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The future of securing livelihoods: Policies, strategies and tools for better lives today and tomorrow

As private and public players at all levels examine our progress in moving people out of poverty, the time is right to explore if and how livelihoods have improved. What factors really determine livelihoods? Which issues will most affect them over the next 20 to 30 years as economic growth shifts from West to East, amid increasing global interdependence? And how can rising living standards across the globe be ensured and sustained?

Livelihoods are constantly at risk. Local and global crises, demographic shifts, climate change, new technologies and other challenges impact livelihoods in many ways. These challenges vary dramatically across countries, cultures and communities. Their impacts' complexity demands that relevant stakeholders from the public and private sectors, universities, nonprofits and the public join forces in a holistic way to design future strategies for securing sustainable livelihoods.

The recent financial and economic crisis, for example, affected livelihoods in a variety of ways and triggered more inequality and unemployment. Inequality further worsens the situation of people who already struggle because it disproportionately reduces their opportunities to make a living, and erodes their ability to cope with economic shocks.

As for unemployment, youth, in particular, struggle to find jobs and to earn resources to pay for their lives' core needs. Paradoxically, in parallel, firms in many industries and countries struggle to find the talent they need, and face skill shortages and mismatches. This is sparking new employer practices and thinking about the private sector's role in skills development. At the same time, many lack the entrepreneurial skills that can help spark job creation. Major changes are therefore required throughout education systems, from pre-kindergarten to college to workforce training, and will be crucial for the future of livelihoods.

Demographic shifts due to medical progress and fertility-rate fluctuations also pose significant challenges to societies. Pensions, for example, need to be rethought, particularly in wealthier countries, where people now live long after retirement, and

some less prosperous countries need to harness their still-growing working-age population to drive economic growth. With this backdrop, creating job opportunities for those who enter the workforce is essential. At the same time, social protection systems, including health insurance and retirement programs, are weak or nonexistent in low-income countries. These need to be strengthened, particularly for those whose livelihoods are at risk.

Climate change is also increasingly affecting livelihoods. Extreme weather events, such as floods and hurricanes, occur more often and with increased intensity. These events take lives; destroy crops, homes and roads; create health hazards and trigger mass migration. They also take a heavy toll on the sustainability of insurance systems. Longer term, biodiversity loss and rising sea levels may significantly reduce global economic growth and deeply transform our living conditions. Interestingly, climate change represents both a threat and an opportunity for livelihoods. Many sectors are joining forces to build sustainable economies and climate-resilient infrastructures.

To face such challenges, technology offers a host of opportunities and solutions for future livelihoods. Better access to and improved information and communication technologies, nanotechnology and biotechnology, as well as "green innovation", are but a few advances that could materially help livelihoods. Technology already helps prevent more environmental degradation and damage from natural disasters, playing a critical role in social areas, such as health. Over time technology will foster conditions for better and more-sustainable livelihoods. It remains unclear, nonetheless, whether technological trends will create or destroy jobs in the future, and the debate over whether innovation is slowing down or speeding up continues.

Global security represents a very different livelihood challenge. Since the end of the Cold War, the world has not experienced a major global conflict. Nevertheless, security concerns are mounting across the world, and these concerns

affect livelihoods. Local safety issues also weigh on livelihood development possibilities. Violence and crime are prevalent in many urban areas. Conflicts within societies, as evidenced by protests during the Arab Spring in the Middle East and elsewhere, are both a symptom and a trigger of livelihood disruption. Cyber-crime also affects the security of financial and intellectual assets. Finally, cyber-war risks raise the spectre of new security threats to critical infrastructures and lives.

Confronting the many challenges of future livelihoods and imagining opportunities for them is a massive, complex undertaking. Livelihood debates and solutions draw from many different policy areas and a vast number of stakeholders. So, by extension, when changes or reforms are required, strong resistance often follows. All too often, policy-makers are biased by short-term and personal vested interests, rather than long-term societal goals. Forging consensus and quick, coordinated action among national governments in such urgent areas as global warming, international financial regulation and cyber-crime remains, unfortunately, particularly challenging.

This special edition of *The Economist*, with the theme "Securing Livelihoods", features informative and provocative articles from recent editions of the magazine. It brings insights into the trends concerning global livelihoods, and asks provocative questions about some of the "pillars" that shape them, such as technology, demographics, jobs, pensions, poverty, inequality and climate change. The selected articles also help identify future challenges and opportunities, such as maintaining social protections—for example, pensions, coping with escalating health costs in ageing societies, creating sustainable jobs and responding to climate change.

These articles do not cover all angles of livelihoods and the challenges and opportunities that shape their sustainability. But we hope this publication will spark debate among participants brought together by the OECD Development Centre, the Economist Intelligence Unit and the Rockefeller Foundation at the Foundation's Bellagio Center in August 2014.

Exploring key trends and strategies affecting the future of livelihoods, and examining the complex interdependencies of the many factors that shape livelihoods in a systematic way will undoubtedly prove challenging. Identifying potential future scenarios with stories of systems and their interactions demands creativity, imagination, optimism and innovation. We hope the conversation and post-meeting publications will inform and inspire global, national and local debate about the strategies and policies that can secure and improve livelihoods today and in the coming decades.

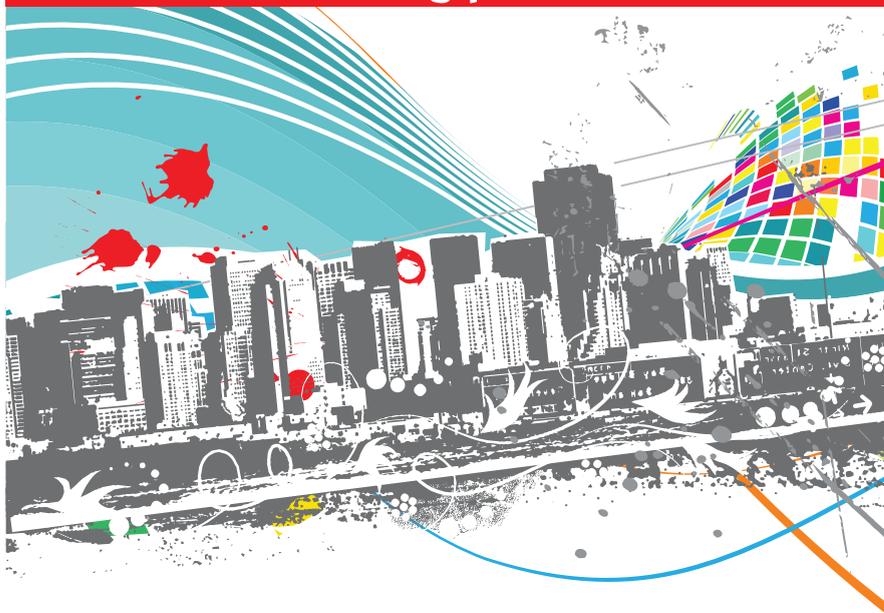
Together we hope to provide strategic guidance to public and private organisations, and the public, on how to address the coming challenges and to leverage opportunities to improve livelihoods across the globe. ■



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The future of jobs

The onrushing wave

Reprinted from The Economist, Jan 18th 2014

Previous technological innovation has always delivered more long-run employment, not less. But things can change

IN 1930, when the world was “suffering... from a bad attack of economic pessimism”, John Maynard Keynes wrote a broadly optimistic essay, “Economic Possibilities for our Grandchildren”. It imagined a middle way between revolution and stagnation that would leave the said grandchildren a great deal richer than their grandparents. But the path was not without dangers.

One of the worries Keynes admitted was a “new disease”: “technological unemployment... due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour.” His readers might not have heard of the problem, he suggested—but they were certain to hear a lot more about it in the years to come.

For the most part, they did not. Nowadays, the majority of economists confidently wave such worries away. By raising productivity, they argue, any automation which economises on the use of labour will increase incomes. That will generate demand for new products and services, which will in turn create new jobs for displaced workers. To think otherwise has meant being tarred a Luddite—the name taken by 19th-century textile workers who smashed the machines taking their jobs.

For much of the 20th century, those arguing that technology brought ever more jobs and prosperity looked to have the better of the debate. Real incomes in Britain scarcely doubled between the beginning of the common era and 1570. They then tripled from 1570 to 1875. And they more than tripled from 1875 to 1975.

Industrialisation did not end up eliminating the need for human workers. On the contrary, it created employment opportunities sufficient to soak up the 20th century’s exploding population. Keynes’s vision of everyone in the 2030s being a lot richer is largely achieved. His belief they would work just 15 hours or so a week has not come to pass.

When the sleeper wakes

Yet some now fear that a new era of automation enabled by ever more powerful and capable computers could work out differently. They start from the observation that, across the rich world, all is far from well in the world of work. The essence of what they see as a work crisis is that in rich countries the wages of the typical worker, adjusted for cost of living, are stagnant. In America the real wage has hardly budged over the past four decades. Even in places like Britain and Germany, where employment is touching new highs, wages have been flat for a decade. Recent research suggests that this is because substituting capital for labour through automation is increasingly attractive; as a result owners of capital have captured ever more of the world’s income since the 1980s, while the share going to labour has fallen.

At the same time, even in relatively egalitarian places like Sweden, inequality among the employed has risen sharply, with the share going to the highest earners soaring. For those not in the elite, argues David Graeber, an anthropologist at the London School of Economics, much of modern labour consists of stultifying “bullshit jobs”—low- and mid-level screen-sitting that serves simply to occupy workers for whom the economy no longer has much use. Keeping them employed, Mr

Graeber argues, is not an economic choice; it is something the ruling class does to keep control over the lives of others.

Be that as it may, drudgery may soon enough give way to frank unemployment. There is already a long-term trend towards lower levels of employment in some rich countries. The proportion of American adults participating in the labour force recently hit its lowest level since 1978, and although some of that is due to the effects of ageing, some is not. In a recent speech that was modelled in part on Keynes’s “Possibilities”, Larry Summers, a former American treasury secretary, looked at employment trends among American men between 25 and 54. In the 1960s only one in 20 of those men was not working. According to Mr Summers’s extrapolations, in ten years the number could be one in seven.

This is one indication, Mr Summers says, that technical change is increasingly taking the form of “capital that effectively substitutes for labour”. There may be a lot more for such capital to do in the near future. A 2013 paper by Carl Benedikt Frey and Michael Osborne, of the University of Oxford, argued that jobs are at high risk of being automated in 47% of the occupational categories into which work is customarily sorted. That includes accountancy, legal work, technical writing and a lot of other white-collar occupations.

Answering the question of whether such automation could lead to prolonged pain for workers means taking a close look at past experience, theory and technological trends. The picture suggested by this evidence is a complex one. It is also more worrying than many economists and politicians have been prepared to admit.

The lathe of heaven

Economists take the relationship between innovation and higher living standards for granted in part because they believe history justifies such a view. Industrialisation clearly led to enormous rises in incomes and living standards over the long run. Yet the road to riches was rockier than is often appreciated.

In 1500 an estimated 75% of the British labour force toiled in agriculture. By 1800 that figure had fallen to 35%. When the shift to manufacturing got under way during the 18th century it was overwhelmingly done at small scale, either within the home or in a small workshop; employment in a large factory ▶▶

was a rarity. By the end of the 19th century huge plants in massive industrial cities were the norm. The great shift was made possible by automation and steam engines.

Industrial firms combined human labour with big, expensive capital equipment. To maximise the output of that costly machinery, factory owners reorganised the processes of production. Workers were given one or a few repetitive tasks, often making components of finished products rather than whole pieces. Bosses imposed a tight schedule and strict worker discipline to keep up the productive pace. The Industrial Revolution was not simply a matter of replacing muscle with steam; it was a matter of reshaping jobs themselves into the sort of precisely defined components that steam-driven machinery needed—cogs in a factory system.

The way old jobs were done changed; new jobs were created. Joel Mokyr, an economic historian at Northwestern University in Illinois, argues that the more intricate machines, techniques and supply chains of the period all required careful tending. The workers who provided that care were well rewarded. As research by Lawrence Katz, of Harvard University, and Robert Margo, of Boston University, shows, employment in manufacturing “hollowed out”. As employment grew for highly skilled workers and unskilled workers, craft workers lost out. This was the loss to which the Luddites, understandably if not effectively, took exception.

With the low-skilled workers far more numerous, at least to begin with, the lot of the average worker during the early part of this great industrial and social upheaval was not a happy one. As Mr Mokyr notes, “life did not improve all that much between 1750 and 1850.” For 60 years, from 1770 to 1830, growth in British wages, adjusted for inflation, was imperceptible because productivity growth was restricted to a few industries. Not until the late 19th century, when the gains had spread across the whole economy, did wages at last perform in line with productivity (see chart 1).

Along with social reforms and new political movements that gave voice to the workers, this faster wage growth helped spread the benefits of industrialisation across wider segments of the population. New investments in education provided a supply of workers for the more skilled jobs that were by then being created in ever greater numbers. This shift continued into the 20th century as post-secondary education became increasingly common.

Claudia Goldin, an economist at Harvard University, and Mr Katz have written that workers were in a “race between education and technology” during this period, and for the most part they won. Even so, it was not until the “golden age” after the second world war that workers in the rich world secured real prosperity, and a large, property-owning middle class came to dominate politics. At the same time communism, a legacy of industrialisation’s harsh early era, kept hundreds of millions of people around the world in poverty, and the

effects of the imperialism driven by European industrialisation continued to be felt by billions.

The impacts of technological change take their time appearing. They also vary hugely from industry to industry. Although in many simple economic models technology pairs neatly with capital and labour to produce output, in practice technological changes do not affect all workers the same way. Some find that their skills are complementary to new technologies. Others find themselves out of work.

Take computers. In the early 20th century a “computer” was a worker, or a room of workers, doing mathematical calculations by hand, often with the end point of one person’s work the starting point for the next. The development of mechanical and electronic computing rendered these arrangements obsolete. But in time it greatly increased the productivity of those who used the new computers in their work.

Many other technical innovations had similar effects. New machinery displaced handicraft producers across numerous industries, from textiles to metalworking. At the same time it enabled vastly more output per person than craft producers could ever manage.

Player piano

For a task to be replaced by a machine, it helps a great deal if, like the work of human computers, it is already highly routine. Hence the demise of production-line jobs and some sorts of book-keeping, lost to the robot and the spreadsheet. Meanwhile work less easily broken down into a series of stereotyped tasks—whether rewarding, as the management of other workers and the teaching of toddlers can be, or more of a grind, like tidying and cleaning messy work places—has grown as a share of total employment.

But the “race” aspect of technological change means that such workers cannot rest on their pay packets. Firms are constantly experimenting with new technologies and production processes. Experimentation with different techniques and business models requires flexibility, which is one critical advantage of a human worker. Yet over time, as best practices are worked out and then codified,

it becomes easier to break production down into routine components, then automate those components as technology allows.

If, that is, automation makes sense. As David Autor, an economist at the Massachusetts Institute of Technology (MIT), points out in a 2013 paper, the mere fact that a job can be automated does not mean that it will be; relative costs also matter. When Nissan produces cars in Japan, he notes, it relies heavily on robots. At plants in India, by contrast, the firm relies more heavily on cheap local labour.

Even when machine capabilities are rapidly improving, it can make sense instead to seek out ever cheaper supplies of increasingly skilled labour. Thus since the 1980s (a time when, in America, the trend towards post-secondary education levelled off) workers there and elsewhere have found themselves facing increased competition from both machines and cheap emerging-market workers.

Such processes have steadily and relentlessly squeezed labour out of the manufacturing sector in most rich economies. The share of American employment in manufacturing has declined sharply since the 1950s, from almost 30% to less than 10%. At the same time, jobs in services soared, from less than 50% of employment to almost 70% (see chart 2). It was inevitable, therefore, that firms would start to apply the same experimentation and reorganisation to service industries.

A new wave of technological progress may dramatically accelerate this automation of brain-work. Evidence is mounting that rapid technological progress, which accounted for the long era of rapid productivity growth from the 19th century to the 1970s, is back. The sort of advances that allow people to put in their pocket a computer that is not only more powerful than any in the world 20 years ago, but also has far better software and far greater access to useful data, as well as to other people and machines, have implications for all sorts of work.

The case for a highly disruptive period of economic growth is made by Erik Brynjolfsson and Andrew McAfee, professors at MIT, in “The Second Machine Age”, a book to be published later this month. Like the first great era of industrialisation, they argue, it should deliver enormous benefits—but not without a period of disorienting and uncomfortable change. Their argument rests on an underappreciated aspect of the exponential growth in chip processing speed, memory capacity and other computer metrics: that the amount of progress computers will make in the next few years is always equal to the progress they have made since the very beginning. Mr Brynjolfsson and Mr McAfee reckon that the main bottleneck on innovation is the time it takes society to sort through the many combinations and permutations of new technologies and business models.

A startling progression of inventions seems to bear their thesis out. Ten years ago technologically minded economists pointed to driving cars in traffic as the sort of human accomplishment ▶▶



Bring on the personal trainers

Probability that computerisation will lead to job losses within the next two decades, 2013 (1=certain)

Job	Probability
Recreational therapists	0.003
Dentists	0.004
Athletic trainers	0.007
Clergy	0.008
Chemical engineers	0.02
Editors	0.06
Firefighters	0.17
Actors	0.37
Health technologists	0.40
Economists	0.43
Commercial pilots	0.55
Machinists	0.65
Word processors and typists	0.81
Real estate sales agents	0.86
Technical writers	0.89
Retail salespersons	0.92
Accountants and auditors	0.94
Telemarketers	0.99

Source: "The Future of Employment: How Susceptible are Jobs to Computerisation?" by C.Frey and M.Osborne (2013)

that computers were highly unlikely to master. Now Google cars are rolling round California driver-free no one doubts such mastery is possible, though the speed at which fully self-driving cars will come to market remains hard to guess.

Brave new world

Even after computers beat grandmasters at chess (once thought highly unlikely), nobody thought they could take on people at free-form games played in natural language. Then Watson, a pattern-recognising supercomputer developed by IBM, bested the best human competitors in America's popular and syntactically tricky general-knowledge quiz show "Jeopardy!" Versions of Watson are being marketed to firms across a range of industries to help with all sorts of pattern-recognition problems. Its acumen will grow, and its costs fall, as firms learn to harness its abilities.

The machines are not just cleverer, they also have access to far more data. The combination of big data and smart machines will take over some occupations wholesale; in others it will allow firms to do more with fewer workers. Text-mining programs will displace professional jobs in legal services. Biopsies will be analysed more efficiently by image-processing software than lab technicians. Accountants may follow travel agents and tellers into the unemployment line as tax software improves. Machines are already turning basic sports results and financial data into good-enough news stories.

Jobs that are not easily automated may still be transformed. New data-processing technology could break "cognitive" jobs down into smaller and smaller tasks. As well as

opening the way to eventual automation this could reduce the satisfaction from such work, just as the satisfaction of making things was reduced by deskilling and interchangeable parts in the 19th century. If such jobs persist, they may engage Mr Graeber's "bullshit" detector.

Being newly able to do brain work will not stop computers from doing ever more formerly manual labour; it will make them better at it. The designers of the latest generation of industrial robots talk about their creations as helping workers rather than replacing them; but there is little doubt that the technology will be able to do a bit of both—probably more than a bit. A taxi driver will be a rarity in many places by the 2030s or 2040s. That sounds like bad news for journalists who rely on that most reliable source of local knowledge and prejudice—but will there be many journalists left to care? Will there be airline pilots? Or traffic cops? Or soldiers?

There will still be jobs. Even Mr Frey and Mr Osborne, whose research speaks of 47% of job categories being open to automation within two decades, accept that some jobs—especially those currently associated with high levels of education and high wages—will survive (see table). Tyler Cowen, an economist at George Mason University and a much-read blogger, writes in his most recent book, "Average is Over", that rich economies seem to be bifurcating into a small group of workers with skills highly complementary with machine intelligence, for whom he has high hopes, and the rest, for whom not so much.

And although Mr Brynjolfsson and Mr McAfee rightly point out that developing the business models which make the best use of new technologies will involve trial and error and human flexibility, it is also the case that the second machine age will make such trial and error easier. It will be shockingly easy to launch a startup, bring a new product to market and sell to billions of global consumers (see article). Those who create or invest in blockbuster ideas may earn unprecedented returns as a result.

In a forthcoming book Thomas Piketty, an economist at the Paris School of Economics, argues along similar lines that America may be pioneering a hyper-unequal economic model in which a top 1% of capital-owners and "supermanagers" grab a growing share of national income and accumulate an increasing concentration of national wealth. The rise of the middle-class—a 20th-century innovation—was a hugely important political and social development across the world. The squeezing out of that class could generate a more antagonistic, unstable and potentially dangerous politics.

The potential for dramatic change is clear. A future of widespread technological unemployment is harder for many to accept. Every great period of innovation has produced its share of labour-market doomsayers, but technological progress has never previously failed to generate new employment opportunities.

The productivity gains from future automation

will be real, even if they mostly accrue to the owners of the machines. Some will be spent on goods and services—golf instructors, household help and so on—and most of the rest invested in firms that are seeking to expand and presumably hire more labour. Though inequality could soar in such a world, unemployment would not necessarily spike. The current doldrum in wages may, like that of the early industrial era, be a temporary matter, with the good times about to roll (see chart 3).

These jobs may look distinctly different from those they replace. Just as past mechanisation freed, or forced, workers into jobs requiring more cognitive dexterity, leaps in machine intelligence could create space for people to specialise in more emotive occupations, as yet unsuited to machines: a world of artists and therapists, love counsellors and yoga instructors.

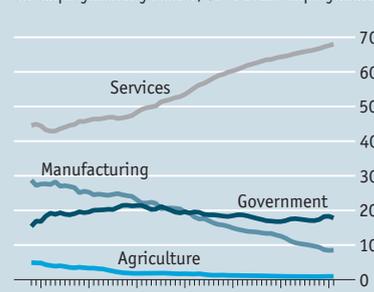
Such emotional and relational work could be as critical to the future as metal-bashing was in the past, even if it gets little respect at first. Cultural norms change slowly. Manufacturing jobs are still often treated as "better"—in some vague, non-pecuniary way—than paper-pushing is. To some 18th-century observers, working in the fields was inherently more noble than making gewgaws.

But though growth in areas of the economy that are not easily automated provides jobs, it does not necessarily help real wages. Mr Summers points out that prices of things-made-of-widgets have fallen remarkably in past decades; America's Bureau of Labour Statistics reckons that today you could get the equivalent of an early 1980s television for a twentieth of its then price, were it not that no televisions that poor are still made. However, prices of things not made of widgets, most notably college education and health care, have shot up. If people lived on widgets alone—goods whose costs have fallen because of both globalisation and technology—there would have been no pause in the increase of real wages. It is the increase in the prices of stuff that isn't mechanised (whose supply is often under the control of the state and perhaps subject to fundamental scarcity) that means a pay packet goes no further than it used to.

So technological progress squeezes some incomes in the short term before making ▶▶

Not what it was

US employment by sector, % of total employment



Source: US Bureau of Labour Statistics



everyone richer in the long term, and can drive up the costs of some things even more than it eventually increases earnings. As innovation continues, automation may bring down costs in some of those stubborn areas as well, though those dominated by scarcity—such as houses in desirable places—are likely to resist the trend, as may those where the state keeps market forces at bay. But if innovation does make health care or higher education cheaper, it will probably be at the cost of more jobs, and give rise to yet more concentration of income.

The machine stops

Even if the long-term outlook is rosy, with the potential for greater wealth and lots of new jobs, it does not mean that policymakers should simply sit on their hands in the mean time. Adaptation to past waves of progress rested on political and policy responses. The most obvious are the massive improvements in educational attainment brought on first by the institution of universal secondary education and then by the rise of university attendance. Policies aimed at similar gains would now seem to be in order. But as Mr Cowen has pointed out, the gains of the 19th and 20th centuries will be hard to duplicate.

Boosting the skills and earning power of the children of 19th-century farmers and labourers took little more than offering schools where they could learn to read, write and do algebra. Pushing a large proportion of college graduates to complete graduate work successfully will be harder and more expensive. Perhaps cheap and innovative online education will indeed make new attainment possible. But as Mr Cowen notes, such programmes may tend to deliver big gains only for the most conscientious students.

Another way in which previous adaptation is not necessarily a good guide to future employment is the existence of welfare. The alternative to joining the 19th-century industrial proletariat was malnourished deprivation. Today, because of measures introduced in response to, and to some extent on the proceeds of, industrialisation, people in the developed world are provided with unemployment benefits, disability allowances and other forms of welfare. They are also much more likely

than a bygone peasant to have savings. This means that the “reservation wage”—the wage below which a worker will not accept a job—is now high in historical terms. If governments refuse to allow jobless workers to fall too far below the average standard of living, then this reservation wage will rise steadily, and ever more workers may find work unattractive. And the higher it rises, the greater the incentive to invest in capital that replaces labour.

Everyone should be able to benefit from productivity gains—in that, Keynes was united with his successors. His worry about technological unemployment was mainly a worry about a “temporary phase of maladjustment” as society and the economy adjusted to ever greater levels of productivity. So it could well prove. However, society may find itself sorely tested if, as seems possible, growth and innovation deliver handsome gains to the skilled, while the rest cling to dwindling employment opportunities at stagnant wages. ■

The world economy

For richer, for poorer

Reprinted from The Economist, Oct 13th 2012

Growing inequality is one of the biggest social, economic and political challenges of our time. But it is not inevitable, says Zanny Minton Beddoes

IN 1889, at the height of America’s first Gilded Age, George Vanderbilt II, grandson of the original railway magnate, set out to build a country estate in the Blue Ridge mountains of North Carolina. He hired the most prominent architect of the time, toured the chateaux of the Loire for inspiration, laid a railway to bring in limestone from Indiana and employed more than 1,000 labourers. Six years later “Biltmore” was completed. With 250 rooms spread over 175,000 square feet (16,000 square metres), the mansion was 300 times bigger than the average dwelling of its day. It had central heating, an indoor swimming pool, a bowling alley, lifts and an intercom system at a time when most American homes had neither electricity nor indoor plumbing.

A bit over a century later, America’s second Gilded Age has nothing quite like the Vanderbilt extravaganza. Bill Gates’s home near Seattle is full of high-tech gizmos, but, at 66,000 square feet, it is a mere 30 times bigger than the average modern American home. Disparities in wealth are less visible in Americans’ everyday lives today than they were a century ago. Even poor people have televisions, air conditioners and cars.

But appearances deceive. The democratisation of living standards has masked a dramatic

concentration of incomes over the past 30 years, on a scale that matches, or even exceeds, the first Gilded Age. Including capital gains, the share of national income going to the richest 1% of Americans has doubled since 1980, from 10% to 20%, roughly where it was a century ago. Even more striking, the share going to the top 0.01%—some 16,000 families with an average income of \$24m—has quadrupled, from just over 1% to almost 5%. That is a bigger slice of the national pie than the top 0.01% received 100 years ago.

This is an extraordinary development, and it is not confined to America. Many countries, including Britain, Canada, China, India and even egalitarian Sweden, have seen a rise in the share of national income taken by the top 1%. The numbers of the ultra-wealthy have soared around the globe. According to Forbes magazine’s rich list, America has some 421 billionaires, Russia 96, China 95 and India 48. The world’s richest man is a Mexican (Carlos Slim, worth some \$69 billion). The world’s largest new house belongs to an Indian. Mukesh Ambani’s 27-storey skyscraper in Mumbai occupies 400,000 square feet, making it 1,300 times bigger than the average shack in the slums that surround it.

The concentration of wealth at the very top is part of a much broader rise in disparities all along the income distribution. The best-known way of measuring inequality is the Gini coefficient, named after an Italian statistician called Corrado Gini. It aggregates the gaps between people’s incomes into a single measure. If everyone in a group has the same income, the Gini coefficient is 0; if all income goes to one person, it is 1.

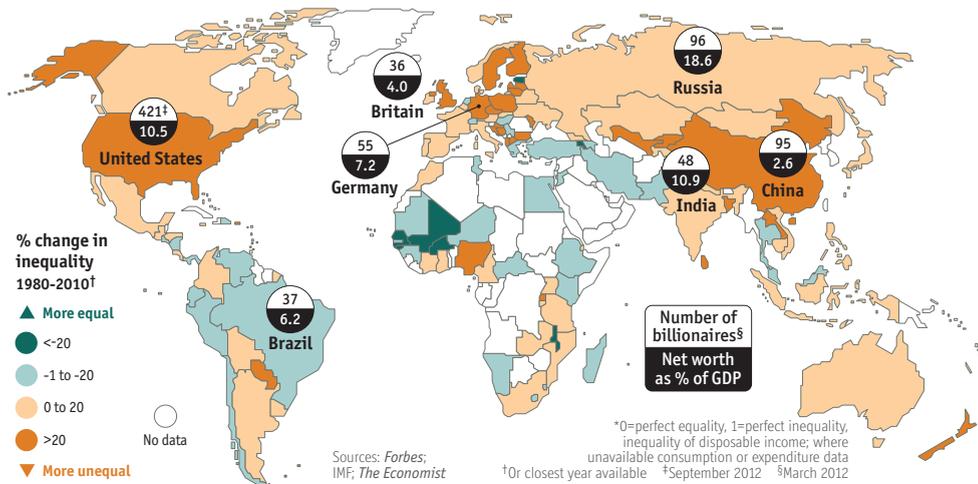
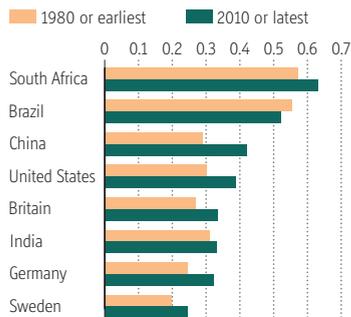
The level of inequality differs widely around the world. Emerging economies are more unequal than rich ones. Scandinavian countries have the smallest income disparities, with a Gini coefficient for disposable income of around 0.25. At the other end of the spectrum the world’s most unequal, such as South Africa, register Ginis of around 0.6. (Because of the way the scale is constructed, a modest-sounding difference in the Gini ratio implies a big difference in inequality.)

Income gaps have also changed to varying degrees. America’s Gini for disposable income is up by almost 30% since 1980, to 0.39. Sweden’s is up by a quarter, to 0.24. China’s has risen by ▶▶



More or less unequal

Income inequality, Gini coefficient*



around 50% to 0.42 (and by some measures to 0.48). The biggest exception to the general upward trend is Latin America, long the world's most unequal continent, where Gini coefficients have fallen sharply over the past ten years. But the majority of the people on the planet live in countries where income disparities are bigger than they were a generation ago.

That does not mean the world as a whole has become more unequal. Global inequality—the income gaps between all people on the planet—has begun to fall as poorer countries catch up with richer ones. Two French economists, François Bourguignon and Christian Morrisson, have calculated a “global Gini” that measures the scale of income disparities among everyone in the world. Their index shows that global inequality rose in the 19th and 20th centuries because richer economies, on average, grew faster than poorer ones. Recently that pattern has reversed and global inequality has started to fall even as inequality within many countries has risen. By that measure, the planet as a whole is becoming a fairer place. But in a world of nation states it is inequality within countries that has political salience, and this special report will focus on that.

From U to N

The widening of income gaps is a reversal of the pattern in much of the 20th century, when inequality narrowed in many countries. That

narrowing seemed so inevitable that Simon Kuznets, a Belarusian-born Harvard economist, in 1955 famously described the relationship between inequality and prosperity as an upside-down U. According to the “Kuznets curve”, inequality rises in the early stages of industrialisation as people leave the land, become more productive and earn more in factories. Once industrialisation is complete and better-educated citizens demand redistribution from their government, it declines again.

Until 1980 this prediction appeared to have been vindicated. But the past 30 years have put paid to the Kuznets curve, at least in advanced economies. These days the inverted U has turned into something closer to an italicised N, with the final stroke pointing menacingly upwards.

Although inequality has been on the rise for three decades, its political prominence is newer. During the go-go years before the financial crisis, growing disparities were hardly at the top of politicians' to-do list. One reason was that asset bubbles and cheap credit eased life for everyone. Financiers were growing fabulously wealthy in the early 2000s, but others could also borrow ever more against the value of their home.

That changed after the crash. The bank rescues shone a spotlight on the unfairness of a system in which affluent bankers were bailed out whereas ordinary folk lost their houses and jobs. And in today's sluggish

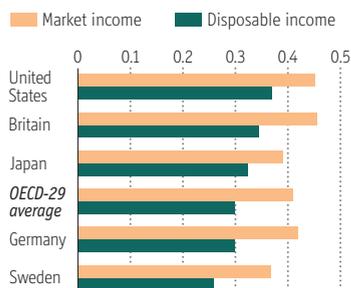
economies, more inequality often means that people at the bottom and even in the middle of the income distribution are falling behind not just in relative but also in absolute terms.

The Occupy Wall Street campaign proved incoherent and ephemeral, but inequality and fairness have moved right up the political agenda. America's presidential election is largely being fought over questions such as whether taxes should rise at the top, and how big a role government should play in helping the rest. In Europe France's new president, François Hollande, wants a top income-tax rate of 75%. New surcharges on the richest are part of austerity programmes in Portugal and Spain.

Even in more buoyant emerging economies, inequality is a growing worry. India's government is under fire for the lack of “inclusive growth” and for cronyism that has enriched insiders, evident from dubious mobile-phone-spectrum auctions and dodgy mining deals. China's leaders fear that growing disparities will cause social unrest. Wen Jiabao, the outgoing prime minister, has long pushed for a “harmonious society”.

Many economists, too, now worry that widening income disparities may have damaging side-effects. In theory, inequality has an ambiguous relationship with prosperity. It can boost growth, because richer folk save and invest more and because people work harder in response to incentives. But big ▶▶

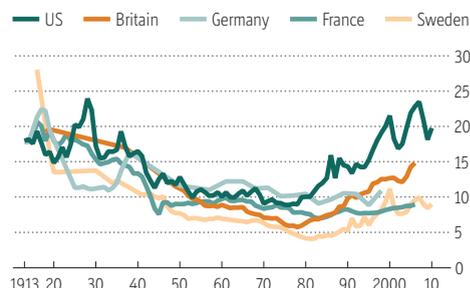
Gini coefficient*, late 2000s



Global inequality, Gini coefficient*



Top 1% income share‡, %



Sources: The World Top Incomes Database; IMF; OECD; World Bank; “Inequality among World Citizens: 1820-1992”, by Bourguignon & Morrisson, *The American Economic Review*, 2002; “A short history of global inequality: The past two centuries”, by Branko Milanovic, *Explorations in Economic History*, May 2011

*0=perfect equality, 1=perfect inequality †Estimate ‡Includes capital gains, except Britain and France

income gaps can also be inefficient, because they can bar talented poor people from access to education or feed resentment that results in growth-destroying populist policies.

The mainstream consensus has long been that a growing economy raises all boats, to much better effect than incentive-dulling redistribution. Robert Lucas, a Nobel prize-winner, epitomised the orthodoxy when he wrote in 2003 that “of the tendencies that are harmful to sound economics, the most seductive and...poisonous is to focus on questions of distribution.”

But now the economics establishment has become concerned about who gets what. Research by economists at the IMF suggests that income inequality slows growth, causes financial crises and weakens demand. In a recent report the Asian Development Bank argued that if emerging Asia’s income distribution had not worsened over the past 20 years, the region’s rapid growth would have lifted an extra 240m people out of extreme poverty. More controversial studies purport to link widening income gaps with all manner of ills, from obesity to suicide.

The widening gaps within many countries are beginning to worry even the plutocrats. A survey for the World Economic Forum meeting at Davos pointed to inequality as the most pressing problem of the coming decade (alongside fiscal imbalances). In all sections of society, there is growing agreement that the world is becoming more unequal, and that today’s disparities and their likely trajectory are dangerous.

Not so fast

That is too simplistic. Inequality, as measured by Gini coefficients, is simply a snapshot of outcomes. It does not tell you why those gaps have opened up or what the trend is over time. And like any snapshot, the picture can be misleading. Income gaps can arise for good reasons (such as when people are rewarded for productive work) or for bad ones (if poorer children do not get the same opportunities as richer ones). Equally, inequality of outcomes might be acceptable if the gaps are between young people and older folk, so may shrink over time. But in societies without this sort of mobility a high Gini is troubling.

Some societies are more concerned about equality of opportunity, others more about equality of outcome. Europeans tend to be more egalitarian, believing that in a fair society there should be no big income gaps. Americans and Chinese put more emphasis on equality of opportunity. Provided people can move up the social ladder, they believe a society with wide income gaps can still be fair. Whatever people’s preferences, static measures of income gaps tell only half the story.

Despite the lack of nuance, today’s debate over inequality will have important consequences. The unstable history of Latin America, long the continent with the biggest income gaps, suggests that countries run by entrenched wealthy elites

do not do very well. Yet the 20th century’s focus on redistribution brought its own problems. Too often high-tax welfare states turned out to be inefficient and unsustainable. Government cures for inequality have sometimes been worse than the disease itself.

This special report will explore how 21st-century capitalism should respond to the present challenge; it will examine the recent history of both inequality and social mobility; and it will offer four contemporary case studies: the United States, emerging Asia, Latin America and Sweden. Based on this evidence it will make three arguments. First, although the modern global economy is leading to wider gaps between the more and the less educated, a big driver of today’s income distributions is government policy. Second, a lot of today’s inequality is inefficient, particularly in the most unequal countries. It reflects market and government failures that also reduce growth. And where this is happening, bigger income gaps themselves are likely to reduce both social mobility and future prosperity.

Third, there is a reform agenda to reduce income disparities that makes sense whatever your attitude towards fairness. It is not about higher taxes and more handouts. Both in rich and emerging economies, it is about attacking cronyism and investing in the young. You could call it a “True Progressivism”. ■

Poverty

Not always with us

Reprinted from The Economist, Jun 1st 2013

The world has an astonishing chance to take a billion people out of extreme poverty by 2030

IN SEPTEMBER 2000 the heads of 147 governments pledged that they would halve the proportion of people on the Earth living in the direst poverty by 2015, using the poverty rate in 1990 as a baseline. It was the first of a litany of worthy aims enshrined in the United Nations “millennium development goals” (MDGs). Many of these aims—such as cutting maternal mortality by three quarters and child mortality by two thirds—have not been met. But the goal of halving poverty has been. Indeed, it was achieved five years early.

In 1990, 43% of the population of developing countries lived in extreme poverty (then defined as subsisting on \$1 a day); the absolute number was 1.9 billion people. By 2000 the proportion was down to a third. By 2010 it was 21% (or 1.2 billion; the poverty line was then \$1.25, the average of the 15 poorest countries’ own poverty lines in 2005 prices, adjusted for differences in purchasing power). The global poverty rate had been cut in half in 20 years.

That raised an obvious question. If extreme



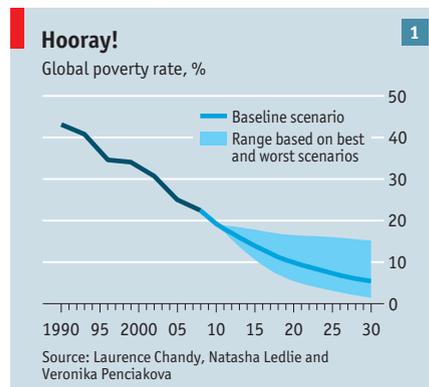
poverty could be halved in the past two decades, why should the other half not be got rid of in the next two? If 21% was possible in 2010, why not 1% in 2030?

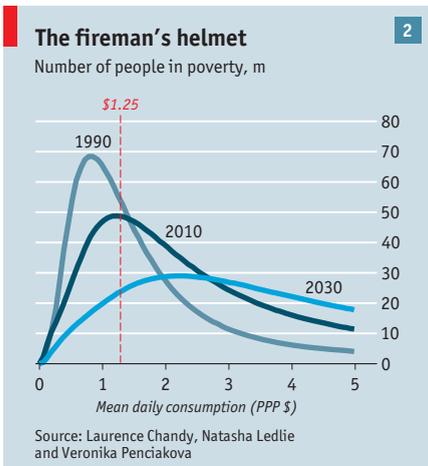
Why not indeed? In April at a press conference during the spring meeting of the international financial institutions in Washington, DC, the president of the World Bank, Jim Yong Kim, scrawled the figure “2030” on a sheet of paper, held it up and announced, “This is it. This is the global target to end poverty.” He was echoing Barack Obama who, in February, promised that “the United States will join with our allies to eradicate such extreme poverty in the next two decades.”

This week, that target takes its first step towards formal endorsement as an aim of policy round the world. The leaders of Britain, Indonesia and Liberia are due to recommend to the UN a list of post-2015 MDGs. It will be headed by a promise to end extreme poverty by 2030.

There is a lot of debate about what exactly counts as poverty and how best to measure it. But by any measure, the eradication of \$1.25-a-day poverty would be an astonishing achievement. Throughout history, dire poverty has been a basic condition of the mass of mankind. Thomas Malthus, a British clergyman who founded the science of demography, wrote in 1798 that it was impossible for people to “feel no anxiety about providing the means of subsistence for themselves and [their] families” and that “no possible form of society could prevent the almost constant action of misery upon a great part of mankind.” For most countries, poverty was not even a problem; it was a plain, unchangeable fact.

To eradicate extreme poverty would also be remarkable given the number of occasions ▶▶





when politicians have promised to achieve the goal and failed. “We do have an historic opportunity this year to make poverty history,” said Tony Blair, Britain’s prime minister in 2005. Three years before that, Thabo Mbeki, South Africa’s president said that “for the first time in human history, society has the capacity, the knowledge and the resources to eradicate poverty.” Going further back: “For the first time in our history,” said Lyndon Johnson, “it is possible to conquer poverty.” That was in 1964. Much will have to change if Mr Kim’s piece of paper is not to become one more empty promise.

So how realistic is it to think the world can end extreme poverty in a generation? To meet its target would mean maintaining the annual one-percentage-point cut in the poverty rate achieved in 1990-2010 for another 20 years. That would be hard. It will be more difficult to rescue the second billion from poverty than it was the first. Yet it can be done. The world has not only cut poverty a lot but also learned much about how to do it. Poverty can be reduced, albeit not to zero. But a lot will have to go right if that is to happen.

Growth Decreases Poverty

In 1990-2010 the driving force behind the reduction of worldwide poverty was growth. Over the past decade, developing countries have boosted their GDP about 6% a year—1.5 points more than in 1960-90. This happened despite the worst worldwide economic crisis

since the 1930s. The three regions with the largest numbers of poor people all registered strong gains in GDP after the recession: at 8% a year in East Asia; 7% in South Asia; 5% in Africa. As a rough guide, every 1% increase in GDP per head reduces poverty by around 1.7%.

GDP, though, is not necessarily the best measure of living standards and poverty reduction. It is usually better to look at household consumption based on surveys. Martin Ravallion, until recently the World Bank’s head of research, took 900 such surveys in 125 developing countries. These show, he calculates, that consumption in developing countries has grown by just under 2% a year since 1980. But there has been a sharp increase since 2000. Before that, annual growth was 0.9%; after it, the rate leapt to 4.3%.

Growth alone does not guarantee less poverty. Income distribution matters, too. One estimate found that two thirds of the fall in poverty was the result of growth; one-third came from greater equality. More equal countries cut poverty further and faster than unequal ones. Mr Ravallion reckons that a 1% increase in incomes cut poverty by 0.6% in the most unequal countries but by 4.3% in the most equal ones.

The country that cut poverty the most was China, which in 1980 had the largest number of poor people anywhere. China saw a huge increase in income inequality—but even more growth. Between 1981 and 2010 it lifted a stunning 680m people out poverty—more than the entire current population of Latin America. This cut its poverty rate from 84% in 1980 to about 10% now. China alone accounts for around three quarters of the world’s total decline in extreme poverty over the past 30 years.

What is less often realised is that the recent story of poverty reduction has not been all about China. Between 1980 and 2000 growth in developing countries outside the Middle Kingdom was 0.6% a year. From 2000 to 2010 the rate rose to 3.8%—similar to the pattern if you include China. Mr Ravallion calculates that the acceleration in growth outside China since 2000 has cut the number of people in extreme poverty by 280m.

Can this continue? And if it does, will it eradicate extreme poverty by 2030?

To keep poverty reduction going, growth

would have to be maintained at something like its current rate. Most forecasters do expect that to happen, though problems in Europe could spill over and damage the global economy. Such long-range forecasts are inevitably unreliable but two broad trends make an optimistic account somewhat plausible. One is that fast-growing developing countries are trading more with each other, making them more resilient than they used to be to shocks from the rich world. The other trend is that the two parts of the world with the largest numbers of poor people, India and Africa, are seeing an expansion of their working-age populations relative to the numbers of dependent children and old people. Even so, countries potentially face a problem of diminishing returns which could make progress at the second stage slower than at the first.

There is no sign so far that returns are in fact diminishing. The poverty rate has fallen at a robust one percentage point a year over the past 30 years—and there has been no tailing off since 2005. But diminishing returns could occur for two reasons. When poverty within a country falls to very low levels, the few remaining poor are the hardest to reach. And, globally, as more people in countries such as China become middle class, poverty will become concentrated in fragile or failing states which have seen little poverty reduction to date.

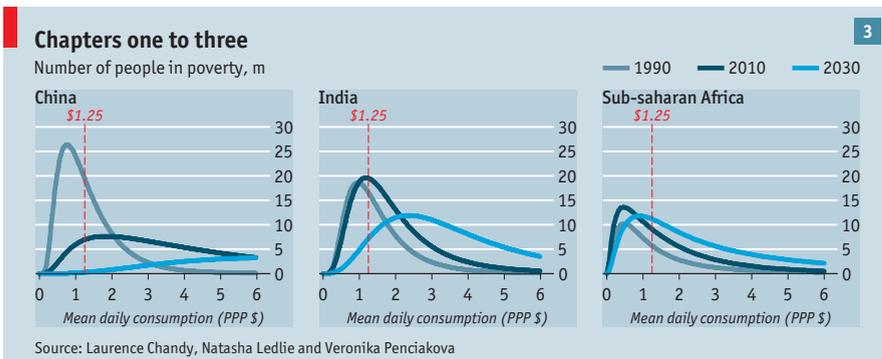
The sweetest spot

In a study for the Brookings Institution, a think-tank in Washington, DC, Laurence Chandy, Natasha Ledlie and Veronika Penciakova look at the distribution of consumption (how many people consume \$1 a day, \$2 a day and so on) in developing countries. They show how it has changed over time, and how it might change in future. Plotted on a chart, the distribution looks like a fireman’s helmet, with a peak in front and a long tail behind. In 1990 there were hardly any people with no income at all, then a peak just below the poverty line and then a long tail of richer folk extending off to the right (see chart 2).

As countries get richer, the helmet moves to the right, reflecting the growth in household consumption. The faster the rate, the farther to the right the line moves, so the strong 4.3% annual growth in consumption since 2000 has pushed the line a good distance rightward.

But the shape of the line also matters. The chart shows that in 1990 and 2000, the peak was positioned slightly to the left of the poverty line. As the shape moved to the right, it took a section of the peak to the other side of the poverty mark. This represents the surge of people who escaped poverty in 1990-2010.

At the moment the world is at a unique sweet spot. More people are living at \$1.25 than at any other level of consumption. This means growth will result in more people moving across the international poverty line than across any other level of consumption. This is a big reason why growth is still producing



big falls in poverty.

But as countries continue to grow, and as the line continues to be pulled to the right, things start to change. Now, the peak begins to flatten. In 2010, according to Mr Chandy, there were 85m people living at or just below the poverty line (at a consumption level between \$1.20 and \$1.25 a day). If poverty falls at its trend rate, the number of people living at \$1.20-1.25 a day will also fall: to 56m in 2020 and 28m in 2030.

This is good news, of course: there will be fewer poor people. But it means the rate of poverty reduction must slow down, even if consumption continues to grow fast. As Mr Chandy says, unless growth goes through the roof, "it is not possible to maintain the trend rate of poverty reduction with so many fewer individuals ready to cross the line."

So what impact, in practice, might diminishing returns have? Messrs Chandy and Ravallion try to answer that by calculating what different rates of household consumption mean for poverty reduction and how much household income would have to grow to eradicate extreme poverty.

Mr Ravallion provides an optimistic projection. If developing countries were to maintain their post-2000 performance, he says, then the number of extremely poor people in the world would fall from 1.2 billion in 2010 to just 200m in 2027.

This would be a remarkable achievement. It took 20 years to reduce the number of absolutely poor people from 1.9 billion in 1990 to 1.2 billion in 2010 (a fall of less than half). Mr Ravallion's projection would lift a billion people out of poverty in 17 years and implies almost halving the number in just ten (from 2012 to 2022).

But even this projection does not get to zero poverty. The figure of 200m poor implies a poverty rate of just over 3%. To get to zero would require something even more impressive. Mr Ravallion estimates that to reach a 1% poverty rate by 2027 would require a surge in household consumption of 7.6% a year—an unrealistically high level.

Drops of good cheer

Mr Chandy and his co-authors get similar results. They take a projection of falling poverty based on forecasts of consumption by the Economist Intelligence Unit, our sister company. If growth were two points better than forecast, then the poverty rate would be just over 3%; if two points worse, it would be almost 10%—a big disappointment. If income distribution within countries gets progressively better or worse (ie, if the poorest 40% do better or worse than the top 10%), then the range of outcomes would be the same as if growth were higher or lower. And if you combine all these variables, then the range is wide indeed, from a miserable 15% poverty rate (lower growth, more inequality) to a stunning 1.4% (higher growth, less inequality).

Two conclusions emerge from these exercises.



First, the range of outcomes is wide, implying that prospects for eradicating poverty are uncertain. The range is also not symmetrical, suggesting the risk of failure is greater than the hope of success. It is also noticeable that no one is forecasting zero poverty. If that were taken as the post-2015 target, then it would be missed. However, reducing the rate to 3% would lift a billion people out of poverty and that would be remarkable enough. In the best case, the global poverty rate falls to a little over 1%, or just 70m people. That would be astonishing. To get to these levels, the studies suggest, you cannot rely on boosting growth or improving income inequality alone. You need both.

Second, the geography of poverty will be transformed. China passed the point years ago where it had more citizens above the poverty line than below it. By 2020 there will be hardly any Chinese left consuming less than \$1.25 a day: everyone will have escaped poverty. China wrote the first chapter of the book of poverty reduction but that chapter is all but finished.

The next will be about India. India mirrors the developing world as a whole: growth will push a wave of Indians through the \$1.25 barrier over the next decade (see chart 3). The subcontinent could generate the largest gains in poverty reduction in the next decade (which is why the current Indian slowdown is worrying). After that, though, continued growth will benefit relatively comfortable Indians more than poor ones.

The last chapter will be about Africa. Only in sub-Saharan Africa will there be large numbers of people below the poverty line. Unfortunately they are currently too far below it. The average consumption of Africa's poorest people is only about 70 cents a day—barely more than it was 20 years ago. In the six poorest countries it falls to only 50 cents a day. The continent has made big strides during the past decade. But even 20 more years of such progress will not move the remaining millions out of poverty. At current growth rates, a quarter of Africans will still be consuming less than \$1.25 a day in 2030. The disproportionate falls in Africa's poverty rate will not happen until after that date.

Make Bono history

The record of poverty reduction has profound implications for aid. One of the main purposes of setting development goals was to give donors

a wish list and persuade them to put more resources into the items on the list. This may have helped in some areas but it is hard to argue that aid had much to do with halving poverty. Much of the fall occurred in China, which ignored the MDGs. At best, aid and the MDGs were marginal.

The changing geography of poverty will pose different aid problems over the next 20 years. According to Mr Chandy, by 2030 nearly two-thirds of the world's poor will be living in states now deemed "fragile" (like the Congo and Somalia). Much of the rest will be in middle-income countries. This poses a double dilemma for donors: middle-income countries do not really need aid, while fragile states cannot use it properly. A dramatic fall in poverty requires rethinking official assistance.

Yet all the problems of aid, Africa and the intractability of the final billion do not mask the big point about poverty reduction: it has been a hugely positive story and could become even more so. As a social problem, poverty has been transformed. Thanks partly to new technology, the poor are no longer an undifferentiated mass. Identification schemes are becoming large enough—India has issued hundreds of millions of biometric smart cards—that countries are coming to know their poor literally by name. That in turn enables social programmes to be better targeted, studied and improved. Conditional cash-transfer schemes like Mexico's Oportunidades and Brazil's Bolsa Família have all but eradicated extreme poverty in those countries.

As the numbers of poor fall further, not only will the targets become fewer, but the cost of helping them will fall to almost trivial levels; it would cost perhaps \$50m a day* to bring 200m people up above the poverty line. Of course, there will be other forms of poverty; the problems of some countries and places will remain intractable and may well require different policies; and \$1.26 a day is still a tiny amount.

But something fundamental will have shifted. Poverty used to be a reflection of scarcity. Now it is a problem of identification, targeting and distribution. And that is a problem that can be solved. ■

The world economy

A game of catch-up

Reprinted from *The Economist*, Sep 24th 2011

The shift in economic power from West to East is accelerating, says John O'Sullivan. The rich world will lose some of its privileges

QUARRY BANK MILL is a handsome five-storey brick building set in the valley of the river Bollin at Styal, a small English village a few miles south of Manchester. It was built ▶▶

in 1784 by Samuel Greg, a merchant, who found profit in supplying cotton thread to Lancashire's weavers. The raw cotton shipped from America's slave plantations was processed on the latest machinery, Richard Arkwright's water frame. Later Greg extended the factory and installed coal-fired steam engines to add to the water power from the Bollin. All this gave a huge boost to productivity. In 1700 a spinster with a pedal-driven spinning wheel might take 200 hours to produce a pound of yarn. By the 1820s it would take her around an hour.

Greg's mill was part of a revolution in industry that would profoundly alter the world's pecking order. The new technologies—labour-saving inventions, factory production, engines powered by fossil fuels—spread to other parts of western Europe and later to America. The early industrialisers (along with a few late developers, such as Japan) were able to lock in and build on their lead in technology and living standards.

The “great divergence” between the West and the rest lasted for two centuries. The mill at Styal, once one of the world's largest, has become a museum. A few looms, powered by the mill's water wheel, still produce tea towels for the gift shop, but cotton production has long since moved abroad in search of low wages. Now another historic change is shaking up the global hierarchy. A “great convergence” in living standards is under way as poorer countries speedily adopt the technology, know-how and policies that made the West rich. China and India are the biggest and fastest-growing of the catch-up countries, but the emerging-market boom has spread to embrace Latin America and Africa, too.

And the pace of convergence is increasing. Debt-ridden rich countries such as America have seen scant growth since the financial crisis. The emerging economies, having escaped the carnage with only a few cuts and grazes, have spent much of the past year trying to check their economic booms. The IMF forecasts that emerging economies as a whole will grow by around four percentage points more than the rich world both this year and next. If the fund is proved right, by 2013 emerging markets (on the IMF's definition) will produce more than half of global output, measured at purchasing-power parity (PPP).

One sign of a shift in economic power is that investors expect trouble in rich countries but seem confident that crises in emerging markets will not recur. Many see the rich world as old, debt-ridden and out of ideas compared with the young, zestful and high-saving emerging markets. The truth is more complex. One reason why emerging-market companies are keen for a toehold in rich countries is that the business climate there is far friendlier than at home. But the recent succession of financial blow-ups in the rich world makes it seem more crisis-prone.

The American subprime mess that turned into a financial disaster had the hallmarks



of a developing-world crisis: large capital inflows channelled by poorly regulated banks to marginal borrowers to finance a property boom. The speed at which bond investors turned on Greece, Ireland and then Portugal was reminiscent of a run on an overborrowed emerging economy.

Because there is as yet no reliable and liquid bond market in the emerging world to flee to, scared investors put their money into US Treasury bonds and a few other rich-country havens instead. So few are the options that even a ratings downgrade of American government debt in August spurred buying of the derided Treasuries. Indeed the thirst in emerging markets for such safe and liquid securities is one of the deeper causes of the series of crises that has afflicted the rich world. Developing countries bought rich-world government bonds (stored as currency reserves) as insurance against future crises. Those purchases pushed down long-term interest rates, helping to stoke a boom in private and public credit.

Today's faltering GDP growth is a hangover from that boom and adds to the sense of malaise in the rich world. Many households in America, Britain and elsewhere have taken to saving hard to reduce their debts. Those with spare cash, including companies, are clinging on to it as a hedge against an uncertain future. A new breed of emerging-market multinational firms, used to a tough business climate at home, seem keener to invest in the rich world than most Western firms, which have lost their mojo.

Grandeur and decline

People who grew up in America and western Europe have become used to the idea that the West dominates the world economy. In fact it is anomalous that a group of 30-odd countries with a small fraction of the world's population should be calling the shots. For most of human history economic power has been determined by demography. In 1700 the world's biggest economy (and leading cotton producer) was India, with a population of 165m, followed by China, with 138m. Britain's 8.6m people produced less than 3% of the world's output. Even in 1820, as the industrial revolution in Britain was gathering pace, the two Asian giants still accounted for half the world's GDP.

The spread of purpose-built manufactories like Quarry Bank Mill separated economic

power and population, increasingly so as the West got richer. Being able to make a lot more stuff with fewer workers meant that even a small country could be a giant economic power. By 1870 the average income in Britain was six times larger than in India or China. But by the eve of the first world war Britain's income per head had been overtaken by that of America, the 20th century's great power.

America remains the world's biggest economy, but that status is under threat from a resurgent China. With hindsight, its change in fortune can be traced to 1976, the year of America's bicentennial and the death of Mao Zedong. By then income per person in China had shrunk to just 5% of that in America, in part because of Mao's extreme industrial and social policies.

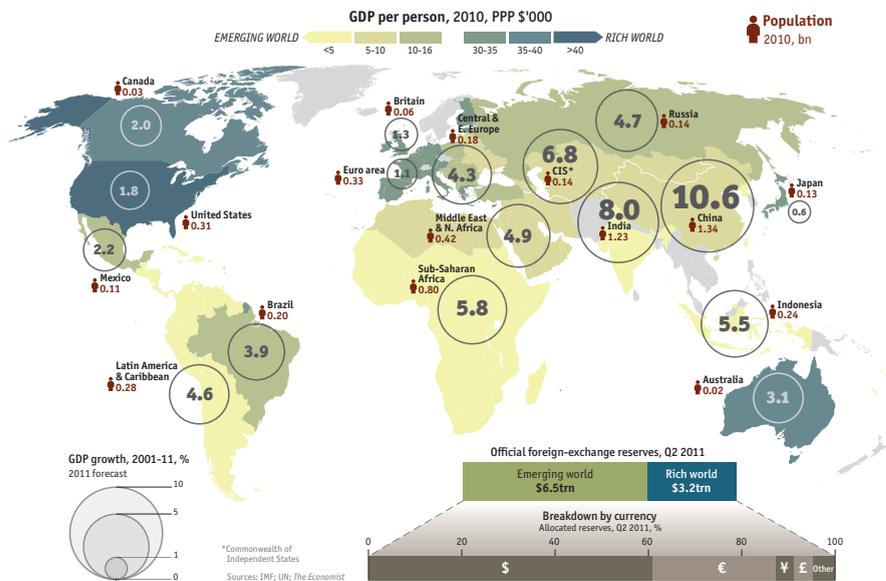
The average Indian was scarcely richer than the average Chinese. Both China and India had turned inward, cutting themselves off from the flow of ideas and goods that had made Japan and other less populous Asian economies richer. India's economy, like China's, was largely closed. Huge swathes of industry were protected from foreign competition by high import tariffs, leaving them moribund.

China was first to reverse course. In 1978 Deng Xiaoping won approval for a set of economic reforms that opened China to foreign trade, technology and investment. India's big liberalisation came a little later, in 1991. The GDP of China and India is many times bigger now than it was in the mid-1970s. In both economies annual growth of 8% or more is considered normal. Average living standards in China are still only a sixth and in India a fourteenth of those in America at PPP exchange rates, but the gap is already much smaller than it was and is closing fast.

Moreover, the great convergence has spread beyond India and China. Three-quarters of biggish non-oil-producing poor countries enjoyed faster growth in income per person than America in 2000-07, says Arvind Subramanian, of the Peterson Institute for International Economics, in his new book, “Eclipse: Living in the Shadow of China's Economic Dominance”. This compares with 29% of such countries in 1960-2000. And those economies are catching up at a faster rate: average growth in GDP per person was 3.3 percentage points faster than America's growth rate in 2000-07, more than twice the difference in the previous four decades.

If emerging markets keep on growing three percentage points a year faster than America (a conservative estimate), they will account for two-thirds of the world's output by 2030, reckons Mr Subramanian. Today's four most populous emerging markets—China, India, Indonesia and Brazil—will make up two-fifths of global GDP, measured at PPP. The combined weight in the world economy of America and the European Union will shrink from more than a third to less than a quarter.

Economic catch-up is accelerating. Britain's economy doubled in size in the 32 years from 1830 to 1862 as increased productivity spread from cotton to other industries. America's ►►



migrants to urban jobs becomes harder to repeat. The rapid growth rates of the recent past are unlikely to be sustained.

Status anxiety

Few forecasters expect America to be a poorer place in ten or 20 years' time than it is now. The present may be grim, but eventually the hangover from the financial crisis will fade and unemployment will fall. What rich Western countries face is a relative economic decline, not an absolute fall in average living standards (though a few of their citizens may become worse off). That matters politically, because most people measure their well-being by how they are doing in relation to others rather than by their absolute level of income.

The effect of the loss of top-dog status on the well-being of the average American is unlikely to be trivial. Britain felt similar angst at the beginning of the 20th century, noting the rise of Germany, a military rival. It seemed stuck with old industries, such as textiles and iron, whereas Germany had advanced into fields such as electricals and chemicals. That Britain was still well off in absolute terms was scant consolation. The national mood contrasted starkly with the triumphalism of the mid-19th century, says Nicholas Crafts of Warwick University. A wave of protectionist sentiment challenged the free-trade consensus that had prevailed since 1846. It was seen off, but not before it had split the Tory party, which lost the 1906 election to the Liberals.

No country, or group of countries, stays on top forever. History and economic theory suggest that sooner or later others will catch up. But this special report will caution against relying on linear extrapolation from recent growth rates. Instead, it will suggest that the transfer of economic power from rich countries to emerging markets is likely to take longer than generally expected. Rich countries will be cursed indeed if they cannot put on an occasional growth spurt. China, for its part, will be lucky to avoid a bad stumble in the next decade or two. Emerging-market crises have been too quickly forgotten, which only makes them more likely to recur.

Education and social security will have to adapt to a world in which jobs continue to be created and displaced at a rapid rate. The cost of oil and other commodities will continue to rise faster than prices in general, shifting the terms of trade in favour of resource-rich countries and away from big consumers such as America. The yuan will eventually become an international currency and rival to the dollar. The longer that takes, the less pressure America will feel to control its public finances and the likelier it is that the dollar's eclipse will be abrupt and messy.

The force of economic convergence depends on the income gap between developing and developed countries. Going from poor to less poor is the easy part. The trickier bit is making the jump from middle-income to reasonably rich. Can China and others manage it? ■

GDP doubled in only 17 years as it overtook Britain in the 1870s. The economies of China and India have doubled within a decade.

This is cause for optimism. An Indian with a basic college education has access to world-class goods that his parents (who might have saved for decades for a sputtering scooter) could only have dreamed of buying. The recent leap in incomes is visible in Chinese cities, where the cars are new but the bicycles look ancient, and in the futuristic skyline of Shanghai's financial district.

China is still a fairly poor country but, by dint of its large population, it is already the world's second-largest economy measured in current dollars. It may overtake America as the world's leading economy within a decade (see box), a prospect that has given rise to many concerns in that country. More generally, there are worries about what the ascendancy of emerging markets would mean for jobs, pay and borrowing costs in the rich world.

The first worry is about direct competition for things that are in more or less fixed supply: geopolitical supremacy, the world's oil and raw materials, the status and perks that come with being the issuer of a trusted international currency. For most people, most of the time, their country's ranking in terms of military power is not a big issue. The emerging world's hunger for natural resources, on the other hand, has made rich-world consumers palpably worse off by pushing up the prices of oil and other commodities. The yuan's increased use beyond China's borders is a (still distant) threat to the dollar's central role in trade and international finance, but if the dollar were eventually shoved aside, it would make Americans poorer and raise the cost of their borrowing.

A second set of anxieties relates to job security and pay. Ever stronger trade links between rich and would-be rich countries will mean a reshuffle in the division of labour

around the world, creating new jobs and destroying or displacing existing ones. Low-skilled manufacturing and middle-skilled service jobs that can be delivered electronically have been outsourced to cheaper suppliers in China, India and elsewhere (indeed, China is now rich enough to be vulnerable to losing jobs to Vietnam and Indonesia). The threat of outsourcing puts downward pressure on pay, though most American studies suggest that trade accounts for only a small part of the increase in wage inequality.

A third concern, which is at odds with the first two, is that the emerging markets are prone to crises that can cause a still-fragile world economy to stumble. Sluggish GDP growth in the rich world means developing countries have to fall back on internal spending, which in the past they have not managed well. It raises the risks of the overspending, excessive credit and inflation that have spurred past emerging-market crises. Even if crises are avoided, emerging markets are prone to sudden slowdowns as they become richer and the trick of shifting underemployed rural





Innovation pessimism

Has the ideas machine broken down?

Reprinted from The Economist, Jan 12th 2013

The idea that innovation and new technology have stopped driving growth is getting increasing attention. But it is not well founded

BOOM times are back in Silicon Valley. Office parks along Highway 101 are once again adorned with the insignia of hopeful start-ups. Rents are soaring, as is the demand for fancy vacation homes in resort towns like Lake Tahoe, a sign of fortunes being amassed. The Bay Area was the birthplace of the semiconductor industry and the computer and internet companies that have grown up in its wake. Its wizards provided many of the marvels that make the world feel futuristic, from touch-screen phones to the instantaneous searching of great libraries to the power to pilot a drone thousands of miles away. The revival in its business activity since 2010 suggests progress is motoring on.

So it may come as a surprise that some in Silicon Valley think the place is stagnant, and that the rate of innovation has been slackening for decades. Peter Thiel, a founder of PayPal, an internet payment company, and the first outside investor in Facebook, a social network, says that innovation in America is “somewhere between dire straits and dead”. Engineers in all sorts of areas share similar feelings of disappointment. And a small but growing group of economists reckon the economic impact of the innovations of today may pale in comparison with those of the past.

Some suspect that the rich world’s economic doldrums may be rooted in a long-term technological stasis. In a 2011 e-book Tyler Cowen, an economist at George Mason

University, argued that the financial crisis was masking a deeper and more disturbing “Great Stagnation”. It was this which explained why growth in rich-world real incomes and employment had long been slowing and, since 2000, had hardly risen at all (see chart 1). The various motors of 20th-century growth—some technological, some not—had played themselves out, and new technologies were not going to have the same invigorating effect on the economies of the future. For all its flat-screen dazzle and high-bandwidth pizzazz, it seemed the world had run out of ideas.

Glide path

The argument that the world is on a technological plateau runs along three lines. The first comes from growth statistics. Economists divide growth into two different types, “extensive” and “intensive”. Extensive growth is a matter of adding more and/or better labour, capital and resources. These are the sort of gains that countries saw from adding women to the labour force in greater numbers and increasing workers’ education. And, as Mr Cowen notes, this sort of growth is subject to diminishing returns: the first addition will be used where it can do most good, the tenth where it can do the tenth-most good, and so on. If this were the only sort of growth there was, it would end up leaving incomes just above the subsistence level.

Intensive growth is powered by the discovery of ever better ways to use workers and resources. This is the sort of growth that allows continuous improvement in incomes and welfare, and enables an economy to grow even as its population decreases. Economists

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label the all-purpose improvement factor responsible for such growth “technology”—though it includes things like better laws and regulations as well as technical advance—and measure it using a technique called “growth accounting”. In this accounting, “technology” is the bit left over after calculating the effect on GDP of things like labour, capital and education. And at the moment, in the rich world, it looks like there is less of it about. Emerging markets still manage fast growth, and should be able to do so for some time, because they are catching up with technologies already used elsewhere. The rich world has no such engine to pull it along, and it shows.

This is hardly unusual. For most of human history, growth in output and overall economic welfare has been slow and halting. Over the past two centuries, first in Britain, Europe and America, then elsewhere, it took off. In the 19th century growth in output per person—a useful general measure of an economy’s productivity, and a good guide to growth in incomes—accelerated steadily in Britain. By 1906 it was more than 1% a year. By the middle of the 20th century, real output per person in America was growing at a scorching 2.5% a year, a pace at which productivity and incomes double once a generation (see chart 2). More than a century of increasingly powerful and sophisticated machines were obviously a part of that story, as was the rising amount of fossil-fuel energy available to drive them.

But in the 1970s America’s growth in real output per person dropped from its post-second-world-war peak of over 3% a year to just over 2% a year. In the 2000s it tumbled below 1%. Output per worker per hour shows a similar pattern, according to Robert Gordon, an economist at Northwestern University: it is pretty good for most of the 20th century, then slumps in the 1970s. It bounced back between 1996 and 2004, but since 2004 the annual rate has fallen to 1.33%, which is as low as it was from 1972 to 1996. Mr Gordon muses that the past two centuries of economic growth might actually amount to just “one big wave” of dramatic change rather than a new era of uninterrupted progress, and that the world is returning to a regime in which growth is mostly of the extensive sort (see chart 3).

Mr Gordon sees it as possible that there were only a few truly fundamental innovations—the ability to use power on a large scale, to keep houses comfortable regardless of ▶▶

outside temperature, to get from any A to any B, to talk to anyone you need to—and that they have mostly been made. There will be more innovation—but it will not change the way the world works in the way electricity, internal-combustion engines, plumbing, petrochemicals and the telephone have. Mr Cowen is more willing to imagine big technological gains ahead, but he thinks there are no more low-hanging fruit. Turning terabytes of genomic knowledge into medical benefit is a lot harder than discovering and mass producing antibiotics.

The pessimists' second line of argument is based on how much invention is going on. Amid unconvincing appeals to the number of patents filed and databases of "innovations" put together quite subjectively, Mr Cowen cites interesting work by Charles Jones, an economist at Stanford University. In a 2002 paper Mr Jones studied the contribution of different factors to growth in American per-capita incomes in the period 1950-93. His work indicated that some 80% of income growth was due to rising educational attainment and greater "research intensity" (the share of the workforce labouring in idea-generating industries). Because neither factor can continue growing ceaselessly, in the absence of some new factor coming into play growth is likely to slow.

The growth in the number of people working in research and development might seem to contradict this picture of a less inventive economy: the share of the American economy given over to R&D has expanded by a third since 1975, to almost 3%. But Pierre Azoulay of MIT and Benjamin Jones of Northwestern University find that, though there are more people in research, they are doing less good. They reckon that in 1950 an average R&D worker in America contributed almost seven times more to "total factor productivity"—essentially, the contribution of technology and innovation to growth—that an R&D worker in 2000 did. One factor in this may be the "burden of knowledge": as ideas accumulate it takes ever longer for new thinkers to catch up with the frontier of their scientific or technical speciality. Mr Jones says that, from 1985 to 1997 alone, the typical "age at first innovation" rose by about one year.

A fall of moondust

The third argument is the simplest: the evidence of your senses. The recent rate of progress seems slow compared with that of the early and mid-20th century. Take kitchens. In 1900 kitchens in even the poshest of households were primitive things. Perishables were kept cool in ice boxes, fed by blocks of ice delivered on horse-drawn wagons. Most households lacked electric lighting and running water. Fast forward to 1970 and middle-class kitchens in America and Europe feature gas and electric hobs and ovens, fridges, food processors, microwaves and dishwashers. Move forward another 40 years, though, and things scarcely



change. The gizmos are more numerous and digital displays ubiquitous, but cooking is done much as it was by grandma.

Or take speed. In the 19th century horses and sailboats were replaced by railways and steamships. Internal-combustion engines and jet turbines made it possible to move more and more things faster and faster. But since the 1970s humanity has been coasting. Highway travel is little faster than it was 50 years ago; indeed, endemic congestion has many cities now investing in trams and bicycle lanes. Supersonic passenger travel has been abandoned. So, for the past 40 years, has the moon.

Medicine offers another example. Life expectancy at birth in America soared from 49 years at the turn of the 20th century to 74 years in 1980. Enormous technical advances have occurred since that time. Yet as of 2011 life expectancy rested at just 78.7 years. Despite hundreds of billions of dollars spent on research, people continue to fall to cancer, heart disease, stroke and organ failure. Molecular medicine has come nowhere close to matching the effects of improved sanitation.

To those fortunate enough to benefit from the best that the world has to offer, the fact that it offers no more can disappoint. As Mr Thiel and his colleagues at the Founders Fund, a venture-capital company, put it: "We wanted flying cars, instead we got 140 characters." A world where all can use Twitter but hardly any can commute by air is less impressive than the futures dreamed of in the past.

The first thing to point out about this appeal to experience and expectation is that the science fiction of the mid-20th century, important as it may have been to people who became entrepreneurs or economists with a taste for the big picture, constituted neither serious technological forecasting nor a binding commitment. It was a celebration through extrapolation of then current progress in speed, power and distance. For cars read flying cars; for battlecruisers read space cruisers.

Technological progress does not require all technologies to move forward in lock step, merely that some important technologies are always moving forward. Passenger aeroplanes have not improved much over the past 40

years in terms of their speed. Computers have sped up immeasurably. Unless you can show that planes matter more, to stress the stasis over the progress is simply a matter of taste.

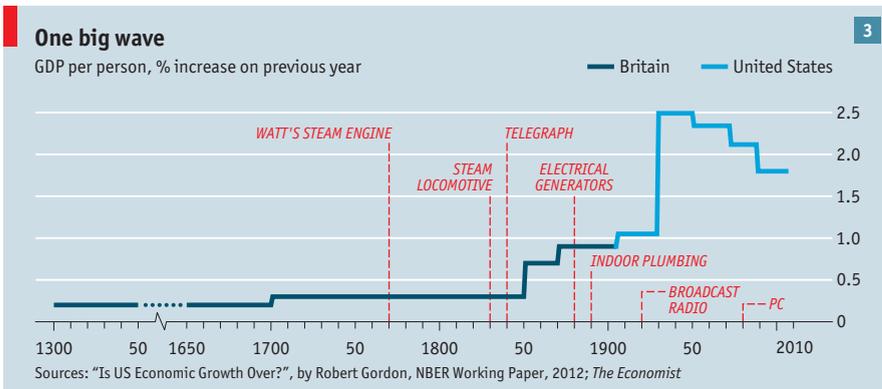
Mr Gordon and Mr Cowen do think that now-mature technologies such as air transport have mattered more, and play down the economic importance of recent innovations. If computers and the internet mattered to the economy—rather than merely as rich resources for intellectual and cultural exchange, as experienced on Mr Cowen's popular blog, *Marginal Revolution*—their effect would be seen in the figures. And it hasn't been.

As early as 1987 Robert Solow, a growth theorist, had been asking why "you can see the computer age everywhere but in the productivity statistics". A surge in productivity growth that began in the mid-1990s was seen as an encouraging sign that the computers were at last becoming visible; but it faltered, and some, such as Mr Gordon, reckon that the benefits of information technology have largely run their course. He notes that, for all its inhabitants' Googling and Skypeing, America's productivity performance since 2004 has been worse than that of the doldrums from the early 1970s to the early 1990s.

The fountains of paradise

Closer analysis of recent figures, though, suggests reason for optimism. Across the economy as a whole productivity did slow in 2005 and 2006—but productivity growth in manufacturing fared better. The global financial crisis and its aftermath make more recent data hard to interpret. As for the strong productivity growth in the late 1990s, it may have been premature to see it as the effect of information technology making all sorts of sectors more productive. It now looks as though it was driven just by the industries actually making the computers, mobile phones and the like. The effects on the productivity of people and companies buying the new technology seem to have begun appearing in the 2000s, but may not yet have come into their own. Research by Susanto Basu of Boston College and John Fernald of the San Francisco Federal Reserve suggests that the lag between investments in





information-and-communication technologies and improvements in productivity is between five and 15 years. The drop in productivity in 2004, on that reckoning, reflected a state of technology definitely pre-Google, and quite possibly pre-web.

Full exploitation of a technology can take far longer than that. Innovation and technology, though talked of almost interchangeably, are not the same thing. Innovation is what people newly know how to do. Technology is what they are actually doing; and that is what matters to the economy. Steel boxes and diesel engines have been around since the 1900s, and their use together in containerised shipping goes back to the 1950s. But their great impact as the backbone of global trade did not come for decades after that.

Roughly a century lapsed between the first commercial deployments of James Watt's steam engine and steam's peak contribution to British growth. Some four decades separated the critical innovations in electrical engineering of the 1880s and the broad influence of electrification on economic growth. Mr Gordon himself notes that the innovations of the late 19th century drove productivity growth until the early 1970s; it is rather uncharitable of him to assume that the post-2004 slump represents the full exhaustion of potential gains from information technology.

And information innovation is still in its infancy. Ray Kurzweil, a pioneer of computer science and a devotee of exponential technological extrapolation, likes to talk of "the second half of the chess board". There is an old fable in which a gullible king is tricked into paying an obligation in grains of rice, one on the first square of a chessboard, two on the second, four on the third, the payment doubling with every square. Along the first row, the obligation is minuscule. With half the chessboard covered, the king is out only about 100 tonnes of rice. But a square before reaching the end of the seventh row he has laid out 500m tonnes in total—the whole world's annual rice production. He will have to put more or less the same amount again on the next square. And there will still be a row to go.

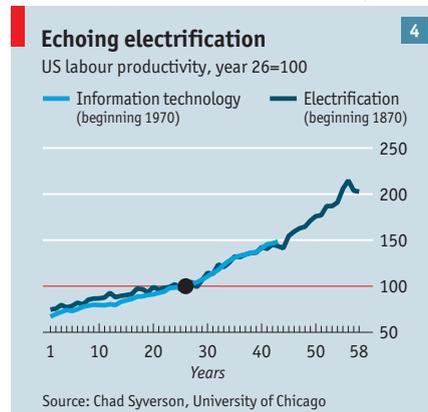
Erik Brynjolfsson and Andrew McAfee of MIT make use of this image in their e-book

"Race Against the Machine". By the measure known as Moore's law, the ability to get calculations out of a piece of silicon doubles every 18 months. That growth rate will not last for ever; but other aspects of computation, such as the capacity of algorithms to handle data, are also growing exponentially. When such a capacity is low, that doubling does not matter. As soon as it matters at all, though, it can quickly start to matter a lot. On the second half of the chessboard not only has the cumulative effect of innovations become large, but each new iteration of innovation delivers a technological jolt as powerful as all previous rounds combined.

The other side of the sky

As an example of this acceleration-of-effect they offer autonomous vehicles. In 2004 the Defence Advanced Research Projects Agency (DARPA), a branch of America's Department of Defence, set up a race for driverless cars that promised \$1 million to the team whose vehicle finished the 240km (150-mile) route fastest. Not one of the robotic entrants completed the course. In August 2012 Google announced that its fleet of autonomous vehicles had completed some half a million kilometres of accident-free test runs. Several American states have passed or are weighing regulations for driverless cars; a robotic-transport revolution that seemed impossible ten years ago may be here in ten more.

That only scratches the surface. Across the board, innovations fuelled by cheap



processing power are taking off. Computers are beginning to understand natural language. People are controlling video games through body movement alone—a technology that may soon find application in much of the business world. Three-dimensional printing is capable of churning out an increasingly complex array of objects, and may soon move on to human tissues and other organic material.

An innovation pessimist could dismiss this as "jam tomorrow". But the idea that technology-led growth must either continue unabated or steadily decline, rather than ebbing and flowing, is at odds with history. Chad Syverson of the University of Chicago points out that productivity growth during the age of electrification was lumpy. Growth was slow during a period of important electrical innovations in the late 19th and early 20th centuries; then it surged. The information-age trajectory looks pretty similar (see chart 4).

It may be that the 1970s-and-after slowdown in which the technological pessimists set such store can be understood in this way—as a pause, rather than a permanent inflection. The period from the early 1970s to the mid-1990s may simply represent one in which the contributions of earlier major innovations were exhausted while computing, biotechnology, personal communication and the rest of the technologies of today and tomorrow remained too small a part of the economy to influence overall growth.

Other potential culprits loom, however—some of which, worryingly, might be permanent in their effects. Much of the economy is more heavily regulated than it was a century ago. Environmental protection has provided cleaner air and water, which improve people's lives. Indeed, to the extent that such gains are not captured in measurements of GDP, the slowdown in progress from the 1970s is overstated. But if that is so, it will probably continue to be so for future technological change. And poorly crafted regulations may unduly raise the cost of new research, discouraging further innovation.

Another thing which may have changed permanently is the role of government. Technology pessimists rarely miss an opportunity to point to the Apollo programme, crowning glory of a time in which government did not simply facilitate new innovation but provided an ongoing demand for talent and invention. This it did most reliably through the military-industrial complex of which Apollo was a spectacular and peculiarly inspirational outgrowth. Mr Thiel is often critical of the venture-capital industry for its lack of interest in big, world-changing ideas. Yet this is mostly a response to market realities. Private investors rationally prefer modest business models with a reasonably short time to profit and cash out.

A third factor which might have been at play in both the 1970s and the 2000s is energy. William Nordhaus of Yale University has found that the productivity slowdown which



started in the 1970s radiated outwards from the most energy-intensive sectors, a product of the decade's oil shocks. Dear energy may help explain the productivity slowdown of the 2000s as well. But this is a trend that one can hope to see reversed. In America, at least, new technologies are eating into those high prices. Mr Thiel is right to reserve some of his harshest criticism for the energy sector's lacklustre record on innovation; but given the right market conditions it is not entirely hopeless.

Perhaps the most radical answer to the problem of the 1970s slowdown is that it was due to globalisation. In a somewhat whimsical 1987 paper, Paul Romer, then at the University of Rochester, sketched the possibility that, with more workers available in developing countries, cutting labour costs in rich ones became less important. Investment in productivity was thus sidelined. The idea was heretical among macroeconomists, as it dispensed with much of the careful theoretical machinery then being used to analyse growth. But as Mr Romer noted, economic historians comparing 19th-century Britain with America commonly credit relative labour scarcity in America with driving forward the capital-intensive and highly productive "American system" of manufacturing.

The view from Serendip

Some economists are considering how Mr Romer's heresy might apply today. Daron Acemoglu, Gino Gancia, and Fabrizio Zilibotti of MIT, CREI (an economics-research centre in Barcelona) and the University of Zurich, have built a model to study this. It shows firms in rich countries shipping low-skill tasks abroad when offshoring costs little, thus driving apart the wages of skilled and unskilled workers at home. Over time, though, offshoring raises wages in less-skilled countries; that makes innovation at home more enticing. Workers are in greater demand, the income distribution narrows, and the economy comes to look more like the post-second-world-war period than the 1970s and their aftermath.

Even if that model is mistaken, the rise of the emerging world is among the biggest reasons for optimism. The larger the size of the global market, the more the world benefits from a given new idea, since it can then be applied across more activities and more people. Raising Asia's poor billions into the middle class will mean that millions of

great minds that might otherwise have toiled at subsistence farming can instead join the modern economy and share the burden of knowledge with rich-world researchers—a sharing that information technology makes ever easier.

It may still be the case that some parts of the economy are immune, or at least resistant, to some of the productivity improvement that information technology can offer. Sectors like health care, education and government, in which productivity has proved hard to increase, loom larger within the economy than in the past. The frequent absence of market pressure in such areas reduces the pressure for cost savings—and for innovation.

For some, though, the opposite outcome is the one to worry about. Messrs Brynjolfsson and McAfee fear that the technological advances of the second half of the chessboard could be disturbingly rapid, leaving a scourge of technological unemployment in their wake. They argue that new technologies and the globalisation that they allow have already contributed to stagnant incomes and a decline in jobs that require moderate levels of skill. Further progress could threaten jobs higher up and lower down the skill spectrum that had, until now, seemed safe.

Pattern-recognition software is increasingly good at performing the tasks of entry-level lawyers, scanning thousands of legal documents for relevant passages. Algorithms are used to write basic newspaper articles on sporting outcomes and financial reports. In time, they may move to analysis. Manual tasks are also vulnerable. In Japan, where labour to care for an ageing population is scarce, innovation in robotics is proceeding by leaps and bounds. The rising cost of looking after people across the rich world will only encourage further development.

Such productivity advances should generate enormous welfare gains. Yet the adjustment period could be difficult. In the end, the main risk to advanced economies may not be that the pace of innovation is too slow, but that institutions have become too rigid to accommodate truly revolutionary changes—which could be a lot more likely than flying cars. ■

Asian welfare states

New cradles to graves

Reprinted from The Economist, Sep 8th 2012

The welfare state is flowering in Asia. Will it free the continent from squalor? Or sink it in debt?

A CARTOON cat decorates the T-shirt worn by Agus Kurniawan, a two-year-old cradled

in his mother's lap. But the cat is hard to see, because young Agus cannot hold himself upright. His body is bowed by microcephaly, an undersized skull and brain, which plays havoc with his motor functions.

His mother has been advised to seek therapy in Bandung, 60km (37 miles) away from their home in Gunturmekar, a village in the Indonesian province of West Java. The family's medical bills there would in principle be paid by the government under a scheme called Jamkesmas, which has covered over 76m of Indonesia's poorer citizens since 2008.

But his mother says she cannot afford to make the trips. Her hopes now rest with another scheme called PNPМ Generasi. It gives funds to the village (about 47m rupiah, or \$5,300 last year) which a board of 11 villagers decides how to spend. But it is doubtful Agus will qualify. PNPМ Generasi is dedicated to improving school attendance, maternal health and infant nutrition. But feeding is not Agus's problem, his mother admits. He'll eat anything.

For decades Indonesia's government has tried to improve the lot of villages like Gunturmekar through piecemeal projects. Some, like Jamkesmas, have breadth but no depth: it has an annual budget of less than \$10 per person. Others, like PNPМ Generasi, respond to the community's demands not the individual's. But Indonesia is now embarking on something more systematic: it is laying the foundations of a welfare state.

Last October Indonesia's parliament passed a law pledging to provide health insurance to all of the country's 240m citizens from January 1st 2014. One government agency will collect premiums and foot the bills, making it the biggest single-payer system in the world, says Dr Hasbullah Thabrany of Universitas Indonesia in Jakarta. The same law also committed the government to extend pensions, death benefits and worker-accident insurance to the nation by July 2015. The government has said little about the cost or generosity of these broader benefits. If Indonesia tried to universalise the kind of package now enjoyed by civil servants and 9m salaried employees, it would have to collect over 18% of wages to fund the scheme fully, according to calculations by Mitchell Wiener of the World Bank. Passing the law is always easier than paying for it.

Indonesia is not the only country in developing ▶▶



Asia rapidly expanding health insurance. In the Philippines, 85% of the population are now members of PhilHealth, the government-owned health insurer, compared with 62% in 2010. China's rural health-insurance scheme, which in 2003 covered 3% of the eligible population, now covers 97.5%, according to official statistics. India has also extended (albeit modest) health insurance to roughly 110m people, more than twice the number of the uninsured Americans whose plight motivated Obamacare; this is, as America's vice-president once said about his boss's reforms, a "big fucking deal".

This new Asian interest in social welfare goes far beyond health. Thailand, which achieved universal health care in 2001, introduced pensions for the informal sector in May 2011. China's National Audit Office last month declared that the country's social-security system was "basically" in place. India expanded its job-guarantee programme to every rural district in 2008, promising 100 days of minimum-wage work a year to any rural household that asks for it.

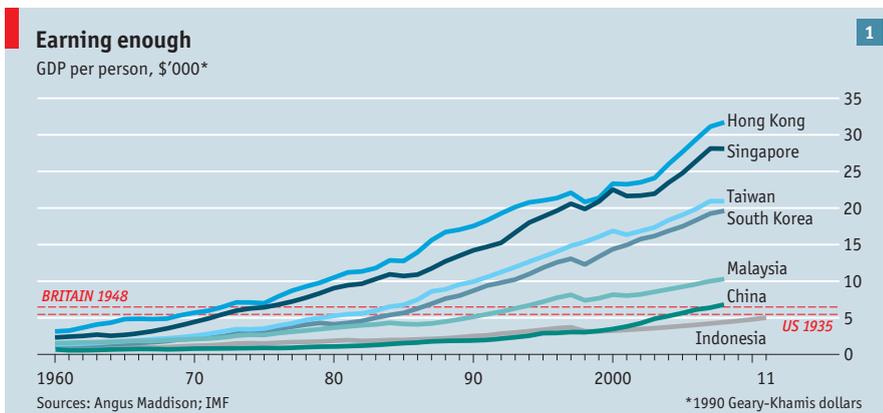
Tigers turning marsupial

Rich countries like South Korea and Taiwan have gone further. In 2008 Korea introduced an earned-income tax credit, a universal basic pension and an insurance scheme providing long-term care for the elderly. December's presidential election is fast becoming a game of welfare one-upmanship. Even Singapore, long opposed to the idea of a "crutch economy", offered cash handouts, disguised as tax rebates, to people with low incomes and low-rent homes in this year's budget.

Although poorer countries still limit themselves to ad hoc welfare offerings, fitting the spending level to revenues one budget at a time, there is an increasing trend towards entitlements served by statutory institutions that will outlive the budgetary cycle. As these systems mature, welfare provision will be demand-led, not supply-driven; welfare will become integral to the state. Asia's tigerish economies are turning marsupial, carrying their dependants along with them as they prowl.

Some of the national leaders who unleashed those tiger economies would be shocked and disturbed by the development. To them the welfare state was a Western aberration that would serve only to undermine thrift, industry and filial duty. Those virtues, they argued, underpinned their economic miracles and won envious admiration abroad, not least in Western countries bent under the weight of their social obligations.

That is not to say that Asia boomed in the complete absence of welfare provisions. But its arrangements took a distinctive form which Ian Holliday of Hong Kong University has termed "productivist". This model subordinated social policy to economic goals. In Europe, some politicians like to say growth is necessary to pay for health care and other goodies. Productivism reversed that logic: welfare



provision is a means to the end of economic progress, not the other way around.

Institutionalised welfare provision was reserved not for the neediest cases, but for workers in the most productive industries. Even for these lucky few, welfare was not a right or an entitlement; it was more like an investment in manpower. Welfare services (injury insurance, health care, pensions) were delivered by state-owned corporations rather than ministries, in part so that no one would come to think of pensions and health as the state's responsibility. This model of welfare tried to keep savings high and work incentives sharp. In Korea, for example, anyone aged 18-65 used to be ineligible for public assistance.

Thus Asia's tigers kept social spending low as a percentage of GDP while their economies grew at unprecedented rates. This rapid economic progress was combined with big social advances in literacy and life expectancy. But the model fell foul of two closely linked disruptions and one implacable trend.

The trend was a steep decline in fertility. The average South Korean woman can now expect to give birth to only 1.39 children in her lifetime; in Singapore, the figure is 1.37; in Hong Kong, only 1.14. This welfare model assumed that Asia's tightly knit families would take care of the social responsibilities its governments refused to shoulder. But asked

to tutor their children, care for their parents and supplement their husband's income, women have rebelled. The Singaporean women interviewed by Shirley Hsiao-Li Sun, a sociologist at Nanyang Technological University in Singapore, "want more direct and universal state subsidies, especially for education and health care," she writes.

The disruptions were the interruption of miracle growth and the erosion of authoritarian rule. The Asian financial crisis of 1997-98 resulted in a spike in lay-offs among industrial workers, and governments found it impossible to leave the jobless masses to their fate. Before 1998, none of Taiwan's unemployed got state benefits. By 2001, all of them did. In South Korea President Kim Dae-jung pushed through a controversial 1999 act guaranteeing a minimum income to the poor, even if they could work. That minimum is now about 97% of America's poverty guideline, measured at purchasing-power parity, in a country with only about 67% of America's GDP per head.

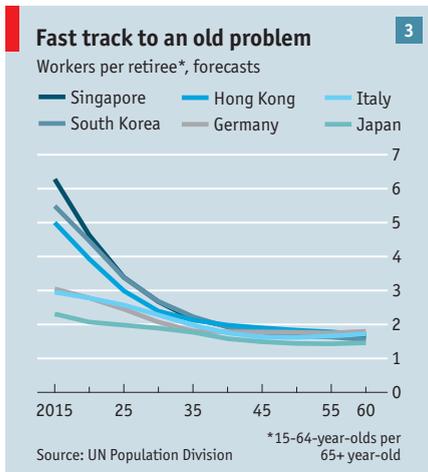
Asian values and welfare

At the same time, in much of Asia, newly assertive opposition parties showed that the distaste for welfare expressed by authoritarian leaders was not shared by the population at large. Welfare promises won votes. Even in China, where there are no national votes to win, policymakers began to promise a "harmonious society" not just a fast growth rate.

It seems that every country that can afford to build a welfare state will come under mounting pressure to do so. And much of Asia has hit the relevant level of prosperity (see chart 1). Indonesia is now almost as developed as America was in 1935 when it passed the landmark Social Security Act, according to figures compiled by the late Angus Maddison, an economic historian. China is already richer than Britain was in 1948, when it inaugurated the National Health Service (NHS) which, to judge by political ructions—and Olympic opening ceremonies—has become crucial to its sense of national identity.

Asian welfare still looks lean by Western standards. Public health spending is still only 2.5% of GDP, compared with about 7% in the OECD group of rich nations. That will





change as Asia ages, but high co-payments (in South Korea), low payments to hospitals (in Thailand) and sparse facilities (in Indonesia and elsewhere) have also contained costs.

The results of the region's welfare-state-building are neatly summarised by the Asian Development Bank's Social Protection Index (see chart 2). It divides a country's social spending by the number of potential beneficiaries and expresses the result as a percentage of the country's GDP per head. If Japan's social-security spending were divided in this way, each beneficiary would receive about 13% of the country's GDP per head. For South Korea, even after two decades of democracy, that figure is only 7.1%

Asian countries have tended to spread their spending thin. South Korea's mean-tested basic pension covers about 70% of the elderly but pays only 5% of the average wage, according to Randall Jones of the OECD. Indonesia's Jamkesmas scheme purports to cover everyone in the bottom 30%. But in reality, about 80% of cardholders do not know what they are entitled to, and some, like Agus's mother, could not make it to a hospital even if they did.

The paucity of Asia's coverage partly reflects distinctive problems. One is informal workers, who remain a big share of the labour force by rich-world standards even in relatively prosperous countries, where they include everyone from day labourers to self-employed lawyers. When Thailand tried to enroll people who were neither poor nor employed by big firms in a voluntary health-insurance scheme in the 1990s, the sick tended to join but the healthy stayed away, leaving a large share of the population uncovered. In 2001 the government decided it was cheaper to pay for their coverage itself, demanding only a 30-baht co-payment per visit to the doctor.

Just as contributions are hard to collect, so beneficiaries are often hard to identify. Many Asian programmes are intended only for the poor, but they can be hard to distinguish from everyone else. Over half of the Indonesians who now hold the free Jamkesmas health-

insurance card do not belong to the bottom 30% for whom such cards are intended, says Matthew Wai-Poi of the World Bank. With the bank's help, the government has drawn up a new list of the indigent, based on proxies for poverty (dirt floors, unprotected wells, shared toilets without drains, and so on) that are easier to verify and harder to manipulate. That said, in other countries people have been known to hide their motorbike and borrow the neighbours' kids to seem more deserving than they are.

At least Jamkesmas attempts to target the poor. One of Indonesia's biggest fiscal giveaways subsidises motor fuel regardless of who uses it, and thus mostly ends up with the car-owning rich. Last year those subsidies cost the government nine times what health care did.

The third problem is the sheer size of some countries and their range of living standards. Enforcing national welfare standards in a country like China, India or Indonesia is more akin to establishing common standards, not in a single country like Germany or Greece, but in the European Union as a whole—not something that has advanced noticeably far in 50 years.

Second-mover advantage

Under the current system migrant workers in China worry that their pension entitlements will not follow them if they move from one province to another. The owner of the Fukang Market store in a village outside Beijing is originally from Shanxi province, 500km away. He and his wife have not joined the local pension scheme, worried that if, say, their store were torn down, they would have to move—but their pension would not follow.

However, as latecomers to the welfare state, Asian countries also have certain advantages. They can learn from the West's mistakes, and they can leapfrog some of its obsolete practices.

The starkest lesson they can learn is fiscal. Bambang Widianto, the head of Indonesia's task-force against poverty, confesses to being scared by the example of Greece. Unlike Singapore, where citizens are required to contribute to a provident fund from which their pensions will be drawn, the pensions

Indonesia has promised to offer to the nation in 2015 will be partly on a "defined benefit" basis, under which a person's pension may not necessarily match his contributions. The government thus has crucial decisions to make about the size of the benefits and the distribution of the burden. Unfortunately, Mr Widianto says, "no one is doing those calculations right now."

Statutory retirement ages tend to be low in developing Asia: averaging 59 for men and 58 for women, according to the OECD. In Thailand, people can withdraw their pension fund at 55 and many workers are required to retire at 60. Thai women can expect to live for 27 years after retirement, the OECD calculates; Sri Lankan women for almost 35 years. Fortunately, the fiscal problems implicit in such longevity can be headed off before the new schemes mature. As M. Ramesh of the Hong Kong Institute of Education points out, South Korea cut the benefits offered by its national pension scheme, introduced in 1988, before anyone had made the 20 years of contributions required to qualify for it.

New technological possibilities should make Asia's schemes cheaper to run than the West's old ones. Britain's NHS spent almost ten years and £6.4 billion trying to get its records digitised before abandoning the effort last year. India's new health-care scheme for the poor aims to be cashless and paperless from the start, using swipeable smart cards to make payments and convey information. In Pakistan over 140,000 poor people have received cash transfers over the phone under the Benazir Income Support Programme.

Some Asian countries will increasingly stake out the welfare frontier. The region has already set some records. Singapore must be the only capitalist society to house more than 80% of its population in public housing. South Korea beats the world in college enrolment (it has more students than 18- to 23-year-olds).

Beyond catch-up

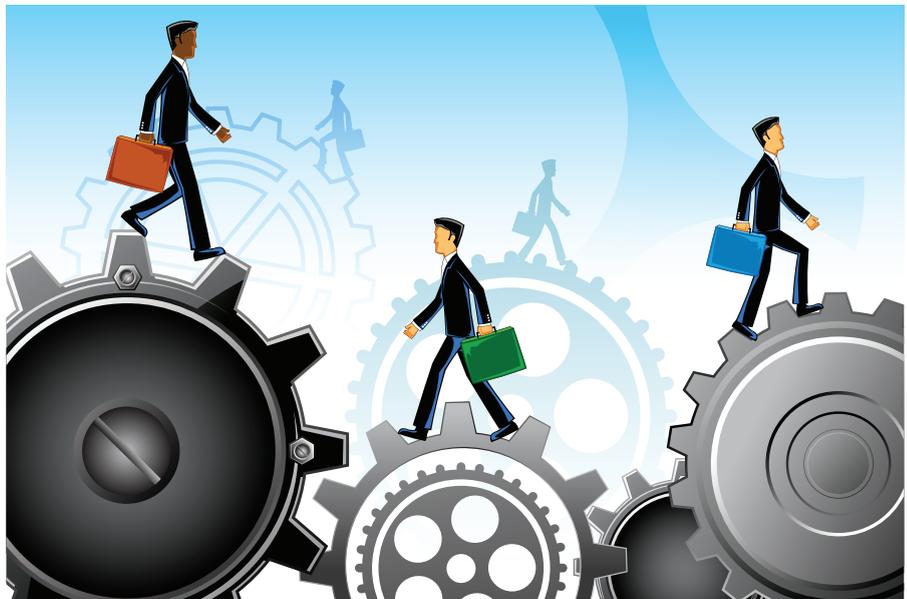
But Asian countries will also face new challenges—or at least old challenges accelerated (see chart 3). Singapore, South Korea and Hong Kong are ageing faster than any other countries. By 2040 they will have fewer than two people of working age to support every person aged 65 or more. They will have to pioneer ways to lighten that burden and keep the elderly active. In the West, the welfare state rescued the elderly from indigence. In the East, it will have to spare them from indolence.

South Korea already subsidises the employment of the elderly. It is now also beginning to socialise the burden of caring for them. In 2008 it introduced insurance for long-term geriatric care. Needy cases are given a score out of 100 for decrepitude, based on whether they can brush their teeth, remember their birth date, and so on. If their score is bad enough, they may get help from the state with daily tasks like bathing or housework. ▶▶



Singapore is helping people to flog their homes rather than to tidy them. It is offering S\$20,000 (\$16,000) to over-54-year-olds if they sell their flat, save the proceeds and move into one of the small studios the government is building.

By 2030 Asia (excluding Japan) will account for over half of the world's elderly and about half of the global burden of non-communicable diseases, like cancer and diabetes. If Asia's welfare provision continues to widen and deepen, the region will host most of the world's pensioners and patients. Asia may no longer boast a distinctive welfare model. But by the time Agus's mother retires, the world of welfare will have become increasingly Asian. ■



Pensions Falling short

Reprinted from The Economist, Apr 7th 2011

People in rich countries are living longer. Without big reforms they will not be able to retire in comfort, says Philip Coggan

WHEN GERTRUDE JANEWAY died in 2003, she was still getting a monthly cheque for \$70 from the Veterans Administration—for a military pension earned by her late husband, John, on the Union side of the American civil war that ended in 1865. The pair had married in 1927, when he was 81 and she was 18. The amount may have been modest but the entitlement spanned three centuries, illustrating just how long pension commitments can last.

A pension promise can be easy to make but expensive to keep. The employers who promised higher pensions in the past knew they would not be in their posts when the bill became due. That made it tempting for them to offer higher pensions rather than better pay. Over the past 15 years the economics of the deal have become clear, initially in the private sector, where pensions (and health-care costs after retirement) were central to the bankruptcy of General Motors and many other firms.

There are big national differences, but in most developed countries the bulk of retirement income (around 60%, according to the OECD) comes from the state. Most countries offer some kind of basic safety net for those who have no other income. In addition to this, they may have a social-insurance scheme to which workers and employers contribute. Despite the insurance label, these are essentially pay-as-you-go (PAYG) systems in which benefits are paid out of current taxes.

In some countries workers also have pension rights that are linked to their employment, whether it is in the public or the private sector. Such schemes can be funded (as in America, Britain and the Netherlands) or unfunded

(as in much of Europe). In some cases the state has required such schemes to cover all employees. Australia, for instance, has turned itself into the world's fourth-largest market for fund management by setting up a compulsory national pension scheme for its 22m people. On top of that, people accumulate savings (sometimes called pensions and sometimes not) that they expect to draw on during their declining years.

The four challenges

Pension provision is higgledy-piggledy and often complex, but most rich countries are having to deal with four main underlying problems. This special report will analyse these in detail and suggest ways of tackling them. The first is that people are living longer, but they are retiring earlier than they were 40 years ago. A higher proportion of their lives is thus spent in retirement. Second, the large generation of baby-boomers (in America, those born between 1946 and 1964) is now retiring. But the following generations are smaller, leaving the children of the boomers with a huge cost burden.

Third, some employees have been promised pensions linked to their salaries, known as defined-benefit (DB) schemes. In the 1980s and 1990s the true cost of these promises was hidden by a long bull market in equities. But the past dismal decade for stockmarkets depleted those funds and left employers on the hook for the shortfall. Private-sector employers have largely stopped making such promises to new employees; the public sector is beginning to face the same issues, particularly in Britain and America.

Fourth, private-sector employers are now providing pensions in which the payouts are linked to the investment performance of the funds concerned. These defined-contribution (DC) schemes transfer nearly all the risk to

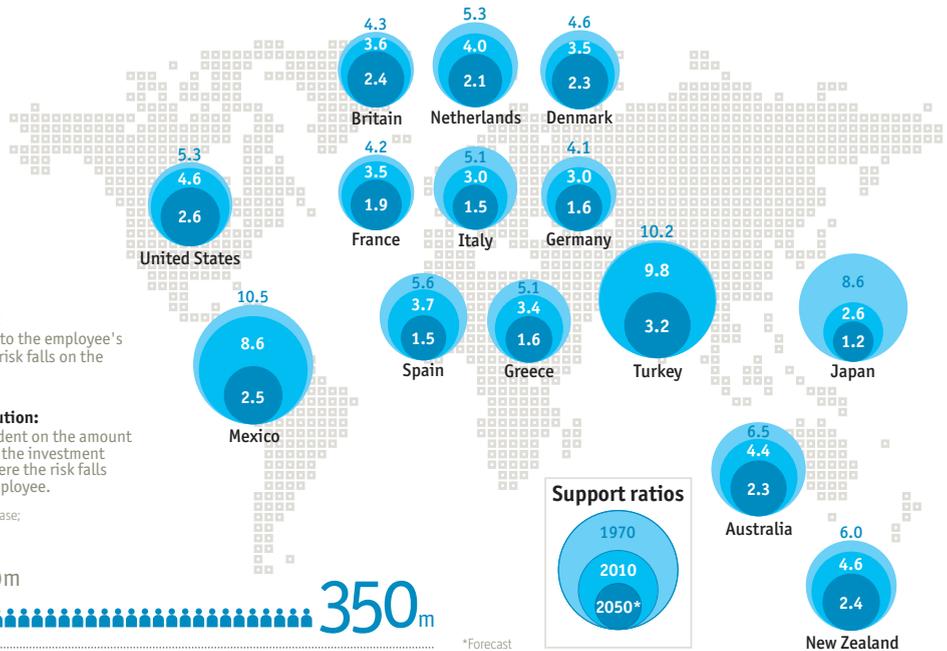
the employees. In theory, they can provide an adequate retirement income as long as enough money is paid in, but employees and employers are contributing too little. Both sorts of funded schemes, DB and DC, essentially face the same problem. "The aggregate amount of pension savings is inadequate," says Roger Urwin of Towers Watson, a consultancy.

Estimating the cost of pension provision has proved enormously difficult. People have consistently lived longer than the actuaries have expected. In 1956 a 60-year-old woman retiring from a job in Britain's National Health Service had a life expectancy of just under 20 years; by 2010 she could expect to live for another 32 years.

Paying a pension for longer is much more expensive, particularly if the payout is linked to inflation. The Economist asked MetLife, an insurance company, to calculate what a couple in America would have to spend on an annuity paying out the maximum level of Social Security benefit (the state pension) at age 66: \$4,692 a month now and rising in line with inflation. The answer is almost \$1.2m.

Politicians tend to underestimate the cost of financing PAYG systems. It is tempting to look simply at the ratio of cash benefits to contributions, rather than allowing for the value of the promises being made to future pensioners. But even on a cash basis, pension finances are deteriorating. In 2010 America's Social Security system ran a cash deficit for the first time since 1983 as more money was paid out in benefits than was collected in contributions. This happened about six years earlier than expected, thanks to unusually high unemployment.

The immediate cash cost is only part of the problem; the longer-term calculation also involves the value of future pension promises. In bearing that burden, the key figure is the ratio of workers to pensioners, known as ▶▶



Key terms

Support ratio:

The number of people of working age compared with the number of people beyond retirement age.

Participation rate:

The proportion of the population that is in the labour force.

Defined benefit:

A pension linked to the employee's salary where the risk falls on the employer.

Defined contribution:

A pension dependent on the amount contributed, and the investment performance, where the risk falls mainly on the employee.

Sources: J.P. Morgan; Guinness World Records; Human Mortality Database; OECD; US Social Security Administration; Towers Watson



Total pension assets, 13 major pension markets, 2010



The most siblings to reach pension age, 7 sons and 12 daughters born to Eugene and Alice Theriault in Canada between 1920 and 1941. They were all claiming a government pension in 2007, with their ages ranging from 66 to 87.

the support (or dependency) ratio. This is deteriorating steadily in all rich countries (see chart). As a result, the tax burden is set to rise, at a time when many countries are still struggling to cope with the fiscal deficits left over from the financial crisis.

Pensions paid through a funded scheme do not necessarily work better. Many American states and cities have been underfunding the pension schemes for their employees for years, gambling on the stockmarkets to bail them out. That gamble has failed, and now taxpayers are expected to come to the rescue. Either taxes must rise or benefits must be cut.

A cut by another name

The most obvious "cut" is for people to work longer so that pensions are paid over a smaller proportion of their lifetime. In many countries reform attempts have accordingly concentrated on raising the minimum retirement age or increasing the number of years for which an employee has to contribute before qualifying for full benefits. In France a move to raise the minimum retirement age to 62 was accompanied by a phased increase in the minimum level of contributions from 40.5 to 41.5 years, a change that was duly attacked by left-wing commentators as being unfair to unemployed workers, part-timers and students entering the job market late. Italy has gone one stage further: from 2015 on,

future changes in the retirement age will be indexed to the rise in life expectancy.

Sweden, Germany and Japan already have an automatic balancing system to deal with deteriorating pension finances, largely by making the inflation-linking of benefits less generous. The Netherlands, which has the best-funded (and widely admired) DB pension system in the world, also limits inflation-linking, but delivers pensions that are very close to average earnings. Research by Towers Watson shows that it has a higher ratio of pension assets to GDP than any other country—and it benefits from economies of scale, with pension provision dominated by the giant ABP and PGGM funds. However, contributions are high and the rules on solvency are extremely strict, requiring liabilities to be more than 100% funded.

Pension promises involve a transfer from one generation to another, even when one of those generations is too young to vote. That is true even when schemes are funded, and the money invested in equities and bonds; future workers will have to generate the income needed to pay the dividends on those shares and the interest on that debt.

That is turning pensions into a battleground, pitting young against old and taxpayers against pensioners. The fiscal crisis has exacerbated the fight. Pension promises made by the government (either to all citizens or to public-

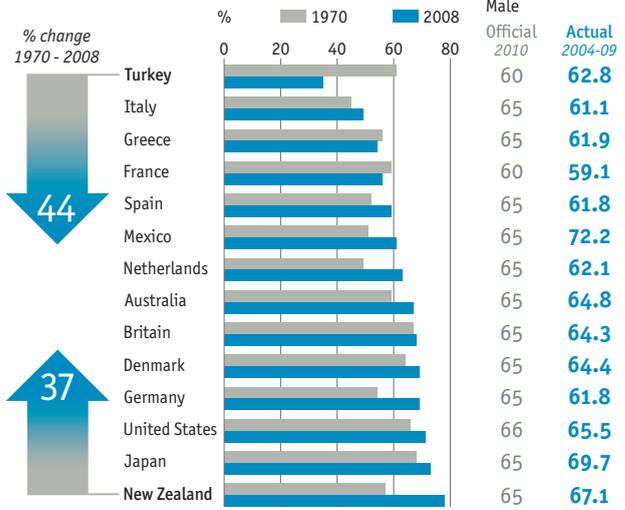
sector workers) do not show up in the debt-to-GDP ratios that are used to analyse state finances. Adding them in makes the position look even more alarming. On conservative accounting assumptions, the combined pension deficits of the American states are equal to a quarter of the gross federal debt.

The problem is particularly acute at the level of America's states because so many of them have balanced-budget amendments. When pension shortfalls require higher contributions, the money must be found from somewhere: higher taxes, less spending on other services or higher contributions from workers (amounting to a pay cut). A further difficulty is that pension rights have been deemed to be legally (and in some cases constitutionally) protected—though some Republican governors have tried to cut unions' bargaining rights.

The key figure is the ratio of workers to pensioners, known as the support ratio. This is deteriorating steadily in all rich countries

Private-sector workers may be aggrieved at having to fund the generous pensions of their public-sector counterparts through their taxes. But unions are strongest in the public sector and will fight hard. Nobody seriously disputes that employees should keep the pension rights they have accrued so far, although they may receive the benefits later; the battle is over whether employees should be allowed to keep accruing the same perks in the future. ►►

Participation rates of 50-64-year-olds



Retirement age

Official 2010	Actual 2004-09
60	62.8
65	61.1
65	61.9
60	59.1
65	61.8
65	72.2
65	62.1
65	64.8
65	64.3
65	64.4
65	61.8
66	65.5
65	69.7
65	67.1

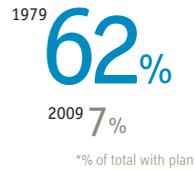
Sir Winston Churchill became prime minister at



–then the standard retirement age.

Defined-benefit pension holders

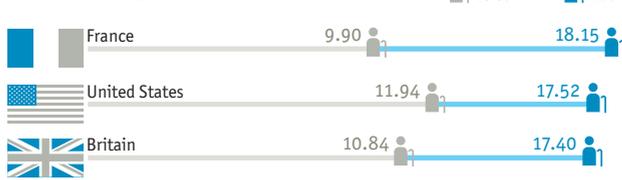
American private-sector workers* with no other plan type



The first American to receive a monthly Social Security cheque was



Life expectancy at 65, male, years



Britain's coalition government is desperately trying to cut its deficit, so a rise in pension costs is particularly inopportune; as it is, the gap between public-sector pension benefits paid and contributions received is expected to widen from £4 billion in 2010-11 to £10.3 billion by 2015-16. A recent government-commissioned report into the cost of public-sector schemes by Lord Hutton, a former Labour minister, proposed a number of changes, including a later retirement age, higher employee contributions and a pension based on the employee's career-average, rather than final, salary.

Since pensions are a form of deferred pay, workers view such reforms as a pay cut, albeit to pension rights they have not yet accrued. There is room for debate about whether such cuts are fair. But in some countries the raid on pensioners' assets has been rather more brazen. Hungary, for instance, set up a mandatory pension system in 1998 to supplement the state scheme, with contributions deducted from wages and invested in a private fund. By 2010 the fund had amassed nearly \$14 billion of assets, but the cash-strapped government has in effect nationalised it by imposing stiff financial penalties on workers who want to remain in the private sector. Argentina, for its part, seized private-sector pension assets in 2008.

If all the burden is not to fall on the state, workers need to save more during their lifetimes. That may require a change in attitude. The old system was distinctly paternalist: either

the employer or the government would provide. In America and Britain the switch from DB to DC schemes in the private sector has left the responsibility with the individual worker, but employees have yet to rise to the challenge. They are not putting enough money in, and inevitably will not get enough out. British pensioners with DC plans have accumulated an average pension pot of only £27,000, according to Aviva, an insurance company—enough to buy a pension of just £2,000 a year, with no inflation protection. That will not go far to supplement Britain's meagre state pension.

Whether or not people can expect a comfortable retirement depends on the replacement ratio—the proportion of their lifetime average earnings that their pension will pay out. This does not have to be close to 100% because generally pensioners need less to live on than full-time workers. They avoid the expenses associated with work and dependent children, have mostly paid off the mortgage on their house and no longer need to save for their retirement.

But the ratio often falls short of expectations. The OECD reckons that the average worker in its member countries currently gets a state pension of around 42% of his average earnings. If state benefits are cut, more of the burden will fall on private provision. A recent survey by Aviva suggested that European workers are hoping for a replacement ratio in the region of 70% but are likely to get only 35-55%, depending

on the country.

The replacement ratio needs to be higher than average for the least well paid, who spend proportionately more on essentials such as food, fuel and shelter. The OECD reckons that the net replacement ratio (allowing for the effect of taxes) for the poorest workers, on half mean earnings, averages just under 83%, but there are big national differences; in Denmark, Greece and the Netherlands it is more than 100%, but in Germany, Mexico and Japan it is under 60%.

So despite the need for cutting costs, governments need to ensure that their elderly citizens have enough money to maintain a decent standard of living. In the majority of countries poverty rates among the elderly are higher than those in the general population. Women are in a worse position than men: they live longer, typically earn less and spend a shorter time in the workforce. If they are married, their pension entitlements often depend on their husbands' earnings.

Japan, which started greying earlier than other developed economies, can be viewed as an ominous precedent. Its only advantage in the pensions battle has been that its workers tend to retire later than those in other countries—around a decade after those in France. Nevertheless, the ageing of its population over the past 20 years has been accompanied by deflationary pressures, sluggish economic growth and moribund asset markets. Public spending on pensions has risen by more than 80%. In the corporate sector lax accounting standards disguised the true cost of providing pensions. When the standards were changed, the true horror was revealed: in 2003 the average plan was just 42% funded, so the government had to take over the liabilities of many companies. Even after this rescue, Japan Airlines had to slash pensions by 30% as part of a restructuring plan—a huge blow to pensioners' standard of living.

Where Japan has led, other ageing economies may follow. This special report will focus on rich countries, where most of the problems arise. The details may differ but the impact of the baby-boomers shows up everywhere; their pensions will be a huge burden on coming generations. ■

Working women

Still struggling

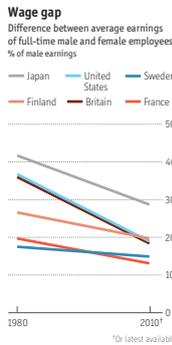
Reprinted from The Economist, Nov 25th 2011

Women have made huge progress in the workplace, but still get lower pay and fewer top jobs than men

SINCE 1970 the proportion of women in the workforce across the rich world has increased from 48% to 64%, a sharp rise but ▶▶



one which nevertheless leaves women in rich countries underemployed compared with women in China. There are large variations from country to country, but the broad trend in most places is still slightly upwards. Yet while women have made big strides in all kinds of careers they find it harder than men to bag the most senior jobs. Just 3% of Fortune 500 CEOs are women. And despite sheaves of equal-pay legislation, women still get paid less than men for comparable work. This week's special report explores the reasons why progress seems to have stalled and what can be done about it. ■



television. Over a drink and a snack in her stylish house in the woods outside Helsinki she explains that she plans to be at home for about a year, but will keep in close touch with her company and then resume work full-time. Her husband, Pekka Erkinheimo, a lawyer with another company, will do his share. In this part of the world balancing work and children is for fathers as well as for mothers.

Finland's gap between male and female employment rates is less than three percentage points, among the smallest in the world, and the vast majority of Finnish women have full-time jobs. Anne Brunila, executive vice-president of Fortum, an energy company, says that those who stay at home are often questioned about their choice. But working women's lives are made easier by employers' enlightened attitudes, excellent public child-care provision and generous family leave.

Almost all rich countries provide paid maternity leave, averaging about 20 weeks. Many also offer paid parental leave, which may be available to either parent but is generally taken by the mother, so a number of countries, including Finland, now have separate "mommy and daddy quotas", allocating periods of leave to each parent that cannot be transferred. Four out of five Finnish new fathers take a month off.

All this leave may seem rather expensive for employers, but "we accept it", says Ms Inkeroinen of the Confederation of Finnish Industries: children are seen as the responsibility of society as a whole. Not all employers are so philosophical. There is anecdotal evidence that small businesses in particular try to avoid hiring women who seem likely to start a family. And it is striking that in all the Nordic countries working women are heavily concentrated in the public sector, which finds it easier than many private firms to accommodate the comings and goings.

America is in a class of its own as the only rich country where women get no paid

maternity leave at all (though two states, California and New Jersey, offer six weeks at reduced rates of pay). In practice some 60% of women in jobs that require a college education do get paid while on baby leave, but most women doing mundane work do not. Until the Pregnancy Discrimination act of 1978 women could be sacked for being pregnant or having a child, and until the Family and Medical Leave act of 1993 they had no right to take time off to give birth. Now at least they get 12 weeks, albeit unpaid, after which most return to work fairly promptly. Finding child care is entirely up to the parents. It may seem surprising that American women are not put off by all this. They actually produce more children than most Europeans: more than two per woman. The OECD average is only 1.7, well below the replacement rate of 2.1, and in most big European countries the figure is much lower (see chart 4).

What women want

The only European countries whose birth rates come close to America's are France, the Nordics and Britain, and except for Britain they all have excellent child-care facilities. In France the écoles maternelles play a big part in allowing women to go out to work, and the Nordic countries are famous for their affordable ▶▶

Work and family

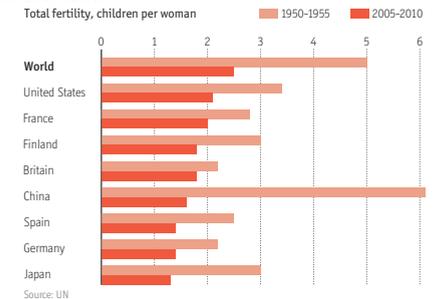
Baby blues

Reprinted from The Economist, Nov 26th 2011

A juggler's guide to having it all

"THE MOST STRESSFUL thing about having this baby was arranging cover at work for the time I was going to be away," says Sara Leclerc, an in-house lawyer with an international fire-protection firm. Her new baby girl is asleep and her four-year-old son is watching

Birth dearth





day-care centres with well-qualified staff. In Finland local authorities must guarantee a place for every child under three. Parents on low incomes get it free; the better-off pay up to €250 (\$340) a month. The centres are open from 7-8am to 5-6pm and provide breakfast and lunch. School hours for older kids are similarly work-friendly, about the same as an adult working day, with a free lunch. Moreover, those schools produce sparkling results: Finland regularly comes near the top the OECD's PISA rankings for educational achievement.

A study by the ILO of child care in ten countries last year found huge national differences in provision. In some countries nurseries are seen as a public entitlement, rather like schools. In others the care of small children is considered a private matter. Most countries come somewhere in between. Denmark puts the most money into child care, followed by other Nordic countries. France is also high on the list, as, perhaps surprisingly, is Britain. America and Japan spend well below the average.

The study found that most countries are seriously short of good-quality child care for children under three. The market does not provide enough of it because if done properly it is too expensive for most parents, so governments often subsidise it. Provision for older pre-school children is better but still patchy, and the hours are usually too short to allow parents to work full-time. And even when the children start school, facilities for keeping them in after hours are often lacking. That is a particular beef of working parents in Germany where most schools finish at lunchtime, hours before parents get home from their jobs.

How quickly women should return to work after having a child is a vexed question. Clearly they need time to recover physically, to get the baby into a routine and to find child care, so something longer than the basic maternity leave at first sight seems preferable, but it makes it harder to settle back into the job afterwards. If new mothers are off for only a few months their skills will still be fresh when they return and their employers find it easier to arrange temporary cover. Germany used to encourage women to stay home for up to three years after having a baby, but in

2007 the government changed the incentives because women were becoming disconnected from the labour market. Data on return rates are scarce, but in some European countries at least a quarter of the women go back to work when their maternity leave runs out, and in Anglophone countries about half the women are back on their child's first birthday.

Home or away?

What is best for the children? The answer is far from clear-cut, and cultural attitudes play a part. In Germany a woman who contracts out the care of her young children is still called a Rabenmutter, a bad mother. In America nobody thinks anything of dropping off the kids at a childminder.

The academic literature has turned up some evidence that if the mother is back in employment within less than a year of the birth the child's cognitive development may be slightly slowed, and the more so the more hours she works. But the person who looks after the child at home does not necessarily have to be the mother: the father or another person who is well disposed towards it may do an equally good job. In some countries grandparents play a big part in children's upbringing.

And much depends on other factors: the quality of the parenting when the mother is at home, the child itself (boys are more likely than girls to suffer from a mother's absence) and the family's economic circumstances. Poverty is very bad for children, so if the mother's work helps to avert it they will benefit.

If the child care is being outsourced, then its quality makes all the difference. Poor child care can set a child back. Yet in Denmark, where women tend to go back to work within a few months of giving birth and public child-care provision is first-class, studies have found no ill effects on children's behaviour in their first year of life. And once the child is older than one, being in formal child care may actually be good for it, particularly if it comes from an underprivileged background. In France pre-school attendance at an école maternelle from age two seems to have positive effects on later academic performance.

But even if the kids are all right, women still need to figure out whether work will actually pay. That depends not just on wages and child-care costs but also on a number of other factors such as tax policies and benefits. The OECD reckons that across its member countries the net average cost of child care after allowing for fees, cash benefits and tax concessions is 18% of the average wage, which makes children seem a bit of a luxury. Child-care arrangements are often a complicated patchwork quilt of paid help, family, friends and neighbours. In some countries, including Switzerland, Ireland and Britain, the combined effect of the cost of child care and the lack of tax

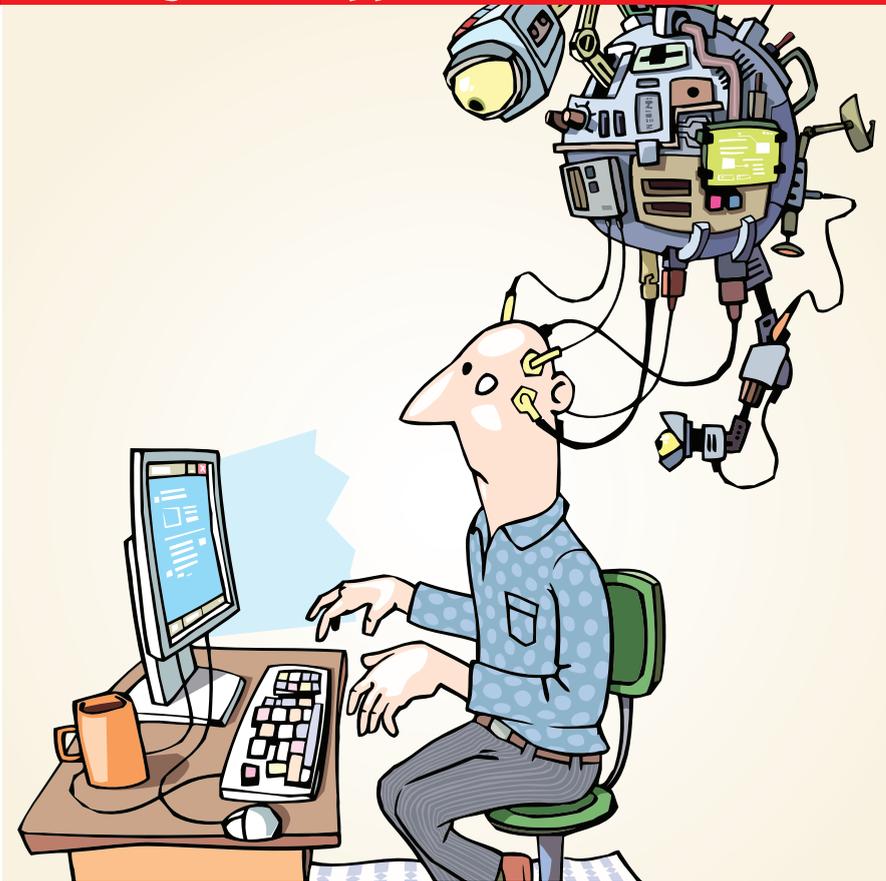
concessions and benefits makes it unattractive for mothers of young children to work unless they are very well paid. If governments in such countries want to get more women into the labour force, they will need to ensure that good-quality child care is more widely available and more affordable, for example by making it tax-deductible.

In Britain, where it is not, even highly paid professional women such as corporate lawyers and accountants complain that after paying their nanny's salary, tax and social-security contributions they see little or nothing of their own after-tax earnings. For low-paid parents the calculation becomes even more unattractive. Women in single-parent households—which in rich countries now make up one in five households with children—are often financially better off not working.

But the calculation is not just about immediate payback. Across the earnings spectrum, women who have been out of the labour force for a while find it hard to get back in because their skills deteriorate, they become less confident and employers fret about the hole in their CV. Studies of the effect of career breaks show that even a few years away have a devastating impact on lifetime earnings and pension rights, not only because there is no pay coming in but because of the loss of seniority and promotion. That is why many women are prepared to work for only a small net return while their children are young.

All this is assuming that every woman will have a family. Most do, though they leave it increasingly late: in rich countries the average age at which they have their first child is now 28, compared with 24 in 1970. But growing numbers of women are forsaking motherhood altogether. Of those born in 1965 (who will by and large have completed their families), 18% are childless, with large variations from country to country. In Portugal the figure is only 4%, in Italy around 20%. Some of these women may not have been able to have a family, but most will have chosen not to. The more highly educated and successful they are, the more likely they are to have made that choice. Sylvia Ann Hewlett, founder and president of the Centre for Work-Life Policy in New York, notes that among American college-educated women aged 41-45 in white-collar jobs, two-fifths have no kids.

In future women will have to retire much later than they do now because they live ever longer and current pension ages are becoming ever less affordable. If they have no children, their careers will be just as long as men's. And even if they do, as most will, the time spent bringing them up will account for only a minor part of their total working life. Women's role in perpetuating the species is not nearly enough to explain the huge gap in opportunities at the top of organisations. ■



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of millions of people living in abject poverty, especially in rural areas. A good job would be the best way out.

Yet even as many people face a job famine, a minority is benefiting from an intensifying war for talent. That minority is well placed to demand interesting and fulfilling work and set its own terms and conditions. But above all the pay of such people—from executives to investment bankers and software engineers in Silicon Valley—is soaring. The most talented increasingly get a multiple of the salary of the average performer. This has led to rising inequality in incomes in many countries which may be increasing social tensions.

Mr Obama can reasonably point out that he was elected in the wake of a financial meltdown that had threatened to bring about another Great Depression, with an unemployment rate that would make the current one look like a lucky escape. The co-ordinated global stimulus by members of the G20 in 2009, though far from perfect, helped save the world from something much worse—though that probably provides little comfort to the 205m people round the globe who are now unemployed. Nor is there much scope for further stimulus.

But today's jobs pain is about more than the aftermath of the financial crisis. Globalisation and technological innovation are bringing about long-term changes in the world economy that are altering the structure of the labour market. As a result, unemployment is likely to remain high in the rich economies even as it falls in the poorer ones. Edmund Phelps, a Nobel prize-winning economist, thinks that in America the "natural rate" of unemployment (below which higher demand would push up inflation) in the medium term is now around 7.5%, significantly higher than only a few years ago.

Michael Spence, another Nobel prize-winning economist, in a recent article in Foreign Affairs agrees that technology is hitting jobs in America and other rich countries, but argues that globalisation is the more potent factor. Some 98% of the 27m net new jobs created in America between 1990 and 2008 were in the non-tradable sector of the economy, which remains relatively untouched by globalisation, and especially in government and health care—the first of which, at least, seems unlikely to generate many new jobs in the foreseeable future. At the same time, says Mr Spence, the

The future of jobs

The great mismatch

Reprinted from The Economist, Sep 10th 2011

In the new world of work, unemployment is high yet skilled and talented people are in short supply. Matthew Bishop explains

"FAR AND AWAY the best prize that life offers is the chance to work hard at work worth doing," observed Theodore Roosevelt, then America's president, in a Labour day speech on September 7th 1903. Today the billions of people the world over who seek that prize are encountering simultaneous feast and famine. Even in developed economies that are currently struggling, many people, perhaps more than ever, are doing the job of their dreams, taking home both a good salary and a sense of having done something worthwhile. In booming emerging countries such as China and India, many at least have a better job than they ever thought possible. Yet at the same time in much of the world unemployment is persistently high and many of the jobs on offer are badly paid, onerous and unsatisfying.

This has serious political implications, not least for America's current president, Barack Obama, who risks losing his own dream job because of his perceived failure to have created enough work for his fellow citizens.

As Mr Obama entered the White House in January 2009, the country's unemployment rate was about to climb above 8%, up from around 5% a year earlier. It has not recovered since and is currently around 9%. Until the presidential election in November next year Mr Obama is likely to be dogged by the phrase "jobless recovery"—always assuming that the recovery does not double-dip into an even more jobless recession.

Much as Americans complain, compared with some other countries their economy presents a picture of good health. In the weaker economies of the euro zone, jobs have been sacrificed in the name of austerity, especially in the public sector, to avoid defaulting on debts built up by free-spending governments. Anger at high unemployment has caused unrest and may have been a contributory factor in the riots in Britain last month. In late July thousands of unemployed young Spaniards, known as los indignados (the indignant), having protested in cities across their own country, began a long march to Brussels to draw attention to the shockingly high jobless rate of over 40% among their age group.

Outside the rich world, the Arab Spring that brought down the governments of Tunisia and Egypt earlier this year was triggered in part by the lack of decent work for young people. Even in booming China and India policymakers worry about how to ensure there are enough decent jobs, especially for young people and graduates. Both countries still have hundreds

Working the figures

Unemployment rate

2010 or latest, %

0.0 Total labour-force participation rate, 2011, %

Youth unemployment

Aged 15-24, %

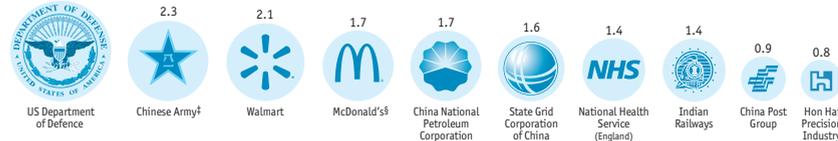


Global employment, bn

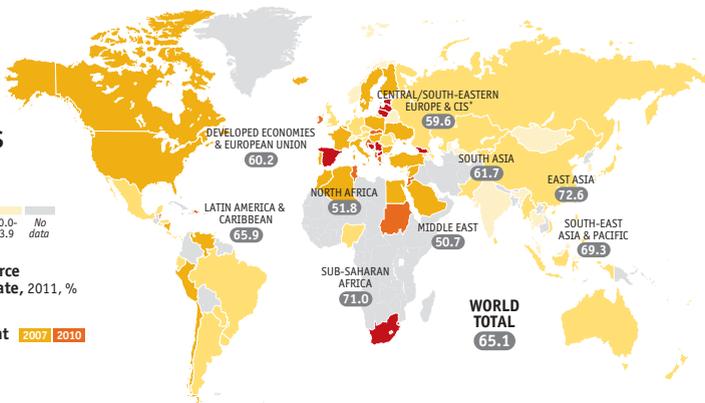


Biggest employers, 2010

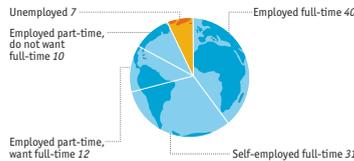
Number of employees, m



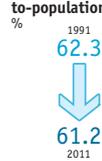
Sources: IMF; ILO; Gallup; Fortune; EU; The Economist. All 2011 data are forecasts. †Commonwealth of Independent States ‡Surveys conducted in 129 countries and areas †2008 ‡Includes franchise employees



Global workforce†, 2009-10, %



Global employment-to-population ratio



mix of jobs available to Americans in the tradable sector (including manufacturing) that serves global markets is shifting rapidly, with a growing share of the positions suitable only for skilled and educated people.

Fear of continuing high unemployment also made a bestseller of Tyler Cowen's book, "The Great Stagnation: How America Ate All the Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better". It argues that for much of its history America (and to some extent other rich countries) enjoyed the benefits of free land, lots of immigrant labour and powerful new technologies. But over the past 40 years these advantages have faded and America has found itself on a technological plateau, he says. To the obvious question about the internet, he retorts that the web has provided lots of utility for users but much less in the way of profits—and relatively few new jobs.

Lowering this new natural rate of unemployment will require structural reforms, such as changing education to ensure that people enter work equipped with the sort of skills firms are willing to fight over, adjusting the tax system and modernising the welfare safety net, and more broadly creating a climate conducive to entrepreneurship and innovation. None of these reforms is easy, and all will take time to produce results, but governments around the world should press ahead with them.

The changes now under way will pose huge

challenges not only to governments but also to employers and individual workers. Yet they also have the potential to create many new jobs and substantial new wealth.

To understand why these changes are so exciting for some people and so scary for others, a good place to start is the oEconomy section on the website of oDesk, one of several booming online marketplaces for freelance workers. In July some 250,000 firms paid some 1.3m registered contractors who ply their trade there for over 1.8m hours of work, nearly twice as many as a year earlier.

oDesk, founded in Silicon Valley in 2003, is a "game-changer", says Gary Swart, its chief executive. His marketplace takes outsourcing, widely adopted by big business over the past decade, to the level of the individual worker. According to Mr Swart, this "labour as a service" suits both employers, who can have workers on tap whenever they need them, and employees, who can earn money without the hassle of working for a big company, or even



of leaving home.

It is still small, but oDesk shows how globalisation and innovation in information technology, the two big trends that have been under way for some time, are moving the world nearer to a single market for labour. Much of the work on oDesk comes from firms in rich economies and goes to people in developing countries, above all the Philippines and India. Getting a job done through oDesk can bring the cost down to as little as 10% of the usual rate. So the movement of work abroad in search of lower labour costs is no longer confined to manufacturing but now also includes white-collar jobs, from computer programming to copywriting and back-office legal tasks. That is likely to have a big impact on pay rates everywhere.

Who ate my job?

This is causing alarm among middle-grade white-collar workers in the rich world, who saw what happened to manufacturing jobs in their economies. But workers in emerging markets who have those sorts of skills and qualifications are delighted. "I'm making in a week on oDesk what I made in a month as a schoolteacher, and I get to spend far more time with my family," says Ayesha Sadaf Kamal, a freelance copywriter in Islamabad. Conversely, Janet Vetter, who used to have a full-time job as a copywriter for a magazine in New York, lost her job and now moves between part-time and freelance work. "I feel isolated as a freelancer and have had no health insurance since the start of the year; it's too expensive," she says.

It is tempting to think of the globalisation of the labour market as a zero-sum game in which Mrs Kamal in Pakistan is benefiting at the direct expense of Ms Vetter in America. But economists point out that such calculations suffer from the "lump of labour fallacy"—the belief that there is only a fixed amount of work to go round. A better explanation, they say, is the theory of comparative advantage, one of the least controversial ideas in economics, which suggests that free markets make the world better off because everyone can concentrate on doing what they are best at.

A global labour market will not make every individual in the world better off: there will be losers as well as winners

All the same, a global labour market will not make every individual in the world better off: there will be losers as well as winners, and they may put up stiff resistance to change if the losses prove too painful. For instance, total global GDP could double if all barriers to the free movement of labour were removed, argues Michael Clemens in a recent paper, "Economics and Emigration: Trillion-Dollar Bills on the Sidewalk?". Yet the political implications of such mass migration make it improbable that governments, especially in rich countries, would unconditionally open their doors.

Compared with previous bursts of global integration and technological upheaval, the ▶▶

changes now taking place in the labour market may produce an unusually large number of losers, partly because they have coincided with a particularly deep recession and partly because they are happening exceptionally fast. The priority for policymakers must be to keep the number of losers as small as possible. ■

Technology and jobs

Coming to an office near you

Reprinted from The Economist, Jan 18th 2014

The effect of today's technology on tomorrow's jobs will be immense—and no country is ready for it



INNOVATION, the elixir of progress, has always cost people their jobs. In the Industrial Revolution artisan weavers were swept aside by the mechanical loom. Over the past 30 years the digital revolution has displaced many of the mid-skill jobs that underpinned 20th-century middle-class life. Typists, ticket agents, bank tellers and many production-line jobs have been dispensed with, just as the weavers were.

For those, including this newspaper, who believe that technological progress has made the world a better place, such churn is a natural part of rising prosperity. Although innovation kills some jobs, it creates new and better ones, as a more productive society becomes richer and its wealthier inhabitants demand more goods and services. A hundred years ago one in three American workers was employed on a farm. Today less than 2% of them produce far more food. The millions freed from the land were not consigned to joblessness, but found better-paid work as the economy grew more sophisticated. Today the pool of secretaries has shrunk, but there are ever more computer programmers and web designers.

Remember Ironbridge

Optimism remains the right starting-point, but for workers the dislocating effects of technology may make themselves evident faster than its benefits (see article). Even if new jobs and

wonderful products emerge, in the short term income gaps will widen, causing huge social dislocation and perhaps even changing politics. Technology's impact will feel like a tornado, hitting the rich world first, but eventually sweeping through poorer countries too. No government is prepared for it.

Why be worried? It is partly just a matter of history repeating itself. In the early part of the Industrial Revolution the rewards of increasing productivity went disproportionately to capital; later on, labour reaped most of the benefits. The pattern today is similar. The prosperity unleashed by the digital revolution has gone overwhelmingly to the owners of capital and the highest-skilled workers. Over the past three decades, labour's share of output has shrunk globally from 64% to 59%. Meanwhile, the share of income going to the top 1% in America has risen from around 9% in the 1970s to 22% today. Unemployment is at alarming levels in much of the rich world, and not just for cyclical reasons. In 2000, 65% of working-age Americans were in work; since then the proportion has fallen, during good years as well as bad, to the current level of 59%.

Worse, it seems likely that this wave of technological disruption to the job market has only just started. From driverless cars to clever household gadgets (see article), innovations that already exist could destroy swathes of jobs that have hitherto been untouched. The public sector is one obvious target: it has proved singularly resistant to tech-driven reinvention. But the step change in what computers can do will have a powerful effect on middle-class jobs in the private sector too.

Until now the jobs most vulnerable to machines were those that involved routine, repetitive tasks. But thanks to the exponential rise in processing power and the ubiquity of digitised information ("big data"), computers are increasingly able to perform complicated tasks more cheaply and effectively than people. Clever industrial robots can quickly "learn" a set of human actions. Services may be even more vulnerable. Computers can already detect intruders in a closed-circuit camera picture more reliably than a human can. By comparing reams of financial or biometric data, they can often diagnose fraud or illness more accurately than any number of accountants or doctors. One recent study by academics at Oxford University suggests that 47% of today's jobs could be automated in the next two decades.

At the same time, the digital revolution is transforming the process of innovation itself, as our special report explains. Thanks to off-the-shelf code from the internet and platforms that host services (such as Amazon's cloud computing), provide distribution (Apple's app store) and offer marketing (Facebook), the number of digital startups has exploded. Just as computer-games designers invented a product that humanity never knew it needed but now cannot do without, so these firms will no doubt dream up new goods and services to employ millions. But for now they are singularly light

on workers. When Instagram, a popular photo-sharing site, was sold to Facebook for about \$1 billion in 2012, it had 30m customers and employed 13 people. Kodak, which filed for bankruptcy a few months earlier, employed 145,000 people in its heyday.

The problem is one of timing as much as anything. Google now employs 46,000 people. But it takes years for new industries to grow, whereas the disruption a startup causes to incumbents is felt sooner. Airbnb may turn homeowners with spare rooms into entrepreneurs, but it poses a direct threat to the lower end of the hotel business—a massive employer.

No time to be timid

If this analysis is halfway correct, the social effects will be huge. Many of the jobs most at risk are lower down the ladder (logistics, haulage), whereas the skills that are least vulnerable to automation (creativity, managerial expertise) tend to be higher up, so median wages are likely to remain stagnant for some time and income gaps are likely to widen.

Anger about rising inequality is bound to grow, but politicians will find it hard to address the problem. Shunning progress would be as futile now as the Luddites' protests against mechanised looms were in the 1810s, because any country that tried to stop would be left behind by competitors eager to embrace new technology. The freedom to raise taxes on the rich to punitive levels will be similarly constrained by the mobility of capital and highly skilled labour.

The main way in which governments can help their people through this dislocation is through education systems. One of the reasons for the improvement in workers' fortunes in the latter part of the Industrial Revolution was because schools were built to educate them—a dramatic change at the time. Now those schools themselves need to be changed, to foster the creativity that humans will need to set them apart from computers. There should be less rote-learning and more critical thinking. Technology itself will help, whether through MOOCs (massive open online courses) or even video games that simulate the skills needed for work.

The definition of "a state education" may also change. Far more money should be spent on pre-schooling, since the cognitive abilities and social skills that children learn in their first few years define much of their future potential. And adults will need continuous education. State education may well involve a year of study to be taken later in life, perhaps in stages.

Yet however well people are taught, their abilities will remain unequal, and in a world which is increasingly polarised economically, many will find their job prospects dimmed and wages squeezed. The best way of helping them is not, as many on the left seem to think, to push up minimum wages. Jacking up the floor too far would accelerate the shift from human workers to computers. Better to top up low wages with public money so that anyone ▶▶

who works has a reasonable income, through a bold expansion of the tax credits that countries such as America and Britain use.

Innovation has brought great benefits to humanity. Nobody in their right mind would want to return to the world of handloom weavers. But the benefits of technological progress are unevenly distributed, especially in the early stages of each new wave, and it is up to governments to spread them. In the 19th century it took the threat of revolution to bring about progressive reforms. Today's governments would do well to start making the changes needed before their people get angry. ■

Working conditions in factories

When the jobs inspector calls

Reprinted from The Economist, Mar 31st 2012

Do campaigns for "ethical supply chains" help workers?



"DEATH to Apple executives," a protester shouted after a recent performance of "The Agony and Ecstasy of Steve Jobs", a popular off-Broadway play. Apple executives must have been delighted when Mike Daisey, the playwright and star, recently retracted his nastiest allegations about the mistreatment of workers making Apple's products in China. Apparently, he did not meet a worker poisoned by exposure to chemicals, or child workers at the factory gate. With its share price soaring as the latest iPad storms the market, Apple might be tempted to forget about the fuss over its labour practices. But that would be a mistake.

Any big company that makes things in poor countries faces scrutiny of its supply chain. Campaigners against harsh working conditions (and unions back home that hate competition from low-wage countries) will pounce on any hint of scandal. Horrified

headlines can tarnish a brand. Companies need to pay heed.

Wages for factory workers in China have been soaring at double-digit rates for years, for reasons that have little if anything to do with Western activists and a lot to do with productivity improvements. But some workers are abused, as even Apple admits. In February it invited the Fair Labour Association (FLA), a prominent non-governmental organisation (NGO), to look at the factories it uses in China, including those of Foxconn, which assembles iPhones and iPads for Apple and is owned by Hon Hai, a Taiwanese. The FLA report, expected soon, is unlikely to give Apple a clean bill of health. Aret van Heerden, the organisation's boss, gripes that although conditions in the factories are better than he expected, there are "tons of issues".

In the past 20 years what has become known as the "ethical supply chain" movement has targeted brands such as Nike, Gap and Coca-Cola. But its army of activists, some in business themselves, are grappling with growing evidence that appointing an outside body to audit and set standards, as Apple has done, is not going as well as it should. Apple could turn into a test case of how to improve things.

Not a bad Apple

Tim Cook, Apple's boss, this week visited a new Foxconn factory in central China which employs 120,000 people. He has insisted that Apple is doing a lot to improve working conditions. But he also echoes the concerns of critics. "We think the use of underage labour is abhorrent. It's extremely rare in our supply chain, but our top priority is to eliminate it totally," he declared.

After a bad press in the early 1990s, Nike is now one of the loudest advocates of improving working conditions. In 1992 it established a code of conduct for suppliers. (Apple did not get around to that until 2005.) In 1996 Nike helped create the Apparel Industry Partnership, which drew up a code of conduct for factories, and in 1999 evolved into the FLA.

Having a code of conduct and being part of an industry initiative on workers' rights has become standard practice for multinationals. But there are big differences in the toughness of codes, how rigorously compliance is monitored and how remedial action is taken.

Factory audits also vary. Nike first published the overall results of its monitoring in 2000, but did not list details of all the factories in its supply chain until 2006. (Apple did not publish details of its supply chain until this year.)

When Nike opened up it was a conscious effort to challenge industry norms. Clothing and shoe firms took it for granted that revealing which factories they used would put them at a competitive disadvantage. But Nike reckoned the downside was negligible and the lack of transparency hindered the monitoring process, says Hannah Jones, the firm's head of corporate social responsibility. Secrecy led to some factories that worked for a variety of

companies undergoing multiple audits. Other factories escaped entirely.

Another challenge is preventing corruption, says Alan Hassenfeld, a former boss of Hasbro who is now the driving force behind the International Council of Toy Industries' code, called ICTI Care. Factory managers sometimes bribe auditors. Some firms use fake books showing shorter hours and higher pay. Some workers collaborate in these violations more willingly than is assumed. Many migrants, for example, want to work long hours to save as much money as possible in a short time—and then go home.

NGOs can be both a help and a hindrance, reckons Mr Hassenfeld. Some only campaign. Others work with firms to help put things right. Some do both. Campaigning NGOs can put pressure on a firm to do better, but they rarely support it when expelling a factory from its supply chain, which also hurts workers, says Mr Hassenfeld. "One of the things we need to do is be tougher with repeat offenders, to make an example of them," he adds.

"Governments are not pulling their weight," complains Aron Cramer of BSR, an NGO. He thinks there has been "too much outsourcing of enforcement to the private sector". Individual firms may find enforcement difficult. Governments may do better, but few governments of emerging markets like to be bossed around.

"Nobody thinks this process is perfect, but we have made progress," says Mr Hassenfeld. Mr Cramer agrees. At least for firms at the top of the supply chain, "the old problems of forced labour and child labour are largely gone," he says. The worst abuses tend to be further down the supply chain, and in particular sectors, such as agriculture and mining. Nonetheless, there remains much to do even among first-tier suppliers on things like excessive hours and inadequate pay, says Mr Cramer.

Richard Locke of the Massachusetts Institute of Technology has taken a detailed look at how things really work. He persuaded four global firms regarded as leaders in ethical supply chains (Nike, Coca-Cola, HP and PVH, a big American producer of clothing) to let him analyse six years of data from their factory audits, starting in 2005. His research, to be published this year in a book, "Promoting Labour Rights in a Global Economy", drew four conclusions.

First, codes of conduct, compliance programmes and audits "[do] not deliver sustained improvements in labour conditions over time," he says. Rather, these things help gather information that highlights the problem without remedying it. At HP, for example, only seven of the 276 factories in its supply chain fully complied with its code of conduct at the last audit. At the factories he visited, Mr Locke typically found that many suppliers serving global brands drift in and out of compliance.

Down the chain

Second, investing time and money in helping ►►

factories improve their managerial and technical capabilities did produce some benefit in improved working conditions. But his third conclusion found that for significant and sustained improvement to take place, the relationship between a company and its suppliers needed to change too. The relationship had to become more collaborative. In particular, gains from changes in the production process needed to be shared.

Mr Locke's fourth conclusion poses the toughest challenge. For firms trying to improve working conditions the fault may well be in their own business model. Just-in-time manufacturing has made supply chains leaner. Slimmer inventory cuts costs and allows firms to move more quickly. As products' life-cycles shorten, this is a crucial competitive edge. But a last-minute design change or the launch of a new product can mean suppliers having to pull out all the stops to keep up—or face a stiff financial penalty.

Timberland, a bootmaker and vocal supporter of ethical working practices, admitted as much in 2007 in a company report, noting that "some of our procedures were making it difficult for factories to control working hours", including developing a huge number of new styles and the simultaneous launch of many new products. Nike has since said much the same.

As part of his research, Mr Locke visited an inkjet-printer factory in Malaysia which, at its historic peak in 2007, produced 1m products a month for HP. The factory, which made six to eight models a year with an average lifespan of less than nine months, experienced extreme demand volatility—with the result that it sometimes had to increase monthly output by 250%, then cut it again. This forces suppliers to ask their workers to put in vast amounts of overtime. Apple's product launches presumably produce similar surges.

Nike's Ms Jones says her company has taken this to heart by trying to incorporate the need to protect workers into the design of its production process. She is now jointly accountable for enforcing the code of conduct with the head of the supply chain, a change which she says has removed an "us-versus-them problem". Members of Nike's 140-strong corporate social responsibility team are now involved in all branches of the supply chain. The firm is thinking harder about how it schedules product launches. And it espouses a philosophy of continuous improvement by delegating more responsibility to workers. This will only work if they are treated well, says Ms Jones.

Apple's sales continue to boom despite all the stories about the working conditions of the people who make iPads and iPhones. So how seriously should firms take these issues? Nike claims its approach means that good labour and environmental practices boost profits—even without taking into account any reputational benefits they may deliver. Productivity is rising and the turnover of workers is down, which saves money recruiting and training

replacements. With hindsight, the criticism seems to have been good for Nike. Could the same be true for Apple? ■

Migration after the crash

Moving out, on and back

Reprinted from The Economist, Aug 27th 2011

Migration after the global economic crisis is different, but still continuing



LISA RAKOCZY arrived in north London in the mid-2000s from Krakow to study English, hoping to support herself by working as a cleaner. All went well—until the crash and ensuing economic crisis hit her previously prosperous clients. Competition for jobs became fiercer as middle-class families started to spend less on household help. For a while, she eked out enough to pay for her language course by cleaning lavatories in railway stations. Later, her sister, a teacher in Poland, helped her to make ends meet. But by the end of last year, Ms Rakoczy had tired of the trials of an immigrant's life and headed home.

A typical case, you might think. Indeed, in the wake of the crash, many immigrants have gone back. Just as predictably, many would-be emigrants have stayed at home, either because moving abroad no longer seems worth the effort or because immigration rules in many countries have become more restrictive.

Yet at the airport, Ms Rakoczy may have crossed a young Briton bound for Shanghai, a Chinese computer programmer moving to Canada or a Portuguese worker on his way to oil-rich Norway. The recession has not stopped all migration, but rather led to new patterns and different destinations. Never before—or at least not in recent history—has the map of global migration been at the same time so varied and so changeable.

Liberalisation of travel after the end of the cold war, the West's economic boom of the 2000s and rapid growth of emerging markets—all of these contributed to a new surge of

migration until the onset of the economic crisis. But as unemployment has risen, governments have grown more sensitive to arguments that immigration can be a drain on public services and damage the job prospects of the native population.

Take Britain, where the government has introduced a "migration cap" for workers coming from outside the European Union. David Cameron, the prime minister, has said that the aim is to cut unskilled immigration. A "points system" is meant to identify immigrants who will be most useful to the economy. In addition, the student visa regime is to be tightened. (Only the churlish would point out that both he and Nick Clegg, his coalition partner, were themselves beneficiaries of time spent abroad before studying.)

Britain may be going further than other countries, but it is by no means alone. Young east European democracies such as Poland are piloting schemes to restrict the numbers of incomers. The Danish government has recently reintroduced limited border controls in defiance of the European Union's Schengen agreement, which permits passport-free travel between 23 of the 27 EU countries. The government claims this measure was needed to combat crime and smuggling, though many suspect that it is really about pandering to the anti-immigration Danish People's Party, on which it relies for support.

Spain, Denmark and Japan are among those countries giving a new meaning to the phrase "pay as you go": they compensate workers who agree to return to their country of origin. The effect of such measures seems limited. Up to April 2010, only 11,400 immigrants in Spain had taken up the offer. This summer, the government in Madrid reintroduced controls on Romanian immigrants. And France has

Hitting the buffers

Inflows of permanent immigrants
% change on a year earlier, 2009



Source: OECD

sought to deport Romanian gypsies.

Other governments, more squeamish about targeting distinct ethnic minorities or social groups, have tried to revive the “buffer theory”—that migrants return home when the economy contracts, freeing jobs for the native population and providing what some call a “conjunctural shock absorber”. To boost this effect, Australia has cut the number of skilled worker visas that it offers. Malaysia more or less stopped issuing work permits in 2009.

Yet the “buffer theory” seems to be based on weak empirical foundations. A recent study by Policy Network, a think-tank, concluded that trends in unemployment and income have only a modest impact on net immigration. Using data from the past three recessions in Britain, they reckon that immigration falls when unemployment rises—but only for a limited period, after which it picks up again, often before there is any clear improvement in the economy. Similarly, the number of returning immigrants goes up only temporarily, when those who always intended to return do so.

Still, the general picture now is of less migration. The OECD, an international think-tank, says that migration into its member countries dropped by 7% in 2009. Recent national data suggest that migration will have fallen further in 2010. Dig deeper, however, and the position gets more complicated. Ireland was particularly attractive during its banking and building boom. But in 2009 its net migration was negative. Ireland now has its highest outward migration since 1989.

Australia is also a magnet for young Chinese, the largest group of immigrants in 2010. Sweden, too, is proving increasingly popular. Meanwhile, Greece, plagued by an unattractive combination of fiscal problems, austerity and unemployment, has seen a new wave of emigration, notably to America and Canada. As for Spain, modestly prosperous Britons and Germans no longer see the Costa del Sunshine as their ideal retirement resort.

“Circular” migration, in which people come and go between destinations, is on the rise, as is “on-migration”, where a migrant moves first from China to Canada, say, and then on to America. OECD researchers reckon that at least 19% of migrants who arrived in America at the turn of the millennium had left for other destinations five years later. On-migration is also common among migrants from Africa and Asia. Europeans, for their part, tend to live abroad for only a limited time.

“The notion that migration is a one-way movement of permanent settlement is outdated. Most of it is temporary—and it’s time the debate about immigration recognised this reality,” argues Philippe Legrain, an analyst of immigration and the author of “Aftershock”, a recent book analysing economic changes in the wake of the financial crash.

Some countries are starting to recognise this. While sounding tough, politicians are tweaking earlier decisions intended to restrict immigration. Germany, which has long

insisted that it is not an “immigrant country”, has nonetheless quietly increased the number of skilled migrants it allows in. Sweden has liberalised its work-permit system.

An even more intriguing development is that America and China have begun to reverse roles. America has always been the greatest immigration magnet of all. But stricter security measures to thwart terrorist attacks and the severity of its recession have changed this. Both legal and illegal immigration have tumbled, with the greatest decrease among Mexican illegal immigrants (only partly due to stricter border controls, as potential immigrants can now also find better jobs at home).

Go East

At the more educated end of the market, foreign-born college graduates are increasingly likely to leave America after gaining skills and qualifications. Some of this may be cyclical: they may return when the economy picks up. Yet in the current climate, travellers have a good chance of meeting an Asian-born graduate from an American college who is moving somewhere else to work.

Even as America’s allure is fading, China is becoming a destination of choice for many young workers. According to Chinese statistics, last year Shanghai had 143,000 foreigners with residents’ visas. That does not count the many thousands of Westerners believed to be there on tourism visas, or the illegals from elsewhere in Asia. South Koreans (121,000) top the list of expatriates resident in China, followed by Americans (71,000) and Japanese (66,000). Teaching English is the commonest job for Westerners, but there are also many, usually young, entrepreneurs opening shops, bars and restaurants.

The boom in China and the country’s activities in Africa have also encouraged more Africans to consider seeking their fortune in the Middle Kingdom. Some 100,000 are settled in Guangzhou. But African immigrants are not the only ones who wind up in this bustling city in southern China. One recent academic study identified five different residential zones of immigrant populations. African traders and Koreans, for instance, live in crowded districts. French and Indian workers congregate in high-rise buildings. Successful immigrants from the Middle East and west Africa cluster in a large white-collar estate with private gardens.

The world may be witnessing the beginnings of a big trek East. Students have started to move to South Korea and Japan. “Many international students remain in their host country,” says Madeleine Sumption, a researcher at the Migration Policy Institute in Washington, DC. She expects this trend to fuel growth in migration between Asian countries.

Far from disappearing in the wake of the crash, Ms Sumption says, migration is still “a sensible long-term investment for many people.” Although hard times may change migrants’ destinations, they do not sap the will to move in search of a better life. This

is good news: migrants did not contribute to the economic crisis, and they may yet help to overcome it. ■

Migration and climate change

A new (under) class of travellers

Reprinted from The Economist, Jun 25th 2009

Victims of a warming world may be caught in a bureaucratic limbo unless things are done to ease—and better still, pre-empt—their travails



THE airstrip at Lokichoggio, in the scorched wastes of north Kenya, was once ground zero for food aid. During Sudan’s civil war, flights from here kept millions of people alive. The warehouses are quieter now, but NGOs keep a toehold, in case war restarts—and to deal with what pundits call the “permanent emergency” of “environmentally induced” migration.

Take the local Turkana people. Their numbers have surged in recent decades, and will double again before 2040. But as the area gets hotter and drier, it has less water, grazing and firewood. The drought cycle in northern Kenya has gone from once every eight years to every three years and may contract further. That means no recovery time for the Turkana and their livestock; the result is an increasingly frantic drift from one dry place to another.

A local crisis with local causes? Only partly. Scientists think it is part of a global phenomenon: people across the world on the move as a result of environmental degradation. Just how many are moving, or about to move, is maddeningly unclear.

The International Organisation for Migration thinks there will be 200m climate-change migrants by 2050, when the world’s population is set to peak at 9 billion. Others put the total at 700m.

These startling numbers may conjure up a picture of huge, desperate masses, trekking long distances and if necessary overrunning border defences because their homelands have dried up or been submerged. But at least initially, the situation in Kenya and other parts ▶▶

of east Africa is likely to be more typical: an already poor population whose perpetual search for adequate pasture and shelter grows harder and harder. In such conditions, local disputes—even relatively petty ones between clans and extended families—can easily worsen, and become embroiled in broader religious or political fights. And that in turn makes it harder for everybody in the area to survive, and more desperate to find new places to live, even if they are not far away.

A new report—“In Search of Shelter”—by the United Nations University, the charity CARE and Columbia University in New York lists the eco-migration “hot spots”: dry bits of Africa; river systems in Asia; the interior and coast of Mexico and the Caribbean; and low islands in the Indian and Pacific Oceans.

A one-metre rise in sea levels could displace 24m people along the Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze and Yellow rivers—which together support a quarter of humanity. A two-metre rise could uproot 14m people on the Mekong alone and swamp much of its farmland. Meanwhile, the melting of the Himalayan glacier will cause floods and erosion upstream, boosting the price of rice and other staples. And many regional conflicts could be exacerbated.

The scale of the likely population shift raises big questions. Will climate-change migrants be recognised? The classic definition of refugees—tossed between states by war or tyranny—is outdated. Eco-migrants will be paperless paupers, whose multiple woes are hard to disentangle.

Poverty campaigners want a revised legal regime to protect the new migrants. However, this looks tricky. America resists calling them “environmental refugees”: the word “refugee” implies guarantees that cannot realistically be given to the coming torrent of migrants. As American diplomats quietly admit, their rich country is still reeling from Hurricane Katrina in 2005, which killed 1,800 people and displaced hundreds of thousands.

Can the United Nations High Commissioner for Refugees (UNHCR) expand to cope with eco-migrants? It has already struggled to widen its remit to include the internally displaced (26m at the end of 2008) as well as strictly-defined refugees (10m, excluding the Palestinians who come under another agency). A tenfold surge in the numbers within its orbit would push the agency out of control, says James Milner, a professor at Ottawa’s Carleton University. Meanwhile some aid workers see signs of a competition between institutions to take ownership of the eco-migration issue, perhaps by oversimplifying it.

Charles Ehrhart of CARE thinks UNHCR will remain central, but wonders how it or anybody can now distinguish between “forced” and “voluntary” migration. He says climate change may cut agricultural output by half in lowland Africa by 2020. “In such a context, does migration constitute a choice or a necessity?”

Migrants’ rights may be easy to assert for islanders whose homes are drowned—but hard in the case of big, messy movements across Africa and Asia. Most of the displaced will drift to the next-most-liveable place, as the poor do anyway.

“Many states are already overwhelmed by internally displaced populations,” says Mr Ehrhart. “Will they be able to support even more people on the move? If not, whose duty is it to make up the difference?” At the least, the gap between carbon usage and climate change’s effects portends angry North-South rows.

Meles Zenawi, who as Ethiopia’s prime minister will speak for Africa at several global gatherings this year, predicts that some parts of the continent will become uninhabitable and “those who did the damage will have to pay.” At the December summit on climate change in Copenhagen, he hopes that Africa will “aggressively” demand compensation for environmental damage as well as help with migrants and the mitigation of climate change: in his view a demand of \$40 billion would be reasonable.

Many agree that more research is needed to pinpoint the reasons why migrants pick up sticks. People concur that climate change fuels conflict in Darfur, but nobody knows how big a factor it is. Drought helped jihadist fighters seize bits of south Somalia, but was it the main reason?

Gloom abounds. James Lovelock, an environmental guru, posits a collapse in human population, in part related to migration, with a few “lifeboat” regions surviving. Then there is the pace of social change. The number of “megacities”—with populations in the tens of millions—may grow to several hundred by the middle of the 21st century. Most are poorly planned.

Would a migrant from a collapsed city receive aid? “We’ve not experienced anything of this kind, where whole regions, whole countries, may well become unviable,” says Jeffrey Sachs, head of Columbia University’s Earth Institute.

No wonder strategists see vast new security risks, and a big expansion in the world’s “ungoverned spaces”. But much can be done before the exodus turns biblical. In West Africa subsistence farming is badly irrigated. Improve that, throw in some seeds and fertiliser, scrap tariffs, build warehouses and roads, and the region may beat the worst of climate change.

Geographers at UN Habitat, a city-planning agency, say conurbations must adapt to the needs of climate-change migrants. “You can’t just stockpile people,” says Alex de Sherbinin of Columbia University. The pressure is tangible in Addis Ababa, which already has teeming slums. The price of teff, a staple, has surged after a famine that is still pushing people to the city. Mr Meles is not alone in his wrath. ■

Youth unemployment

Generation jobless

Reprinted from The Economist, Apr 27th 2013

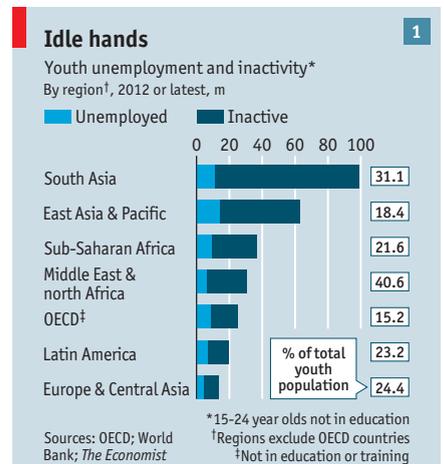
Around the world almost 300m 15- to 24-year-olds are not working. What has caused this epidemic of joblessness? And what can abate it?

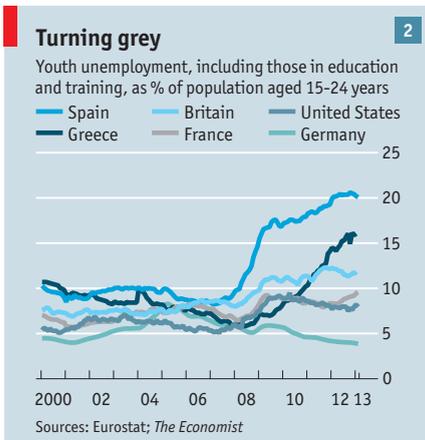


HELDER PEREIRA is a young man with no work and few prospects: a 21-year-old who failed to graduate from high school and lost his job on a building site four months ago. With his savings about to run out, he has come to his local employment centre in the Paris suburb of Sevran to sign on for benefits and to get help finding something to do. He’ll get the cash. Work is another matter. Youth unemployment in Sevran is over 40%.

A continent away in Athlone, a gritty Cape Town suburb, Nokhona, a young South African mother of two, lacks a “matric” or high-school qualification, and has been out of work since October 2010, when her contract as a cleaner in a coffee shop expired. She hopes for a job as a maid, and has sought help from DreamWorker, a charity that tries to place young jobseekers in work. A counsellor helps Nokhona brush up her interview skills. But the jobless rate among young black South Africans is probably around 55%.

Official figures assembled by the International Labour Organisation say that ►►





75m young people are unemployed, or 6% of all 15- to 24-year-olds. But going by youth inactivity, which includes all those who are neither in work nor education, things look even worse. The OECD, an intergovernmental think-tank, counts 26m young people in the rich world as “NEETS”: not in employment, education or training. A World Bank database compiled from households shows more than 260m young people in developing economies are similarly “inactive”. The Economist calculates that, all told, almost 290m are neither working nor studying; almost a quarter of the planet’s youth (see chart one).

If the figures did not include young women in countries where they are rarely part of the workforce, the rate would be lower; South Asian women account for over a quarter of the world’s inactive youth, though in much of the rich world young women are doing better in the labour force than men.

On the other hand, many of the “employed” young have only informal and intermittent jobs. In rich countries more than a third, on average, are on temporary contracts which make it hard to gain skills. In poorer ones, according to the World Bank, a fifth are unpaid family labourers or work in the informal economy. All in all, nearly half of the world’s young people are either outside the formal economy or contributing less productively than they could.

Young people have long had a raw deal in the labour market. Two things make the problem more pressing now. The financial crisis and its aftermath had an unusually big effect on them. Many employers sack the newest hires first, so a recession raises youth joblessness disproportionately. In Greece and Spain over a sixth of the young population are without a job (see chart two). The number of young people out of work in the OECD is almost a third higher than in 2007.

Second, the emerging economies that have the largest and fastest-growing populations of young people also have the worst-run labour markets. Almost half of the world’s young people live in South Asia, the Middle East and Africa. They also have the highest share of

young people out of work or in the informal sector. The population of 15- to 24-year-olds in Africa is expected to rise by more than a third, to 275m, by 2025.

In rich countries with generous welfare states this imposes a heavy burden on taxpayers. One estimate suggests that, in 2011, the economic loss from disengaged young people in Europe amounted to \$153 billion, or more than 1% of GDP. And failure to employ the young not only lowers growth today. It also threatens it tomorrow.

A clutch of academic papers, based mainly on American statistics, shows that people who begin their careers without work are likely to have lower wages and greater odds of future joblessness than those who don’t. A wage penalty of up to 20%, lasting for around 20 years, is common. The scarring seems to worsen fast with the length of joblessness and is handed down to the next generation, too.

The overall ageing of the population might blunt this effect by increasing demand for labour. But Japan’s youth joblessness, which surged after its financial crisis in the early 1990s, has stayed high despite a fast fall in the overall workforce. A large class of hikikomori live with their parents, rarely leaving home and withdrawn from the workforce.

Economists know much less about “scarring” in poor countries. A big study by Richard Freeman of Harvard University and Wei Chi and Hongbin Li of Tsinghua University suggested any impact of joblessness on young Chinese earnings disappears after three years. But studies elsewhere have reported more troubling results. An analysis of the labour market a decade after Indonesia’s financial crisis in 1997 suggested that young people who lost their jobs then were less likely to be in the workforce, and if they were, to have only informal jobs. A study of Argentina and Brazil found that young people who joined the labour force during a recession fared systematically worse as adults.

The damage may be less in dynamic economies and greatest in stagnant ones where unemployment comes in long bouts—as in the swathe of countries around the Mediterranean. Spain, France, Italy and Greece have some of the highest youth joblessness in the rich world. Morocco, Egypt and other north African and Middle Eastern countries have among the worst rates in the emerging world. Though they are at different stages of development, these countries all suffer disproportionately from employment’s main curses: low growth, clogged labour markets and a mismatch between education and work.

Low growth is the most obvious of the three. Joblessness in southern Europe has surged as economies have shrunk. South Africa’s high jobless rate is stoked by the fact that it is now one of Africa’s slowest-growing economies. But rigid labour markets probably matter even more. Countries that let business cartels curb competition; with high taxes on labour and high minimum wages; and where regulations

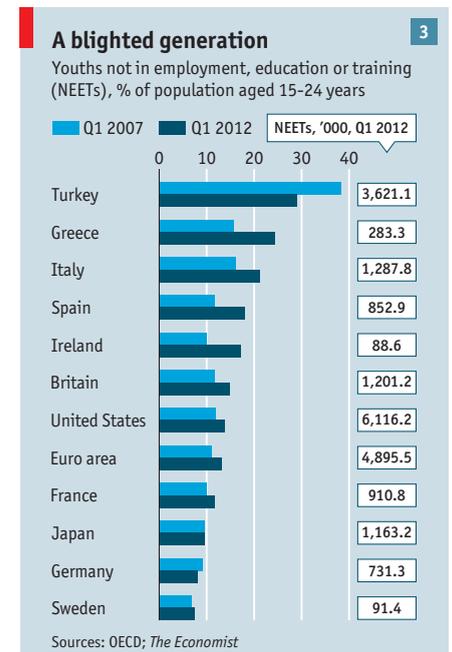
make it hard to fire people, are bad places for the young jobless. In India big factories and firms face around 200 state and federal laws governing work and pay. South Africa has notably strict laws on firing. Despite a few recent reforms, it is hard to fire older workers in southern European countries (young jobless, often living with parents whose livelihoods would be threatened, are wary of reform). North Africa and the Middle East suffer from a bloated and over-regulated public sector, heavy taxes on labour and high minimum wages.

Where are the skilled ones?

Economists are now emphasising a third problem: the mismatch between the skills that young people offer and the ones that employees need. Employers are awash with applications—but complain that they cannot find candidates with the right abilities. McKinsey, a consultancy, reports that only 43% of the employers in the nine countries that it has studied in depth (America, Brazil, Britain, Germany, India, Mexico, Morocco, Saudi Arabia and Turkey) think that they can find enough skilled entry-level workers. Middle-sized firms (between 50 and 500 workers) have an average of 13 entry-level jobs empty.

The most obvious reason for the mismatch is poor basic education. In most advanced economies (whether growing or shrinking) the jobless rate for people with less than a secondary-school education is twice as high as for those with university degrees. But two more subtle reasons deserve attention, too.

Countries with the lowest youth jobless rates have a close relationship between education and work. Germany has a long tradition of high-quality vocational education and apprenticeships, which in recent years have helped it reduce youth unemployment ▶▶



despite only modest growth. Countries with high youth unemployment are short of such links. In France few high-school leavers have any real experience of work. In north Africa universities focus on preparing their students to fill civil-service jobs even as companies complain about the shortage of technical skills. The unemployment rate in Morocco is five times as high for graduates as it is for people with only a primary education. The legacy of apartheid means that young black South Africans often live and go to school many miles from where there are jobs.

Companies used to try to bridge that gap themselves by investing in training; today they do so less. Peter Capelli, of Wharton business school, argues that companies regard filling a job merely like buying a spare part: you expect it to fit. In 1979, he notes, young workers in large American firms received an average of two and half weeks of training a year. In 1991 only 17% reported receiving any training during the previous year. By 2011 only 21% reported gaining any during the past five. Accenture, a consultancy, says that only 21% of the 1,000 American workers they surveyed gained new skills from company-provided training over the past five years.

Mismatch and training gaps may explain why over the past five years youth unemployment in flexible economies like America and Britain has risen more than in previous recessions and stayed high. Britain, which has one of the world's most flexible labour markets, has around 1m NEETs. More than twice as many young Britons (11.5% of the labour force) are unemployed as young Germans (3.9%) (see chart three). Some blame the minimum wage, but Britain also has a long-standing prejudice against practical education. In 2009 only about 8% of English employers trained apprentices compared with up to four times that number in the best continental European countries. 29% of British employers say work experience is "critical" but the share of British children who get a shot at it has been falling for the past 15 years. Only 7% of pupils say they had any mentoring from a local employer and only 19% had visited one.

A more entrepreneurial British economy may have worsened the problem. The share of private-sector employees at big firms (with 250 or more workers) fell from 50% to 40% in 1998-2000. The share at micro-businesses (4 and fewer) rose from 11% to 22%. Small firms are less likely to provide apprenticeships or work experience.

Many countries are now trying to bridge the gap between education and work by upgrading vocational schools, encouraging standard schools to form closer relations with local companies, and embracing apprenticeships. In 2010 South Korea created a network of vocational "meister" schools—from the German for "master craftsman"—to reduce the country's shortage of machine operators and plumbers. The government pays the students' room and board as well

as their tuition. It also refers to them as "young meisters" in order to counteract the country's obsession with academic laurels. In Britain some further-education colleges are embracing the principle that the best way to learn is to do: North Hertfordshire College has launched a business venture with Fit4less, a low-cost gym. Bluegrass College in Kentucky and Toyota have created a replica of a car factory, where workers and students go to classes together.

But it is not enough simply to embrace the German model of training and apprenticeships: you need to update it. Some policymakers want to transform unemployment systems from safety nets into spring boards, providing retraining and job placement. The Nordic countries have been to the fore in this, introducing "youth guarantees"—personalised plans to provide every young person with training or a job. When Germany liberalised its labour market in 2003-05 it also created new ways of getting people back into jobs. For example, to make someone who has been out of work for a long stretch more employable, the state will pay a big chunk of his wages for the first two years of a new job.

Practicality constrains poorer countries' ability to implement such active labour-market policies. The well-to-do Nordic countries found that they could hardly cope with the surge in unemployment after the crisis, despite spending up to 2% of GDP on training. Countries like Spain and Italy, with millions of unemployed people, could not hope to follow suit in a time of boom let alone one of austerity. Culture matters, too. Britain's Labour government raised the number of apprenticeships but diluted their quality in order to keep unemployment figures down. The coalition government has tried to improve quality—but some firms have merely relabelled existing training programmes in order to obtain taxpayers' money.

A deeper worry is that business is going through a particularly dramatic period of creative destruction. New technology is unleashing a storm of "disruptive innovation" which is forcing firms to rethink their operations from the ground up. Companies are constantly redesigning work—for example they are separating routine tasks (which can be automated or contracted out) from skilled jobs. They are also constantly redesigning themselves by "upsizing", "downsizing" and "contracting out". The life expectancy of companies is declining, as is the job tenure of chief executives. Policymakers are finding it more difficult to adapt their labour-market institutions quickly enough.

However, some firms are taking more interest. IBM has sponsored a school in New York. McDonald's has an ambitious new training scheme. India's IT giant, Infosys, plans to train 45,000 new employees a year, including 14,000 at a time at its main campus in Mysore. Americana Group, a regional food and restaurant company with headquarters in Kuwait, allows trainees to spend up to half their

time at work and the rest in college.

In addition, technology is also providing solutions as well as exacerbating problems. It is greatly reducing the historically high cost of vocational education. "Serious games" can provide young people with a chance to gain "virtual" experience at minimum cost: McDonalds uses competitive video games to teach people how to use the till and interact with customers, for example. Mozilla, the creator of the Firefox web browser, has created an "open badges" initiative that allows people to gain recognition for programming skills. Technology is also making it easier to take work to people who live in work-deprived areas or who are shut out of the market by cartels. Amazon's Mechanical Turk, an internet marketplace, enables companies to hire workers to perform simple tasks such as identifying people in photographs. They can take part from anywhere.

It is hard to be optimistic about a problem that is blighting the lives of so many people. But it is perhaps time to be a bit less pessimistic. Policymakers know what to do to diminish the problem—ignite growth, break down cartels and build bridges between education and work. New technology gives them powerful tools too. Countries that make the investments and choices needed to grapple with their unemployed youth could see some dramatic improvement ahead. ■

Health care and technology

Fantastic Voyage

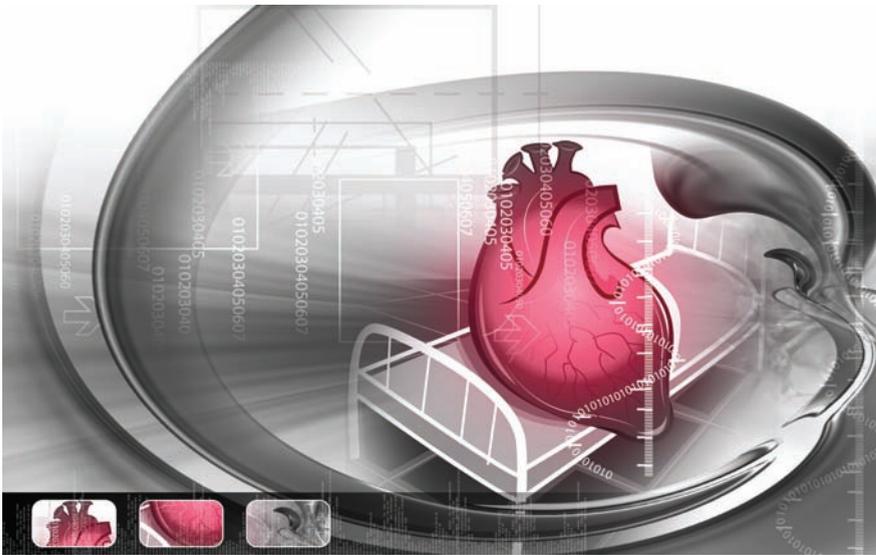
Reprinted from The Economist, Apr 16th 2009

Technology is making health care more portable, precise and personal

HALF a century ago, in a film called "Fantastic Voyage", a tiny Raquel Welch and her team were sent into a dying patient's body in a nano-submarine to save his life. Technology has still not advanced quite that far, but today's sophisticated devices and diagnostics are getting ever closer.

At the university hospital in the German city of Aachen, near the border with Belgium and the Netherlands, complex heart surgery that would once have required a lengthy and costly hospital stay has been turned into a routine procedure. Harald Kühl, a professor of cardiology at the hospital, says that patients who have been given heart-valve replacements in the morning are now usually back on their feet the same evening and discharged the next day.

The main operating room in Aachen is larger than normal and crammed full of advanced imaging technologies. In collaboration with Philips, a Dutch electronics giant, the researchers have fused together X-ray, ultrasound and ▶▶



magnetic-resonance scanners that provide detailed images of people's innards in real time. That allows them to perform precise operations using techniques that leave virtually no scars. Even less invasive is "natural orifice" surgery. In America a woman's gallbladder was recently removed by surgical and optical tools that entered her body through her vagina.

Robotics is also making surgery more precise. Futurists at the Stanford Research Institute in California have developed robots that are used to perform remote surgery on wounded soldiers near the battlefield. Da Vinci robots are now regularly used to carry out delicate operations, such as those for prostate cancer. These are large machines, but robots are getting smaller. Lord Darzi, a British health minister and professor at Imperial College, thinks the next wave will be micro-sized, with tiny motors that can roam around the body and deliver radio waves to kill tumours. In a decade, he says, nano-robots will operate at the molecular scale.

But high-tech applications are no longer automatically seen as a good thing. The proliferation of machinery such as fancy scanners, once applauded, is now criticised as a main cause of runaway health costs. National health systems, private insurers and others who hold the purse strings increasingly demand that innovation be linked clearly to economic value and improved health outcomes. Paul Yock of Stanford's bio-design programme says that innovators must now start with the medical need rather than inventing nifty kit and then searching for an application.

The advances in genomics and information and communications technologies discussed earlier in this report matter because they are enabling other fields—including nanotechnology, robotics, molecular diagnostics and micro-fluidics—that had previously made slow progress in health care to advance much more rapidly.

Taken as a whole, all this has meant a big

shift in care away from a centralised model that puts the physician at its core to a smarter, more decentralised approach centred on the patient. This shift also opens up new ways of coping with the huge problems of ageing populations and surges in chronic ailments such as diabetes and heart disease. The result will be a more portable, precise and personal way to deliver health care.

Traditionally, most important diagnostic tests have been done on big, expensive machines in central laboratories. Usually the patient gives a sample one day and then has to return another day to see the doctor and discuss the results.

This is inconvenient enough for patients in the rich world, says Mr Gates, but in developing countries it is often unfeasible. Patients there typically lose a day's work as they walk to distant medical clinics and cannot afford to lose another day to return for the results.

The doctors' dilemma is that there is no quick and reliable test for certain diseases, such as malaria, so in sub-Saharan Africa malaria medicine is automatically dispensed to children displaying malaria-like symptoms. But retrospective studies have shown that many of those children did not, in fact, have the disease. The lack of a quick test therefore means that precious antimalarial drugs are wasted and other illnesses may go untreated.

You can take it with you

Fortunately, portable and rapid diagnostic tools are on the way, says Gary Cohen of Becton, Dickinson (BD), an American diagnostics giant. His firm believes that a new type of diagnostic toolkit is emerging, thanks to the fusion of genomics, proteomics (which analyses specific proteins) and information technologies. The impact of such "point of care" diagnostics will be as big as that of mobile phones, extending the reach of modern medicine to places that are underserved or unserved today.

Big companies like GE, BD and Philips

are investing heavily in this area, but some surprising advances are coming from start-ups too. One firm has produced a cheap testing kit that can be thrown away after use. Diagnostics for All, started by students at MIT and Harvard, has developed a range of diagnostic tests that are printed on ordinary paper. The key is the use of micro-fluidics technology to direct the sample (say, a drop of blood) through tiny grooved channels to various chambers. Chemicals then react with the sample, providing rapid diagnostic results.

Ustar Biotechnologies, a Chinese start-up, has developed a cheap and portable diagnostic kit that it is marketing with BioHelix, a Boston-based firm. Qimin You, its inventor and Ustar's founder, graduated in North America and worked for Western multinationals for many years. His proposals for cheap diagnostic technologies were turned down by firms unwilling to undermine their existing products, so he left to set up his own firm in China.

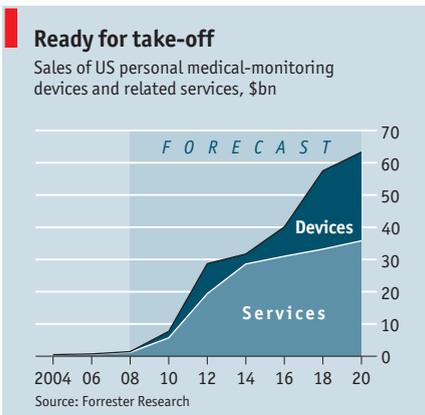
"We've got the technology, and nobody can compete with us on cost," he declares, forecasting a great future for such devices in rich and poor countries alike. Robert Harrison, head of the Clinton Global Initiative, a charity started by Bill Clinton, agrees. His organisation has encountered many similar firms from developing countries now researching, designing and manufacturing medical technology locally, which helps to ensure that solutions are best suited to local conditions.

A guided missile

More established rivals are not standing still. Stephen Oesterle, chief medical officer of Medtronic, a large medical-devices firm, argues that the miracle cures promised by biotechnology will depend on much more targeted drug delivery. Old-fashioned pills were swallowed and absorbed through the gut, but that does not work for biotech drugs because stomach acid would wipe them out. His firm is investing in implanted pumps, precision devices and other clever ways of putting medicine where it is meant to go.

Philips has developed a way for drugs to be encapsulated in bubbles made of biodegradable polymers that can be delivered to a tumour like a guided missile. Selecta BioSciences, an American firm, is testing biodegradable nanoparticles, a technology developed by MIT's Dr Langer that it hopes to use to target lymph nodes.

Another new way of targeting drugs involves the use of a specially designed silicon chip that is able to store and release drugs on demand. When a remote wireless signal is sent, a tiny electrical current zaps the chip to release the desired quantity of the drug. The first generation of such chips, made by MicroCHIPS, an American firm, tackles diabetes. It will go to clinical trials this year and is expected to be commercialised in four years. Future applications will include chips that monitor patients at home for signs of a heart attack or hypoglycaemia and can release



the appropriate life-saving drugs. John Santini, the boss of MicroCHIPS, believes that over the next decade devices will increasingly interact with the body and communicate medical data directly to portable devices or EHRs, thus helping patients to manage their own chronic diseases.

For several decades now, visionaries have tried to shift the medical model from expensive hospital interventions for sick people to cheaper preventive care in the home. They have promoted ideas ranging from kiosks for long-distance medical consultations to smart toilets that tell your doctor about the blood-sugar levels in your urine. Most of these ideas have failed.

James Sweeney is one of the few entrepreneurs to have achieved commercial success, not once but half a dozen times, with businesses selling personal medical devices. His current firm, America's IntelliDOT, makes small wireless devices used for medical monitoring.

He says the biggest difficulty he has had to confront is not the limits of technology but the unwillingness of insurance companies and health systems to reward innovators for products that keep patients at home, where monitoring and care can be provided more easily and cheaply than at the doctor's surgery. But even this grizzled veteran thinks the tipping point for personalised medical devices has arrived, for three reasons.

First, thanks to much-improved technologies for remote communications, "telemedicine" is at last taking off. Second, thanks to cheap and ubiquitous consumer electronics, medical devices in the home are at last moving beyond clunky medical monitors and creepy lavatories. Third, cheap sensors and smart phones are allowing a shift to "body computing".

Two different kinds of telemedicine are being tried out in Britain. In three locations in England the NHS is now running one of the largest trials of "telecare", which aims to monitor and offer remote medical care to the elderly in their homes. The Scottish Centre for Tele-Health has set up video kiosks offering medical consultations in

remote areas to minimise the need for travel to distant hospitals. A trial concluded last month using video equipment made by Cisco, an American technology firm, found that doctors and patients considered this high-tech version of care to be as effective as personal consultations.

Coming to a village green near you

The Mayo Clinic, another American hospital chain offering integrated care, is also running a number of trials. Kaiser Permanente already offers remote medical consultations to its patients in Hawaii, and conducts dermatological examinations this way in California. India's Apollo hospitals regularly use remote video links to connect specialists with distant facilities. And Aravind Eye Hospitals, another pioneering Indian chain, has set up many remote eye-care kiosks in villages.

The sophisticated equipment in Aravind's kiosks is run by well-trained local women, not expensive and elusive doctors. Once an eye test is completed, the patient and all his digitised data are linked by internet video to a physician at the main hospital who decides whether the patient just needs spectacles (made on the spot) or has to go to the hospital.

Christopher Tomazou of Imperial College, a pioneer in this field, argues that devices and diagnostics could transform chronic care if they can leave behind their baggage of "clunky electronics and Big Brother monitoring methods".

Dr Oesterle of Medtronic, a market leader in fields such as remote monitoring of patients with pacemakers, says that cheap "consumer-grade" electronics now make it possible to produce such devices as disposable insulin pumps, which his firm plans to start selling soon. As more such devices win consumer acceptance, care will get both cheaper and better. His firm might become a provider of services as well as hardware.

For his part, Dr Tomazou believes the future belongs not to medical devices enhanced by consumer electronics but to ubiquitous and user-friendly devices like personal digital assistants and mobile phones. These are "very useful for hiding medical monitoring" and for displaying data in ways that enable patients to act on that information. Qualcomm, which makes wireless-communications equipment, thinks a good way to do this is to integrate advanced sensors and short-range wireless networks (known as "femtocells") to create "home health hubs".

On April 2nd Intel announced a \$250m joint venture with GE to market a range of snazzy internet-connected devices that allow doctors to monitor patients at home. The company also helped organise a consortium of companies, known as the Continua Health Alliance, that has produced standards on "interoperability" and communications for such products.

Tim Brown of Ideo, a design consultancy,

goes further, arguing that in future "medical devices for the home will simply disappear into our built environment, our consumer products, our clothing or even our bodies." Philips has already developed bedsheets with metal strands woven into them to allow a patient's heart to be monitored as he sleeps. Dozens of firms, from clothing and shoe manufacturers to consumer-electronics firms, are developing other such "body-computing" tools, both for health applications and for sports.

Devices that will be deployed inside the body are just around the corner. Proteus Biomedical, a Californian firm, has developed a tiny computer chip that can be put inside a normal pharmaceutical pill. This "smart pill" sends an electrical signal when, for example, it is swallowed by a patient. The message is read and stored by electronic equipment inside a small bandage worn by the patient. That information can be downloaded from time to time, or beamed wirelessly to a device in the home that e-mails the patient's doctor.

The point is to monitor the patient's health and ensure compliance with drug regimens. This matters, because studies have shown that patients often fail to take medication as instructed, sometimes with fatal results. The first clinical trial will be of smart pills for tuberculosis. Proteus Biomedical's boss, Andrew Thompson, sees scope for applications to tackle counterfeiting and even interactions between drugs.

Wait for the catch

Like all things that sound too good to be true, these technologies have a catch. The torrent of medical data that will be generated by all these smart devices will need to be analysed. Software can help by sending summaries and alerts, but Kaiser Permanente's Yan Chow thinks "technology is running ahead of our capacity to absorb it." For instance, will doctors be legally obliged to act on that information? Still, he is an enthusiast. Moments later he is gushing about a devious software program designed for the Nintendo Wii, a popular videogaming system, that has proved highly effective in getting recalcitrant children to stick to physical-therapy regimens.

The bigger concern is that technology can never be a substitute for personal responsibility. As Mr Gates points out, "bathroom scales have been around a long time and obesity is still on the rise." Yet there is no denying that the medical technologies now rapidly moving towards commercialisation have the potential to empower patients and give them the tools and data needed to take charge of their own health. This is already beginning to happen. ■

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