



The global economy – is this as good as it gets?

If the evolution of the Digital Age isn't the magic boost productivity needs, the world's economic slowdown might be indefinite. KPMG explores what can be done.

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Economic recovery remains feeble

In 2016, all three international economic agencies – the International Monetary Fund (IMF), the World Bank and the Organisation for Economic Co-operation and Development (OECD) – have revised down their global growth forecasts. This has been a pattern since the Great Recession of 2009. By historical standards, the recovery in developed countries has been feeble, and remains fragile 6 years after the recession's end.

What if this is as good as it gets? Serious economists are now asking this of the world's developed economies. Some are proposing printing money for households to spend to revive the ailing patient. But wouldn't householders conclude that if printing money is the best available medicine, they should save the money for bleak times ahead?

Doctors of economics had earlier prescribed government stimulus spending, followed by reducing interest rates to zero and below, and then injecting money into banks. While these treatments have kept the economy alive it remains on life support.

This KPMG paper delves into the major historical developments that have steered the economy into such poor shape – with the Global Financial Crisis (GFC) just one of many key events. It defines what government and business need to do to turn it around, to restore economic growth, create well-paid jobs and

assist social harmony in both developed and developing nations.

Symptoms masked

Weaknesses in the economies of the United States (US) and other developed countries emerged around the turn of the century. In the early part of the 2000s a housing boom masked the symptoms of a deeper malaise, as US banks borrowed savings accumulated in China and on-lent them as mortgages to homebuyers with low credit ratings.

For this palliative approach to continue, housing prices needed to go up. When they didn't, homeowners began defaulting on their mortgages. Combined with lax financial and corporate governance standards, the rising mortgage defaults precipitated the sub-prime crisis, the GFC and the Great Recession of 2009.

With the weaknesses in the US and other developed economies exposed, policy makers are unsure

how to remedy them. Many economists doubt they can be fixed.

Not everyone is pessimistic

In contrast, some economists – who we shall call 'techno-optimists' – are confident that it is only a matter of time before full economic recovery occurs. As we journey further into the Digital Age they have faith in the restorative power of information and communications technologies, artificial intelligence (AI) and robotics to reboot productivity growth and through it, economic growth.

However, even the techno-optimists foresee a very different society and world of work. They predict a sharp social stratification in the developed world, where the inheritors of wealth, the owners of capital and the highly educated do well. In this scenario, the middle class is hollowed out and the working poor struggling to keep precarious jobs endure falling living standards.

What is productivity growth?

Labour productivity growth is the increase in gross domestic product (GDP) per hour worked. It has three components:

1. Rising amounts of capital per worker (capital deepening).
2. Rising educational attainment.
3. Multifactor productivity growth (MFP).

Capital deepening involves deploying more and better physical capital in production processes. Educational attainment improves the human capital devoted to the production process. MFP measures how well inputs of capital and labour are combined to produce a unit of GDP. It reflects technological progress and managerial expertise.

The productivity halt

The deep-seated source of the malaise in developed economies is a slowdown in the growth of multifactor productivity (MFP) – otherwise known as total factor productivity (TFP) – as the rate of growth-inducing technological progress has slowed.

Table 1 shows low and negative MFP growth rates for developed and emerging economies, and for the global economy as a whole.

Table 1: Multifactor productivity growth, selected countries, 1999-2014 (percent per annum)

	1999-2006	2007-2012	2012	2013	2014
USA	1.0	0.2	0.5	0.6	0.1
Canada	0.1	-0.6	-0.6	0.1	0.2
UK	0.7	-0.8	-1.5	-0.4	-0.1
Germany	1.0	0.1	-0.2	-0.5	-0.3
France	0.6	-0.5	-0.3	-0.4	-0.6
Italy	-0.3	-0.7	-1.2	-0.4	-0.6
Spain	-0.9	-0.7	-0.5	-0.5	-0.1
Europe	0.6	-0.4	-0.6	-0.4	-0.3
Australia	-0.1	-0.8	-0.3	-1.5	-0.9
Japan	0.7	0.2	0.7	1.0	-1.2
China	4.4	2.7	0.4	0.1	-0.1
India	1.3	2.7	-0.7	-0.5	0.2
Latin America	-0.2	-0.8	-1.4	-1.2	-2.8
World	1.3	0.5	-0.1	0.0	-0.2

Source: The Conference Board, at <https://www.conference-board.org/retrievefile.cfm?filename=The-Conference-Board-2015-Productivity-Brief-Summary-Tables-1999-2015.pdf&type=subsite>

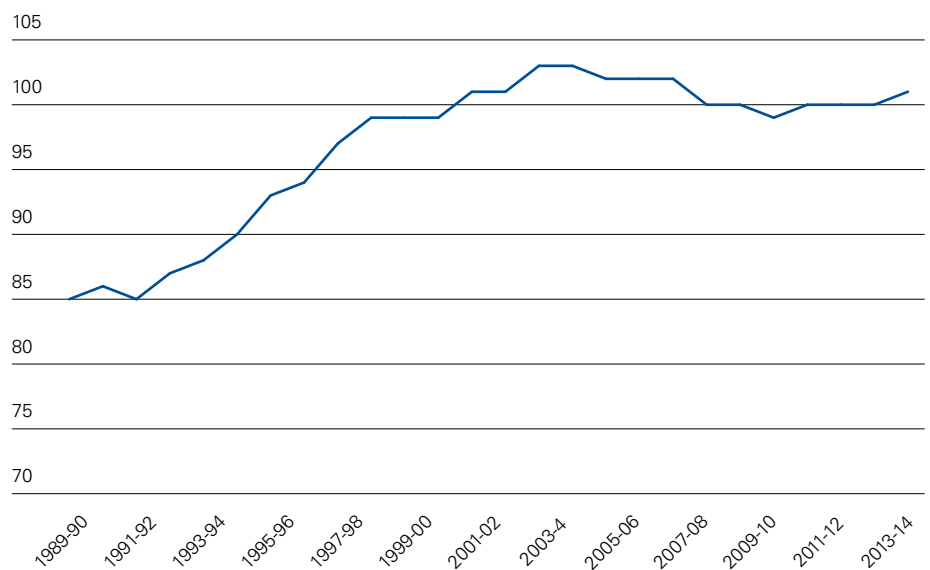
The Conference Board, which compiles and analyses international productivity statistics, summarises the problem:

“An alarming result from this year’s estimates ... is that the growth rate of total factor productivity ... continues to hover around zero for the third year in a row, compared to an average rate of more than 1 percent from 1999-2006 and 0.5 percent from 2007-2012. Most mature economies including the United States, the Euro area and Japan show near zero or even negative TFP growth.”¹

In Australia, MFP growth turned negative around 2004 and the level of MFP remains below where it was then (see Chart 1).

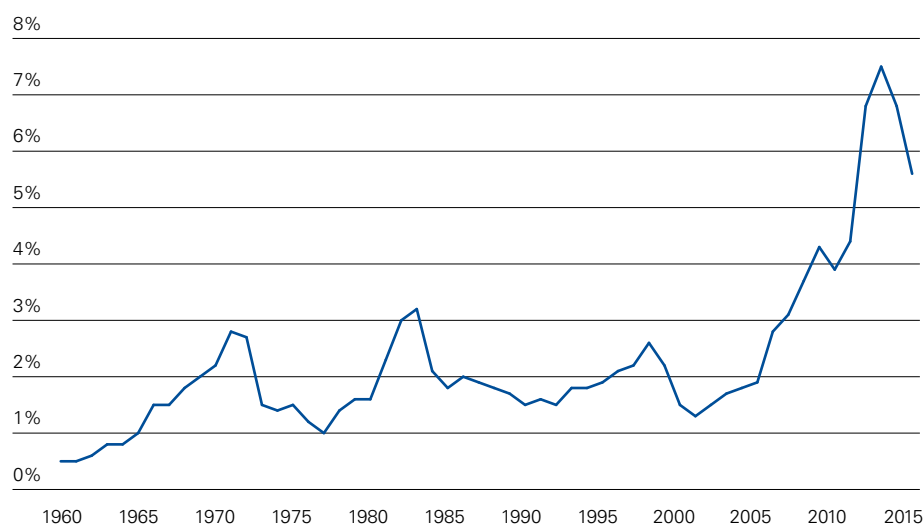
Chart 1: Multifactor Productivity in Australia, 1989-90 to 2013-14

Index 2013-14 = 1.00



Source: Australian Bureau of Statistics

Australia has managed to keep a sense of economic stability thanks to income from the mining boom (Chart 2). But now the boom is over, Australia must rely on a revival in MFP growth for future improvements in material living standards.

Chart 2: Mining investment in Australia as a percentage of GDP, 1960-2015

Source: Australian Bureau of Statistics

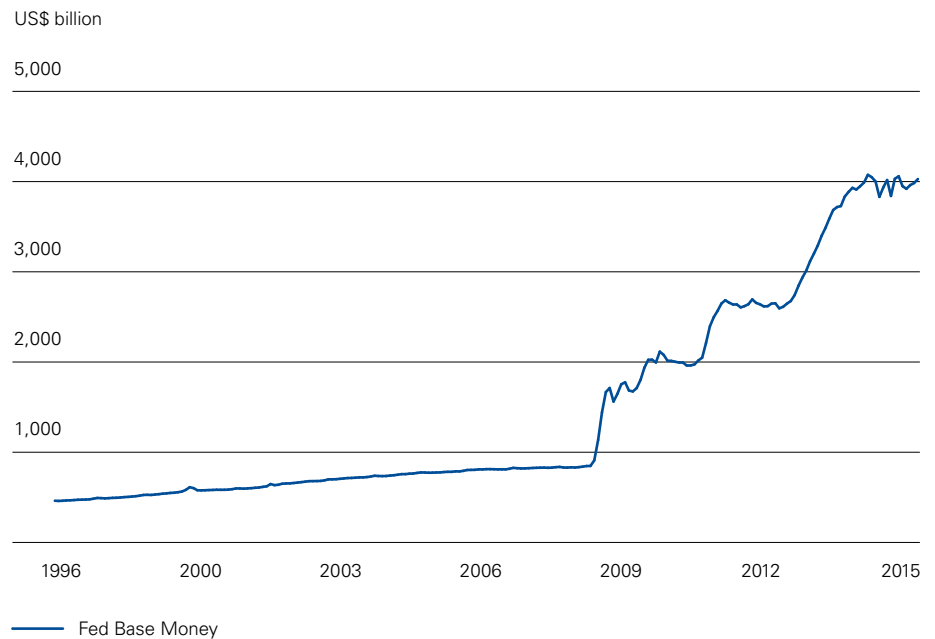
Secular stagnation

Economic torpor in the developed world, coupled with an absence of MFP growth, has revived fears held during and after the Great Depression that the economic system might reach permanent stagnation.

British economist John Maynard Keynes (1883-1946) predicted that in 100 years the economic problem would have been solved and that the material needs of developed countries would be satisfied, leaving the citizenry with the 'dread' of long hours of leisure.² Keynes also predicted we would solve the economic problem in poorer regions of developed countries, and in developing nations.

Prior to World War II, US economist Alvin Hansen coined the term 'secular stagnation'. Hansen worried that the US economy would undergo persistent bouts of low growth caused by a slowdown in technological progress, the closing of the American frontier where new resources had been discovered, and a drastic decline in population growth.

Similar fears have been revived by former US Treasury Secretary, Larry Summers, who asked what happens if consumer and investment spending is so weak that not even zero real interest rates can stimulate it.³ He says the little economic growth that has occurred since the Great Recession of 2009 has relied on unprecedented monetary expansion by central banks, flooding the global economy with cash and lowering real interest rates to below zero (Chart 3).

Chart 3: United States money supply, 1996-2015

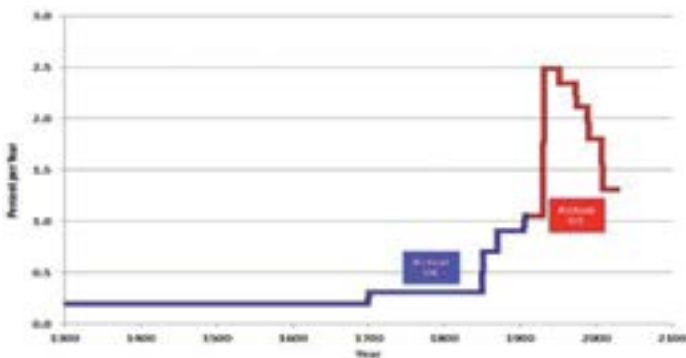
Source: FRED, Federal Reserve data

Summers notes that markets have factored in real interest rates of around zero over the next 10 years.⁴ He argues that structural changes in developed countries have led to an increasing propensity to save, a decreasing propensity to invest, and consequent weak spending and feeble growth.⁵

How did it come to this?

Following 2009, conventional thinking was that economic recovery would gradually gather pace as household, business and public debt was paid down. But some economists have identified more fundamental problems underlying the MFP performance in developed economies. They fear these will lock in an indefinite period of slow growth, or possibly even recession.

Based on history, economists, led by Robert Gordon, Professor of Social Sciences at Northwestern University, suggest that the technological frontier is no longer expanding. They argue that there have been no major inventions to increase MFP since pre-2000. They begin with the observation, depicted in Figure 1, that from before 1300 and up to 1750, there were no transformative inventions and so virtually no growth. It is estimated that from AD 1 to 1820 the annual rate of growth in the Western world was just 0.06 percent.⁶

Figure 1: Growth in real GDP per capita, 1300-2100

Source: Gordon, Robert (2012), *Is U.S. economic growth over? Faltering innovation confronts the six headwinds*, National Bureau of Economic Research Working Paper 18315, Cambridge, Massachusetts.

During the next 250 years there were many big inventions that lifted productivity. Gordon identifies two sub-periods.

1. 1750-1830: Steam engines, cotton spinning and railroads invented.
2. 1870-1900: The 'Great Inventions': electricity, the internal combustion engine and running water with indoor plumbing. These spawned urban sanitation, petroleum refining and natural gas reticulation, chemicals, plastics and pharmaceuticals, elevators, refrigerators and freezers, the telephone, the phonograph, photography, radio, motion pictures and television.⁷

It took the Great Inventions and their offspring a century to permeate the economy. They required physical capital, including power stations and transmission grids, sewage systems, railways and highways, petrochemical plants, assembly line and whitegoods factories, telephone lines and high-rise buildings.

From around 1970, a third wave of inventions ushered in the Computer Age and the internet. But this, Gordon argues, does not appear to have lifted MFP levels or economic growth, other than perhaps in its early years where computers replaced repetitive clerical tasks.

Since the turn of the century the main innovations in the Computer Age have been in communications and entertainment delivered through hand-held devices. They have provided consumer benefits but do not appear to have enhanced productivity. They have not required large amounts of physical capital, but rather, human capital.

The concern expressed by Gordon, fellow economist Tyler Cowan and others is that, in the absence of further Great Inventions, growth will continue to slide until it returns to its pre-1750 negligible rates, as represented in Figure 1. Gordon fears that, "The rapid progress made over the past 250 years could well turn out to be a unique episode in human history."⁸

It is important to differentiate between the pace of innovation and its impact. There is no doubt that there are ample new inventions, but so far their impact on MFP growth – and through it on economic growth and job creation – has been imperceptible. Celebrated growth economist Robert Solow observed, "You can see the computer age everywhere but in the productivity statistics."⁹

Germ of an idea

Chemist and microbiologist Louis Pasteur's discovery of germs in the 1860s led to the development of the sewage system, hospital sanitation, vaccines, antibiotics and refrigeration.

Disruptive doesn't necessarily equal productive

Disruptive technologies such as online product and service supply, social media, ride sharing, room sharing and financial technologies are affecting traditional ways of doing business. They offer competition, obliging management to reduce costs and change business models.

Disruptive technologies, however, tend to replace physical capital with human capital, and do not create large numbers of jobs. Online retail sites replace bricks-and-mortar shops – the same goes for online finance. Social media and online information resources have long threatened printing presses, and ride-sharing and room-sharing services better utilise existing assets.

Techno-optimists suggest that coming developments in AI, robotics, graphene, programmable matter and genetic engineering will have much wider applicability than the computers of the 1990s and 2000s.

In *The Second Machine Age*, authors Erik Brynjolfsson and Andrew McAfee argue that information and communications technologies are general-purpose technologies that will spread across the economy. They consider that the power of information and communications technologies lies in recombining what existed before, supporting the new growth theory of the likes of New York University economist, Paul Romer: “Economic growth occurs whenever people take resources and rearrange them in ways that make them more valuable.”¹⁰

Brynjolfsson and McAfee predict this recombinant growth will eventually occur – “it’s just being held back by our inability to process all the new ideas fast enough,” they write.¹¹ They are confident that innovation and productivity growth will resume, foreseeing a new era of big inventions enabled by AI and digital connectivity.

Techno-optimists attribute the non-appearance of innovations in information and communications technologies in the productivity statistics to the time taken for the reorganisation of production processes. There was a similar lag when electricity replaced the steam engine.¹² The coming inventions might therefore yield much greater productivity gains than the Computer Age did.¹³

Also, GDP and productivity measurement issues might be disguising the true facts. Free text messaging, electronic encyclopaedias and classified advertisements are just a few examples of recent welfare-improving innovations. However, since they are unpriced they do not show up in GDP or productivity statistics. The rising volume of digital goods produced each year that do not have a price will compound the understatement of improvements in living standards.¹⁴

The Digital Age

In 2000 there were 700 million mobile phone subscriptions worldwide. In 2012 the number was 6,000 million. The authors of *The Second Machine Age* foresee more than 6,000 million human brains and a vast array of machines with AI all connected via a single digital network. This, they consider, will generate enormous capacity for combining human ability with AI in generating new ideas and solving problems.

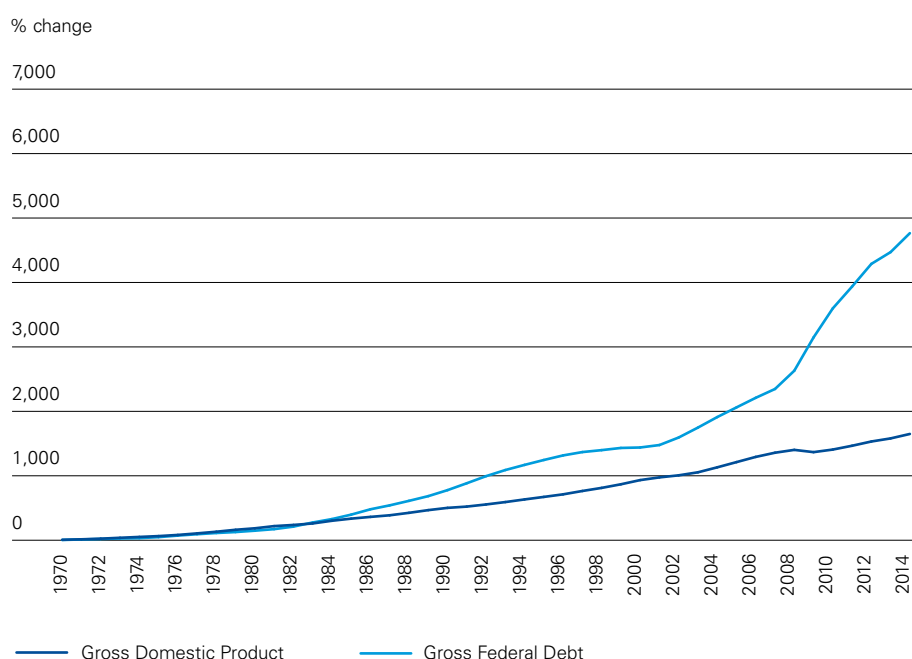
The six headwinds

If new inventions prove to be productivity enhancing, they will still confront powerful forces hostile to growth. These are known as Gordon's six headwinds:

1. Population ageing and the end of a one-off period dating from the 1960s of rapid entry of women into the workforce.
2. The plateauing of educational attainment – particularly higher education.
3. Widening inequality, where the real incomes of the middle and the working poor are stagnating or declining, while the top 1 percent are growing rapidly.
4. Outsourcing of jobs to developing countries with lower wage rates facilitated by the application of advanced information and communications technologies.
5. Environmental constraints on growth, including the necessity of putting a price on carbon emissions, which will reduce discretionary consumer spending.
6. High and rising levels of household and government debt that will need to be repaid (see Chart 4).

These are pushing down consumption and investment spending in developed economies while increasing savings. Despite record low interest rates, major new investment opportunities in developed economies are in extremely short supply. Without rising consumption and investment spending, these economies cannot grow.

Chart 4: United States debt and GDP, 1970-2015



Source: FRED, Federal Reserve data

Japan – a live case study

Despite repeated official stimulatory efforts, Japan's economy has stagnated for 25 years, suffering long bouts of deflation. When authorities attempt to boost consumer spending, Japanese householders go on saving. Today the economy is little more than half the size the IMF and the World Bank predicted when it was growing.

However, Japan had already achieved high living standards before the slowdown. As its population continues to shrink, it will be able to sustain existing living standards and, if the population falls to sufficiently low levels, increase them. The high levels of educational attainment in Japan – the second highest in the OECD behind Korea – have ensured the benefits of past growth have been shared widely.

Policy responses

What has been done around the world done so far to battle the disease of economic stagnation?

1. Monetary easing

While monetary easing since the GFC has prevented a protracted recession, it has failed to stimulate a sustained recovery. After lowering official interest rates to near-zero levels, central banks in the US, Japan and Europe began rounds of quantitative easing, buying bonds from the private sector in exchange for newly created cash. Authorities increased the money supply and weakened their currencies in rounds of competitive devaluations reminiscent of tariff increases during the Great Depression. A modest recovery in the US allowed the Federal Reserve to end this in late-2014 and to lift official interest rates to less than 0.5 percentage points. However, in March 2016, the Federal Reserve signalled that it had no plans in the short term to raise interest rates further.

Concerns about the ongoing weakness of the US recovery have given rise to calls for a third round of easing – known as QE for the people, or helicopter money. It involves central banks printing money and electronically transferring it directly into the bank accounts of consumers. An alternative would be to send the cash to the government to distribute as electronic transfers into consumers' bank accounts or to finance productivity-raising infrastructure investment.

A distinguishing feature of helicopter money is that it would bypass commercial banks that have on-lent the money, with the effect of pushing up the stock market and housing prices, creating unsustainable asset price bubbles. In normal circumstances, printing money would be highly inflationary, but the greater prospect in a world of secular stagnation is for deflation, not inflation. If deflation were to occur and to become established in future expectations, consumers would hoard cash, since its value increases over time as prices fall, holding back spending and stalling economic growth.

What is quantitative easing?

Central banks buy government bonds and corporate bonds from private banks and other financial institutions. In exchange, the central banks give these institutions new cash they have created electronically. The hope is that this new cash will be lent to consumers and investors, boosting both demand for goods and services and future production capacity. The extra spending on consumer items and investment goods would increase economic growth and create jobs.

2. Fiscal policy

Immediately before the GFC, government deficits in the OECD countries averaged around 1.5 percent of GDP. They rose to 8.4 percent at the peak of the crisis in 2009, but by 2015 had been wound back to 3.2 percent.¹⁵ Net government debt as a proportion of GDP has reached more than 80 percent in the US, Great Britain and France. It exceeds 100 percent in Italy and Japan. Australia's net debt-to-GDP ratio of 17 percent is low by OECD standards but, unlike that of other AAA-rated countries, is rising. Governments around the world, worried about the build-up of public debt and the associated debt-servicing obligations, are reining in fiscal deficits.

As the World Bank has observed, "...while previous recoveries were supported by expanded public spending, this time fiscal policy has moved in the opposite direction. This shift was made despite the low cost of borrowing, which would presumably have allowed large-scale public investment projects with higher returns than initial costs."¹⁶

Expansionary fiscal policy might be the only remaining macroeconomic policy instrument to stimulate economic growth. Since global interest rates are expected to remain low for the foreseeable future, government borrowing to finance productivity-raising investments is likely to be a sound form of fiscal stimulus. More radically, financing these investments through the printing of new money might be worthy of consideration in extreme circumstances.

In contrast with borrowing to finance current consumption, investing in education, innovation, transport, communications and urban redesign can lift an economy's growth capacity. Investment in renewable energy can reduce carbon emissions as a complement to putting a price on carbon, alleviating the pressure on household discretionary incomes from solely relying on carbon pricing.

3. Increasing educational attainment rates

Workers with higher educational attainment are usually able to command a skill premium in their remuneration, particularly in the Digital Age. Yet in some developed economies, most notably the US, educational attainment levels are plateauing.

The private and community-wide returns from higher education are large. The OECD estimates that for 25 OECD countries the private return on a university education compared with completing high school averages US\$175,000 for men and US\$110,000 for women. The average public return is US\$91,000 for men and US\$55,000 for women.¹⁷ The OECD estimates the public benefits of higher education in Australia to be twice the size of the benefits to the graduate.¹⁸

Economic growth rates can be lifted by investing in schools in disadvantaged communities, in vocational education and in higher education. Improving the educational attainment of disadvantaged students boosts their income-earning capacity and, in time, overall consumer spending, while reducing inequality and strengthening social cohesion. The private and social returns from university degrees compared with completing high school are large.

4. Reducing inequality

In the Digital Age, levels of social cohesion and perceived fairness will become important determinants of economic and commercial success. Democratic societies with extreme inequality cannot function properly.

In Australia, nominal wages have been growing at their slowest rate since records were first kept in the early 1990s and real wages for lower- and middle-income earners have been flat or falling since 2013.

Australians on low and middle incomes are feeling under financial pressure, which is dampening consumer

spending. It is also lowering their regard for an economic and political system that they consider is preventing their progress.

At the same time, under Australia's progressive tax system the top 3 percent of taxpayers contribute 30 percent of total personal income tax revenue.

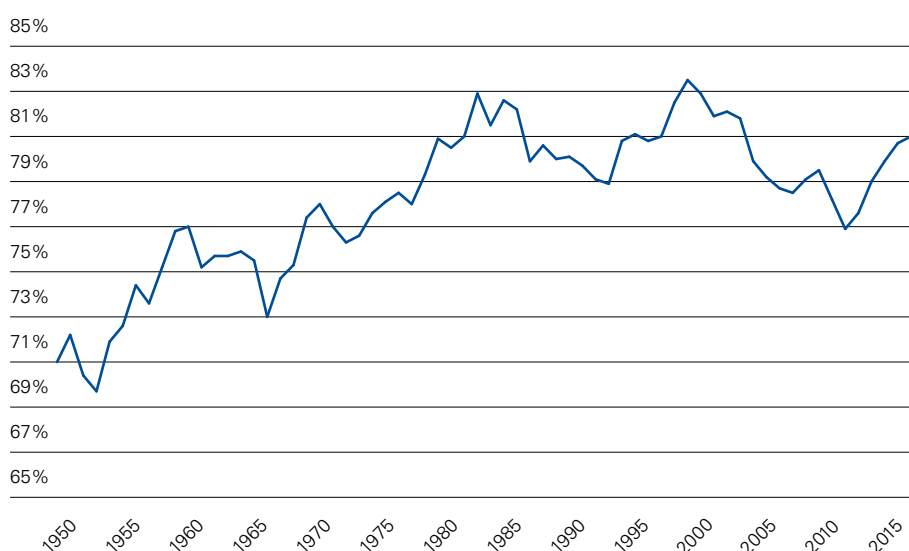
In analysing widening inequality in developed economies, the IMF finds that if the income share of the top 20 percent increases, then GDP growth actually declines over the medium term. It concludes that policymakers should focus on the poor and the middle class.

What can help? The IMF recommends making education more accessible to the disadvantaged, ensuring changes in labour market regulation do not excessively penalise low-income workers, and implementing redistributive policies. One approach could be to make the tax system more efficient while increasing targeted, needs-based spending.¹⁹

5. Structural reform

Australia's economy underwent an economic transformation during the second half of the 1980s into the 1990s, when a series of microeconomic reforms reoriented it from an inward-looking, closed economy to an outward-looking open, competitive economy.

Chart 5: Australia's productivity levels as a proportion of United States productivity levels, 1950-2015



Source: KPMG Economics, The Conference Board

As Chart 5 shows, these reforms took the Australian economy closer to the productivity frontier established by the US, peaking at around 85 percent in the late-1990s, but falling back to less than 80 percent during this century.

Through these pro-competitive structural reforms, Australia has exploited the catch-up possibilities available to it after decades of misguided protectionism. While the same structural reforms cannot be implemented a second time, a number of microeconomic reforms are yet to be undertaken. They are best summarised in the 2015 report of the Competition Policy Review.²⁰ While they are unlikely to yield productivity gains of similar magnitude to those of the last part of the previous century, they can provide a worthwhile contribution to productivity growth. The challenge for policymakers and regulators is to capture the benefits of disruptive technologies by ensuring that competition policy, laws and institutions do not unduly obstruct its impact, while preserving expected consumer safeguards.²¹

6. Tax reform

Almost all taxes act as a drag on economic growth by restricting trade between buyers and sellers and reducing the incentives to work, invest and take risks. In a world of mobile capital and labour, it is argued that direct taxes, such as company tax and personal tax, slow growth more than indirect taxes, such as consumption taxes and land tax. Stamp duty on conveyances and insurance are especially costly to growth.

Estimates of the extent of the drag on growth of various taxes – known as the marginal excess burden – prepared by the Australian Treasury suggest that it is similar for personal tax and the GST, raising doubts about the growth dividend from increasing the GST to fund personal tax cuts.²²

Reducing or eliminating inefficient taxes can increase economic growth rates but care needs to be taken to avoid outcomes that increase the overall tax burden on lower to middle income households.

7. Expanding the technological frontier at home

To date, the Computer Age does not appear to have expanded the technological frontier in developed economies to the extent that perhaps was earlier anticipated. However, a range of developments could have a positive effect on MFP growth.

From the latter part of the 20th Century, manufacturing was largely relocated from high-wage developed

countries to China, while back-office clerical tasks were relocated predominantly to India. After China changed its growth model in 2011 from manufacturing export-led growth to the service economy and greater equality in domestic consumption, manufacturing is being relocated from China to lower-wage countries such as Bangladesh and Vietnam.

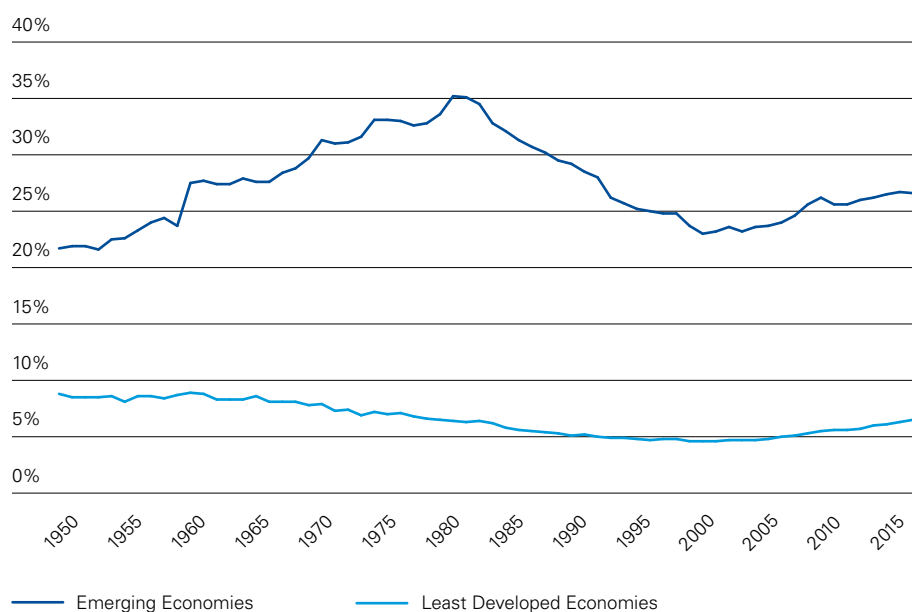
Technological advances such as 3D printing and AI hold the prospect of re-shoring of manufacturing, as well as insourcing of back-office services into developed countries. Re-shoring of manufacturing is underway in the US, aided by the development of low-cost gas and a narrowing of wage relativities with China. AI technologies are making inroads in advisory services such as accounting and legal advice. Advances in robotics will change patterns of comparative advantage initially in favour of developed economies.

Future technologies will weaken locational advantages based on relative wages, economies of scale and proximity to markets. They include programmable matter utilising nanotechnology and regenerative medicine to reverse ageing and age-related diseases. While these and other sophisticated technologies have the potential to increase leisure time, longevity and the quality of life in developed countries, they will not create the numbers of jobs that large-scale manufacturing has done in the past.

8. Expanding the technological frontier abroad

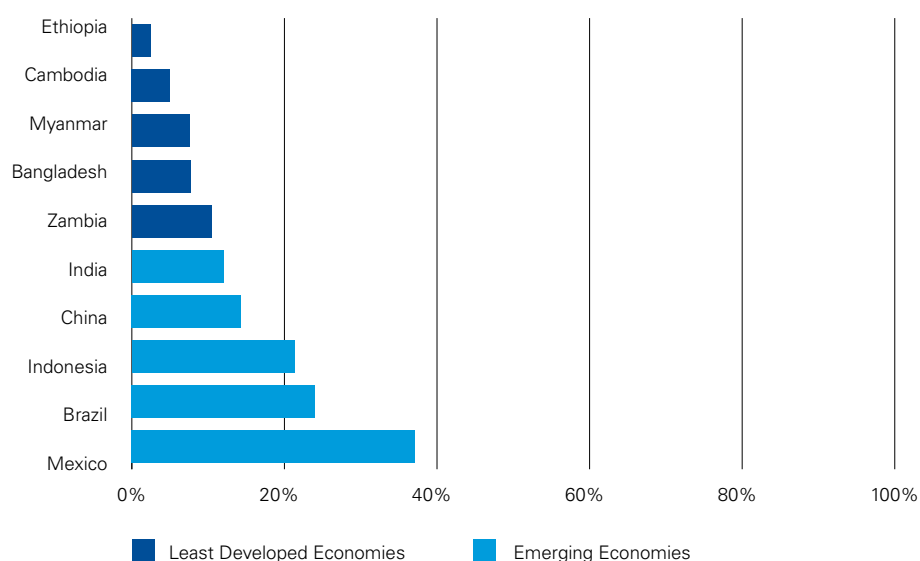
A more promising source of income in developed economies is likely to be the building of economic and social infrastructure in less developed economies. Potential for this can be seen by examining labour productivity levels in a selection of countries as a fraction of US productivity. Chart 6 divides less developed economies into two categories: emerging and least developed economies.

Chart 6: Labour productivity as a percentage of United States labour productivity, emerging and least developed economies, 1950-2015



Source: KPMG Economics, The Conference Board

Chart 7: Labour productivity as a percentage of United States labour productivity, emerging and least developed economies, 2015



Source: KPMG Economics, The Conference Board

The productivity of the selected emerging economies as a proportion of US productivity levels is between 12 percent and 37.1 percent, while that of the selected least developed economies is between 2.4 percent and 10.4 percent. Although emerging economies have been catching up to the US frontier, the least developed countries have a long way to go.

Foreign investors in these least developed countries can help them exploit catch-up possibilities through capital deepening requiring large quantities of physical capital. China is active in several least developed African countries, building infrastructure and providing aid for the development of schools and medical facilities.

The future of the global economy

As populations continue to age and fertility rates fall, the world's population will peak around the middle of this century. Economists such as Ross Garnaut, Professorial Fellow at Melbourne University, identify a plausible scenario in which all but the world's poorest and unstable countries will catch up with developed-country living standards.²³

In the ageing populations of developed countries, the propensity to save will increase, contributing to the glut of global capital. That capital will seek investment opportunities in developing countries, as well as in least developed countries that are able to build institutions such as enforceable laws that protect assets from expropriation and damage through conflicts. If MFP growth remains weak in the developed world, new investment opportunities will be scarce and products from earlier technological breakthroughs will become commoditised and relocated to developing countries.

Growth in developed and least developed countries will be supported by exploiting catch-up possibilities through investment in income-generating infrastructure such as highways, railways, urban public transport and electricity generation and transmission. Government income transfers from developed to least developed countries, in order to finance infrastructure and institution building, would help lift them into the ranks of the developing countries. It would also contribute to employment through contracting arrangements.

The Digital Age doesn't mean jobs

If the Digital Age spurs a resumption of MFP growth in developed economies, the economic outlook will be brighter. However, optimists about future productivity-raising inventions are not optimistic about future job prospects. Routine tasks will disappear to robots and digital technologies. Cognitive jobs, including bank teller, clerical, accounting and advisory positions, will also go.²⁴ This will hollow the middle class in developed countries. In contrast, non-routine jobs, both cognitive and manual, are growing.

The winners will be the owners and operators of the machines, achieving large returns on their human capital and reinvested wealth. Highly educated, creative thinkers will command high incomes. Performers of non-routine manual tasks, such as personal services for the wealthy, child care and aged care workers, will have good job prospects but their pay will be low since there will be so many of them. Ongoing expansion of non-routine, manual jobs is keeping down unemployment in the US, Australia and several other developed countries. But these will continue to be casual, part-time and precarious jobs.

What this means for business and government

Slow productivity growth, high savings rates and feeble economic growth in developed countries with ageing populations, combined with expanding economic catch-up opportunities in the developing world, create threats and opportunities for business.

- Profitability will continue to slide in mature industries in developed countries, especially for those whose output can be commoditised and relocated to developing countries based on low relative wages and economies of scale.
- The Digital Age will enable the re-shoring of activities that can be undertaken through the deployment of AI and robotics.
- Disruptive technologies will challenge existing business models, obliging established companies to compete or lose market share to new, agile rivals.
- Business models that are dependent upon the resumption of strong growth rates in developed countries will be especially risky.
- Prospects in developed countries will remain good in personal services for retirees and working-age people earning high incomes, and these will present growth opportunities.

- Tourism, higher education and agribusiness servicing the growing middle classes of developing countries will offer investment opportunities.
- Contracting for infrastructure work in developing and least developed countries will need to feature in growth strategies for engineering and construction businesses.

Australia's better growth prospects are in tourism, higher education and agribusiness, connected to economic development in Asia. In tourism and agribusiness, foreign investment offers good job prospects for semi-skilled workers.

Federal and state governments in Australia will need to take advantage of historically low borrowing costs to invest in productivity-raising infrastructure such as urban public transport and fast rail. This will present opportunities for businesses in these fields while boosting employment in the construction sector.

The question of whether robotics and AI will materially lift MFP growth rates to enable a resumption of strong economic growth remains contested. But even if growth resumes, a disturbing pattern is developing: the new jobs being created are at the top and the bottom of the skill range while the middle is being hollowed out. This will continue to increase inequality and disillusionment with the political system.

How can things be turned around?

Governments, businesses, trade unions and community organisations need to recognise that, at least for some time to come and maybe indefinitely, developed countries will continue to experience slow economic growth based on weak growth in MFP.

A breakdown in social cohesion can be averted only if governments are willing to invest in high-quality education and training to equip as much of the workforce as possible with the skills demanded in the Digital Age. And governments will need to ensure a basic standard of living for those who are made redundant or lack the necessary skills to participate continuously in the future world of work.

Business models will need to be modified and government policy prescriptions need to change.

If they don't then this is, quite possibly, as good as it gets.

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