](#)
- 228 RB Freeman, ‘Who owns the robots rules the world’ (May 2015) IZA World of Labor. Freeman has advanced the same idea before, most recently in JR Blasi, RB Freeman and DL Kruse, *The Citizen’s Share: Putting Ownership Back into Democracy* (2013)
- 229 E McGaughey, ‘Votes at work in Britain: shareholder monopolisation and the ‘single channel’’ (2017) [46\(4\) Industrial Law Journal](#) (summary on the [LSE British Politics and Policy Blog](#)).
- 230 PJ Purcell, ‘The Enron Bankruptcy and Employer Stock in Retirement Plans’ (11 March 2002) [CRS Report for Congress](#)
- 231 AA Berle, ‘How Labor Could Control’ (1921) 28 New Republic 37
- 232 AA Berle, ‘Property, Production and Revolution’ (1965) [65 Columbia Law Review 1](#), 17.

233 e.g. Oxford University Act 1854 [ss 16-21](#) and Cambridge University Act 1856 [ss 5-51](#). E McGaughey, ‘Votes at Work in Britain: Shareholder Monopolisation and the ‘Single Channel’ (2017) [46\(4\) Industrial Law Journal](#). Also, ‘The codetermination bargains: the history of German corporate and labour law’ (2016) [23\(1\) Columbia Journal of European Law 135](#).

234 See further E McGaughey, ‘Ideals of the Corporation and the Nexus of Contracts’ (2015) [78\(6\) Modern LR 1057](#), 1061-1070

235 See T Raiser, ‘The Theory of Enterprise Law in the Federal Republic of Germany’ (1988) [36\(1\) American Journal of Comparative Law 111](#)

236 S Deakin, ‘The Corporation as Commons: Rethinking Property Rights, Governance and Sustainability in the Business Enterprise’ (2012) [37\(2\) Queen’s Law Journal 339](#). cf I Ferreras, *Firms as Political Entities* (2017) 1-11 and chs 5-6.

237 e.g. in the Model Articles for Public Companies, [Sch 3](#), a new para 34(2) could state: ‘The company’s workers shall be registered as members and entitled to 30 per cent of the total votes in the general meeting. Each person shall have one vote.’

238 In the US, a norm first found in the Delaware General Corporation Law of 1969 §141(h). See S Arshat and WK Stapleton, ‘Delaware General Corporation Law: 1969’ (1969) 25 *Business Lawyer* 287. In the UK, the astonishing Model Articles, [Sch 3](#), para 23(2) read ‘Directors are entitled to such remuneration as the directors determine...’

239 E McGaughey, ‘Does Corporate Governance Exclude the Ultimate Investor?’ (2016) [16\(1\) Journal of Corporate Law Studies 221](#), 237-8 (summary on the [Oxford Business Law Blog](#)). LD Brandeis, *Other People’s Money and How the Bankers Use It* (1914)

240 UDHR 1948 [art 25](#), ‘Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood... beyond his control.’

241 This is the view taken by T Paine, *Agrarian Justice* (1797) on a ‘national fund’ to pay ‘compensation in part, for the loss of his or her natural inheritance, by the introduction of the system of landed property.’

242 The Sozialgesetzbuch has twelve volumes: SGB II concerns unemployment, SGB VI pensions.

243 On the US today see E McGaughey, ‘Fascism-lite in America (or the Social Ideal of Donald Trump)’ (2018) [BJALS](#)

244 cf J Hickel, *The Divide* (2017) ch 9 and ‘Basic income isn’t just a nice idea. It’s a birthright’ (4 March 2017) [Guardian](#)

245 J Portes, H Moore et al, *Social prosperity for the future: A proposal for universal basic services* (2017) [Institute for Global Prosperity](#)

246 See also G Standing, *Basic Income: And How We Can Make It Happen* (2017) ch 7, summarising proposals. Standing favours abolishing personal allowances to encourage voting. But auto voting enrolment, or even nudges in pay-slips, seem easier.

247 Basic income transfers to employed people (but not tax exemptions) risk subsidising employers partly because of the ‘endowment effect’ (workers see pay as theirs, and hang on, but a transfer payment from government less so) and partly because of employers’ potential political influence. See also S Deakin and F Wilkinson, ‘Labour law, social security and economic inequality’ (1991) [15 Cambridge Journal of Economics 125](#), 144-5

248 UDHR 1948 [art 23\(3\)](#)

249 cf H Hansmann and R Kraakman, 'Towards Unlimited Liability for Corporate Torts' (1991) 100 Yale LJ 1879

250 See LA Bebbchuk and JM Fried, 'The Uneasy Case for the Priority of Secured Claims in Bankruptcy' (1996) 105 Yale LJ 857, 881-890. 'Non-adjusting' creditors include tort victims, employees, consumers and small businesses, but a bank is 'adjusting'.

251 cf RA Coase, 'The Problem of Social Cost' (1960) 3 JLE 1. Coase refused to recognise bargaining power's relevance.

252 *Walkovszky v Carlton*, 223 NE2d 6 (NY 1966)

253 n.b. in the UK, where the National Health Service is free, there were no cases until *Chandler* on the corporate veil and personal injuries (save one doubtful conflict of laws case). See C Mitchell, 'Lifting the corporate veil in the English courts: an empirical study' [1999] Company, Financial and Insolvency Law Review 15. This suggests tort law was needed less with the NHS.

254 PL Davies, *Company Law* (2010) ch 4. There is no inherent reason why tort law cannot hold one person (human or legal) responsible for what another does. See the pathbreaking cases of *Chandler v Cape plc* [2012] [EWCA Civ 525](#) and *Lungowe v Vedanta Resources plc* [2017] [EWCA Civ 1528](#). The problem is rather that judicial paths have been historically hard to break.

255 n.b. E Palmerini et al, 'Regulating Emerging Robotic Technologies in Europe: Robotics facing Law and Ethics' (2014) Robolaw, EU Grant number 289092, suggested 'care robots will become more sophisticated and may' assist 'in purchasing food, drugs, newspapers, or bus tickets.... it could be useful if robots would have the capacity to perform legal transactions.' This is, with respect, inaccurate: if I write a cheque, does my pen need legal personality for the transaction to take effect?

256 This would mean updating the Product Liability Directive 85/374/EEC. On possibly the first thorough discussion of these issues, see A Bertolini, 'Robots as Products: The Case for a Realistic Analysis of Robotic Applications and Liability Rules' (2013) 5(2) Law, Innovation and Technology 214.

257 JL Delaney, 'The robot that takes your job should pay taxes, says Bill Gates' (17 February 2017) [Quartz](#)

258 cf B Gates, *The Road Ahead* (1996) 19, 'luck has played a role, but I think the most important element was our original vision.' See further, P Piff, 'Does money make you mean?' (2013) [TEDxMarin](#), showing Monopoly game players who got twice the money, more for passing go, and double dice rolls, viewed their (inevitable) victory as deserved, despite knowing it was rigged.