



South African Reserve Bank

**Speech by Daniel Mminele,
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**The Fourth Industrial Revolution and the future of work:
some implications for central banking**

Introduction

Good morning, ladies and gentlemen.

I would like to start by thanking the University of Zululand for the opportunity to share some thoughts with you on an issue which will invariably have an impact on all of our lives, namely 'The Fourth Industrial Revolution and the future of work'.

Policymakers (including fiscal and monetary authorities), business entities and academic institutions all around the world are grappling with the implications of the Fourth Industrial Revolution and what this means for the future of work. This issue also formed part of the theme of the 10th BRICS¹ Summit that was concluded in Johannesburg last week.

Indeed, this topic is also relevant for an institution such as yours, as education is the key to unlocking benefits and avoiding the potential negative repercussions. Machines are developing at a rapid speed and their application is becoming increasingly sophisticated, which undoubtedly has massive implications for education and the skills set required for moving successfully into the future. The future requires not only a

¹ Brazil, Russia, India, China, South Africa

different skills set, but also a different way of learning, a commitment to lifelong development, with young people at the coalface of this change.

Against this brief background, I would like to share with you a few thoughts about how the future of work is changing the world of work, and some initiatives of international organisations such as the G20² in this regard. I would also like to explore some of the implications for central banking.

What is ‘the future of work’, and how is it changing the world of work?

One could argue that a country’s experience of the Fourth Industrial Revolution depends on certain socio- and macroeconomic fundamentals, such as the level of its development and the skills set of its labour force, among other things. But this does not change the fact that preparedness is essential.

For many emerging markets, structural impediments have hindered development to such an extent that artificial intelligence is not an immediate possibility, and the adaptation of new technology to local conditions in these economies is therefore likely to be slower. Nonetheless, adaptation is inevitable.

There appears to be a great deal of emphasis on the Fourth Industrial Revolution currently taking place, perhaps more so than was the case with the previous three industrial revolutions. Many are asking: why is there so much hype, and what makes this revolution different?

Like the first three industrial revolutions, the Fourth Industrial Revolution will have significant transformative impacts on society. However, this time, the systemic impact is expected to be much more intense, as new technologies are developing at exponential speed, with much wider coverage given a far more integrated and globalised world.

² Group of Twenty

Furthermore, it is not just a matter of manual tasks being overtaken by automation. Rather, technology is developing tacit knowledge and completing cognitive tasks. It is not only the low-skilled jobs or tasks that are at risk of being eliminated, but also the more highly qualified professional jobs like those of financial analysts. There was a time when ideas like driver-less cars and talking robots were only found in sci-fi movies, and seemed so imaginative and unrealistic. These are no longer things of the distant future; they are becoming part of our lives and will become increasingly common in the coming years.

Indeed, there are conflicting views about the impact that such automation will have on jobs, skills and wages. A McKinsey report³ estimates that, by the year 2030, at least one-third of the activities of 60% of all the occupations could be automated. This implies that, globally, up to 375 million people may need to change jobs or learn new skills within the next 12 years. As Professor Klaus Schwab, the founder and Executive Chair of the World Economic Forum, notes: these shifts mean that we live in a time of great promise and of great peril.

The positive aspects include the ability to connect billions more people through digital networks, improving the efficiency of organisations dramatically. There is also the capacity to reduce costs significantly, to reduce the necessity for businesses to have a physical presence, and to create opportunities for new, small-scale producers to enter the increasingly globalised markets. If harnessed correctly, technological change can bring about immense economic opportunities, new and better ways of doing business, the creation of new industries, new and better-quality jobs, higher GDP⁴ growth, and improved living standards. The current technological developments have the potential to lift growth and productivity, thereby raising living standards over the longer term.

However, if organisations and governments fail to embrace new technologies to capture the benefits they bring, changes in labour markets may instead contribute to rising inequality, as the middle-skilled jobs relative to both high- and low-skilled jobs

³ Mc Kinsey Global Institute. Jobs lost, jobs gained: what the future of work will mean for jobs, skills and wages. December 2017

⁴ Gross domestic product

are lost and the real wages decline among the lower-skilled workers in some countries. These developments could aggravate income inequality both within and between countries.⁵ If left unchecked, security concerns and threats may also increase, compromising governments, businesses and individuals.

For the ladies in the audience, I should note that the World Economic Forum believes that women tend to possess more of the human characteristics that should give them an advantage in the new jobs of the Fourth Industrial Revolution. These characteristics include, among others, the capacity for empathy, creativity, listening skills, learning ability and collaboration (instead of competition).

The Fourth Industrial Revolution, and our ability and willingness to respond to the ever-evolving needs of the workplace, is particularly important for a continent such as Africa, because of its rapidly growing and dynamic population. How we deal with the changing African demographics will make the difference between having either a 'dividend' of young producers and consumers, *or* a growing unemployment problem.⁶ Why is this so important for Africa in particular?

Africa emerged from each of the previous three industrial revolutions lagging behind much of the rest of the world. We have not kept pace with the move from the mechanisation of production to mass production, and finally to the computer age. Now that we are entering the Fourth Industrial Revolution, Africa will unfortunately do so on the back foot once again.

Sub-Saharan Africa (SSA) has the second-largest working-age population, accounting for 13% of the world's total. Furthermore, more than 60% of its population is under the age of 25, and it is estimated that, by 2030, SSA will be home to more than one-quarter of the world's total under-25 population.⁷

⁵ Taken from "The Future of Work: Trends, Impacts and the Case for G20 Action", March 2018

⁶ The 'fourth industrial revolution': potential and risks for Africa, The Conversation

⁷ World Economic Forum. The Future of Jobs and Skills in Africa, Preparing the Region for the Fourth Industrial Revolution. May 2017

However, SSA does not make optimal use of its human capital potential. The World Economic Forum's Human Capital Index⁸ indicates that SSA captures, on average, only 55% of its full human capital potential, compared to a global average of 65%. The World Economic Forum asserts that the region's capacity to adapt to the requirements of future jobs, relative to the region's exposure to these future trends, leaves little space for complacency. On a bigger scale, urgent efforts are needed to close the continent's skills gap.

SSA is therefore relatively underprepared for the impending disruption to jobs and skills brought about by the Fourth Industrial Revolution, and needs to take action quickly.

The G20 approach to the future of work

As I have already alluded, the future of work has become a topic of international focus. Under Argentina's presidency – as part of achieving its objective of strong, sustainable, balanced and inclusive growth – the G20 has recognised the importance of focusing on the Fourth Industrial Revolution, understanding that it has an important role to play in devising policy responses to deal with the ramifications of the future of work.

The G20 has also recognised that policy consistency across its members, especially where there are spillovers, can strengthen the effectiveness of individual members' policy efforts and increase the benefits of international collaboration. In addition, through international cooperation, the opportunities presented by the Fourth Industrial Revolution can be better exploited to ensure that none are left behind in the process.

With this in mind, the G20 has considered the economic and social impacts of technological changes on the future of work. Under the Framework Working Group, the G20 Finance Track has devised a menu of policy options that member countries can draw on when responding to the impacts of technological change – specifically in

⁸ Measures the extent to which countries and economies optimize their human capital through education and skills development and its deployment throughout the life-course

the areas of tax, public expenditure and transfers, competitive conditions, and measurement and data. The menu is structured around four overarching objectives:

- (i) harnessing the benefits of technology for growth and productivity;
- (ii) supporting people during transitions and addressing distributional challenges;
- (iii) securing sustainable tax systems; and
- (iv) ensuring the best possible evidence to inform decision making.

Countries are encouraged, when devising their growth strategies⁹, to identify policy actions as well as areas of potential international cooperation.

South Africa is an active member of the G20 and has been contributing to the debate on this topic, and will include, in its growth strategy, an outline of South Africa's policy approaches to this priority area.

The future of work and central banking

Much of the research being conducted on the future of work in relation to the Fourth Industrial Revolution revolves around issues directly related to fiscal policy. Beyond this, many of the policy areas being affected, such as skills and competition, are outside of the direct ambit of central banks. However, insofar as the future of work could have an impact on the macroeconomy – through its effect on labour, aggregate demand and supply, prices and therefore the equilibrium interest rate – it certainly could influence the conduct of monetary policy.

Monetary policy could be affected through various channels. Prices could be lowered, for example, as retail sales become digitalised, as many already are. As a result, inflation could decelerate because online retailers face much lower operational costs than traditional businesses. Anders Borg, Sweden's former Minister of Finance, also notes that feed-through from exchange rate depreciations might be less than it has

⁹ Under Australia's G20 Presidency in 2014, all G20 countries were asked to prepare medium-term growth strategies to provide a systematic framework for addressing policies and priorities in the growth agenda. The strategies prepared are comprehensive in scope, spanning macroeconomic policies and structural reforms to promote strong, sustainable, and balanced growth.

been historically. The theoretical starting point is that a permanent depreciation should be fully absorbed by consumer prices. In a digital world, currency depreciation could imply that the profit-margin squeeze is accelerating. The recent limited impact of dollar appreciation on inflation in some of the emerging markets shows that this could be at least one underlying factor.¹⁰

Monetary policy will also be affected by labour demand and supply. One can assume that, during a transition, jobs will be lost. However, should the displaced workers be unable to find other jobs, the equilibrium rate of unemployment could increase, shifting the Phillips curve¹¹ outwards. Inflation could decelerate if we assume that the productivity of robots will be greater than that of humans, causing a decline in the wages of the remaining workforce. However, the *shape* of the Philips curve can also be affected if, for example, trade union power is reduced or the expected disinflation is not realised because firms decide to increase mark-ups, cancelling out the impact of lower wage growth. The macroeconomic impact of these developments remains uncertain. What is clear, however, is that monetary policy will have to keep pace with, and be cognisant of, any potential changes in this regard, and adjust accordingly.

An area where technological advancement is indeed having a profound impact on central banking is in the financial technology (fintech) space. Fintech architecture, with which some central banks are currently experimenting (e.g. blockchain and distributed ledger technology (DLT) solutions), is making it possible to manage massive numbers of transactions as well as the transfers and settlements of large sums of money. However, in many ways this is a technology that is still in its infancy, and the extent of efficiency benefits still have to be demonstrated. But further developments could certainly see much greater efficiencies and a reduction in costs.

The South African Reserve Bank (SARB) recently launched Project Khokha, which had as its scope the trial of interbank wholesale settlement using DLT. This was South

¹⁰ World Economic Forum. How will the Fourth Industrial Revolution affect economic policy? 28 January 2016.

¹¹ The Phillips curve, named after William Phillips, describes the historical inverse relationship between rates of unemployment and corresponding rates of wage increases that are evidenced within an economy. According to the theory, faster economic growth leads to higher inflation, which in turn leads to more jobs and less unemployment.

Africa's first DLT initiative, whose aim was to contribute to the global initiatives that assess the application and use case for DLT. Project Khokha was successful in that it proved that the typical daily volume of the South African payment system could be processed in less than two hours with full confidentiality of transactions and settlement finality. This demonstrated to us that DLT has potential, but it has also become evident that there is a long road ahead before large-scale adoption can be considered.¹²

New technology is increasing the efficiency of key banking functions through enabling the creation of new financial services. In terms of lending and borrowing, for example, 'crowd-funding'¹³ and online 'peer-to-peer lending platforms'¹⁴ are buzzwords. These applications are closely related to financial intermediation, a core and heavily regulated element of financial institutions. The fintech applications in this field are still a small fraction of overall credit, but are growing very rapidly in some jurisdictions. This requires ongoing monitoring by central banks.

Fintech also provides opportunities to increase financial inclusion, and provides unbanked households and firms with access to loans and savings. Low-income countries still have a large part of the population lacking access to services that are widespread in high-income countries, such as formal savings in financial institutions. Greater competition in the banking sector, concentration risks, and greater security of remittances are added benefits which ultimately mean reduced costs for participation in the formal economy and easier access to public services based on improved government databases.

However, while new technology provides opportunities, it also poses a number of challenges, including financial stability risks and cyber security risks. The more financial systems depend on electronic platforms and digital records, the more exposed they are to cyberattacks, which can disrupt the flow of funds across the

¹² Some of the considerations relate to the interlinkages and cost-speed-and-scale comparative analysis with current systems, and the fit with current legal and regulatory requirements.

¹³ Crowdfunding is the practice of funding a project or venture by raising small amounts of money from a large number of people, typically via the Internet.

¹⁴ Peer-to-peer lending, also abbreviated as P2P lending, is the practice of lending money to individuals or businesses through online services that match lenders with borrowers.

economy and create financial instability. Therefore, a robust cyber-resilience and cyber-risk framework is crucial to creating an enabling environment for financial services innovation.¹⁵

One area which has been receiving increasing attention in central banking circles relates to so-called crypto-currencies. The rapid pace of usage, and the complexities of such crypto-assets, have forced central banks to reassert some fundamentals relating to the definition of money, its characteristics, and the role of the central bank in this regard. There is a broad consensus that crypto-assets do not meet the traditional definition of money, as they are not a means of exchange, a store of value, nor a unit of account. At the very least, as explained by Augustin Carstens, the General Manager of the Bank for International Settlements¹⁶, they lack the characteristics of 'good money' as what constitutes 'good money' is the level of trust and credibility that the public has in the currency, and that trust has to be earned and supported. Central banks, however, are exploring the use of central bank digital currencies, which could be of more benefit and would likely be safer.

As part of its fintech Programme, the SARB has taken cognisance of the investigatory studies done on crypto assets, and has placed high emphasis on monitoring the developments in this area. It has adopted a 'back to basics' approach by focusing on the underlying economic function or activity being performed (deposit taking, payments, lending and investments) rather than the specific technology. The SARB's position on crypto-assets is that these are not recognised as currency or legal tender in South Africa, and that only the SARB is allowed to issue legal tender. Any merchant or beneficiary has a right to refuse crypto-assets as a means of payment.

Although the Financial Stability Board has concluded that there are currently no immediate financial stability risks arising from crypto-assets, there are other potential risks arising with respect to consumer and investor protection, market integrity, tax

¹⁵ The SARB undertook a cyber-crisis simulation exercise last year, with assistance from the World Bank. The simulation included three different but related cyberspace incidents, namely failure to settle Treasury bills, a failure of the stock exchange, and an attack on a small bank paying out social grants. Much was learnt from this exercise. It also allowed authorities to test the strength of their crisis communication arrangements, coordination and decision making under critical situations, including recovery and resolution strategies.

¹⁶ Augustin Carstens, Money in the digital age: what role for central banks?"BIS, February 2018

evasion, money laundering and terrorism financing, which require ongoing monitoring. We therefore need to ensure that as these technologies evolve, we robustly assess in parallel dimensions such as legal, governance, risk and operational frameworks.

I have said much about how the Fourth Industrial Revolution could be changing the world of work and the implications that it might have for central banking, from monetary policy to financial stability, currency operations and payment systems.

Recent monetary policy developments

At the conclusion of its most recent meeting about two weeks ago, the SARB's Monetary Policy Committee (MPC) decided to leave the repurchase rate unchanged at 6.5% per annum. This was judged to be consistent with a still accommodative stance of monetary policy given the current weak state of the economy.

The MPC did, however, note with concern that the risk profile to both the growth and inflation outlooks had deteriorated when compared to the observations at its previous sitting in May 2018, and this was reflected in the Bank's forecasts. A number of risks that had been highlighted in previous meetings had either materialised or still persisted, in an environment that continued to be characterised by heightened uncertainty. While the external environment has had a more dominant influence on the outlook, domestic factors also played a role.

Headline inflation is now expected to average 4.8% in 2018 (down from 4.9%) before increasing to 5.6% in 2019 and decreasing again to 5.4% in 2020 (up from 5.2% in both years). The forecast for core inflation is expected to average 4.6% in 2018 (up from 4.5%), 5.5% in 2019, and 5.3% in 2020 (up from 5.1% in both years). Although the forecasts suggest that inflation outcomes will remain within the inflation target range, the MPC is concerned that they are drifting further away from the midpoint of the target band.

The MPC deemed the key risks to the inflation outlook to be higher oil prices, a more depreciated exchange rate, and higher electricity prices. Although oil prices have retreated from the recent high levels of around USD80 per barrel, they are expected

to still remain at relatively elevated levels over the forecast period. Together with the depreciation of the domestic currency, upside risks to domestic fuel prices and ultimately to inflation remain. The nominal effective exchange rate of the rand has depreciated by almost 9% and exhibited increased volatility from the first quarter of 2018 to the second quarter. The increased volatility resulted from a deterioration in sentiment towards emerging markets, owing to the combined headwinds of tightening financial conditions, weakening economic growth, and rising trade tensions, which resulted in capital outflows. The rand is likely to continue to be vulnerable to these developments. In addition, electricity prices continue to pose a further upside risk given the uncertainty around the speed at which Eskom will adjust electricity tariffs.

Should these risks materialise, it may become necessary to adjust monetary policy settings in the future to ensure that inflation remains more comfortably inside the target range and closer to the midpoint, and to ensure that inflation expectations are anchored towards the midpoint of the target range. The MPC will not hesitate to act when deemed appropriate. However, in line with flexible inflation targeting, the MPC will also continue to be careful not to overreact to initial price pressures and be guided by its assessment of second round effects of any price pressures, which could contribute to inflation moving too far away from the mid-point of the range, or even exceeding the target range, on a sustained basis.

The SARB's forecast for GDP growth for 2018 was revised down from 1.7% to 1.2%, while the forecasts for both 2019 and 2020 were slightly higher at 1.9% and 2.0% respectively. Following the broad-based contraction of 2.2% in the first quarter of 2018, indications based on high frequency data suggest continued sluggish performance of the economy in the second quarter, but with a likelihood that a technical recession will be avoided.

As indicated previously, with South Africa having no fiscal space and monetary policy similarly currently not being able to provide further stimulus, the attention needs to firmly shift towards fully restoring confidence and urgent implementation of structural reforms to help lift the potential rate of growth of the South African economy.

Conclusion

Let me conclude by reiterating the remarks made by Robert Shiller of Yale University on the subject of the Fourth Industrial Revolution: “You cannot wait until a house burns down to buy fire insurance on it. We cannot wait until there are massive dislocations in our society to prepare for the Fourth Industrial Revolution.”

Indeed, it is up to us whether we succeed in the Fourth Industrial Revolution – whether it will be a time of great promise or a time of great peril, both for the continent and for our country. New technologies will transform the world we live in. The exponential speed and scope of this transformation brings with it the potential for unlimited possibilities and endless opportunities, but also massive challenges.

Educational institutions need to understand the implications of the Fourth Industrial Revolution in order to better prepare their students for this new future. Our fate is in our hands. We cannot afford to be left behind, and institutions such as the University of Zululand have an important role to play in ensuring that we are not left behind.

Thank you for your attention.