
No Worker Left Behind

How to improve pay and work for the low paid

Jonathan Dupont



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About the Author

Jonathan Dupont joined Policy Exchange in April 2014 as a Research Fellow in the Economics & Social Policy Unit. Prior to joining, he has worked as a parliamentary researcher, an independent economic researcher and an analyst for the There is Nothing British about the BNP campaign.

He has co-written multiple books on public policy, and a paper on fiscal rules – Binding the Hands of Government – for the Institute of Economic Affairs. Jonathan read Philosophy, Politics and Economics at the University of Oxford.

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Executive Summary

Does growth still benefit the ordinary worker?

- Over the last few years, many have argued that modern growth only benefits those at the top, while those at the bottom and the middle are subject to stagnant living standards and disappearing careers.
- These fears have been significantly heightened by the coming together of several one-off shocks in the 2000s: the financial crisis, unsustainable public finances, an insecure jobs market, the global commodity crunch and the rising costs of an ageing population.
- The good news is that once you look past these short term factors, the majority of the fears have been vastly overstated. Even the bottom 20% saw their real disposable income increase by 86% between 1977 and 2013, while income inequality has been flat for twenty years. The most important reason for the slowdown in wage growth in the immediate years before the recession was a higher proportion of employee compensation going to pensions and National Insurance contributions.
- Nevertheless, some recent trends in the labour market seem potentially concerning:
 - An ever increasing share of income has gone to those at the top, with the top 1% in particular seeing their share rise from 6.7% to 14.7% between 1980 and 2010.
 - Even in America, overall household incomes have grown strongly – but there has been disappointingly slow wage growth for male earners.
 - Many worry that we are on the verge of a new revolution in advanced artificial intelligence (AI) and automation. Some economists claim it has the potential to eliminate up to ten million or half the jobs in the UK.

Why have those at the top seen faster growth in their incomes?

Productivity

- Once you adjust for different measurements of inflation and a higher proportion of compensation going to pensions or healthcare, there has been no ‘decoupling’ between wages and growth in either the US or the UK. Ultimately, pay remains fundamentally linked to productivity.
- The worldwide slowdown in growth in the 1970s saw slower rises in wages for American workers. Up until 1997 however, British workers benefitted from catch-up growth as Britain closed the gap in labour productivity with the US.

Skills and Substitution

- At the same time, technology and trade have eliminated many of the traditional middle ‘routine’ jobs that can be automated, outsourced or both. The twenty years between 1979 and 1999 saw a roughly 400 % increase in the number of care assistants and software engineers and a near elimination of manufacturing jobs such as boring & drill machine setters (a 94% fall), coal miners (a 93% fall) and grinding machine setters (86%). While there was a substitution away from old forms of work, highly skilled workers continued to see strong increases in their pay.
- By around the mid-1990s a new agenda of welfare reform and the general recovery in the economy ensured that initial rises in long term unemployment and inequality flattened off. Under successive governments, welfare was restructured to improve the incentives for and help in finding work. Meanwhile, the combined tax and welfare system continued to ensure that inequality of living standards was much lower than inequality of market income. The ratio between the richest and the bottom quintile for original income is a massive 15 times, but it falls to 4 once you take into account benefits and taxes.

Superstars

- While overall inequality has not increased, we have continued to see faster growth for those at the very top of the income distribution, forming an almost power law: the 0.01% are seeing faster growth than the 0.1% who in turn are seeing faster growth than the now infamous 1%.
- Part of the rise at the top is explained by misleading statistics, tax changes, the rise of the City, and cultural norms shifting towards greater meritocracy. However, likely the most significant factor behind the rise of the 1% is a new global and digital market for superstars. We have seen similar rises in wages at the top not just on public boards, but for private companies, hedge funds, lawyers, athletes and entertainers. Since the abolition of the maximum wage in 1961, top footballers have seen their weekly wage increase forty times faster than the average wage.
- The rise of the 1% is likely harmless, if not beneficial to ordinary workers. While many picture a zero sum game in which increases in the 1% come at the expense of ordinary families, this doesn’t seem to hold up in the data. On cross country comparisons, there is essentially no relationship between the increase in the share of the 1% and changes in median living standards. The increase in the share of the 1% is compensated for by faster growth and more generous welfare transfers.

Will a new era of technological advances put an end to middle jobs?

- Just as the Industrial Revolution replaced routine manpower with the steam engine, will future AI see the replacement of routine service jobs? Are checkout assistants and train drivers going the way of the typing pool or switchboard operator?
- While AI and robots may be its currently fashionable face, automation is as old as civilisation. Societies have always sought to replace human with trade

or technology – it is how they get richer. The future is inherently unknowable, but we can demarcate three broad scenarios:

- **Rise of the Robots.** Recent developments have seen machine perception finally become reliable, allowing AIs to interact in the real world without much human help. If this continues, self-driving cars could replace taxis, flying drones soldiers, and algorithms bureaucrats. It would be cheaper (and safer) than ever before for the poor to play or travel or afford a comfortable standard of living, but much harder to find a well-paid, high quality job. A recent survey of the world's leading AI experts concluded that by 2050 we will most likely have a human level intelligence – and an AI doesn't have to be as smart as a human to still be tempting to an employer.
- **Steady as it Goes.** Throughout the second half of the twentieth-century, experts repeatedly forecast that human-level AI lay 15-25 years in the future. Today could easily be another false dawn, with AI improvements proceeding at much the same pace as they have in past decades. Even the Industrial Revolution took decades, if not centuries, to transition us from a farming to industrial to services economy.
- **Rise of the Workers.** Instead of just taking jobs, new technology could make it easier for unskilled workers to be productive. A layman with access to IBM's Watson artificial intelligence could potentially make a preliminary diagnosis of a patient more accurately than a doctor with a decade of training. Technology removes the boring and monotonous work, and makes it easier to find creative and productive jobs. However, AIs will take longer to replace some of the core human skills such as emotional intelligence or physical flexibility.
- All in all, it seems plausible that many routine jobs and jobs that rely only on navigating the physical world will gradually get automated away over the next few decades. We are a long way, however, from a general purpose AI that could replace social, creative or analytical work, suggesting there will continue to be an abundance of jobs for humans for the foreseeable future.
- While a significant shift in the labour market, this would not be completely unprecedented – roughly, it would represent around a 30% bigger shift than the transition we saw from manufacturing and production to services since the 1970s. Since the advent of the welfare reform agenda in the mid-1990s, this shift does not seem to have caused higher levels of unemployment.
- Equally, it is possible that new technology would actually decrease inequality in earnings by commodifying basic intellectual work and bringing many current graduate jobs into the reach of everyone. However, given the experience of the 1980s, we cannot rule out this change leading to a significant increase in the inequality of market wages.

Do we need the state to intervene more in labour markets?

- There is little reason to think that greater state intervention in labour markets would actually reverse the changes that we have seen, and in many cases it could make matters worse:

Increasing the Minimum Wage can't guarantee a Minimum Income.

- Many have suggested that we could improve the incomes of the low paid through a significant rising in the Minimum Wage, potentially setting it equal to the Living Wage. However, while the Living Wage has been an effective voluntary programme for those employers who can afford it, it would have very different effects if made compulsory.
- Many of the sectors currently affected by the Minimum Wage are those for which it has proved hardest over decades, if not centuries, to improve productivity in. But if employers can't increase productivity, a higher Minimum Wage will have to be paid for by lower profits, higher prices to consumers, slower wage increases higher up the wage ladder, or cutbacks in non-wage forms of compensation such as training or other perks.
- The standard metric for measuring the impact of the Minimum Wage is its 'bite', its ratio compared to the average hourly wage. According to the Low Pay Commission, the bite across the economy as a whole for workers aged 22 and over is currently 53%. However, in specific low paying sectors such as retail the bite of the Minimum Wage compared to the average wage is already 79%, in social care 78%, hairdressing 85%, hospitality 88% and cleaning 92%. Across the economy, for workers with no qualifications the bite was 86%.
- The latest data has the UK median hourly full-time earnings at £13.15, giving the Minimum Wage a 49% bite on the slightly different OECD metric. Raising the Minimum Wage to the current national Living Wage level would increase its bite to 60%, more than twice as large as the increase over the Minimum Wage's first fourteen years. It would move the UK from having around a middling bite for an advanced economy to one of the highest. However, the current Living Wage is artificially capped to ensure it doesn't grow too fast beyond earnings. To achieve the actual Minimum Income Standard would require a Living Wage 20% higher again and the equal highest bite in the entire OECD at 70%.
- Unlike tax credits, Minimum Wages are a relatively blunt tool with only a weak impact on poverty. Many of those on the Minimum Wage do not live in poor households at all, while over half of the benefit of a Living Wage would simply go back to the Treasury in higher net tax receipts. A compulsory Living Wage is closer to a tax increase than a policy to improve living standards.
- The theoretical argument in favour of a Minimum Wage is that it can help to counter imperfections in the labour market that unfairly benefit employers. Greater automation and trade, however, are not market failures. Higher Minimum Wages, if anything, accelerate the process of automation – encouraging supermarkets, for example, to replace checkout workers with machines. The more technological change disrupts the bottom of the labour market, the more likely a high Minimum Wage is to lead to unemployment.

Copying European style labour regulation is unlikely to do away with lousy jobs.

- While so-called lousy jobs certainly exist, the deterioration in the quality of work has been greatly overstated. There is little sign that jobs are becoming less interesting or satisfying, or that British jobs are particularly insecure. Most British workers in self-employment or even those on zero hour contracts are satisfied with their arrangement

- In general, markets do a much better job than governments at compensating workers for unpleasant or risky work. Technological change is already automating a lot of the most monotonous and boring work. Heavy handed labour regulation risks increasing unemployment – and almost any job is better in terms of happiness and life satisfaction than no work.

Industrial Policy won't bring back displaced routine jobs in manufacturing or clerical work.

- Manufacturing has been in long term decline in every major economy as technology increases productivity and consumers choose to spend greater proportions of their incomes on services. Over half of the fall in manufacturing in Britain seen since 1980 is explained by customers choosing to spend less of their income on manufactured goods, rather than any change in trade or technology. Even if Britain could turn itself into Germany, this would still only reverse half the decline in manufacturing employment seen since 1980.
- Less flexible labour markets and regulation can slow down the process of structural change, but often make the eventual adjustment ever worse. Trying to defy or turn the economic tide ultimately risks hurting the underlying competitiveness of your economy and reduces the number of people in work. Since the mid-1990s, Anglo-Saxon countries like the US, UK and Canada have seen lower levels of unemployment than continental economies like France, Germany or Italy. Sweden saw almost no net job creation in the private sector over the second half of the twentieth century, with the extra one million added to its working-age population simply absorbed by the public sector.

Higher marginal taxes at the very top won't help in increasing incomes at the bottom.

- Increased global tax competition is already driving down top rates of Income Tax. Even taking into account the fall back to 45p, only Portugal has increased its top rates of tax more than Britain since 2000. Driving away the 1% is unlikely to be in the long term interests of growth or ordinary workers.

How do we combine growth and broad prosperity?

- In the long run, the best way to increase wages, income and living standards is to continue to improve the productivity of the economy through technology and trade. However, disruptive growth by its very nature creates in the short term losers as well as winners. What would a free market approach to inclusive growth look like – how do we ensure that no worker gets left behind?

Everybody in full-time work should receive a Living Income

- Some have argued that in response to widespread automation our welfare system should move towards a Universal Basic Income, or the equivalent Negative Income Tax. This would see everyone receive an unconditional minimum level of income from the state, which would then be progressively taxed away. However, we are currently a long way from a world in which there are literally no jobs, while repeated past experience has shown that work requirements are an essential part of getting people off welfare.

- The combination of a universal basic income with work requirements is more or less the way our current tax and welfare system is already evolving. In the very long run, our goal should be to align the thresholds for Income Tax, Employer National Insurance, Employee National Insurance and the work allowance for Universal Credit.
- As an intermediate step, **we should aim when the economy is doing better for everyone in full-time work to receive a Living Income, effectively bringing an end to in-work poverty.** There is no perfect definition of poverty. However, the Minimum Income Standard (MIS) – setting out what the public believes to be the minimum level of income necessary to achieve an ‘adequate’ standard of living – is as good a definition as any of being poor.
- For a single working age adult without children the MIS / Living Income is currently set at around £270 a week. At present, a full-time worker on the Minimum Wage after taxes and transfers only receives around 75% of the Living Income, while around a quarter of full-time employees are currently paid below the Living Income.
- As Tim Worstall and the Adam Smith Institute has long pointed out, the difference between the Minimum Wage and the Minimum Income Standard / Living Wage is almost entirely due to the taxes charged by government on work. **The most straight forward way to ensure every full time worker earned a Living Income would be to align the Income Tax and National Insurance thresholds at the annual equivalent of the Minimum Wage.** This would in effect convert the current Minimum Wage into a Living Income.
- The Government should monitor progress towards this target, releasing annual updates on the proportion of full time workers receiving a Living Income. In addition, the new annual tax statements offer an opportunity to make more visible the net impact of tax changes. Each tax statement should clearly show not just the tax paid in that year, but also what you would have paid without changes in tax and spending policy. Employer NICs should be grouped with Income Tax and NICs in a single section on taxes on income.
- This policy could be paid for by some combination of:
 - **Growing government spending from 2020 to 2025 moderately slower than growth in the economy as a whole.** Growing Total Managed Expenditure at around 1.1% in real terms a year from 2019-20 to 2025-26 would allow the Government to afford the tax changes. This is basically what will happen automatically if you project many of the current policy assumptions forward from 2019-20. Allowing for the higher costs imposed by demographic changes, this is roughly equal to protecting all departmental spending in real terms, but not increasing it faster.
 - **Lower the target threshold through a more generous Universal Credit.** Alternatively we could make the Living Income cheaper by passing more of it on through Universal Credit. The tax credit system has some key advantages over the tax system: taking into account the income of other household members, and inherently much more tightly focused on those in poverty. On the other hand, Universal Credit lacks the comprehensive nature of the tax system, and raising benefits too high risks hurting work incentives. While tax credits mostly at present seem to go to the worker rather than employer, there is also a risk that raising them too fast could see businesses just cutting wages in response.

- **Make the policy cost neutral by adjusting other tax rates.** Given that some pessimistically believe public sector productivity fundamentally lags behind the private sector (“Baumol Cost Disease”), maintaining the delivery of high quality services with their budgets frozen would be an ongoing challenge. To lower the net cost of the policy package, it would be theoretically possible to simultaneously adjust one of the main rates of taxation at the same time as raising the thresholds. In principle this would still see every worker earning a Living Income, while ensuring no one in the middle was worse off. However, it would not be our preferred option as it would not see the same reductions to the overall cost of living.
- In a world where automation accelerates and replaces many current middle jobs, there will be significant opportunities to improve the efficiency of public services. Equally, even if the market benefits go disproportionately to the rich, our progressive Income Tax system will ensure tax revenues increase even without deliberate charges to marginal rates.
- This gives us the opportunity to pass on some of the benefits in lower tax rates and more generous benefits, creating a Living Income for everyone in full time work.

Offer everyone a second chance to find a new career

- If the age of a job-for-life is over, we will need to make it easier to retrain and undertake lifelong learning. At present, the vast majority of education spending is currently aimed at the under 25s, while most attempts at improving adult education have not proved very successful.
- Simply expanding the current system risks wasting money on low value qualifications. Fortunately, the same technology that is eliminating old jobs is also providing new forms of much cheaper and more flexible education. There will be many people for whom online education is superior to a traditional tertiary education. **Every person in Britain should have instant, unlimited and effectively free access to accredited online courses, enabling a true culture of lifelong learning and allowing anybody with a computer to retrain in a digital career.**
- However, online education will not work for everyone. A range of approaches, trials and providers will be needed for retraining. **At the age of eighteen, every individual should be given an online lifelong learning account.** This would act as the platform, portal and clearing house for other types of financial support including loans, vouchers, financial aid, transfers from savings, matching funds and scholarships. The current student loan system would be integrated into this system, and third parties would be given access to allow trials of ideas such as adult education relocation vouchers. It could also act as a gateway into Policy Exchange’s previously proposed MyFund personal welfare accounts, allowing individuals to use their own savings to fund retraining. Keeping the individual in charge of their own budget will help to ensure that spending is only directed towards high value qualifications.

Give everyone a stake in the growth of the economy

- If automation does massively accelerate, it is possible in future that a greater share of growth will go to the owners of capital. However, that is not

necessarily the same as saying it will only go to the rich. **The Government should aim to significantly raise the level of savings in Britain, creating a capital owning democracy. The ownership of shares and discretionary saving should no longer be the province of the wealthy.** Everybody should have a capital as well as labour stake in the future of our economy.

- Unfortunately, most current interventions designed to increase savings are likely to be less effective for low income households. Many people are not at all close to the ISA limit of £15,000, while past experience shows behavioural nudges seem to be less powerful for the poor. Matching schemes such as the last Government's Savings Gateway or the Child Trust Fund can have some effect, but also run the risk of high expense and deadweight.
- Prize Linked Savings accounts offer the chance to randomly win a set cash prize alongside, or in some cases instead of, a fixed interest rate. They are in effect a combination of a lottery and a bond. In the past, they have been used in around 20 countries including Germany, Austria, Spain, Greece, Italy, Sweden, Switzerland and Japan. While requiring no net government subsidy, they have been shown to increase savings, including among low income households.
- Britain's own Premium Bonds scheme, introduced by Harold Wilson in 1956, has seen more than 23 million people invest over £33 bn. However, while the general principle of making savings more fun is worth building on, there is still a lot we could do to improve the current Premium Bonds model.
- **The Government should pilot a new generation of Premium Bonds, combining a successful historical model with the latest behavioural ideas.** A range of private sector banks and potentially non-profit institutions should be licenced to trial their own ideas for an initially limited time period, experimenting with different defaults, levels of interest, frequency and sizes of prizes to see what works best.

1

Introduction

Does growth still benefit the ordinary worker?

Over the last few years, many have expressed the fear that growth is no longer ‘inclusive.’ While capitalism may drive ever greater riches for those at the top, they worry it no longer acts as an engine of improved living standards for ordinary workers and families.

They have argued that Britain faces three trends hurting middle workers:

- **Stagnating wages.** In Britain, median wages fell 2% in real terms between 2003 and 2013,¹ while some economists argue that real incomes for average workers in America have been stagnant for more than forty years.²
- **The elimination of middle jobs.** Technology and trade have driven a hollowing out of the labour market, with traditional middle blue collar jobs more likely to be lost than those at either the top or the bottom. The proportion of British workers employed in manufacturing peaked in the early 1970s, and has since been in long term decline, falling from 25% in 1978 to around 8% today.³
- **The rise of the lousy job.** Even for those who have kept their job, the quality of work may have decreased: less autonomy, lower job security and more unpleasant work. The number of zero hour contracts looks to have more than doubled in the last few years, while self-employment is at its highest level in four decades.

These fears have been significantly heightened by the coming together of several short term shocks in the 2000s:

- **Low growth.** Most fundamentally, the financial crisis dealt the economy a blow worth 16% of expected GDP,⁴ leading to years of stagnating productivity and pay.
- **Unsustainable public finances.** The 60% increase in real spending on public services between 1997 and 2010 proved unsustainable in the event of a downturn. The resulting 8.8% of GDP hole in the public finances led to a decade of spending restraint, benefit cuts and tax rises.⁵
- **An insecure jobs market.** Unemployment peaked in Britain at 8.5% in late 2011.⁶ While this was much lower than some had feared, part of the price of a more flexible workforce were cutbacks in non-wage compensation, increased levels of zero hour contracts or self-employment, and greater worries over job security.

1 ONS, Annual Survey of Hours and Earnings 2013

2 David Cay Johnston, Income Inequality: 1 inch to 5 miles, David Cay Johnston

3 ONS, Workforce Jobs by Industry, SIC2007

4 Author calculation of the difference between outturn real GDP in 2013 and real GDP following the 1992-2007 trend

5 OBR, Public finances databank, OBR, December 2014

6 ONS, Unemployment Rate 17+, MGX

- **The global commodity crunch.** A global crunch in commodity prices saw world food prices more than double between 2000 and 2014, and energy prices go up 256%.⁷
- **The ageing population.** Employers were forced to divert an increasing amount of compensation away from the pay packet visible to their workers. Between 1999 and 2007, wages and salaries grew 47%, while contributions to Employers' National Insurance grew 67% and contributions to pension schemes grew 98%.⁸

The good news is that once you look past these short term shocks the majority of the fears over inclusive growth have been vastly overstated:

- **Average living standards have not decoupled from growth.** Once you look back beyond the short term impact of the financial crisis and the world commodities bubble – both of which are now reversing – living standards have continued to grow strongly in Britain at every level of the income distribution. The bottom 20% has seen its real disposable income increase 86% between 1977 and 2013.⁹

Some have pointed to the slowdown in wage growth in the five years before the financial crisis, and argued that this could point to a fundamental decoupling between growth and ordinary wages. Adjusted by RPI inflation, real median full-time wages were completely flat from 2002 to 2007, whereas they grew by 9% from 1997 to 2002. Adjusted by CPI inflation, however, median wages continued to grow by 7% from 1997 to 2002.¹⁰ Similarly, real household disposable income of the middle quintile grew by 6% between 2002-3 and 2007-8.¹¹

While median wages didn't stagnate, it is true that their growth slowed down substantially from around the middle of the last decade. One reason for this was that the past growth had been unsustainable: wages had been growing faster than labour productivity, part of the counter cyclical long recovery from the recession of the early 1990s. Even more important was the growing proportion of total compensation going to pensions or taxes, with the wage share of employee compensation falling from 87% in 2001 to 83% in 2007.¹² Between 2000 and 2007, these increased non-wage costs played more than twice as important a role as inequality in explaining the growth of the gap between wages and growth.¹³

Even in America, the level of wage and income stagnation has been vastly overrated: on the CBO's numbers, between 1979 and 2007 median household income before taxes and transfer increased by at least 26%.¹⁴ (Many of the most dramatic estimates seemingly showing long term stagnation fail to adjust properly for inflation, changing family structures or the greater proportion of retired workers).

Furthermore, incomes by themselves underestimate improvements in living standards. Even if they were numerically richer, few people would want to go back to 1970s computers, medicine or crime levels.

7 IMF, World Economic Outlook, October 2014

8 João Paulo Pessoa and John Van Reenen, Decoupling of Wage Growth and Productivity Growth? Myth and Reality, Resolution Foundation, 2012

9 ONS, Equivalised household disposable income, 1977-2012/12, UK (2012/13 prices)

10 Author calculation from ONS, Patterns of Pay, 1997 – 2013 ASHE Results, 2014

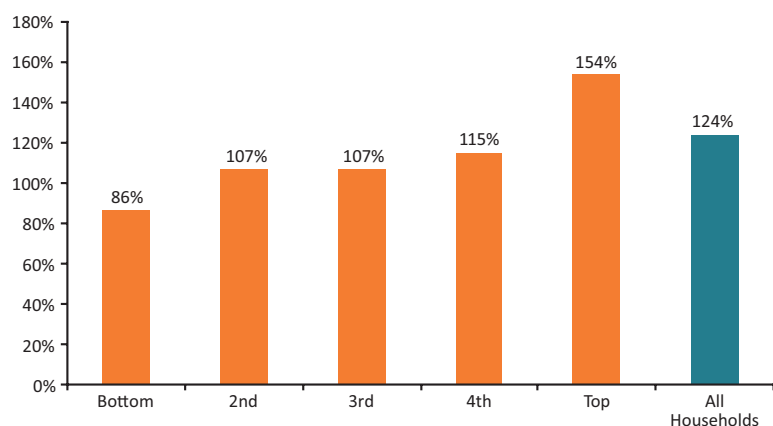
11 ONS, Equivalised disposable household income, 1977-2012/13, UK (2012/13 prices)

12 Author calculation from OECD, Quarterly National Accounts dataset

13 Author calculation from João Paulo Pessoa and John Van Reenen, Decoupling of Wage Growth and Productivity Growth? Myth and Reality, Resolution Foundation, 2012

14 CBO, The Distribution of Household Income and Federal Taxes, 2011, November 2014

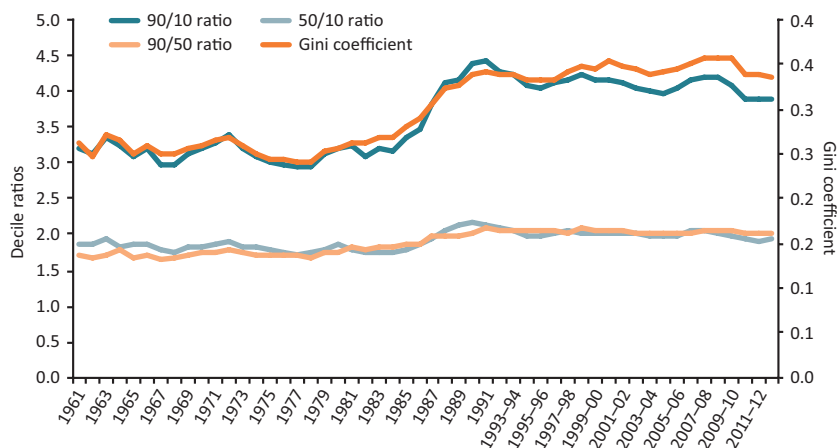
Figure 1: Increase in real household disposable income between 1977 and 2012–13 (ONS)



- **Most measures of inequality have been flat for twenty years.** While the economic revolution of the 1970s and 1980s was a good thing overall, it also indisputably led to an increase in inequality and higher numbers of unemployed workers.

By the mid-1990s, however, most of these trends had levelled off or started to fall. Neither the most common measures of inequality nor the incidence of low pay show significant increases since then.

Figure 2: Inequality in Great Britain (before housing costs, after tax and transfers, IFS)



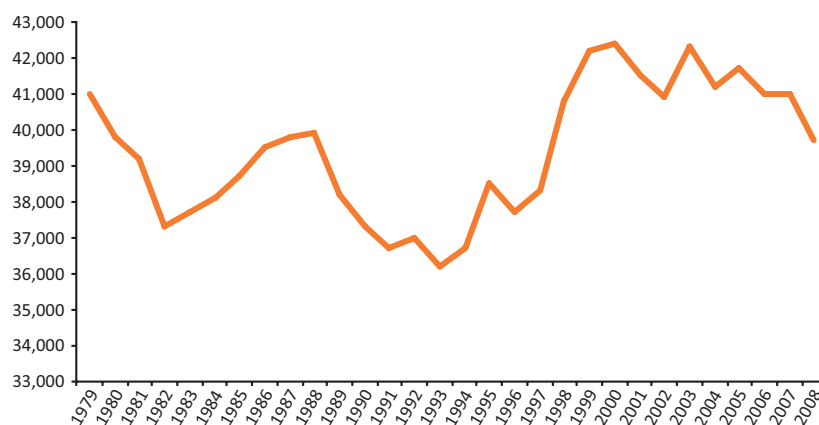
- **There is little evidence of a long term deterioration in the quality of work, even for those at the bottom.** While this is hard to measure, most indexes of work quality show little deterioration before the arrival of the financial crisis. Zero-hour contracts only make up very small parts of the labour market. Much of the rise in self-employment comes from a more entrepreneurial workforce and older workers choosing to continue working part time. While

the pleasantness of jobs is undoubtedly very unequally distributed – perhaps even more so than income – it is not clear that this is growing worse.

However, while these trends may have been overhyped, that does not mean there are not real concerns over some recent trends in the labour market:

- **The 1%.** Some measures of inequality have continued to rise: most notably, the share of income going to the top 1%. On Thomas Piketty's numbers, between 1980 and 2010, the 1% saw their share of British income rise from 6.7% to 14.7%.
- **Slow wage growth.** While overall American incomes may not have literally stagnated, growth in male earnings at the bottom has been very slow – only really rising strongly in the 1990s.

Figure 3: Real US median male earnings (CBO, CPS Data, 2007 dollars)



- **Rise of the Robots.** Many worry that we are on the verge of a new revolution of AI and automation, which would see even more drastic shifts than in the 1980s. Estimates by Frey and Osborne (2013) suggest that 47% of US jobs are at risk of being automated, and ten million jobs in the UK.¹⁵

There is no perfect definition of 'Inclusive Growth'. However, a reasonable working definition might be:

- Nobody who works a full time job should be in poverty. This doesn't just mean they aren't literally starving, but that they achieve a respectable standard of living.
- Everyone who wants to work should be able to find a job. If your old career is lost to technological change or trade, you should be able to find a new line of work.
- As long as the economy is growing, everyone should at least partially share in the benefits, and see their income grow in real terms.

In this paper, we look at four big questions:

¹⁵ Alan Tovey, Ten million jobs at risk from advancing technology, The Telegraph, 10 November 2014

- What caused the changes to ordinary wages, employment, and inequality? Is it the result of exploitative Anglo-American capitalism, or deeper shifts in the structure of the economy?
- How likely is it that we are about to see a new wave of middle job losses and structural unemployment as automation accelerates?
- Do these changes mean that we need a new era of government intervention in labour markets?
- What would a free market approach to inclusive growth look like – creating an economy that is both efficient but fair?

2

Skills, Substitution and Superstars

Why have those at the top seen faster growth in their incomes?

There have been four main factors behind the changes in the pattern of jobs, wages and income in the British economy:

- **The higher productivity of British workers.**
- **The changing types of jobs available in the economy.**
- **Reforms to the tax and benefit system.**
- **The increasing importance of human capital.**

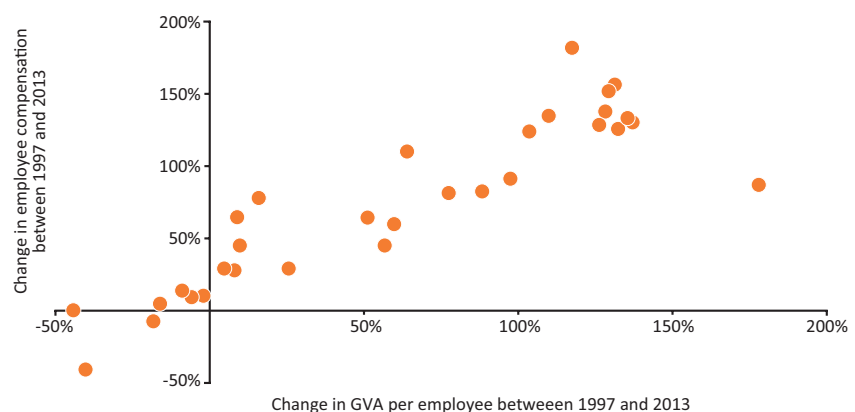
Productivity

In a competitive economy, each worker's compensation will be determined by their productivity – that is, the value they create for their employer and ultimately the customer.

Try to pay them less than this and other employers will tempt them away with higher wages. Force the company to pay more and the job will ultimately disappear as the company can no longer afford to operate.

In the real world, there are no perfectly competitive markets. Nevertheless, the simple demand and supply model of the labour market remains the best rough rule of thumb for the long term evolution of the labour market. There is an extraordinarily close relationship between productivity and employee compensation when compared across time, region or industry.¹⁶

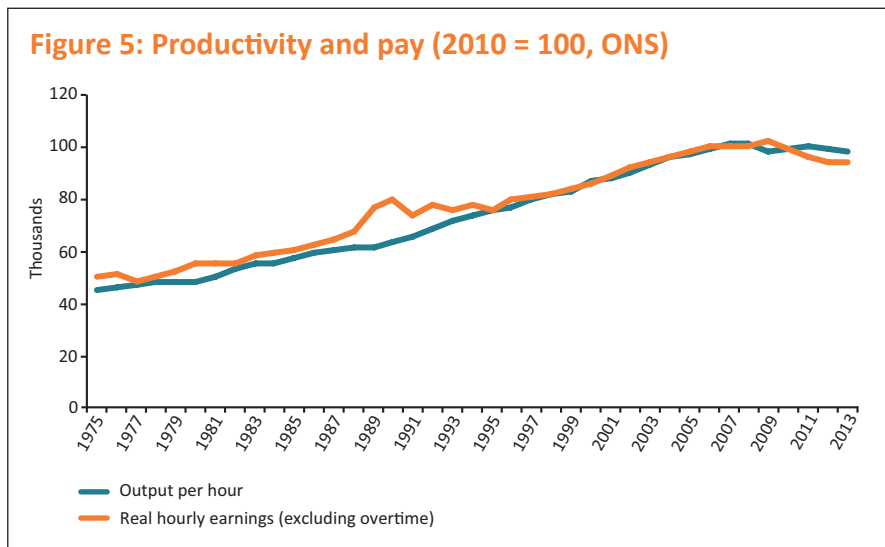
Figure 4: Changes in productivity per employee against compensation per employee (ONS)



* The water supply, sewerage and waste management industry has been excluded as an outlier

¹⁶ Matthew Tinsley, Taxing Jobs – Practical policies for a pay recovery, Policy Exchange, 2014

In recent years, many have worried that this connection between increases in productivity and pay no longer holds – that there has been a ‘decoupling’ between wages and growth in both the UK and US. However, this turns out to be mostly a statistical illusion: once you adjust for different rates of inflation and a higher proportion of compensation going to pensions or healthcare, the gap largely disappears.¹⁷



If employers were really exploiting their workers and not paying them their full worth, you would expect to see a decrease in labour’s share of GDP – but this has been roughly flat in the UK since at least the 1990s. Equally, when you adjust the US data for income that goes to neither workers nor business owners, such as depreciation, it is not clear that there is any real downward trend there either.¹⁸



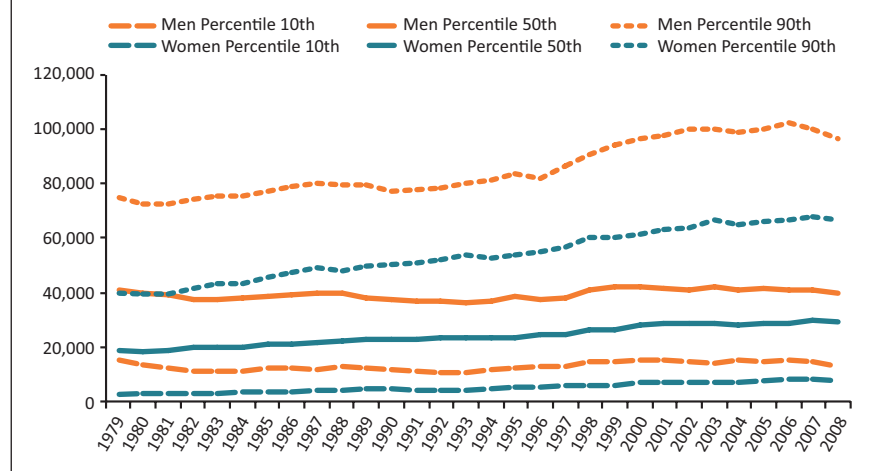
In short, while it is true that median wages have risen slower than those at the top – for reasons we will be exploring later on – there is no sign of some fundamental breakdown of the relationship between productivity and pay. Changes to the productivity of the economy are ultimately more important than changes to Minimum Wages or trade unions or corporate governance.

17 João Paulo Pessoa and John Van Reenen, Decoupling of Wage Growth and Productivity Growth? Myth and Reality, Resolution Foundation, 2012

18 Scott Winship, Workers Get The Same Slice of the Pie As They Always Have, Forbes, 16th December 2014

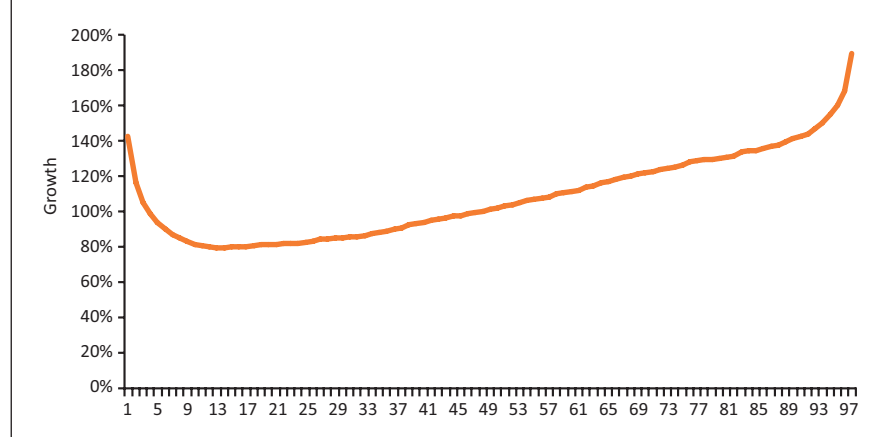
Productivity across the western world slowed in the mid-1970s – a major factor behind the slow growth of median American wages ever since. If the US economy had continued its 1950-70 trend, productivity per worker in 2007 would have been 47% higher than it actually was.¹⁹ American households are among the richest in the world, but being at the forefront of developments in the world economy gave them less room for rapid improvement.

Figure 7: US annual earnings of men and women (CBO, CPS Data, 2007 dollars)



In Britain, however, we have enjoyed several decades of fast catch-up growth in productivity as we put past mistakes behind us. In 1970, British workers were 35% less productive than American workers, but by 2007 they had halved this gap to 17%. This helped ensure rapid growth at every level of the wage distribution.

Figure 8: Real hourly earnings (excluding overtime) growth, full and part-time employees, percentiles, 1975–2013 (ONS)

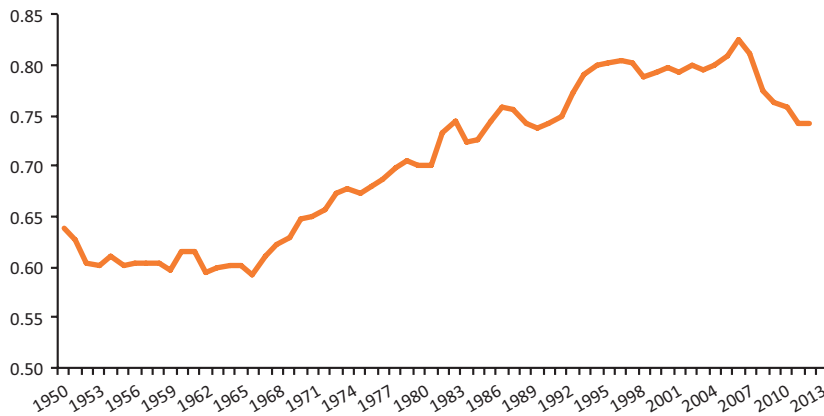


The fact that a substantial gap still exists implies that there is still room for Britain to undertake further catch-up growth, and for British workers to see their wages rise faster than those in America. If Britain could regain the average rate

¹⁹ Author calculation from Total Economy Database, The Conference Board

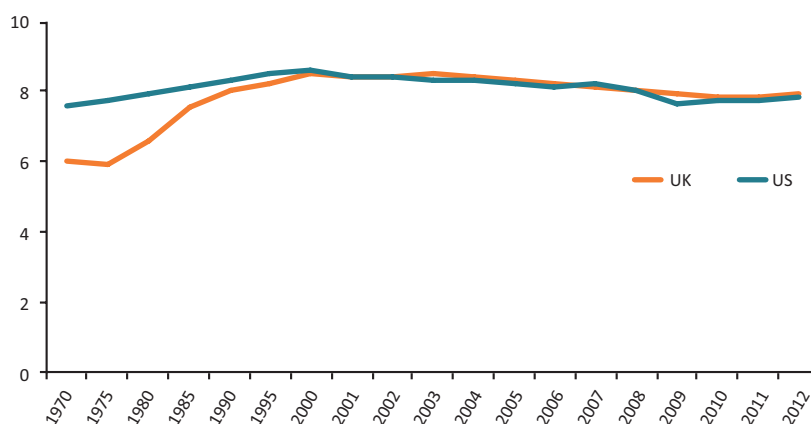
of catch-up it saw before the financial crisis, it would take around 50 years to catch-up with America.²⁰

Figure 9: UK labour productivity as % of US (GDP per person employed, TED)



On the other hand, British catch-up seemed to stagnate from around 1997. Why this happened is less easy to say. This period also saw a significant increase in low-skilled immigration, which could have dragged down both productivity and the median. However, it is striking that this period the catch-up on the supply side of the UK economy ended as measured by independent measures of economic freedom.

Figure 10: Economic freedom of the world (Fraser Institute)



Given that the UK and the US now have roughly equal scores, a more pessimistic interpretation would be that Britain is unlikely to see much further improvement. Many other economies such as Germany or Japan have enjoyed decades of rapid catch-up only to stall a long way before fully matching the US.

²⁰ Author calculation from Total Economy Database, The Conference Board. This calculation assumes that all the damage from the financial crisis proves permanent, but even in the best case scenario where the economy rebounds onto its long term trend, it would still take around 25 years to catch-up.

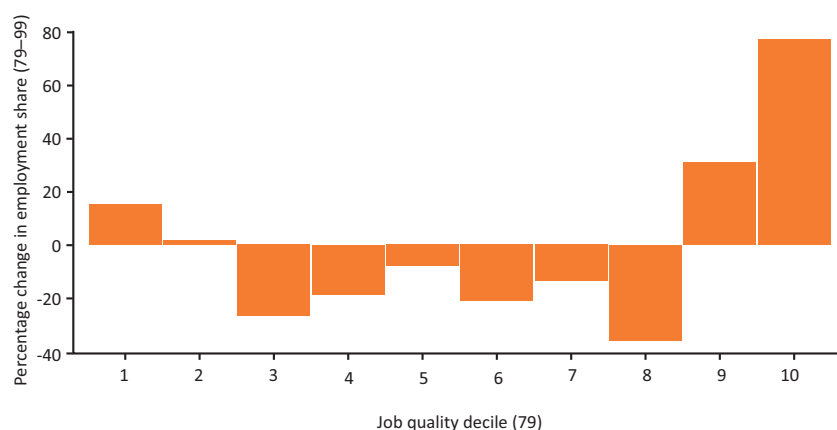
If the era of catch-up growth is truly over, it is possible that lower and middle workers could see similar patterns to American workers in future without the general boost of catch-up growth.

Hollowing Out

If you look at the change in the types of jobs in the economy over the last few decades, a striking pattern emerges. The twenty years between 1979 and 1999 saw a roughly 400% increase in the number of care assistants and software engineers and a near complete elimination of manufacturing jobs such as boring & drill machine setters (a 94% fall), face-trained coal miners (a 93% fall) and grinding machine setters (86%).²¹ In other words, we have more of the jobs at the top and the bottom, but less in the middle. After ranking jobs by their median wage in 1979 from lowest to highest, Goos and Manning (2003) found that the bottom and top two deciles of jobs saw growth in their employment share. The middle sixty percent, however, saw big falls. They described this as a polarisation into ‘lousy and lovely jobs.’²²

Similar patterns have been found in other time periods, using longitudinal as well as cross-sectional data, and in both the US and across the vast majority of Europe.²³

Figure 11: Labour market polarisation (Goos and Manning)



This disappearance of middle jobs – often called the ‘hollowing out’ or polarisation of the labour market – is usually blamed on ‘skill biased technological change’ (SBTC). Economists spoke of a race between technology and education, with governments struggling to up-skill their workforce faster than technology could deprecate old jobs. For much of the late nineteenth and early twentieth Century, technology amplified the productivity of middle workers. You did not need a degree to work on Henry Ford's production line or in a corporation's typing pool.

With the decline of manufacturing and the rise of computers, the equation became more complicated. New technology can be both a complement and a substitute to workers – simultaneously making them more productive and

21 Steve McIntosh, *Hollowing out and the future of the labour market*, BIS, October 2013

22 Maarten Goos and Alan Manning, *Lousy and Lovely Jobs: the Rising Polarization of Work in Britain*, 2003

23 Steve McIntosh, *Hollowing out and the future of the labour market*, BIS, October 2013

replacing elements of their old jobs. Under SBTC, it is argued that for educated workers the former effect dominates, for the middle the latter, and the bottom has seen little change either way. For example, it has never been easier to build a sophisticated financial model; the cash machine has replaced much of the work of a bank teller; computers have had basically no effect on working behind a bar.

In recent years, SBTC has been further refined to the notion of 'task biased technological change'.²⁴ William Nordhaus estimates that between 1900 and 2005 the amount of computational power per hour worked increased by 10,000,000,000,000,000 times²⁵ – and what computers are best at is executing algorithms. First A, then B, then C.

Routine tasks, whether physical or automated, could easily be automated, while jobs that required either creativity, social interaction or dexterous and non-predictable physical interaction stayed put. Michaels, Natraj and Van Reenen (2010) found that the industries with the greatest growth in ICT intensity also saw strong increases in demand for highly educated workers and falls for middle workers. The bottom was largely unaffected.²⁶ Similarly, Bisello (2013), using evidence from the UK Skills Survey find that routine middle-paying jobs, both manual and non-manual, have seen significant falls in their share of employment.²⁷

Alongside the IT revolution, the other major shift to the world economy in recent decades has been the acceleration of globalisation, and in particular the emergence of a huge new supply of low wage labour in China.

For the most part, labour economists believe that technology has played a bigger role in changes to jobs and wages than trade. The increased demand for skilled workers has been seen across nearly all industries and countries, both developed and developing; changes in trade patterns seem too small to explain what was happening to wage inequality; changes in ICT or R&D show a much better correlation with the increase in demand for skilled workers than trade openness.

However, what is now becoming more plausible is that trade acts as a catalyst to faster technological improvement, which in turn tends to increase automation and the demand for skilled labour. Bloom, Draca and Van Reenen (2011) find a strong correlation between industries that were most confronted by Chinese competition and technological changes, such as furniture, textiles, clothing and toys. They estimate that China is responsible for around 15% of the technological upgrades in Europe between 2000 and 2007.²⁸

Is the automation and outsourcing of old jobs, then – substitution, in other words – the main reason for changes in the labour market?

This seems to be the best explanation for the massive increases in those on out-of-work benefits that corresponded with the UK's transition away from a manufacturing economy. At the beginning of the 1980s, there were around one million people receiving the key out-of-work benefits, with very roughly around half on Unemployment Benefit and half on Invalidity Benefit. By the latter half of the 1980s unemployment started to rapidly fall, but the numbers of Invalidity Benefit claimants continued to grow.

“What is now becoming more plausible is that trade acts as a catalyst to faster technological improvement, which in turn tends to increase automation and the demand for skilled labour”

24 David H. Autor, Frank Levy and Richard J. Murnane, *The Skill Content of Recent Technological Change: An Empirical Explanation*

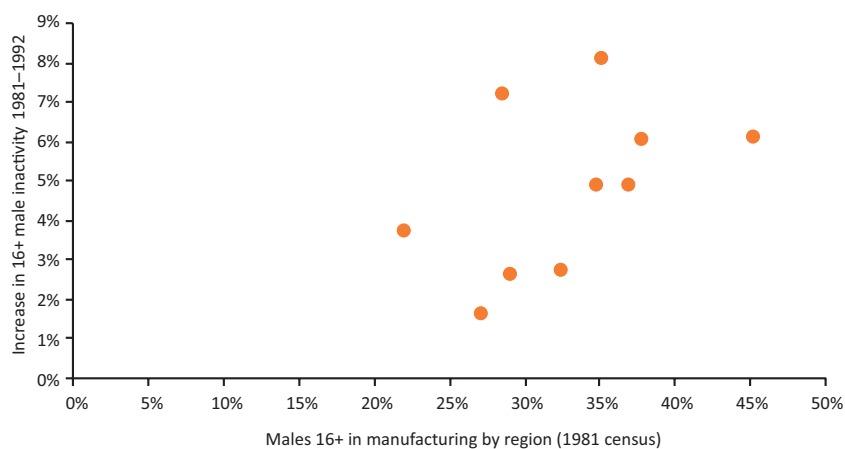
25 William D. Nordhaus, *Two Centuries of Productivity Growth in Computing*, 2007

26 Guy Michaels, Ashwini Natraj, John Van Reenen, *Has ICT Polarized Skill Demand? Evidence from Eleven Countries over 25 years*, 2010

27 Martina Bisello, *Job polarization in Britain from a task-based perspective. Evidence from the UK Skills Surveys*, 2014

28 Nicholas Bloom, Mirko Draca, John Van Reenen, *Trade induced technical change? The impact of Chinese imports on innovation, IT and productivity*, 2010

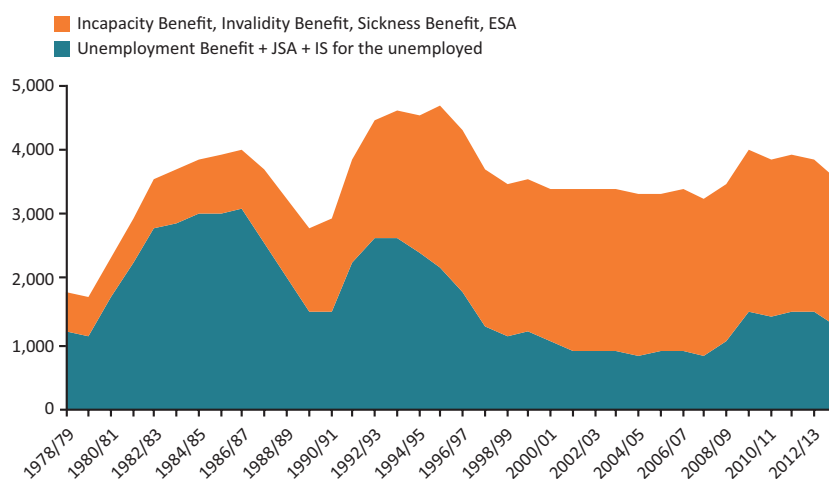
Figure 12: Regional relationship between male inactivity and manufacturing (1981 Census, Labour Force Survey)



From around the mid-1990s, a new agenda of welfare reform and the introduction of active labour market policies at least stemmed the flow.²⁹

In Britain, Invalidity Benefit was replaced by the more restrictive Incapacity Benefit in 1995, Unemployment Benefit by Jobseekers' Allowance in 1996, and the New Deal workfare scheme introduced in 2008. The combination of these programmes at least stopping caseloads from increasing further – after a pause from 1993 to 1997, manufacturing started to shrink rapidly again as a proportion of the workforce – but they did relatively little to shrink the number back down again.

Figure 13: Benefit caseloads (thousands)



29 Jonathan Portes, Welfare and Work: Continuity and Change, National Institute Economic Review 2012 221

While substitution seems a good explanation for increases in long term unemployment, it is much less clear how well it does at explaining changes in wages.

For one thing, while study after study finds the same U-shaped hollowing out of types of jobs, this does not seem to translate into a corresponding ‘hollowing out’ of wages. As McIntosh (2013) reports in a literature review for the Department of Business, Innovation and Skills, “there is no evidence of a hollowing-out on the wage distribution.” Wage inequality has increased – but the middle has still done better than the bottom. (In the 1990s, McIntosh points out, the middle saw faster growth in real wages than the rest of the wage distribution).

While many of the old middle jobs are going away, new middle jobs are being created in their place – often less routine, more interesting and better paid. Previously low skilled jobs are being given more responsibility, while high skilled jobs are put into the reach of intermediate workers through technological changes.

What happens to workers displaced from old, routine occupations? Some have argued that there is a ‘bumping down’ effect in which displaced middle workers move down a rung into low skilled jobs, reducing the wages of those below them.

This, however, seems too negative. We only have relatively limited longitudinal evidence on displaced workers in the UK, but it seems that they migrate to positions both up and down the wage distribution.³⁰

If you look at the population as a whole, the situation is even more positive. The number of workers born in the UK in low skilled jobs has fallen by 1.1 million between 1997 and 2013, while the number of high skilled jobs has increased by 2 million. The overall number of low skilled jobs has stayed roughly constant, but the difference has been filled by a greater number of lower skilled immigrants, who in turn are presumably seeing significant wage growth from their native country.³¹

While technology and trade have eliminated some jobs, they have also made workers in other careers far more productive. If you create a product that can be scaled by digital technology – say an idea, a financial product, a software algorithm or a film – the digital world makes it easier to multiply your impact.

The last forty years have been a good time to be a highly skilled worker. One way to estimate this is to use university graduation as a proxy for highly skilled workers. Despite the massive increases in student numbers, the premium earned by graduates still remains healthy – BIS estimates that over their working life a male graduate will earn £168,000 more than someone with just 2 A-Levels, and a female graduate an ever bigger £252,000.³² Graduates are in effect in a different labour market than non-graduates: they enjoy better employment rates (87% compared to 69.5%), half the unemployment rate (3.5% compared to 7.4%), and median salaries 50% higher (£31,000 compared to £22,000). The trends are still more evident if you compare postgraduates who enjoy an 87.1% employment rate, 2.5% unemployment and £40,000 median salaries.³³

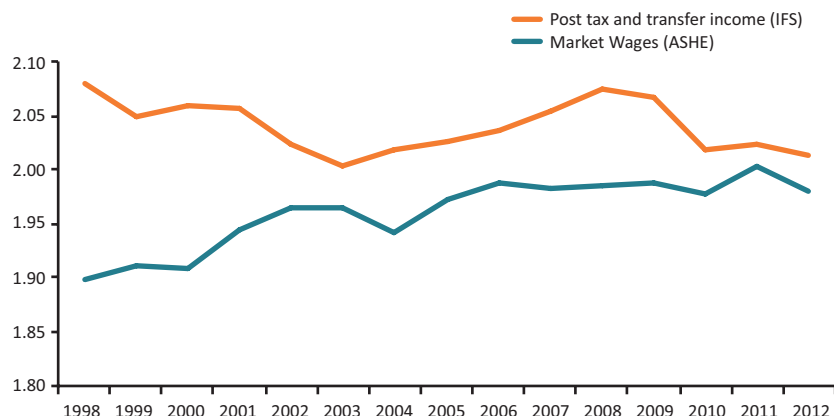
While the rise in long term unemployment largely came to a stop in the mid-1990s, the rise in the wage premium has shown little sign of stopping. One way of looking at this, the ratio between the 90th percentile of the wage distribution and average earnings – the 90:50 ratio – has steadily crept up. In terms of market wages, the top 10% are continuing to pull away.

30 Craig Holmes, *The Route out of the Routine: Where do the Displaced Routine Workers Go?*, SKOPE, 2011; Martina Bisello, *Job polarization in Britain from a task-based perspective. Evidence from the UK Skills Surveys, 2014*

31 Migration Advisory Committee, *Migrants in low-skilled work– The growth of EU and non-EU labour in low-skilled jobs and its impact on the UK*, July 2014

32 Ian Walker and Yu Zhu, *The Impact of University Degrees on the Lifecycle of Earnings: Some Further Analysis*, BIS, 2013

33 BIS, *Graduate Labour Market Statistics, Q3 2014*

Figure 14: Ninety-fifty ratios (ONS, IFS)

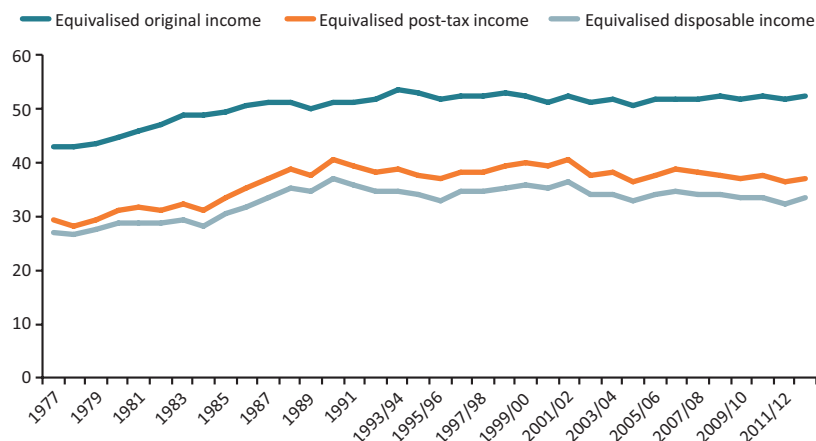
Market wages, however, aren't everything. If you instead look at the 90:50 ratio of household disposable income it has been basically flat, if not in decline. Why?

Tax and Transfers

Growth helps ordinary workers not only through wages, but also the increased revenue it provides to governments for more generous welfare transfers.

What really matters to the living standards of households is their final incomes: the level of income they receive once you have taken into account employment status, wages, taxes, welfare transfers, and other sources of income such as savings. The ratio between the richest quintile and the bottom for original income is a massive 14.7 times – once you take into account benefits and taxes it falls by three quarters to a more manageable 3.8.³⁴

The fall in the unemployment rate which started in 1993 helped ensure market inequality stayed flat, while the impact of the tax and transfer system further lowered inequality.

Figure 15: Inequality in the UK before and after taxes and transfers (ONS)

34 ONS, The effects of taxes and benefits by quintile groups on all households, 2012/13

Overall, the ONS estimates that between 1980 and 2010 the tax system had largely a neutral effect on inequality: direct taxes like Income Tax reduced inequality by 3 percentage points, but this was cancelled out by indirect taxes such as VAT, which increased it 4 percentage points. Most of the reduction in inequality instead came from cash benefits which reduced inequality by 15 percentage points.³⁵

Box A: Is it the employer or employee who gains from changes to taxes and transfers?

Any change to the tax, transfers or regulation ultimately has to be paid for by either consumers, employers or employees – but it is far from always obvious who gains and who loses out.

The legal incidence can easily differ from the economic incidence. Whether we choose to label something an employee or employer tax – or equally a subsidy for ‘wages’ or for ‘hiring’ – is basically irrelevant in the long run to who ends up actually getting the money.

Most economists believe that, despite the name, Employer’s National Insurance is largely paid for by the employee rather than the employer. Around two thirds of any cut would get passed onto the workers.³⁶ But you would also expect around the same effect to a similar change in Income Tax or Employee National Insurance contributions – workers would only gain around two thirds of the benefit.

Alternatively, others have argued that tax credits are captured by employers lowering wages. Rothstein (2008), for example, found that low-skill single mothers in the US only kept \$0.70 of extra additional dollar of the Earned Income Tax Credit, while the increase in supply actually drove down non-eligible wages by \$0.43.³⁷ Azmat (2009) found similar effects from the Working Families’ Tax Credit in the UK.³⁸ By contrast, the Resolution Foundation (2012) found no evidence that tax credits had suppressed the wages of low paid workers.³⁹

Ultimately, given the many uncertainties involved, it is impossible to perfectly estimate the incidence of changes to labour taxes and benefits. In general, the more elastic the demand for low paid workers and the more inelastic the supply, the more tax cuts and higher benefits will be passed onto the workers themselves. In other words, the more effective your welfare system is at ensuring everyone who can do so works, the more tax cuts will get passed onto the workers.

In the future, the combined tax and transfer system is likely to continue to play a key role in sharing the benefits of growth. Most people don’t realise that ‘Anglo-Saxon’ economies such as the US, UK, Canada and Australia, while they might spend less overall on benefits, are some of the most efficient at targeting their benefits at the poorest. According to the OECD, “The distribution of cash benefits for the entire population is most progressive, by a wide margin, in Australia, followed by New Zealand, Denmark, the United Kingdom, Finland and Ireland... taxation is most progressively distributed in the United States. After the United States, the distribution of taxation tends to be most progressive in the English-speaking countries – Ireland, Australia, the United Kingdom, New Zealand and Canada – together with Italy, followed by the Netherlands, the Czech Republic and Germany.”⁴⁰

35 Grace Anyaegbu, The effects of taxes and benefits on income inequality, 1980-2009/10, ONS, 2011

36 José M. González-Páramo and Ángel Melguizo, Who really pays social security contributions and labour taxes?, Vox, 8th February 2013

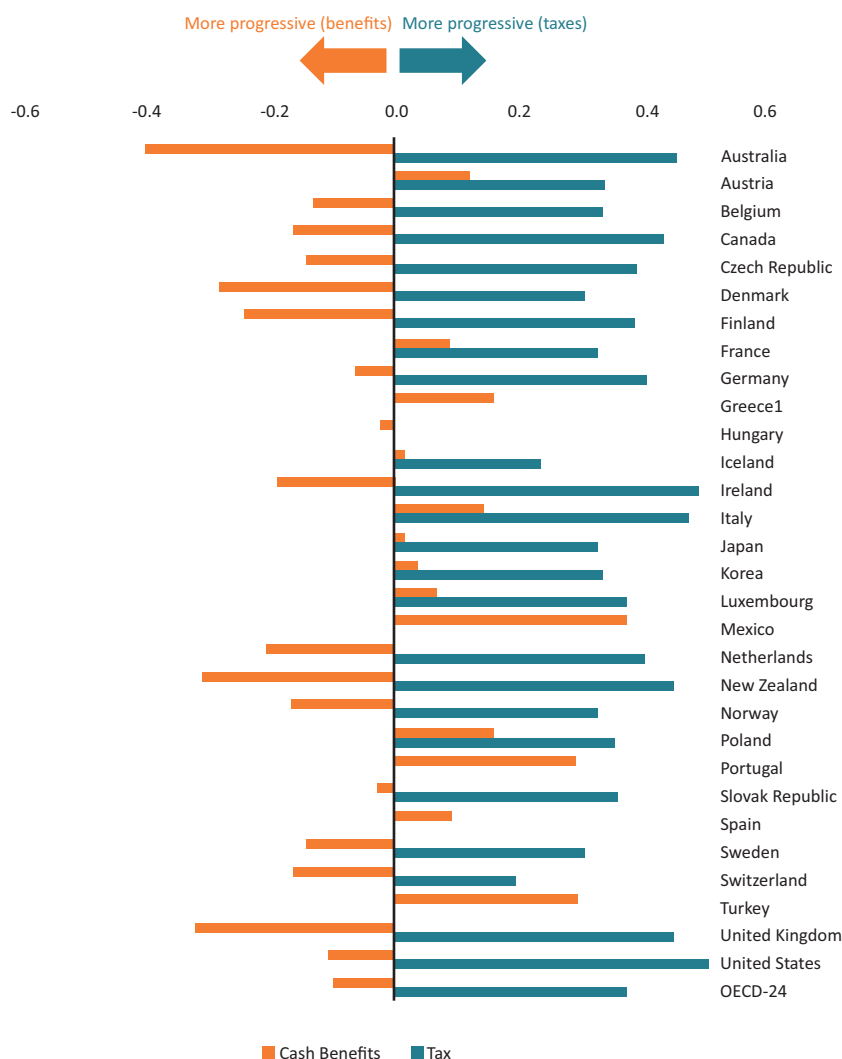
37 Jesse Rothstein, The Unintended Consequences of Encouraging Work : Tax Incidence and the EITC, 2008

38 Ghazala Yasmeen Azmat, The Incidence of an Earned Income Tax Credit: Evaluating the Impact on Wages in the UK, 2009

39 Paul Gregg, Alex Hurrell and Matthew Whittaker, Creditworthy: Assessing the impact of tax credits in the last decade and considering what this means for Universal Credit, Resolution Foundation, 2012

40 OECD, Growing Unequal? Income Distribution and Poverty in OECD Countries, 2008

Figure 16: Progressivity of working age benefits and taxes (OECD, 2008)



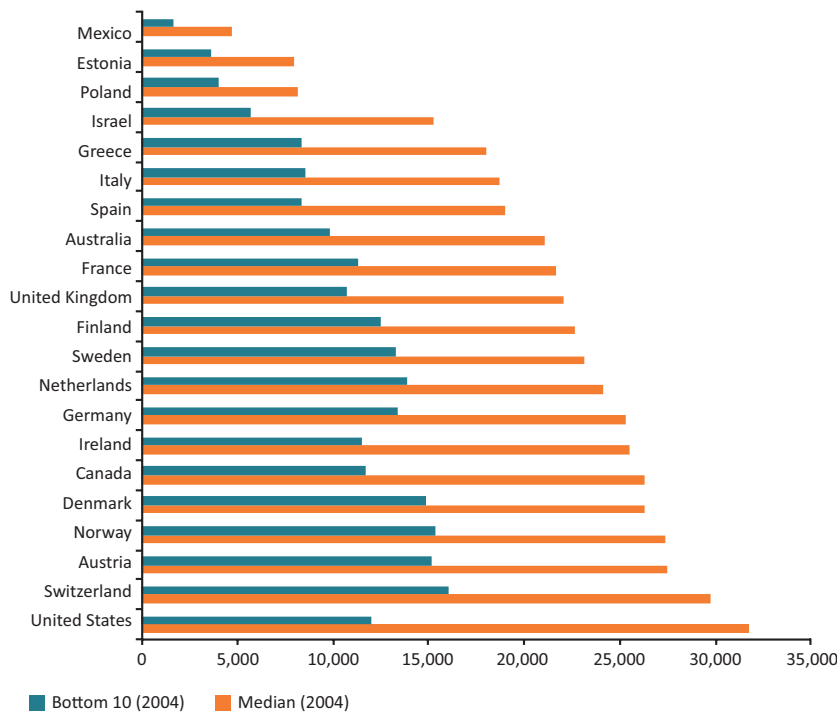
Despite all the fears that higher income inequality will hurt average households, once you take into account taxes and transfers, the median household in the US, UK, Canada or Australia is doing pretty well. On the other hand, 'Anglo-Saxon' economies are doing a proportionally less good job at boosting those at the very bottom.

In short, from around the 1970s to the mid-1990s there was a one off shock to the rate of productivity growth and the structure of the workforce worldwide, which in turn caused a rise in unemployment and inequality.

From the mid-1990s to the arrival of the financial crisis, the combination of faster productivity growth, welfare reform and more generous cash benefits ensured that overall inequality did not increase.

But while this story explains the majority of the labour market, it misses out on one trend that has been dominating much of the concern over inequality recently: the rise of the 1%.

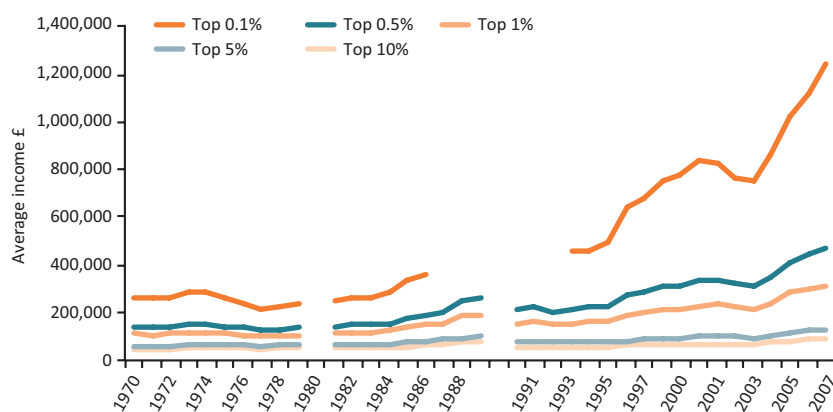
Figure 17: Equivalised disposable household income in 2004 (\$2011, Scott Winship, LIS)



Superstars

Since around the early 1980s, the top 1% as ranked by income have seen their incomes grow much faster than the rest of us. The top 0.5th percentile are doing better than the rest of the 1%, and the top 0.1% significantly better than them again. While we don't have the data for the UK, in the US it seems that the top 0.01% percentile are seeing their incomes and wealth grow still faster yet again. In other words, it is not just the infamous 1% that have pulled ahead of the 99%, but the 1% of the 1%.

Figure 18: Average incomes in the UK (2010 pounds, top incomes database)



The rise of the 1% is not just an American and British phenomenon. Over the last twenty years or so, we have seen rises in the income share of the 1% in Australia, Canada, Finland, Ireland, Korea, Norway, Portugal, Singapore, Sweden, and Switzerland.⁴¹

On the hand, some of these rises have been much more drastic than others. The US has seen the share of its 1% increase from 7.8% in 1970 to 19.3% in 2012, while New Zealand has seen a much smaller rise from 6.6% in 1970 to 8.1% in 2011. The share of the 1% has remained basically flat in France and Germany.⁴²

So, what is causing these changes? Why does it seem to be biting more in some places than others?

Some of the most common explanations for the rise of the 1% are:

- **The rise doesn't exist, and is the result of a statistical illusion.** At the very top of the income distribution, the distinction between labour income from wages and capital income from investment often muddies. Capital income in turn is both harder to accrue to the right time, and in practice to measure. The Piketty-Saez data on which the above estimates of the 1%'s share are based come largely from tax return data, but this excludes much of the wealth of ordinary families such as their ISA, pension or house which is often untaxed.⁴³ Furthermore, income only counts as capital gains when the asset is sold, and even then the income is treated as if it was all gained in a single year rather than only the lifetime of the asset. Richard Burkhauser, Philip Armour and Jeff Larrimore (2013) argue that once you attempt to properly accrue capital gains from both held and realised assets, the income of the top 5% seems to decline by 5-25% between 1989 and 2007.⁴⁴ Furthermore, changes in tax law can cause the way income is reported to shift, or a rush towards realising gains creating a spike. The worldwide move to lower top rates in the 1980s has seen more income show up on tax returns.

Getting perfect numbers on the incomes of those at the very top is difficult given their small numbers, their high proportion of capital like income and perhaps the sophistication of their accountants,. Differences in assumptions show different trends. Nevertheless, while it may have been overstated, given the wide variety of different sources we have, the balance of evidence is still that there has been some increase in income concentration at the top.

- **The rise is the result of the unleashing of the City in the 1980s.** The rise in the income share of the top 10% seems to really take off in the mid-1980s, around the same time as the 'Big Bang' deregulation of financial services which catalysed the City's take off. Bell and Van Reenen (2010) find that 60% of the rise in the income share in both the top 10% and top 1% between 1998 and 2007 went to workers in the financial sector, largely as a result of higher bonuses.⁴⁵

That bankers pay accelerated faster than the rest of the economy is not surprising: Bell and Van Reenen also calculate that between 1995 and 2007 the industry saw a 156% rise in labour productivity, compared to 65% for the economy. Some have argued that this increase wasn't real – that finance was largely acting as a parasite on the economy, making excess returns through one way bets backed by government guarantees of too-big-to-fail. Even if this cynical conclusion was true however, it would represent a fairly localised problem with a specific industry than a problem across the economy as a whole.

41 Alvarado, Facundo, Anthony B. Atkinson, Thomas Piketty and Emmanuel Saez, The World Top Incomes Database, 2014

42 Alvarado, Facundo, Anthony B. Atkinson, Thomas Piketty and Emmanuel Saez, The World Top Incomes Database, 2014

43 Scott Winship, Is Inequality Growing Out Of Control?, Forbes, 24th April 2014

44 Philip Armour, Richard V. Burkhauser, Jeff Larrimore, Levels and Trends in United States Income and Its Distribution A Crosswalk from Market Income Towards a Comprehensive Haig-Simons Income Approach, 2013; Scott Winship, Has Income Inequality Really Risen?, October 9 2013

45 Brian Bell and John Van Reenen, Bankers' Pay and Extreme Wage Inequality in the UK, April 2010, Centre for Economic Performance

However, it seems more likely that the dominance of finance in the UK's top 1% is as much a reflection of finance's dominance of the UK economy as a whole than the deep cause itself. While less drastic, other British industries such as Business Services or Health have seen increases in the share of income going to the top. One estimate suggested that just 13% of the top 1% in America belonged to financial industries.⁴⁶ The strength of financial services in London and New York is certainly one reason why they have seen the most dramatic increases in the share of the 1% – but it is not the only reason.

- **Poor corporate governance and fat cat managers have led to a capture of executive compensation.** In his recent bestseller, Thomas Piketty argued that the lowering of tax rates in the US and UK catalysed the rise of the 'supermanager' in Anglo-Saxon economies. Without the "protective barrier [against] mischief" of ultra-high marginal tax rates, corporate executives are incentivised into gaming executive compensation in their own interest.⁴⁷

There is undoubtedly room for improvement in corporate governance in public companies, but mathematically excessive executive compensation doesn't seem able to explain more than a very small proportion of the magnitude of the rise of incomes at the top. Jim Manzi calculates that out of the 150,000 people who make up the top 0.1% in America, very conservatively estimated, just 27% could be described as a top manager in a public company – and this proportion has been shrinking in recent decades.⁴⁸ By contrast, repeated other studies have found that senior management pay is strongly related to corporate performance.⁴⁹ It seems unlikely to be a coincidence that between 1980 and 2003 both the pay of American CEOs and the capitalisation of large companies increased by a factor of six.⁵⁰

- **There has been a cultural change in favour of greed or inequality or meritocracy.** Even after the recent rises in executive compensation, CEOs arguably are still underpaid from a strict market perspective. The difference between a good and bad leader can be worth millions if not billions of pounds – but then this has always been true for the largest companies. Perhaps what really changed in the 1980s was a gradual loosening up of social norms that previously shamed bosses from claiming too great a multiple over their workforce. In the "greed is good" era by contrast, highly skilled individuals were no longer afraid of asking for what they thought they were worth.

Cultural changes are inherently difficult to test, making this a difficult proposition to either falsify or confirm. For what it is worth, data from the British Social Attitudes survey seems to show little evidence that those at the top have become hard core followers of Ayn Rand. From 1987 to 1995, the percent of the professional / managerial class who believe that the income gap was "too large" actually increased from 76% to 88% – before falling back to 77% by 2007.⁵¹ If you look at some of the most iconic super-rich such as Bill Gates, Warren Buffett or Mark Zuckerberg, they have all pledged to give at least half of their wealth away to philanthropic causes. It is hard, albeit not impossible, to square this with their wealth coming from greater greed and aggression.

All four of the above factors – tax changes, the rise of finance, corporate governance, cultural shifts – probably played some part both in the rise of the 1% and in explaining why it has shown up most strongly in the US and UK.

46 Jon Bakija, Adam Cole and Bradley T. Heim, *Jobs and Income Growth of Changing Income Inequality: Evidence from US Tax Return Data*, April 2013

47 Thomas Piketty, *Capital in the Twenty-First Century*, 2014

48 Jim Manzi, *Piketty's Can Opener*, National Review Online, July 7 2014

49 Brian Bell and John Van Reenen, *Firm Performance and Wages*, 2011; Steven N. Kaplan, *The Real Story Behind Executive Pay*, Steven N. Kaplan, *Foreign Affairs*, May/June 2013

50 Jim Manzi, *Piketty's Can Opener*, National Review Online, July 7 2014

51 Alison Park, Caroline Bryson, Elizabeth Clery, John Curtice and Miranda Phillips, *British Social Attitudes 30*, NatCen, 2013

However, the most convincing argument for the rise of the 1% across a wide variety of industries and countries is that we are now seeing an increasingly global market for superstars. In an increasingly global and digital market, a power law for talent continues right up to the top of the income distribution – just as it does for companies.

Increasingly, being second best in a market does not mean just slightly lower, but often an order of magnitude lower profits and market share than the market

leader. As venture capitalist Peter Thiel argues, the best investment in any tech portfolio is likely to be worth more than the rest put together. The 12 largest tech companies are together worth over 2 trillion, more than every other tech company combined.⁵² Digital economies are creating increasing

returns to scale and network effects: there is only one Google or Amazon or Facebook or Twitter. The ratio between the 90th percentile and the 50th percentile in market cap for FTSE 350 companies is around nine times, and there is a further four and half ratio between the 90th and 99th percentile.

There seems no reason why you would not see the same trends in the labour market – and indeed we do. Kaplan and Rauh (2013) report that it is not just executives at public companies who have seen increases in pay at the top, but also executives in private companies, hedge fund managers, lawyers, and professional athletes.⁵³

In the 1950s, the best-selling author of all time Agatha Christie was estimated to be earning around £100,000 a year,⁵⁴ while a star like Humphrey Bogart enjoyed \$300,000 for a picture.⁵⁵ Today Harry Potter made J K Rowling a dollar billionaire,⁵⁶ while Robert Downey Jr enjoyed \$75 million for his work last year.⁵⁷ Since the abolition of the maximum wage in 1961, top footballers have seen their weekly wage increase forty times faster than the average wage.⁵⁸

“The most convincing argument for the rise of the 1% across a wide variety of industries and countries is that we are now seeing an increasingly global market for superstars”

52 Blake Masters and Peter Thiel, *Zero to One: Notes on Start Ups, or How to Build the Future*, 2014

53 Steven N. Kaplan and Joshua Rauh, *It's the Market: The Broad-Based Rise in the Return to Top Talent*, 2013

54 BBC, On this Day 12 January: “1976: Crime writer Agatha Christie dies”, http://news.bbc.co.uk/onthisday/hi/dates/stories/january/12/newsid_4440000/4440120.stm

55 http://www.cornel1801.com/1/h/Humphrey_Bogart/filmography_quotes.html

56 Fred Dreier, *Billionaire Dropoffs*, *Forbes*, 7th March 2012,

57 Ben Child, *Robert Downey Jr tops list of highest paid actors for second year running*, *The Guardian*, 22 July 2014

58 Joe Bernstein, *Too many average footballers are millionaires... they drive Ferraris but they deserve a Reliant Robin*, *Daily Mail*, 9 January 2011

Figure 19: Average weekly wage of top footballers (Daily Mail)



Even if superstar effects explain much of the rise of the 1%, why has this been so much dramatic in the Anglo-Saxon economies than elsewhere? Why did this start to take off only in the mid-1980s?

As key global hubs of the financial, creative and digital sectors – the homes of London and New York – it is perhaps not surprising that the UK and the US have seen stronger superstar effects than elsewhere. On timing, the 1980s saw not only the lowering in tax rates, but also a step change in the digital revolution.

But a further factor is likely that the Anglo-Saxon economies were ahead of Continental Europe in linking executive compensation to company performance. Before 1980, there was little correlation between the compensation of the highest paid executives and stock performance at the fifty largest firms – afterwards they are nearly perfectly linked. Stocks and stock options grew from a small percentage of total executive compensation in the 1970s to 26% for the largest 50 corporations in the 1980s, 47% in the 1990s and then 60% by 2000-2005. By contrast, as late as 2008 just 19% of the compensation of European executives came in stocks.⁵⁹

Does the rise of the 1% matter?

To summarise, the changes in the wage distribution we have seen have primarily been the results of greater returns to skills, substitution of routine and traditionally middle jobs, and the inexorable rise of the global superstar.

These changes have been seen in nearly every developed country, suggesting they are the result of deep structural forces. It is difficult to see how they can be explained by greater greed or broken corporate governance or deregulation. Given their more flexible labour markets and long run comparative advantage in services it is not surprising that these trends struck the Anglo-Saxon countries first and hardest, but every country will have contend with them at some point.

Fortunately, in terms of its impact on the ordinary worker, the rise of the 1% is relatively harmless. There is little evidence, as many worry, that superstars are having a corrupting influence on democracy. Most studies on the impact of money on politics finds that it has little effect.⁶⁰

Others argue that higher inequality slows growth and hence the living standard of ordinary workers – but both the theoretical models and empirical evidence behind this remain ambiguous. Much of the literature, such as a widely quoted 2011 IMF paper, fails to distinguish between the very different experiences of developed and developing countries.⁶¹

Neither is it necessarily true that increases in the incomes of the 1% come at the expense of the ordinary families, or that this is a zero sum game. Countries with higher inequality can also see higher levels of growth, employment and transfers.

If you look at the median income data, British workers have been doing better than most in the growth of their living standards. While cross country comparisons are difficult due to the large number of other factors involved, there is a small positive correlation in advanced economies between increases in the share of the 1% and improvements in the efficiency of the economy (TFP) between 1980 and 2007 ($R^2 = 0.19$).⁶² More broadly, the Manhattan Institute's Scott Winship has found that in developed countries market inequality is essentially uncorrelated with living standards, with higher inequality countries if anything tending to have higher living standards.⁶³

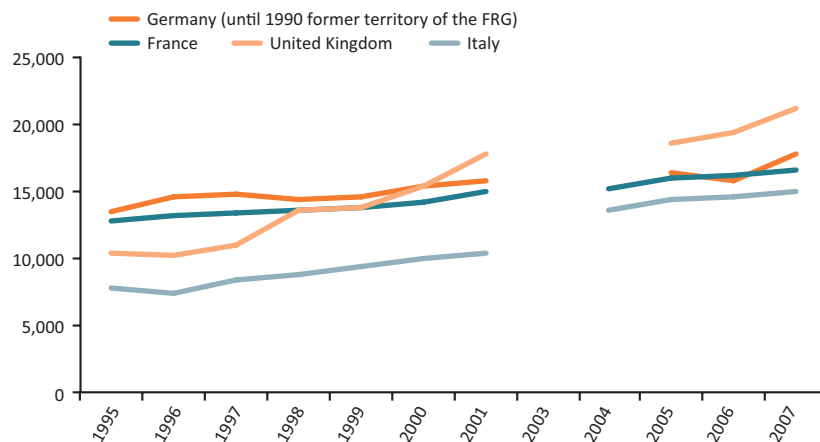
59 Yvan Allaire, Milhaela Firsirotu and François Dauphin, *Inequality and executive compensation: Why Thomas Piketty is Wrong*, Institute for governance of private and public organizations, 2014

60 Stephen Ansolabehere, John M. de Figueiredo and James M. Snyder, Jr., *Are Campaign Contributions Investment in the Political Marketplace or Individual Consumption? Or "Why Is There So Little Money in Politics?"*, 2002

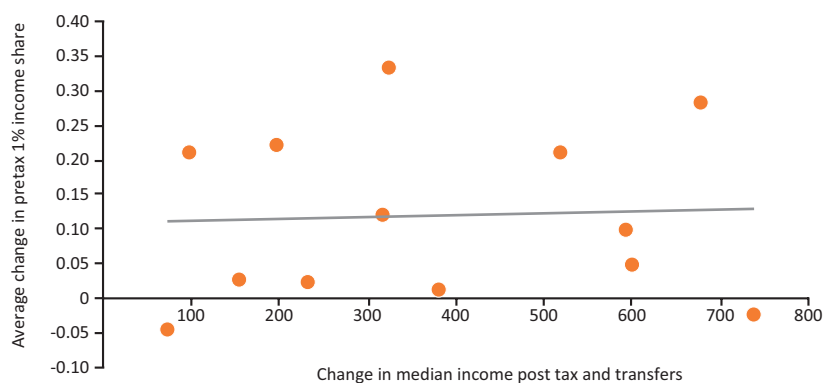
61 Scott Winship, *Overstating the Costs of Inequality*, *National Affairs*, Number 15, Spring 2013

62 Author calculation from World Top Incomes Database and Penn World Tables

63 Scott Winship, *Inequality Does Not Reduce Prosperity: A Compilation of the Evidence Across Countries*, Manhattan Institute, 2014

Figure 20: Median equivalised net income (Euros, Eurostat)

Using the data from the Luxembourg Income Studies for thirteen major countries since the late 1970s, Lane Kenworthy finds that there is essentially no relationship between the increase in the 1% share and changes in median living standards.⁶⁴ The faster increase in the share of the 1% is overshadowed by quicker growth and more generous welfare transfers.

Figure 21: Relationship between changes in real disposable income and increase in top 1% share (Lane Kenworthy, LIS)

While the rise of the 1% is at worst harmless to the ordinary worker, the first two trends, skills and substitution, are potentially more serious.

As long as the economy only gradually evolves, seeking higher levels of skills and substituting for old routine jobs, our education, welfare and tax systems will probably be able to cope: training up the workplace, finding the unemployed new work and moderately redistributing income.

The real question is whether we are about to enter a new era where hollowing out accelerates again.

⁶⁴ Lane Kenworthy, *Has Rising Inequality Reduced Middle-Class Income Growth?*, 2013

3

Is Average Over?

Will a new era of technological advances put an end to middle jobs?

Over the vast majority of human experience, wages were essentially static – a relationship so stable that classical economists talked of the ‘iron law of wages’ preventing them from rising much above subsistence levels. Even after the arrival of the Industrial Revolution and modern economic growth, under one plausible reading of the data there was a thirty years pause before wages started to grow.⁶⁵

Many worry that we are now on the verge of a second Industrial Revolution. Just as machines then replaced human manpower, future AIs threaten to replace mindpower. In the long run, this is likely to offer up a quantum leap in living standards; in the short run, there may be a harsh transition as old forms of employment become deprecated.

On the other hand, there have been false dawns before. Back in 1956, the inventors of the term ‘artificial intelligence’ – and significant contributors to the modern computer age – believed that a two month, 10 man study would be enough to make significant advances on how to make, “Machines use language, form abstraction and concepts, solve kinds of problems now reserved for humans, and improve themselves.” (At the time, the most powerful supercomputer could perform around 40,000 floating-point-operations a second – that’s about 0.00001% as powerful as the latest iPhone). Even Alan Turing believed that we would see a 30% pass rate on his famous ‘Turing Test’ by the year 2000.⁶⁶

We can demarcate three broad scenarios of what might happen in the future:

Scenario 1: Rise of the robots

“For almost 60 years, AI researchers have predicted that AI is right around the corner, yet until a few years ago it seemed as stuck in the future as ever,” admits Kevin Kelly, in a recent article for *Wired* – but this time really is different: “Three recent breakthroughs have unleashed the long-awaited arrival of artificial intelligence: Cheap parallel computation... Big Data... Better algorithms.”⁶⁷ Others point to the development of machine perception finally starting to work, allowing the application of previously developed algorithms and the power of big computing to real world data.⁶⁸

If this continues, we could see radical improvements in AI, communications and robotics allowing the automation of the overwhelming majority of middle and bottom jobs. Self-driving cars would replace taxi drivers, flying drones take over for soldiers, and algorithms do the work of bureaucrats. It would be cheaper (and safer) than ever before for the poor and vulnerable to play or travel or afford

65 Robert C. Allen, *Technical change, capital accumulation, and inequality in the british industrial revolution*, 2009

66 Stuart Armstrong and Kaj Sotala, *How We’re Predicting AI—or Failing To*, Machine Intelligence Research Institute, 2012

67 Kevin Kelly, *The Three Breakthroughs That Have Finally Unleashed AI on the World*, *Wired*, October 2014

68 Bart Selman, *Intelligence Explosion: Science or Fiction?*, Presentation at *The Future of AI: Opportunities and Challenges*, 2015

a comfortable standard of living, but much harder to find a well-paid, high quality job.

By the year 2050, a recent survey of the world's leading AI experts concluded, we will most likely have a human level intelligence.⁶⁹ In general, the best estimate for a 50% chance of a human-level AI ranges from 2035 to 2050.⁷⁰

Of course, an artificial intelligence doesn't have to be as smart as a human to still be awfully tempting to an employer. A computer can work twenty-four hours a day at maximum efficiency and motivation, with the sole cost to employer paying of the power bill. Even if your AI is not as good as the world's best human, it might still be better than 99% of humans. Already AIs are perfectly capable of doing a good job at playing chess, flying a plane, or writing articles for a newspaper.⁷¹ One estimate by Frey and Osborne (2013) suggests that 47% of US jobs are at risk of being automated, and 35% in the UK.

Scenario 2: Steady as it Goes

"The main lesson of thirty-five years of AI research," argued psychologist Steven Pinker back in 1994, "is that the hard problems are easy and the easy problems are hard. The mental abilities of a four-year-old that we take for granted – recognizing a face, lifting a pencil, walking across a room, answering a question – in fact solve some of the hardest engineering problems ever conceived... As new generation of intelligent devices appear, it will be the stock analysts and petrochemical board members who are in danger of being replaced by machines. The gardeners, receptionist, and cooks are secure in their jobs for decades to come."⁷²

Twenty years later, we now do have computers that can recognise faces and lift a pencil and walk across a room and even answer a good deal of questions – but nobody is likely to mistake Siri for a four-year-old.

In general, throughout the second half of the twentieth-century, experts have repeatedly forecast that human-level AI lay 15-25 years in the future, a prediction they shared with non-experts.⁷³ Given that there is little feedback from making technology predictions, there is no reason to expect 'experts' to have much accuracy in their predictions – in fact, if you take the work of Philip Tetlock seriously, they may well be less reliable than the layman.

Automation is unlikely to stop, but it is not inevitable that it will massively accelerate either. Ironically, David Autor, one of the leading economists behind task-based technological change – the automation of routine work – is also one of the leading optimists about the future. He argues that, to quote philosopher Michael Polanyi, "We know more than we can tell," or that "our tacit knowledge exceeds our explicit understanding."⁷⁴ Echoing Pinker, he argues, that for tasks that "demand flexibility, judgement and common sense... computers are often less sophisticated than preschool age children."

A self-driving car, sceptics such as Autor argue, may be able to already handle 99% of common scenarios better than a human driver – at least on roads that have been mapped out for it – but figuring out that last 1% will be the real trick. How do you programme for a road closed at night in heavy fog, with a police officer trying to redirect traffic by hand?

In any situation of great uncertainty, probably the least bad option is to project current trends going forward. In other words, steady as it goes. The rate of improvement in the performance of AIs in tasks we can measure such as playing Chess or Go seem

69 Vincent C. Müller and Nick Bostrom, *Future Progress in Artificial Intelligence: A Survey of Expert Opinion*, 2014

70 Katja Grace, *AI Timeline Surveys*, 2015, <http://aiimpacts.org/ai-timeline-surveys/>

71 Yves Eudes, *The journalists who never sleep*, *The Guardian*, 12th September 2014

72 Steven Pinker, *The Language Instinct: How the Mind Creates Language: The New Science of Language and Mind*, 1995

73 Stuart Armstrong and Kaj Sotala, *How We're Predicting AI – or Failing To*, *Machine Intelligence Research Institute*, 2012

74 David Autor, *Polanyi's Paradox and the Shape of Employment Growth*, 2014

relatively linear.⁷⁵ Even the Industrial Revolution itself was a relatively linear process – the gradual evolution of workers away from farm to factory took decades if not centuries. Worldwide, the shift from manufacturing to services has similarly been a relatively steady evolution – and probably would have been so nationally as well, if we had not spent so much energy in the post war period trying to protect it.

It is notable that the predictions of technological unemployment have been repeated every few decades including: at the birth of the Industrial Revolution and the invention of the loom; Keynes' fears of technological unemployment at the height of the Great Depression; economic historian Robert Heilbroner arguing in 1965, "as machines continue to invade society, duplicating greater and greater numbers of social tasks, it is human labour itself... that is gradually rendered redundant."⁷⁶

“Even the Industrial Revolution itself was a relatively linear process – the gradual evolution of workers away from farm to factory took decades if not centuries. Worldwide, the shift from manufacturing to services has similarly been a relatively steady evolution”

Scenario 3: Steady as it Goes

Just as the Industrial Revolution's cheap physical power boosted the productivity of everyone – not just the physically strong – the rise of abundant AI could prove just as much a multiplier for the low skilled as high skilled.

Beaudry et al (2013) argue that just like the steam engine and the other advances of the early Industrial Revolution, IT is a General Purpose Technology. In the early years it required significant investment, benefiting the owners of intellectual and human capital – but it may already have reached a more mature stage with these effects reversing.⁷⁷

It is not hard to think of plausible scenarios in the next thirty years in which technology complements the bottom and the middle as much or more than the top:

- Automation takes over the most boring, unsafe and monotonous jobs, freeing humans to focus on innate skills such as common sense and emotional intelligence – both of which are more equally distributed than formal skills or technical intelligence.
- A moderately trained worker with a tablet and the right AI algorithms becomes able to do much of the work of today's lawyers or accountants or doctors.
- However, AIs take longer to replace some of the core human skills such as emotional intelligence or physical flexibility. The net result is that AIs act as a great leveller, reducing inequality for everyone but the very top.
- Online markets make flexible working ever easier, matching demand and supply for labour on an hour to hour basis.
- New types of education, allowing instant feedback and near infinite flexibility, make it ever easier to retrain and gain new skills at near zero cost.
- Better data and monitoring increases transparency, making it easier to separate out productive workers from rent seekers and needless bureaucracy.
- The rise of a new global middle classes lead to a surge in demand for luxury goods that are hard or inappropriate to automate: tourism, handmade goods, coaching and so on.

⁷⁵ Katja Grace, The range of human intelligence, 2015, <http://aiimpacts.org/is-the-range-of-human-intelligence-small/>

⁷⁶ David Autor, Polanyi's Paradox and the Shape of Employment Growth, 2014

⁷⁷ Paul Beaudry, David A. Green, Ben Sand, The great reversal in the demand for skill and cognitive tasks, 2013

These trends are not just hypothetical science fiction, but to a large extent already happening. We are already seeing the automation of not just the production line, but basic journalism, medical diagnosis and paralegal tasks. In the Sharing Economy, you can become in effect a London taxi driver without studying the Knowledge, supplement your income from renting out a room on AirBNB, and earn spare cash from freelancing on eLance or TaskRabbit. Elsewhere, the X Prize Foundation is offering a \$10 million prize fund to create a Star Trek style Tricorder able to diagnose health conditions in a small portable device, and \$15 million to build open source software allowing children in the developing world to teach themselves reading, writing and arithmetic.

Which scenario is most likely?

The future is unknowable. None of the above three scenarios seems either inherently impossible or even implausible. Even so, we don't have to be completely agnostic about the future.

Automation – the replacement of human effort with technology or outsourcing – is at least as old as society. Looking forward, we can distinguish between five broad categories of human work:

- **Physical power.** Humans have not relied solely on their own muscle power for a long, long time. Civilisation has been a long progression from harnessing fire to domesticated animals to windmills to fossil fuels to nuclear.
- **Algorithmic work.** What made the Industrial Revolution was not just the unlocking of new power sources, but directing that energy through the automation of many multiple step processes. In a factory, one unskilled worker could do the work of many previous skilled weavers. Electricity, computers and digital communications took this to the next level in the twentieth century. Programming has never been cheap or easy – as evidenced by the number of bugs in your average piece of software – but it scales at almost zero cost.
- **Physical navigation, flexibility and control.** The automation of algorithmic work was always an incomplete revolution. It works in very simple or artificial environments you can control like an assembly line or piece of software – but it does not deal well with the complexity of perceiving and navigating the real world. You still needed humans to bring the inputs to the start of your assembly line, to drive your lorry or ship or to cook the food in your restaurant.

What has potentially changed is that AIs finally seem on the cusp of being able to navigate the normal world both physically and mentally: we have fully autonomous cars, drones, factory robots and even Boris, a hand washing robot.⁷⁸ At present these technologies are very expensive, but given the still relentless progress of Moore's Law it difficult not to see them continuing to drop radically in price.

Autor is right in that they are unlikely to work 100% perfectly in all situations for many decades to come – but they don't necessarily need to. Even if the progress of AI does not accelerate, we could still see a threshold effect in which cheap AI is 'good enough' to disrupt a significant proportion of normal unskilled workers. An AI can handle the 99% of easy situations, and leave the 1% where it is confused to a human override.

⁷⁸ Michael Eyre, 'Boris' the robot can load up dishwasher, BBC News, 12 September 2014

- **Social interaction.** While you might use a robot to cook in the kitchen, it is likely going to be a long time before you want to replace the waiter. As long as we value interaction with other humans, there will still be many, many jobs to do.

It is unlikely that computers will be taking over much of this work in the near future. Besides our innate preference for humans, the techniques that have worked well for improving navigation and data analysis from better pattern matching are less likely to work well in the spontaneity of conversation. Siri might be able to give you the movie times or repeat a pre-scripted joke, but she is a long way from being an entertaining conversationalist. We have had similar programmes that can fake conversation in a text form, such as ELIZA, for over fifty years.

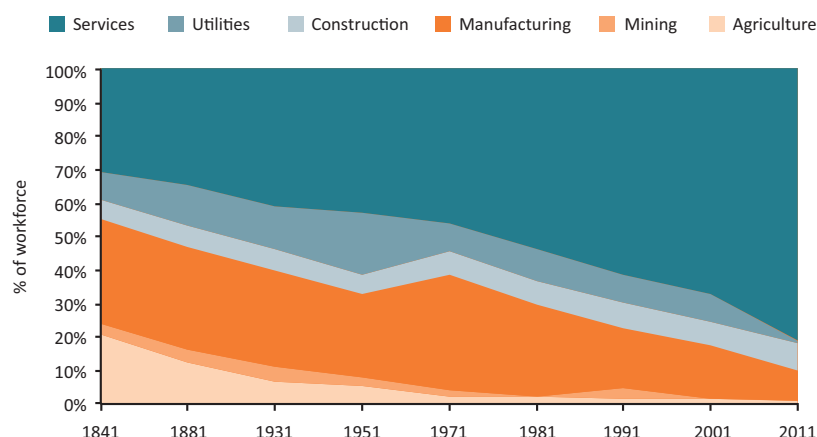
- **Creativity and Problem Solving.** Equally, we are a long way away from a true general human style intelligence, able to understand deep meaning or reason. We do not yet know really know how this works in biological terms, let alone how to implement it in silicon.

In short, the most likely outcome seems to be a continuing automation of routine work as improved pattern matching and navigation make it easier for computers to act with minimal supervision, while social and creative work remains resolutely human. Even in the case of routine work, we are probably talking about a shift playing out over decades rather than years – automated checkouts were technologically feasible for many years before they became common, and even now are far from ubiquitous.

What would mean this for employment?

Certainly, it would represent a significant shift in structure of jobs in the economy. Frey and Osborne (2014) estimate that in the next twenty years 35% of existing jobs are at high risk of automation and 23% at medium risk, in particular in admin, sales and services, transport, construction, extraction and production. If we split the medium risk jobs fifty-fifty, assuming 45% or so of jobs are at risk of getting automated, as a rough estimate this would represent around a 30% bigger shift than we have seen towards services since 1971.

Figure 22: Shape of British workforce (A Vision of Britain Through Time)⁷⁹



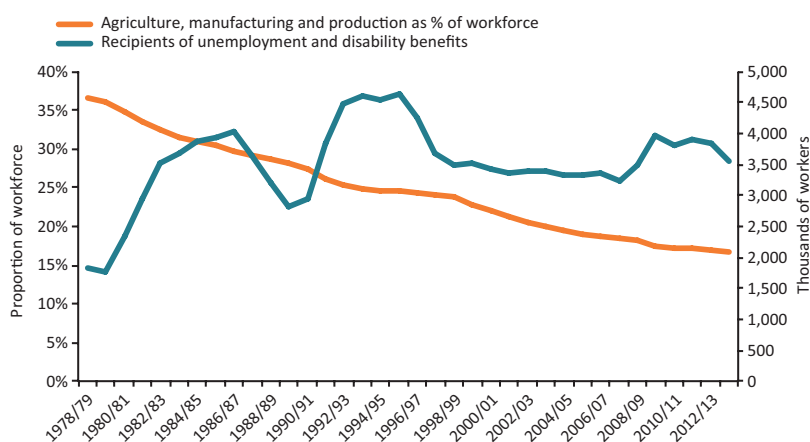
⁷⁹ GB Historical GIS / University of Portsmouth, England through time | Industry Statistics | Standardised Industry Data, A Vision of Britain through Time, 2015; ONS, 170 Years of Industrial Change across England and Wales; 2013

On the other hand it is not a complete order of magnitude or change in type from what we have seen before. It is not hard to think of many occupations dependent on social interaction that society could make productive use of far more of: coaches, tutors, personal care assistants, customer assistants, minders, remote nurses, and so on. The Apple Store, might already have no checkout counters, but it is unlikely to cut back on its ‘Geniuses’, individual staff who can talk through customer problems. These are also all jobs that are likely to be relatively fulfilling: varied, purposeful and connecting with other people.

Those who will find it hardest to adapt are those who struggle at both creative, analytical work and social interaction. But even here it is too pessimistic to just write off a section of society altogether. It is not hard to imagine sceptics before the rise of mass education believing that the majority of farm labourers would never be able to learn to read and write.

Even if you take the most negative assumption about changes in the recipients of disability benefits possible – that they are, in effect, all the disguised unemployed – there is no necessary relationship between the decline of routine jobs and unemployment. The long term decline in non-service industries continued at the start of the millennium, after briefly pausing in the mid-1990s. Nevertheless, unemployment did not start to rise again. Changes to welfare systems rather than changes to technology seem to remain the most likely explanation for long term unemployment.

Figure 23: Does automation increase unemployment? (ONS, DWP)



If automation is unlikely to lead to mass unemployment, what about its impact on incomes, inequality and living standards?

If you look more broadly, the welfare benefits of new technologies are highly unlikely to remain with the rich. Most new technologies from the last few decades from Facebook to GPS have been more likely to be completely free than priced out of the range of ordinary families. Equally, we are all likely to take some of the bounty of higher productivity in shorter working hours, whether it be through more years as a student, longer retirement or a more flexible working week. This has already been happening for at least one hundred and fifty years: the average working week fell from 59 hours in 1856 to 40 in 1956 to around 32 today.⁸⁰

80 Sally Hills, Ryland Thomas and Nicholas Dimsdale, *The UK recession in context — what do three centuries of data tell us?* — Data Annex, Bank of England, 2010

The outlook for market earnings is more uncertain. Certainly, the optimistic scenario remains more than possible: new technology could de-skill occupations that were previously the reserve of graduates, turning intellectual work into a commodity and seeing a more much equal share of earnings below the very top superstars range.

But equally given the experience of the last forty years we can't rule out a further increase in the inequality of market wages.

4

The Return of the State?

Do we need the state to intervene more in labour markets?

In response to the prospect of growing inequality, many have argued that we need the state to intervene much more aggressively at every level of labour markets: fixing wages, regulating contracts, directing industries and taxing away unearned wealth.

Unfortunately, there is little reason to think these changes would actually reverse the changes that we have seen in labour markets, and in many cases they seem likely to make matters worse.

Increasing the Minimum Wage can't guarantee a Minimum Income.

The most frequently suggested solution to the problem of low pay is that we should raise the Minimum Wage further and faster, perhaps even going so far as to align it with the Living Wage level.

The current Minimum Wage is £6.50 for those aged 21 or over, £5.13 for 18-20 years olds, £3.79 for the under 18s and £2.73 for Apprentices. (At the time of going to print, the Low Pay Commission had just recommended an increase to £6.70 for those aged 21 and over from October 2015).

The Living Wage is calculated as the amount that someone needs to earn to achieve the Minimum Income Standard, which in turn is derived from what it costs to buy what a panel of the general public believe to be enough to achieve an 'adequate standard of living.' The current estimated Living Wage is £7.85 an hour, or £9.15 in London.

As a voluntary programme, the Living Wage campaign has been an effective nudge, encouraging employers who can afford to do so to pay more their lowest paid staff. A compulsory Living Wage, however, would be a very different proposition.

Box B: Does the Minimum Wage increase unemployment?

Given that the initial introduction of the Minimum Wage had much smaller effects on employment than some of the worst predictions back in the 1990s, many argue that we need not worry about unemployment from a higher Minimum Wage today.

Clearly, there must be some balancing point: a £50 an hour Minimum Wage would lead to mass unemployment while a 50p Minimum Wage would have no effect whatsoever. Away from obvious extremes, the economic literature on the impact of the Minimum Wage remains deeply contested and it is difficult to say for sure where a danger point lies.

In the most recent round of warring papers, Dube, Lester and Reich (2012) argue that using policy differences between states as an exogenous variable they can show the

Minimum Wage has no effect on employment.⁸¹ Neumark, Salas and Wascher (2013) argue that their research strategy ignores the effect of special heterogeneity, and that the evidence still points towards the conclusion of their 2008 literature review, that “Minimum Wages reduce employment opportunities for less-skilled workers.”⁸² Another paper, Meer and West (2013) argues that you can see the impact of the Minimum Wage most clearly in lower net employment growth,⁸³ while Dube et al (2013) argue that both competing approaches are flawed.⁸⁴ Finally, Clemens and Wither (2014) argue that by comparing states that were directly affected by the rise in the federal Minimum Wage to those that weren’t they can show that increases in the Minimum Wage over the late 2000s reduced the employment ratio by 0.7 percentage points.⁸⁵

Overall, most studies, if by no means all, find little impact on employment. Given that most increases are deliberately calibrated to be small enough precisely so they create no visible impact, others argue that this is unsurprising. In the UK, the independence of the Low Pay Commission was intended to ensure that raises would be cautious enough not to risk unemployment, rather than set by political sound bite.

In the best case scenario, increasing the Minimum Wage would incentivise employers of low paid workers to more urgently increase the productivity of their workers, allowing sustainably higher pay. Indeed, there is some evidence such as Riley and Rosazza Bondibene (2013) that this has in some cases happened.⁸⁶

However, many of the sectors currently affected by the Minimum Wage are precisely those for which it has proved hardest over decades, if not centuries, to improve productivity. The reason labour market polarisation exists is precisely because it is so hard to automate hairdressing or social care or cleaning or waiting on a table.

If a Minimum Wage increase doesn’t come from higher productivity, then inevitably it has to be paid for by someone else: lower profits, higher prices to consumers, slower wage increases higher up the wage ladder or cutbacks in non-wage forms of compensation such as training or other perks.

There is evidence that this has already happened to some extent. The number of employees in non-food retailers earning within 20p of the Minimum Wage almost trebled between 2011 and 2012 as employers compressed the wage distribution.⁸⁷ The Low Pay Commission reports that between 1999 and 2013 that the cost of consumer goods and services involving high levels of Minimum Wage workers (hotel and restaurant workers, hairdressers, dry cleaners etc) had risen much faster than for inflation in general.⁸⁸

The standard metric for measuring the impact of the Minimum Wage is its ‘bite’, its ratio compared to the average wage. According to the Low Pay Commission, for workers aged 22 and over the bite across the whole economy is currently 53%. However, the bite compared to the average wage in specific sectors such as retail is already 79%, in social care 78%, hairdressing 85%, hospitality 88% and cleaning 92%. Across the economy, for workers with no qualifications the bite was 86%.

The latest ASHE data has the UK median hourly full-time earnings at £13.15, giving the Minimum Wage a 49% bite on the slightly different OECD metric. Raising it to the national Living Wage level would increase the bite to 60%, more than twice as large as the increase in the bite over the Minimum Wage’s first

81 Arindrajit Dube, T. William Lester and Michael Reich, Minimum Wage Shocks, Employment Flows and Labor Market Frictions, 2012

82 David Neumark, J. M. Ian Salas, William Wascher, Revisiting the Minimum Wage-Employment Debate: Throwing Out the Baby with the Bathwater?, 2013

83 Jonathan Meer and Jeremy West, Effects of the Minimum Wage on Employment Dynamics, 2013

84 Sylvia Allegretto, Arindrajit Dube, Michael Reich and Ben Zipperer, Credible Research Designs for Minimum Wage Studies, 2013

85 Jeffrey Clemens and Michael Wither, The Minimum Wage and the Great Recession: Evidence of Effects on the Employment and Income Trajectories of Low-Skilled Workers, 2014

86 Rebecca Riley and Chiara Rosazza Bondibene, The Impact of the National Minimum Wage on Firm Behaviour During Recession, 2013

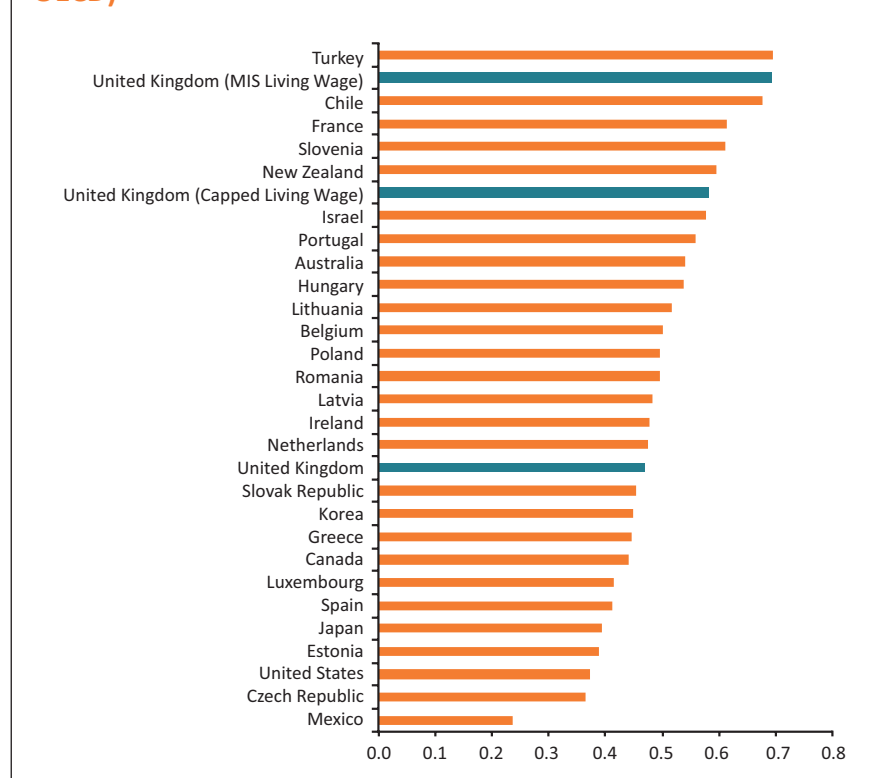
87 Low Pay Commission, National Minimum Wage, 2014

88 Low Pay Commission, National Minimum Wage, 2014

fourteen years. It would move the UK from having around a middling bite to one of the highest. In 2013, NIESR estimated for the Resolution Foundation and IPPR that increasing the Minimum Wage to the Living Wage would reduce labour demand by 160,000 workers overall, and reduce demand for less experienced young and low-skilled workers by 300,000.⁸⁹

Even worse, the current Living Wage is artificially capped to ensure it doesn't grow too fast above earnings. The reference Living Wage – the level that would actually achieve the Minimum Income Standard – is nearly 20% higher, at £9.20 in 2014. Raising the Minimum Wage to this level would give it a bite of 70%, equal highest in the OECD.

Figure 24: Minimum wage bite (% of median full-time earnings, OECD)



Unlike tax credits, Minimum Wages are a relatively blunt tool with only a weak impact on poverty – many of those on the Minimum Wage are second earners who do not live in poor households at all, while conversely many of the poorest are out of work altogether.⁹⁰ Even worse, more than half of the benefit of a Living Wage would simply go back to the Treasury in higher tax receipts and lower tax credits,⁹¹ significantly reducing the actual benefit the living standards of its recipients. A compulsory Living Wage is as much a hidden tax increase as it is a measure to reduce poverty.

Most fundamentally, a Minimum Wage cannot be the answer to technological or other structural change. The theoretical argument in favour of a Minimum Wage is that it can help to counter imperfections in the labour market that unfairly give employers excess bargaining power, such as monopsony employers (“a one company town”) or the search costs of finding a new job. Greater automation

89 Kayte Lawton and Matthew Pennycook, *Beyond the Bottom Line: The challenges and opportunities of a living wage*, 2013

90 Kathryn Ray, Paul Sissons, Katy Jones and Sandra Vegeris, *Employment, Pay and Poverty: Evidence and policy review*, Joseph Rowntree Foundation, 2014

91 Kayte Lawton and Matthew Pennycook, *Beyond the Bottom Line: The challenges and opportunities of a living wage*, 2013

and trade, however, are not market failures or the result of exploitative employers. Equally, while the labour market may not be perfectly competitive, given the close relationship that still exists between productivity and pay, it would be a mistake to believe that it is not competitive at all or that the law of supply and demand has stopped working.

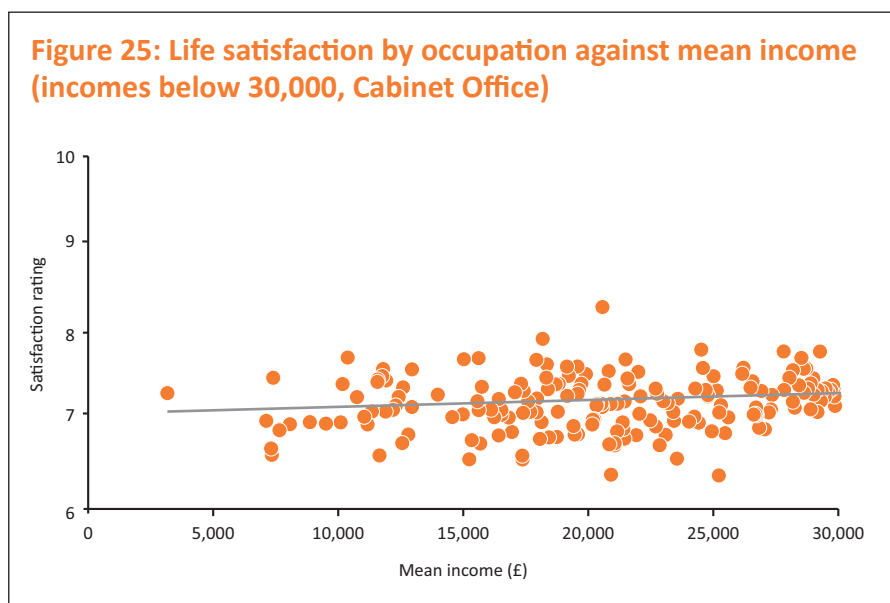
Minimum wages, if anything, accelerate the process of automation – encouraging supermarkets, for example, to replace checkout workers with machines.⁹² The more technological change lowers the relative market wages of low skilled workers, the more likely a high Minimum Wage is to lead to unemployment.

If you don't have a job to start with, a Minimum Wage won't increase your income. Most people intuitively believe that there is something wrong with anyone having to work for less than the Living Wage, which at just £7.85, doesn't seem very high – but market wages will never be perfectly fair in the philosophical sense where effort matches reward.

The best way to ensure everyone receives a fair income for their work remains through the tax and tax credits systems.

Copying European style labour regulation is unlikely to do away with lousy jobs.

Many commentators argue that Britain's surprisingly low unemployment rate has been a Faustian bargain, bought only at the cost of making work less pleasant for those at the bottom. At the top, workers are enjoying ever increased flexibility and autonomy, doing ever more interesting work and choosing their own hours. For those on the other side of labour trends, however, it seems like there are unsociable hours, no guarantee of shifts (“zero hour contracts”), less security of work, a rise in forced self-employment and a generally lower quality of work.



Overall, measuring what exactly counts as good or ‘lousy job’ is far from straight forward. Daniel Pink, in his 2009 book, *Drive* argued that modern workers were motivated not just by respectable levels of pay, but also jobs that gave a sense of “autonomy, mastery and purpose”. He was probably right, but what counts as

92 Ryan Bourne and J. R. Shackleton, *The Minimum Wage: Silver Bullet or Poisoned Chalice?*, Institute of Economic Affairs, March 2014

a good job goes much beyond this. To start with, we care about perks, pensions, riskiness, the niceness of our Boss or colleagues, the length of the commute, the status of the occupation, the pleasantness of the work, avoiding boredom, flexibility, job security, and the possibility for further career progression.

Neither should we be quick to assume that just because a job is low paying that it can't be fulfilling. Below an income of around £30,000, there seems to be basically no correlation between the average pay of an occupation and life satisfaction. Lollipop men and women ("school midday and crossing patrol occupations") report roughly as high life satisfaction as hairdressers (who earn three times as much), or IT technicians (who earn ten times as much).⁹³

However, while it is difficult to perfectly measure the quality of work, for the most part the rise of 'lousy jobs' seems to have been overstated. Inevitably, the recent recession has increased worries over job security, and employers may have made jobs marginally less pleasant as they try to save on labour costs.

If you look back before the arrival of the recession however, there is little sign of a long time deterioration in work:

- **There is little sign that jobs are becoming less interesting.** While the automation of routine work is hard for those who lose their traditional careers, it also means in the long time that we are eliminating some of the most monotonous work. (More anecdotally, one survey found that the two professions which confessed most to being bored were admin and manufacturing jobs.)⁹⁴

There are several more formal indexes based on survey data which tell a mixed story. The task discretion index, aiming to measure "employees' immediate control over their work" fell in the 1990s – most likely from increased bureaucracy – but levelled off in the early 2000s.⁹⁵ The latest 2011 Workplace Employment Relations Study shows employees enjoying increased autonomy at their job.

- **Job satisfaction, as measured by the UK Household Longitudinal Study, has been basically static for the last decade with around 78% reporting job satisfaction.** Admittedly, other data on job satisfaction is mixed. The Work Employment Relations Survey shows between 2004 and 2011 increased satisfaction with sense of achievement, scope for using initiative, influence, training and 'work itself', and falling reports of feeling tense, worried or uneasy. By contrast the Skills Survey data, finds moderate increases between 2006 and 2012 in those reporting low enthusiasm, contentment, job satisfaction and high stress. (Even here, however, the metrics were relatively stable between 2001 and 2006 before the onset of the recession).⁹⁶ Compared internationally with the most recent OECD data from 2005, the UK did well, coming in the top 10 out of 32 for good working environment.⁹⁷
- **Jobs in the UK aren't particularly insecure.** The UK has one of the most flexible labour markets in the world, with the OECD estimating that only the US and Canada provide less protection against dismissal of individuals. However, this lack of formal protection doesn't seem to turn into actual insecurity of outcomes.⁹⁸ Most studies find that 'Employment Protection Legislation' does little to protect jobs overall and, if anything, ends up leading to lower employment for vulnerable workers such as the young and low-skilled.⁹⁹

93 Mark Easton, Vicar or publican – which jobs make you happy?, BBC, 20 March 2014, <http://www.bbc.co.uk/news/magazine-26671221>

94 <http://www.kent.ac.uk/careers/Choosing/career-satisfaction.htm>

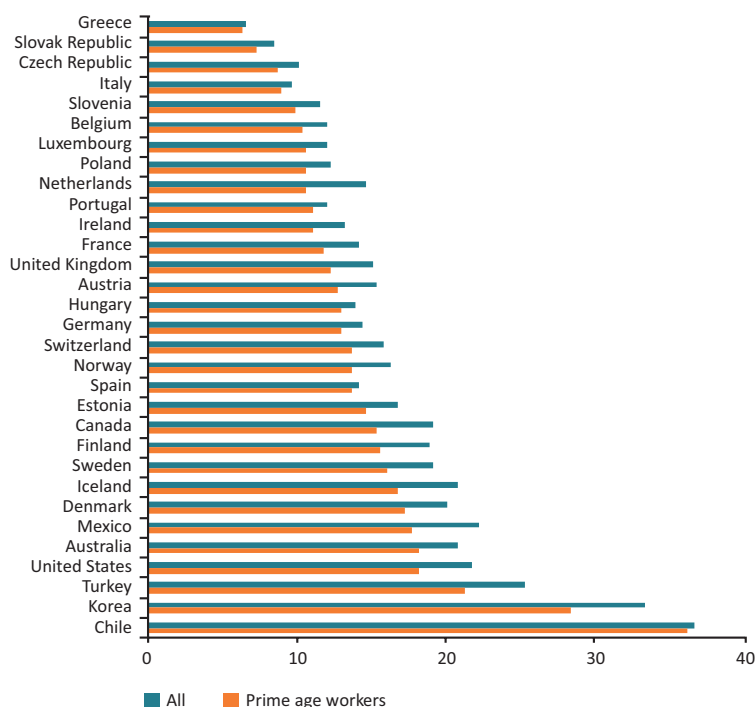
95 Stephen Overell, Thomas Mills, Sam Roberts, Rohit Lekhi, and Ricardo Blaug, The Employment relationship and the quality of work, The Good Work Commission, The Work Foundation, 2010

96 Francis Green, Alan Felstead, Duncan Gallie, and Hande Inanc, Job-related Well-being in Britain – First Findings from the Skills and Employment Survey 2012

97 OECD, OECD Employment Outlook, 2014

98 It is true that the UK does relatively bad on the OECD 'labour market security' index, but this metric is a little misleadingly named – it is based to a large extent on the generosity of unemployment benefits.

99 Kathryn Ray, Paul Sissons, Katy Jones and Sandra Vegeris, Employment, Pay and Poverty: Evidence and policy review, Joseph Rowntree Foundation, 2014

Figure 26: Incidence of less than 12 month job tenure (OECD)

If you look at the incidence of only short terms jobs, the UK is around the middle of the pack. The UK has one of the highest proportions of permanent contracts in the world, having largely avoided the development of a two track labour market that is currently scarring many Eurozone countries

- **The increase in self-employment is mostly a good news story.** Self-employment is at its highest level for more than forty years, with roughly 15% of the workforce or 4.5 million Britons in 2014 working for themselves.¹⁰⁰ While some of this is down to the recession, the increase in self-employment started before the financial crisis, and the composition of those who choose self-employment has not significantly changed.¹⁰¹ The combination of changing tastes as the population ages and the power of new technology is making more flexible working easier, enabling new ‘portfolio careers’, home entrepreneurs and longer careers. A considerable proportion of the recent increase in self-employment came from those 65+ choosing to work longer beyond the state pension age. The number of employees who also freelance on the side has increased 25% since 2005.

This trend has not been costless: the Resolution Foundation estimates that since 2006-7 weekly earnings are down 20% for the self-employed, compared to a 6% fall for those employed by someone.¹⁰² Nevertheless, despite the lower wages, the majority of the self-employed themselves claim to prefer it. A survey by Ipsos MORI of the self-employed finds that 66% of the self-employment originally chose it because of personal preference, and that taking everything into account 79% would still prefer to be self-employed against just 16% who want a boss.

100 ONS, Self-Employed

101 Conor D’Arcy and Laura Gardiner, Just the job – or a working compromise? The changing nature of self-employment in the UK, Resolution Foundation, 2014

102 Conor D’Arcy and Laura Gardiner, Just the job – or a working compromise? The changing nature of self-employment in the UK, Resolution Foundation, 2014

- **The exploitation of zero hour contracts only takes place in a small minority of cases.** While it is hard to get precise and consistent data on their use, zero hour contracts remain a tiny minority and no more than a few percent of the workforce. Around a quarter of those on zero hour contracts are full time students and 43% are in the top three occupational groups of knowledge workers. More than 80% are not looking for another job.

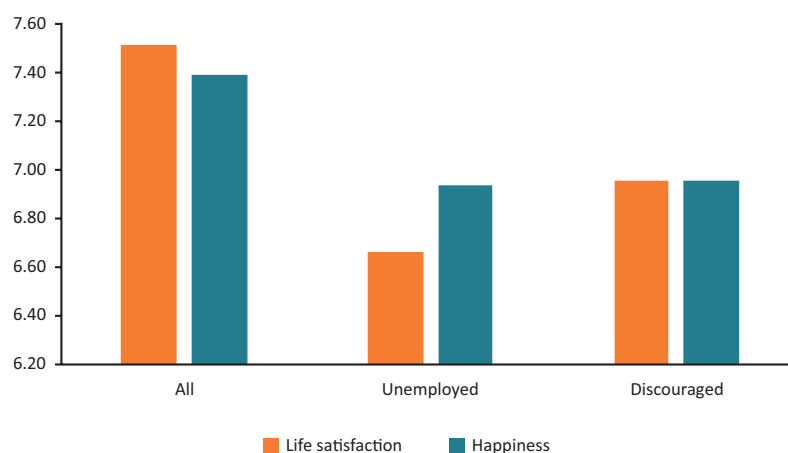
The traditional defence of zero hour contracts is that they allow greater flexibility for both employer and employee, lowering the risk of taking on new staff while making it easier to retain institutional knowledge by keeping on staff longer. Survey data for the CIPD suggests that, for the most part, they are succeeding in this role. 47% of zero hours workers report being satisfied having no contracted hours, compared to 27% saying they are dissatisfied. 52% of zero hours don't want to work any more hours, while 80% report never being penalised for not being available for work. Just 9% report being on an exclusivity contract. There is no difference in job satisfaction between those on zero hour contracts and those who are not.¹⁰³

While the quality of jobs don't seem to be getting any worse, it would be silly to deny that some jobs are much better than others.

That said, markets are surprisingly good at compensating workers for unpleasant work with higher wages, or lowering the wages of pleasant work. There is a reason why 'starving artist' is a cliché. One estimate found that 2% of US GDP or 5% of its wages goes towards paying higher wages to American workers undertaking more hazardous occupations.¹⁰⁴ A recent twin study found that when you properly control for differences in human capital, workers earn more for boring and physically demanding work.¹⁰⁵

By contrast, heavy handed labour regulation in one area might simply lead employers to cutting back elsewhere – or worse, cutting back on the job altogether. No matter how lousy your job is, it is better than unemployment. Average self-reported life satisfaction is higher for 87% of careers than that reported for discouraged workers, and is higher in 97% of careers than being unemployed.

Figure 27: Happiness and life satisfaction (1–10, ONS)



103 CIPD, Zero-hours contracts Myth and Reality, 2013

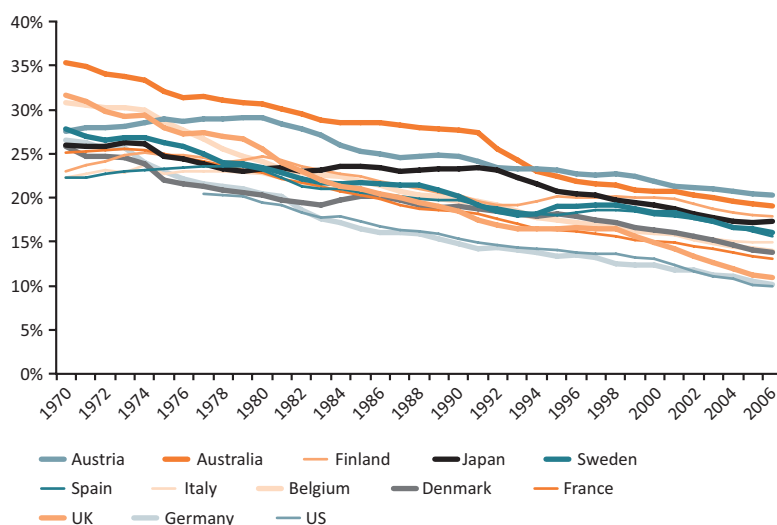
104 W. Kip Viscusi, Job Safety, The Concise Encyclopedia of Economics, <http://www.econlib.org/library/Enc/JobSafety.html>

105 Petri Böckerman, Pekka Ilmakunnas, and Jari Vainiomäki, Using Twins to Resolve the Twin Problem of Having a Bad Job and a Low Wage, 2014

Industrial Policy won't bring back displaced routine jobs in manufacturing or clerical work.

Manufacturing has been in long term decline in every major economy as technology increases productivity and consumers choose to spend greater proportions of their incomes on services. Over half the fall seen since 1980 is explained by customers choosing to spend less of their income on manufactured goods, rather than any trade or technology change. Between 1980 and 2008, just 13% of the increase in real incomes went on manufactured goods.¹⁰⁶ In practice, it is stretching plausibility to believe any Government actually could change the structure and revealed comparative advantage of the British economy in services. The record of post war British Industrial Policy was far from an encouraging one. The creation of cartels, national champions, industrial subsidies and nationalisations did little to turn Britain into a manufacturing powerhouse, with their main effect being to limit competition and productivity, accelerating Britain's relative decline. Industrial Policy could not make the container revolution in shipping go away, or halt Britain's shift from the centre of a world empire to its joining of the European Economic Community with its already strong manufacturing hub.

Figure 28: Number of persons engaged in manufacturing (% of total, EUKLEMS 2007)



Between 1977 and 2006, manufacturing's share of the total workforce shrunk by 11% in the US and 12% in Germany. Even if Britain could turn itself into Germany, this would still only reverse half the decline in manufacturing employment seen since 1980. Neither is it clear that this would be a good deal. In the decade before the financial crisis, median household income grew 40% faster in Britain than in Germany.¹⁰⁷ After a decade of the gap rapidly closing, the incidence of relatively low paid workers in Germany is now not much below that seen in Britain.

None of this is to say to that Britain couldn't develop new manufacturing strengths and industries. (We still, after all, have many farmers.) Britain is already doing very well in many areas of high end production industries such

106 Stephen Broadberry and Tim Leunig, *The impact of Government policies on UK manufacturing since 1945*, 2013

107 Eurostat, Median equivalised net income

as aerospace, industrial chemistry, cars, or oil and gas extraction. It is not hard to imagine the expansion and development of new industries in the future, from new energy supplies to robots making ‘on-shoring’ affordable. If planning legislation was to be loosened, a surge in housing building could provide many new middle jobs.

However, it is unlikely to reverse the long term trend away from manufacturing industries towards services. Less flexible labour markets and regulation can slow down the process of structural change, but, as Britain found in the post war period, often make the eventual adjustment even worse.

Trying to defy or turn the economic tide ultimately risks hurting the underlying competitiveness of your economy and reducing the number of people in work. Since at least the mid-1990s, Anglo-Saxon countries like the US, UK and Canada have seen lower levels of unemployment than continental economies like France, Germany or Italy.¹⁰⁸

On the face of it, the Nordic countries have done better at maintaining high employment and strong labour regulation, but even this can be overstated. Sweden, for example, saw almost no net job creation in the private sector over the second half of the twentieth century, with the extra one million added to its working-age population simply absorbed by the public sector. Neither was there any net job creation in the years running up to the financial crisis.¹⁰⁹

Higher marginal taxes at the very top won’t help in increasing incomes at the bottom.

Should we tax the wages of the highest earners more?

Even if the ultra-wealthy have gained their incomes solely through talent and hard work, they are still the recipient of massive luck in their genes and upbringing. Given they already have more money than they could ever use, most must work for satisfaction of the job itself or status competition rather than their absolute level of income.

The theoretical argument over the tax rates that maximise income remains, inevitably, controversial. Just as with the Minimum Wage, nobody doubts that at some point an ever higher rate proves self-defeating, but the specific point where the Laffer curve bends remains open to fierce debate. At the upper end, assuming away tax loopholes, minimal tax avoidance and little long term impact on growth or behaviour, Diamond and Saez (2011) argue that the revenue maximising rate for the US could be as high as 80%.¹¹⁰ Using more grounded estimates, in 2012 the OBR gave a central estimate that the revenue maximising rate for Income Tax was 48% – although the IFS pointed out under their model there was a one in three chance that the maximising rate was less than 30% or more than 75%.¹¹¹

Putting aside the competing academic debates around elasticities, the practical reality is that global tax competition seems to be driving world marginal tax rates down, with Britain the noticeable exception. Even taking into account the fall back to 45p, since 2000 only Portugal has increased its top income rate more than Britain. Across the OECD,¹¹² the average fall has been 3.3 percentage points.

There is likely to be limited room to increase income taxation at the very top in the UK. Around 30% of Income Tax revenue already comes from the top 1% of earners,¹¹³ with the top 0.01% contributing the equivalent of the bottom nine million.¹¹⁴ It is not impossible to increase taxes overall, but the future tax system

108 IMF, World Economic Outlook, October 2014

109 Steven J. Davis and Magnus Henrekson, Economic Performance and Work Activity in Sweden after the Crisis of the early 1990s, 2006

110 Peter Diamond and Emmanuel Saez, The Case for a Progressive Tax: From Basic Research to Policy Recommendations, 2011

111 James Browne, The 50p income tax rate, Institute for Fiscal Studies, Post Budget Briefing, 2012

112 OECD, Personal income tax & employee social security contributions (All-in rate)

113 Matthew Holehouse, UK tax system is ‘punishing success’, The Telegraph, 5th February 2014

114 Robert Mendick and Matthew Holehouse, How top 3,000 earners pay more tax than bottom 9 million, The Telegraph, 15 November 2014

is likely to have to be based more on consumption, taxing externalities and fixed goods such as land.

The impacts of globalisation and tax competition are likely to be felt most keenly at the top, with superstars the most mobile workers of all. As the IFS has warned, “the world is more mobile than it used to be... if you push [rich people] too far and they emigrate then you lose revenue.”¹¹⁵ France has already had to promise to reverse its experiment with higher marginal tax rates after seeing a surge in exiles.¹¹⁶

Besides its impact on revenue, pushing away superstars is unlikely to be good for the long term growth prospects of the economy. World hubs depend on their ability to maintain native and attract foreign talent. Silicon Valley would not be Silicon Valley without Intel’s Andy Grove (Hungary), Google’s Sergey Brin (Russia), Microsoft’s Satya Nadella (India), Apple’s Jonathan Ives (UK) or Tesla’s Elon Musk (South Africa). Just under half of the richest financiers in Britain are foreign born.¹¹⁷ Driving away the 1% is unlikely to be in the long term interests of either growth or ordinary workers.

115 Matthew Holehouse, UK tax system is ‘punishing success’, The Telegraph, 5th February 2014

116 Anne Penketh, French say au revoir to France: Over two million French people now live abroad, and most are crossing the channel and heading to London, The Independent, 10th October 2014

117 PRNewswire, Nearly Half Of UK’s Wealthiest Financiers Are Foreign Born, June 17 2013

5

A Free Market Approach to Inclusive Growth

How do we combine growth and broadly shared prosperity?

In the long run, the best way to increase wages, income and living standards for everyone is to continue to improve the productivity of the economy through technology and trade.

A significant proportion of household expenditure, especially for those at the bottom, goes on markets where prices are artificially inflated by government intervention and regulation, such as housing, transport, childcare and energy. In the short term, the best way to sustainably lower the cost of living is to build far more houses, deliver more efficient subsidies for renewable energy and more competitive markets, everywhere.

However, disruptive growth by its very nature creates in the short term losers as well as winners. It is not good enough to either ignore the problems this creates – or to alternatively pretend that trade-offs do not exist. It is much easier to get outraged by supposed exploitation or unfairness at the top, than figure out how to improve incomes at the bottom. Governments can't always turn the economic tide – but that doesn't mean they are powerless.

Here are three big ideas for the direction a future Government could take:

- **Everybody in full-time work should receive a Living Income**
- **Everyone should have a second chance to find a new career**
- **Everyone should have a stake in the growth of the economy**

Everybody in full-time work should receive a Living Income

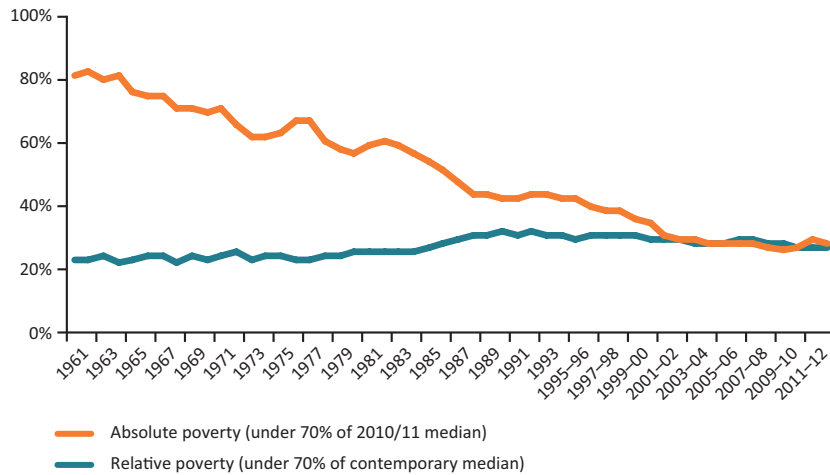
If you look at poverty in absolute terms, it has been declining steadily for over 150 years. Innovation in markets raised the productivity of workers, while competition between employers forced them to pass on the benefits in higher wages. Growth drives higher tax revenues, which in turn allows more generous benefits for the poor.

In 2013, the Living Wage rate was set at £7.65 for those living outside London – and around 12% of full time workers earned less than this. By contrast, if we had run the same calculation in 1975, two thirds of full time workers would have earned less than the 2013 amount in real terms.

However if we really are entering a new phase of automation in which even some of the most basic jobs can be replaced – remember Boris the dishwashing robot – many worry that the relationship between productivity and pay

will no longer deliver a good enough standard of living for modern tastes. Equally, if technology undermines the market value of low skilled work, all a higher Minimum Wage will do is further accelerate automation and increase unemployment.

Figure 29: Relative vs absolute poverty over time (IFS)



In response to this fear, many have argued that our welfare system should move towards a Universal Basic Income, or the more or less equivalent Negative Income Tax. Everyone should be given an unconditional cash grant, giving them the breathing room in the event of unemployment to retrain, intern or ultimately even just do volunteer work if there really is no suitable work.

While there are attractive elements to this vision, we are currently a long, long way from a world in which there are literally no jobs. Initial experiments in America between 1968 and 1980 confirmed the intuition that handing out unconditional income lowers the incentive to find work.¹¹⁸ By contrast, incorporating work requirements into the welfare system has been shown repeatedly to get people off welfare. In America, a series of 31 randomised field trials in the early 1990s found that mandatory work requirements worked far better than other potential welfare policy reforms. Nine out of the thirteen experiments with mandatory work requirements saw significant drops in welfare caseloads, and those people in turn largely ended up in employment with no drops in income.¹¹⁹

The ideal tax and system would combine the simplicity and safety net of a basic income, strict but fair conditionality and full integration with the tax system. The good news is that this is more or less the way the current tax and welfare system is evolving. In the very long run, our goal should be to align the thresholds for Income Tax, Employer National Insurance, Employee National Insurance and the work allowance for Universal Credit. This would effectively turn our current system into a Negative Income Tax with work requirements – which in the case automation does surprise on the upside, could easily be relaxed.

This, however, is a project that could easily take decades given its complexity. While the current system is delivering strong growth in median incomes, it is doing less well for those right at the bottom. Ensuring that everyone in a full-time

118 Jim Manzi, Against the Negative Income Tax, National Review Online, February 15 2011

119 Jim Manzi, Uncontrolled: The Surprising Payoff of Trial-and-Error for Business, Politics and Society, 2012

job receives enough for an adequate standard of living would go a long way to ease over the changes disruptive technology might bring.

Once the economy recovers, the Government should set a long term aspiration that everyone in full term work should receive a Living Income, effectively bringing an end to in-work poverty. There is no perfect definition of being poor. However, the Minimum Income Standard (MIS) – setting out what the public believes to be the minimum level of income necessary to achieve an ‘adequate’ standard of living – is as good a definition as any for a rich, developed country. For a single working age adult without children the MIS is currently set at around £270 a week.¹²⁰

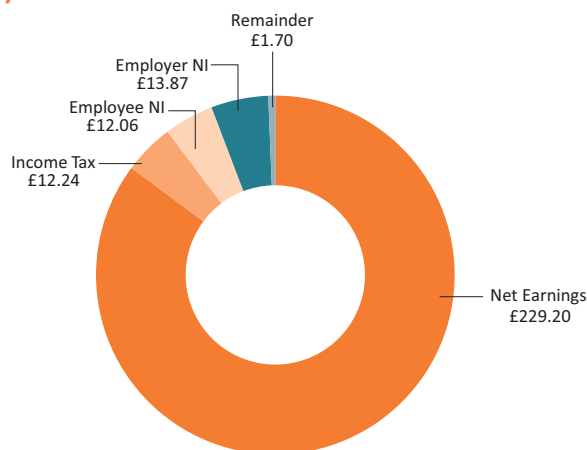
What really matters for living standards is net income after taxes and welfare transfers, rather than the market wage alone. However, at present, a full-time worker on the Minimum Wage after taxes and transfers still only receives around 75% of the MIS.¹²¹ Altogether, around a quarter of full-time employees are currently paid below the MIS level.

While not a project that could be completed in one or two years – especially given the state of the public finances – ensuring every worker received a Living Income would be realistically achievable by the middle of the next decade. In the intermediate years, the Government should monitor its progress towards the aspiration by annually releasing official statistics on the proportion of full time workers receiving less than a Living Income post tax and benefits.

One approach to increasing the number of workers achieving a Living Income would be through more companies paying the Living Wage. However, as previously discussed, more than half the benefit of a Living Wage would go to Treasury rather than higher living standards, while a compulsory Living Wage would give the UK one of the highest Minimum Wages for any advanced country.

However, as Tim Worstall and the Adam Smith Institute have long pointed out, the difference between the Minimum Wage and the Minimum Income Standard is almost entirely due to the taxes charged by government on work. A full-time worker (39 hours) on the Minimum Wage (£6.50) currently earns £229.20 a week after tax, around £40 short of the MIS. However, they also pay just under £40 in taxes on employment: £12.24 in Income Tax, £12.06 in employee NI and £13.87 in employer NI.

Figure 30: Weekly Minimum Wage Worker (39 hr) compared to MIS (£269)



¹²⁰ Abigail Davis, Donald Hirsch and Matt Padley, A Minimum Income Standard for the UK in 2014, Joseph Rowntree Foundation, 2014

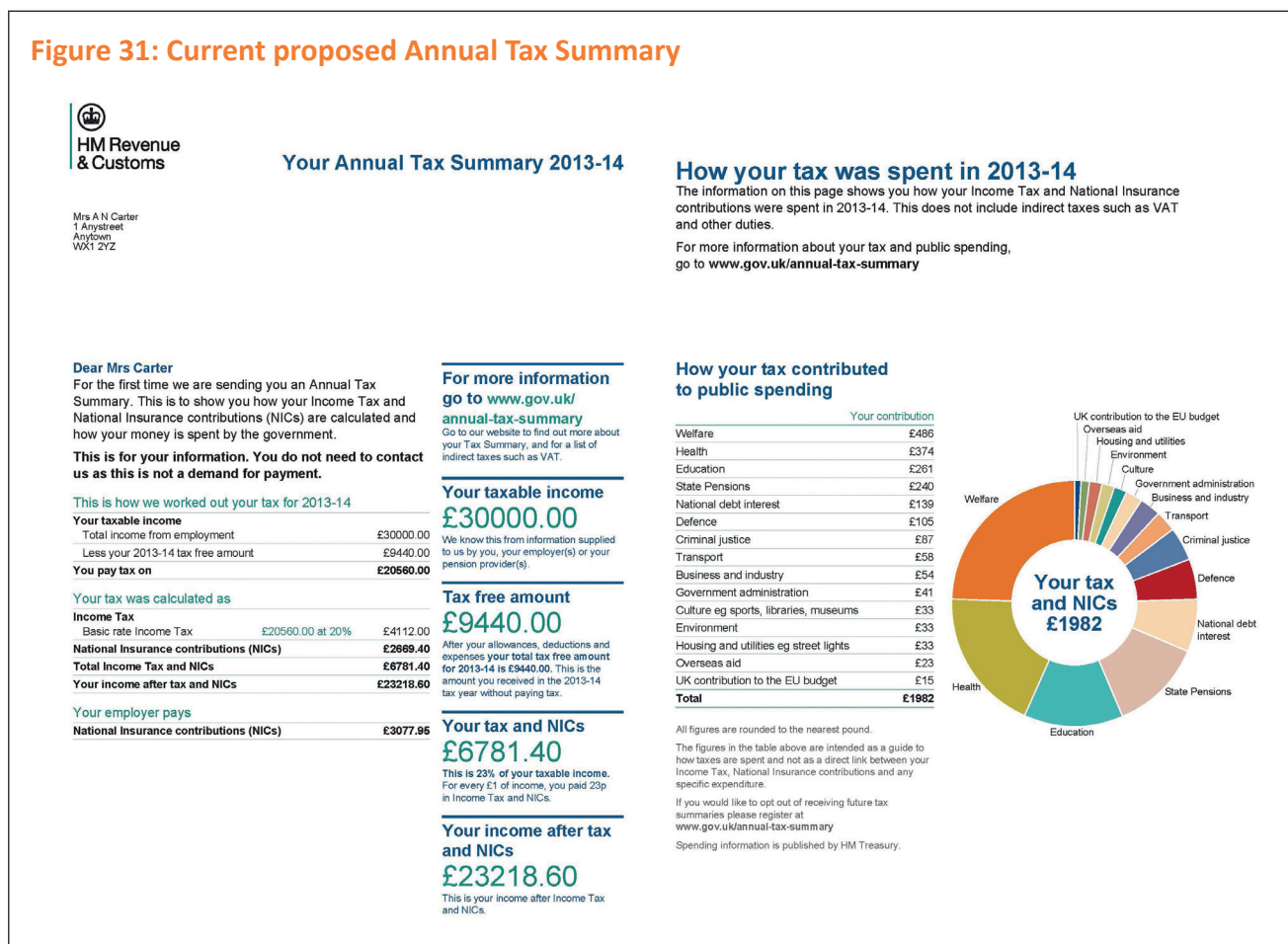
¹²¹ Abigail Davis, Donald Hirsch and Matt Padley, A Minimum Income Standard for the UK in 2014, Joseph Rowntree Foundation, 2014

The most straight forward way to ensure every full time worker earned a Living Income would be to align the Income Tax and National Insurance thresholds at the annual equivalent of the Minimum Wage. If you did that today, someone on a full time Minimum Wage could expect to see their annual after tax income increase from £12,000 to £14,000. It would in effect convert the current Minimum Wage into a Living Wage. After the hole in the public finances is closed, the Government could gradually close the gap between thresholds, with an aim of unifying them by around 2025.

Both the Conservatives and the Liberal Democrats have committed to raising the Income Tax threshold to £12,500 by 2020. However, they have so far made no pledge for National Insurance thresholds which come in much lower – at the equivalent of an annual income of around £8,000 today. Furthermore, their pledges aren't indexed to either increases in inflation or wages. While the annual equivalent of the Minimum Wage today is £13,182, this number is likely to be considerably higher by 2020.

The new annual tax statements offer an opportunity to make more visible the net impact of tax changes. Each tax statement should clearly show not just the tax paid in year, but what you would have paid without changes in tax policy. Workers should be able to see year on year what they have gained from both to changes in tax and public spending.

Figure 31: Current proposed Annual Tax Summary



Furthermore, the current structure is misleading, and is likely to reinforce the impression that employer NICs don't ultimately come out of wages. Employer NICs should be grouped with Income Tax and NICs in a single section on taxes on income. It is true that some of the cost of employer NICs is born out of employer profits rather than wages – but the same is equally true for employee NICs or, for that matter, Income Tax.

There are multiple ways the new Living Income could be paid for:

- **Growing government spending from 2020-25 slower than growth in the economy as a whole once the economy is recovered and the deficit closed.** Given uncertainty about the future, it is impossible to perfectly cost a commitment a decade ahead of time. However as a rough approximation, according to the HMRC Ready Reckoner, taking workers on the Minimum Wage completely out of tax in 2015/16 would cost around 2% of GDP. This is not a small commitment by any means, but it would only be around a quarter of the size of the current fiscal consolidation.

Growing Total Managed Expenditure at around 1.1% in real terms a year from 2019-20 to 2025-26 would allow the Government to afford the tax changes. Under the current fiscal consolidation, total public spending has been cut on average by 0.6% in real terms.

Funding the change entirely through spending restraint would help political buy in and ensure that the benefits go to the entire bottom 90% of the population who have seen their incomes grow slower than the top. Allowing for the higher costs imposed by demographic changes, this is roughly equal to protecting all departmental spending in real terms, but not increasing it faster. Under the current Treasury baseline scoring conventions, this would represent the default with no positive or negative policy action.

- **Lower the target threshold through a higher Universal Credit work allowance.** The tax credit system has some key advantages over the tax system: taking into account the income of other household members, and being inherently much more tightly focussed on those in poverty. A significant raise of the work allowance, the point at which benefits start to get tapered away, or alternatively a shallower slope for the taper itself, would focus more income on the low paid, lowering the level of wage income needed to enjoy an overall Living Income. (It would also ensure that they actually gain the benefit from changes in the tax threshold rather than seeing it clawed back through the tax credits system).

By bringing down the target wage level, it would significantly reduce the scale and cost of the tax threshold changes. Furthermore, it would reduce the pressure on the Minimum Wage to support living standards on its own, allowing us to tilt the inevitable trade off in setting it more towards maximising employment.

However, in the short to medium term you would not want to rely on the tax credits system alone to increase the incomes of the low paid. Universal Credits lacks the comprehensive nature of the tax system, and raising benefits too high risks hurting work incentives. While tax credits mostly seem to go to the worker rather than employer, there is also a risk that raising them too fast could see businesses just cutting wages in response.

- **Make the policy cost neutral by adjusting other tax rates.** Productivity in the public sector is inherently difficult to measure. However, as best as we

can tell, over the long term it has systematically lagged behind the private sector. In order to retain the right staff however, public wages have to remain competitive with private levels, creating a long term tendency for costs to go up even if output is flat (“Baumol cost disease”).

The first best response to this is to double down efforts to increase efficiency and reform in the public sector. There are some signs already that this is working – after being basically flat for the thirteen years between 1997 and 2010, measured public sector productivity has increased 3.7% since 2010.¹²² Furthermore, if we really are on the verge of acceleration in automation this opens the possibility for a revolution in efficiency in the public just as much as private sectors.

Nevertheless, in practice, even protecting public services in real terms would create a serious ongoing challenge, especially given the inevitably growing expectations of the public. While maintaining the target of a Living Income for every full-time worker, we could lower the net cost of the policy package by gradually adjusting one of the other main tax rates simultaneously with the threshold changes.

In principle, this would maintain the principle of the policy, with every full-time worker earned a Living Income, while ensuring that nobody in the middle was worse off. However, it would also be potentially extremely complex, ease the pressure for further reform of the public service and deliver much smaller benefits to ordinary families. Given that the cost of government currently makes up around a third of the final incomes of the average household, increasing its efficiency is one of the most powerful ways to reduce the cost of living.

In reality, you would probably use a combination of all three approaches: raising the Universal Credit work allowance to lower the target Living Income tax threshold; passing on the benefits of continued efficiency and reform in government; selectively raising some taxes if further efficiency proves impossible. Given that nobody knows where the economy will be ten years in the future – we will be lucky to avoid another recession in the future – it is best to remain flexible over methods.

If the benefits of technology and trade continue to go disproportionately to the rich, that will have two important impacts on the public finances. Firstly, thanks to our progressive Income Tax system, it will see the government’s revenues increase – even without any deliberate charges to marginal rates. Secondly, the wave of new technologies will give us the chance to offer a leaner, more personalised and more efficient public sector.

Both will improve the government’s net fiscal position – and that offers us the chance to pass on the benefits in lower taxes and more generous benefits, creating a Living Income for everyone in full time work.

Offer everyone a second chance to find a new career

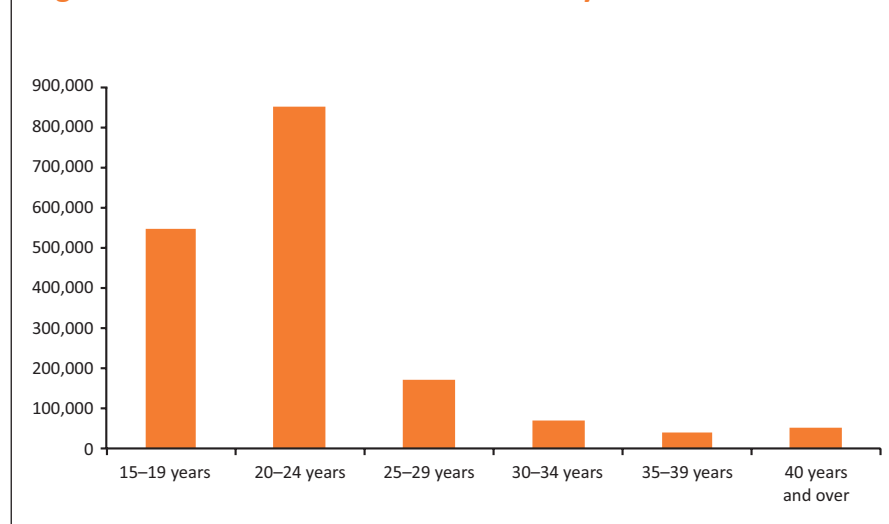
In an era when the majority of workers could expect to stay in the same industry until retirement, it made sense to concentrate the majority of their training and learning at the beginning of their career. If, however, the age of a job-for-life is truly over and many will need to find a second career, do we also need to allow for a second period of education?

Today, the vast majority of education spending is aimed at the under 25s. Under current policy, adults over 25 are only allowed free tuition for their first

122 ONS, Public Sector Productivity Estimates: Total Public Sector, 2012, 6th February 2015

Level 2 further education qualification or an income contingent loan for their first level 3 or level 4 qualification. (If they move on from further qualification to higher education, their level 3 loan is written off).

Figure 32: Full-time students in UK tertiary education



Simply expanding the current student loan system to include the over 25s is unlikely to be the best use of money:

- Around 45% of the cost of the current student loan system is subsidised for by the taxpayer. Depending on take up, massively expanding it could very expensive.¹²³ More importantly, this spending is likely to be highly regressive, with much of the subsidy going to those who are already relatively well off.
- Individuals at the middle rather than the beginning of their lives are more likely to have deep roots: families, houses and non-work lifestyles they don't want to leave behind. Even if it is local, a full-time three year qualification is probably both impractical and overkill.
- Crude unconditional increases in spending is a recipe for waste, low productivity and poor value qualifications:
 - The Wolf Review found that around 350,000 of the 1.8 million in a given 16 to 18 year old cohort “got little to no benefit from the post-16 education system”, completing low level vocational qualifications with no labour market value. The wage returns to NVQ level 2 qualifications are not only low – they are negative. At the university level, the returns some students are getting from newly created low value courses are questionable.
 - In the past, designing effective adult education has proved extremely difficult. In a recent study for DWP, after controlling for individual differences the effect of training on wages proved statistically insignificant.¹²⁴ Past Government schemes like Train to Gain or Skills for Life have shown nil to very modest gains. Out of 7 Random Control Trials and 27 Control Trials for literacy interventions, just 5 found a positive impact. For interventions in numeracy, just one study out of four Random Control Trials and 8 Control Trials found an impact.¹²⁵ A recent large scale randomised field experiment found adult education vouchers had no significant impact on earnings, education or subsequent employment. There

¹²³ University Alliance, H.E.L.P. UK A new Higher Education Loan Programme: adding to the debate on funding, 2014

¹²⁴ Sin Yi Cheung and Stephen McKay, Training and progression in the labour market, DWP, 2010

¹²⁵ Anna Vignoles, The returns to investments in adult skills in the UK, and the effectiveness of policies aimed at improving them, Institute of Education, 2009

was some evidence that they might moderately help low skilled workers with only vocational training, but even here the results lacked statistical significance.¹²⁶

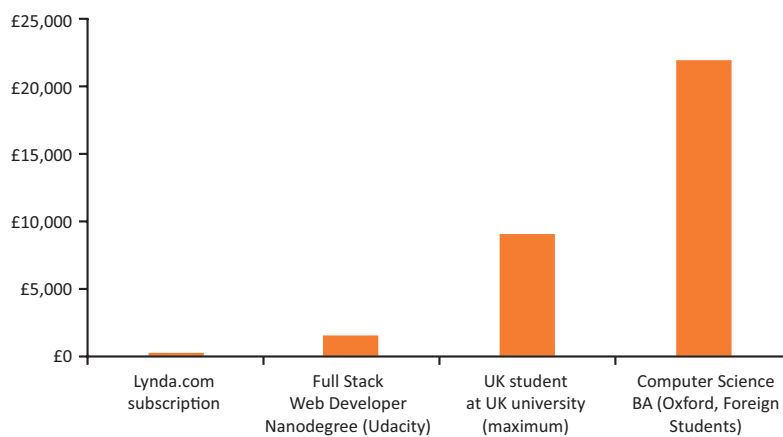
- In general, untargeted increases in education subsidies run the risk of increasing the proportion of education spending going to signalling and useless qualifications. This is both unfair and likely to be highly regressive.

More positively, the support needed for mid-life career transition is likely to take a much broader form than simply expanding a one-size-fits-all degree system.

The good news is that the same technological changes that are automating away jobs, are also likely to provide much cheaper routes to retraining. The potential of online education, or Massively Open Online Courses (MOOCs), has perhaps been overhyped, but they still remain a compelling opportunity: orders of magnitude cheaper than traditional college courses; no need to leave the house for universal, instant and repeatable online access to the world's best tutors; the potential for instant feedback and rapid evolution of pedagogy from analysing millions of students.

While they may not be for everyone or for every sort of retraining, MOOCs are still likely to play a major role in the future. Indeed, they are most likely to be effective in relatively concrete and specific areas of vocational training, with some of the early trailblazers such as Udacity already pivoting to work alongside tech firms like Google and Salesforce to develop market valued qualifications.

Figure 33: Annual tuition cost of learning programming/ computer science (£)



More broadly, any type of formal education, online or off, may not be what is needed in many cases to enable career transition.

For many careers, the best form of learning is on-the-job and the easiest way to improve your labour market value can be to move location, intern, and work your way up. Past a young age, the costs of moving location, building up a speculative portfolio or working as an Intern or Apprenticeship becomes hard to afford. This is especially true for those already with a low savings cushion. On the other hand, simply offering an unqualified loan for career transition runs the risk of high deadweight cost – in effect, offering a fully paid up second gap year on the taxpayer.

The best means of ensuring high value qualifications, reducing deadweight and maximising fit to personal needs is ensuring individuals have some skin in

126 Guido Schwerdt, Dolores Messer, Ludger Woessmann and Stefan C. Wolter, Effects of Adult Education Vouchers on the Labor Market: Evidence from a Randomized Field Experiment, 2011

the game. Individuals should have both choice and financial responsibility in choosing the support and retraining they need.

At the age of eighteen, every individual should be given an online Lifelong Learning Account.¹²⁷ This would act as the platform, portal and clearing house for other types of financial support including loans, vouchers, financial aid, transfers from savings, matching funds and scholarships. As a first step, the current student loan system could be integrated into and extended through this system.

What sorts of products could be offered through this platform?

- **The account should act as a gateway into Policy Exchange's previously proposed MyFund personal welfare accounts, allowing individuals to use their own savings to fund retraining.** In our 2014 report *Making Contributions Count* we proposed diverting at least £250 from individuals National Insurance contributions into a new personal welfare account, which would pay out half the cost of the first six months of unemployment. Over the course of a working life, a normal working individual should comfortably build up a fund worth over £10,000. Subject to keeping the equivalent of six month's benefits payments in their account – which would take only five years of contributions to build up – individuals should be able to draw on this resource to fund retraining. As this is their own money, with any surplus at the end of working life getting added to pensions, there would be strong incentives for individuals to spend the money well.
- **The Government should use the portal to pilot other interventions in retraining, adult education and career transition.** There could be pilots of more targeted vouchers for adult education, and allow third parties such as charities and Work Programme providers to offer their own programmes, matching funding and scholarships. Not every programme need be strictly focussed on formal education. The American Enterprise Institute has suggested the idea of targeted work relocation vouchers for the long-term unemployed in areas of high unemployment, which we could pilot in some of Britain's most deprived areas. We could even cautiously pilot the use of targeted grants, loans or financing from MyFund to pay for individuals to work for six months as an intern, apprentice or building up their portfolio as they transition between careers.
- **Finally, every person in Britain should have instant, unlimited and effectively free access to accredited MOOCs, enabling a true culture of lifelong learning and allowing anybody with a computer to retrain in a digital career.** MOOCs are effectively so cheap that concerns over cost deadweight are much less worrying compared to the potential of universal, unmetred access. This could be paid for through a combination of an individual's MyFund account, Government deals with the largest providers and, where needed, simple subsidies.

Give everyone a stake in the growth of the economy

What if automation does accelerate, undermining the market value of labour and increasing the returns to capital.

It is easy to picture this as an oligarchic world, in which a few Silicon Valley titans own the software that will more or less by itself run our factories, drive

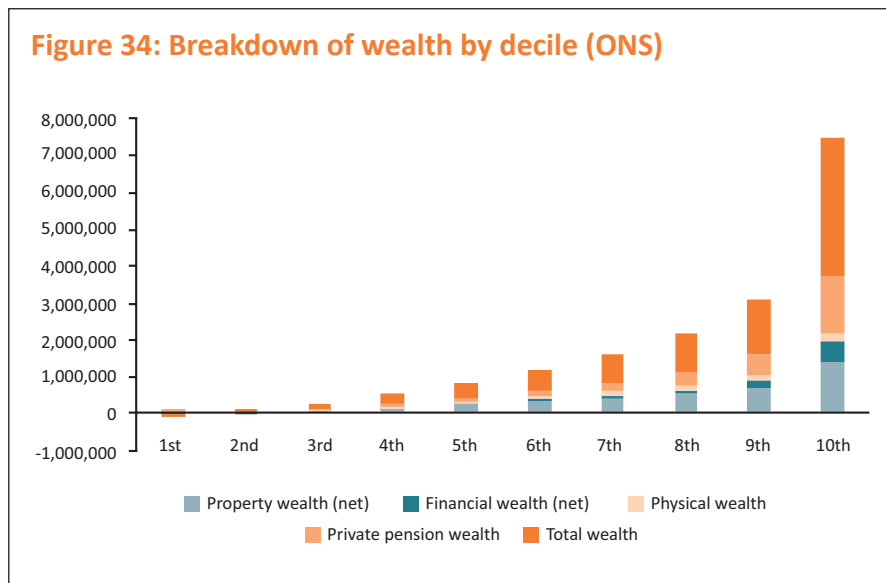
127 The National Careers Service already offers 'Lifelong Learning Accounts', but they are largely tools to manage your CV rather than the funding of education and retraining.

our vehicles and deliver our shopping – but it doesn't have to be. Anybody can gain a stake in the future success of a Google or Apple or Facebook at the cost of one of their shares.

In the long run, as Piketty's *Capital in the Twenty-First Century* reminded the economic world, or as Einstein apocryphally noted, compound interest is the most powerful force going. The Government should aim to significantly raise the level of savings in Britain, creating a capital owning democracy. The ownership of shares and discretionary saving should no longer be the province of the rich. Everybody should have a capital as well as labour stake in the future of our economy."

Achieving this aspiration will be a significant challenge. Household savings rates have recovered a little since their trough just before the recession, but they are still a long way from the 11-12% we see today in France or Germany, let alone the levels saved by much poorer Chinese households. Making matters worse, wealth is far more unequally distributed than income. The ratio between the 90% decile and the 10% decile is ten times larger for wealth than for income.¹²⁸ Around 11 million people are not saving enough to meet the recommended replacement income for retirement,¹²⁹ and almost a quarter of households own no private pension wealth at all.¹³⁰

Figure 34: Breakdown of wealth by decile (ONS)



There is no one reason for Britain's low savings rates. House prices, ageing, global trade patterns, hyperbolic discounting, crowding out from the public pension system and cultural change have all played their part. Neither is saving one uniform thing – the right investment vehicle and policy mix will depend on whether the primary purpose is retirement or investment or building wealth.

Equally, we will need to trial a range of measures building on current reforms to reach higher savings rates:

- In the UK, the 2014 Budget saw the Government introduce an expansive agenda to encourage saving: merging cash and share ISAs into a New ISA with a £15,000 limit; abolishing the 10p rate for savings; loosening the restrictions

128 ONS, *Wealth and Assets Survey 2010-12*, July 2014

129 James Barty, *Help to Save: Defusing the pensions time bomb*, Policy Exchange, 2014

130 ONS, *Wealth and Assets Survey 2010-12*, May 2014

on pension savings, including an end to the requirement to buy an annuity and charging the normal Income Tax rate on cash taken at retirement.

- Behavioural nudges, carefully chosen defaults and opt-out systems offer the chance to combat our instinctive hyperbolic discounting of the future. So far, auto-enrolment has seen around 5 million workers enrolled into a pensions scheme with only 10% choosing to opt out.¹³¹ Schemes in which employees committed in advance to allocate part of future salary rises towards their pension saw average savings rates increase from 3.5% to 13.6% over 40 months.¹³²
- Elsewhere, Policy Exchange has suggested the creation of personal welfare MyFund accounts; the introduction of Bonus ISAs to allow individuals to roll over unused ISA allowances; the phasing in of a compulsory 12% auto-enrolment rate.

Unfortunately, many of these reforms are only likely to have a limited impact on increasing savings among those on low incomes. Most people are a long way from the current annual ISA limit of £15,000. The introduction of the relatively generous Saver's Credit income tax credit in the US for low and moderate income families had relatively little impact.¹³³ Even nudges seem to be less powerful for low income households – one opt-out scheme in which tax refunds were by default allocated to US Savings Bond created no net effect on savings.¹³⁴

Other schemes aim to build a savings habit through the government either temporarily matching individual contributions or simply directly crediting the account. The last Government, for example, planned to introduce a national matching scheme in the Savings Gateway, and to ensure a minimal level of financial assets in the Child Trust Fund. Once pressures have eased on the public finances, there is a good case for experimenting further with more targeted versions of similar schemes. However, if not carefully designed matching schemes can be susceptible to high levels of deadweight, encouraging contributors to redirect existing rather than create new savings. The evaluations of the second round of pilots of the Savings Gateway found “no discernible evidence that [Savings Gateway accounts] led to higher overall ‘net worth’... this conclusion holds for lower and higher income groups alike.”¹³⁵

One final underutilised type of pro savings nudge, however, has a proven track record, including amongst low income households – and requires new no subsidy from the government.

Prize Linked Savings accounts offer the chance to randomly win a set cash prize alongside, or in some cases instead of, a fixed interest rate. They are in effect a combination of a lottery and a bond. In the past, they have been used in around 20 countries including Germany, Austria, Spain, Greece, Italy, Sweden, Switzerland and Japan.

There is a range of evidence for Prize Linked Savings accounts effectiveness at raising savings, including:

- A recent online experiment saw the creation of Prize Linked Accounts increase “total savings quite dramatically (on average by 12 percentage points), and that that the demand for the PLS account comes from reductions in lottery expenditures and current consumption.”¹³⁶

131 DWP, Automatic Enrolment evaluation report, 2014

132 Richard H. Thaler and Shlomo Benartzi, *Save More Tomorrow: Using Behavioral Economics to Increase Employee Saving*, 2004

133 Esther Duflo, William Gale, Jeffrey Liebman, Peter Orszag, and Emmanuel Saez, *Savings Incentives for Low- and Moderate-Income Families in the United States: Why is the Saver's Credit Not More Effective?*, 2007

134 Erin Todd Bronchetti, Thomas S. Dee, David B. Huffman, and Ellen Magenheimer, *When a Nudge Isn't Enough: Defaults and Saving among Low-Income Tax Filers*, 2013

135 Paul Harvey, Nick Pettigrew, Richard Madden, Carl Emmerson, Gemma Tetlow and Matthew Wakefield, *Final Evaluation of the Saving Gateway 2 Pilot: Main Report*, HMT / DfES, 2007

136 Kadir Atalay, Fayzan Bakhtiar, Stephen Cheung, and Robert Slonim, *Savings and prize-linked savings accounts*, 2014

- In South Africa, a PLS programme enrolled 750,000 participants in two years.¹³⁷
- The 2009 Save to Win project in Michigan created 11,600 new savings accounts and \$8.6 million deposits in 11 months. 56% of surveyed account holders said this was their first time regularly saving money, and 39% reported financial assets of less than \$5,000.¹³⁸

Furthermore, prize Linked Savings accounts already have a (very) long and significant track record in Britain.

Trying to pay off the debt from the Nine Years War in 1694, the Government offered 100,000 tickets at £10 each in the ‘Million Adventure.’ Each ticket offered a 6.15% annual return, and further annual cash prizes from £10 to £1000. The contemporary record suggests the programme was a significant success, with tens of thousands of investors, including those with relatively low incomes through syndicates.

More recently, Harold Wilson introduced the Premium Savings Bond in 1956 programme to create “Savings with a Thrill!” The programme proved an immediate success, with £5 million bought on the first day, and it still running today.

For each £1 invested, an investor is allocated a number, with investors able to hold up to £40,000 in Bonds. Each month, a draw is held offering the chance for one of two £1 million prizes, and a range of lower value prizes. Analysis of time series data seems to suggest that sales respond most to the size of the largest prize, despite this only providing 2% of the expected value of the return.¹³⁹ Across its history, more than 23 million people in Britain have invested more than £33 billion in Premium Bonds.¹⁴⁰ If you put to one side the richest households, Premium Bonds are owned by a larger proportion of households than stocks or shares.¹⁴¹

While the general principle of making savings more fun is worth building on, there is still a lot we could do to improve the current Premium Bonds model. The value of prizes paid out is relatively low – currently equal to around 1.35% – while it is possible for a modest saver to win nothing and see no returns on their savings at all.

Without further experimentation, it is difficult to say what size or frequency prizes would maximise the amount saved. Could we offer a low but steady interest rate to everyone – but then one or two large jackpot prizes on top of this? The one real conclusion from the literature so far on behavioural nudges is that very small and hard to predict changes can have significant impacts on eventual savings rates. Rather than seek to design a perfect model from scratch, we need much more experimentation.

The Government should pilot a new generation of Premium Bonds, combining a successful historical model with the latest behavioural ideas. A range of private sector banks and potentially non-profit institutions should be licenced to trial their own ideas for an initially restricted time period, experimenting with different minimum contributions, defaults, interest rates, frequency and sizes of prizes.

137 Peter Tufano, *Saving whilst Gambling: An Empirical Analysis of U.K. Premium Bonds*, 2008

138 Melissa Schettini Kearney, Peter Tufano, Jonathan Guryan, Erik Hurst, *Making Savers Winners: An Overview of Prize-linked Savings Products*, 2010

139 Peter Tufano, *Saving whilst Gambling: An Empirical Analysis of U.K. Premium Bonds*, 2008

140 Sebastian Lobe and Alexander Hölzl, *Why are British Premium Bonds so successful? The effect of saving with a thrill*, 2008

141 Peter Tufano, *Saving whilst Gambling: An Empirical Analysis of U.K. Premium Bonds*, 2008

