

Policy making in a complex environment

KEY POINTS

The current financial crisis has highlighted the increase in economic inequality globally and given rise to a call for efficient market policies that also embrace principles of social justice.

Over the next two decades, emerging markets and developing countries will power global growth as they shed their role as suppliers of low-cost goods and services, and become providers of capital, talent and innovation.

Africa's changing demographic structure, increasing urbanisation, untapped agricultural potential and need for better infrastructure present significant opportunities for growth.

While climate change is a major threat, developments in science and technology will enable countries to mitigate the effects, without undermining growth.

INTRODUCTION

In the next few decades, the world is expected to experience unprecedented changes. A confluence of diverse and numerous developments – an explosion of urbanisation, revolutionary innovations in science and technology and a rebalancing of economic power from developed to developing countries – offer new opportunities. However, the cumulative effect of these developments is highly uncertain. Managed correctly, the interconnectedness that has enabled globalisation can bring enormous benefits, not least a reduction in poverty and greater social integration. However, failure to curb the financial, technological and social threats associated with globalisation pose substantial risks. The global effects of the financial crisis that began in 2008 are a case in point.

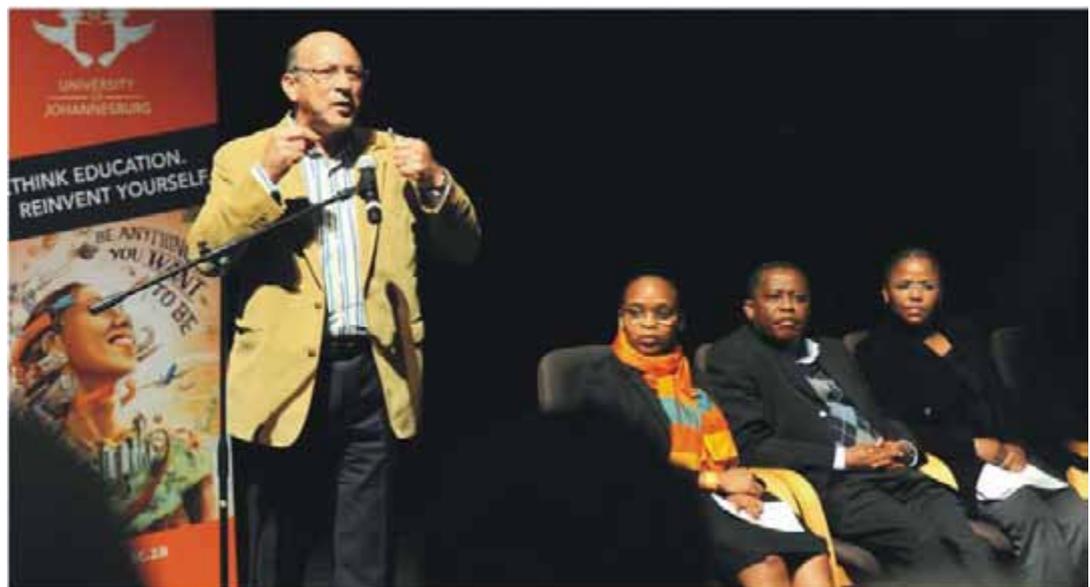
To take advantage of the opportunities while preparing prudently for the risks will require policies and actions that regulate and incentivise innovation, capitalise on recent trends, such as increasing urbanisation, and enhance the capacity to resolve conflicts and address challenges at a global level, necessitating a better understanding of the main drivers shaping trends.

INCREASED INTEGRATION, INCREASED COMPLEXITY, INCREASED RISK

Economic integration has accelerated over the past three decades. Between 1980 and 2005, world merchandise imports and exports increased more than seven times, while global foreign investment flows grew 18-fold.¹ This was on the back of a 32 percent rise in real world gross domestic product (GDP).

Technology has both deepened and accelerated the world's interconnectedness, enabling higher growth, a leap in trade and a great surge in cross-border investment. The pace is likely to quicken further over the next two decades as information flows and capital movements, trade and migration speed up.

Air transport, container traffic and logistical chains have negated the effects of distance. Better infrastructure has hastened the flow of people into towns and cities. The world's population has nearly doubled since 1950; the urban share of the total has increased from 29 percent in 1950 to over 50 percent in 2009. The internet, mobile telephony and growth in computing power have made virtual proximity almost universal.



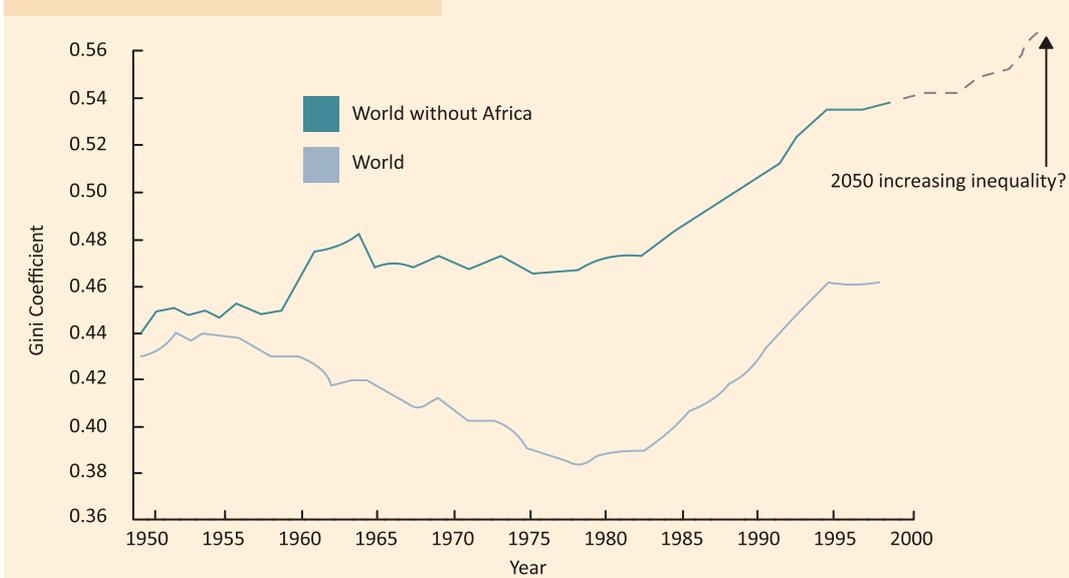
Global integration has brought benefits, spurring growth for a generation. Until the 2008/09 crisis, many developing countries were making good progress in reducing poverty. Between 1981 and 2005, the share of the population in the developing world living below US\$1.25 a day more than halved, from 52 percent to 25 percent. China cut the percentage of its citizens living in poverty to about a quarter of its 1990 level in just two decades. Between 1997 and 2007, the percentage of Africans living on US\$1.25 a day fell from 59 percent to 50 percent. Economic growth, spurred in large part by exports, has been key to reducing poverty in developing countries. Over the past three decades, global trade grew almost twice as fast as GDP, due to revolutions in transport and communications, and a sharp decline in import tariffs.

Globalisation has also been marked by negative trends. Inequality has risen. The gap between the rich and the poor has grown in almost three-quarters of Organisation for Economic Cooperation and Development (OECD) member countries over the past two decades.² The Gini coefficient, which measures inequality of

distribution (0 being total equality and 1 being the widest disparity), worsened globally from 0.44 in 1950 to 0.54 in 2000.³ A quarter of the population in developing countries still lives on less than US\$1.25 a day, 1 billion people lack clean drinking water, 1.6 billion have no access to electricity, and 3 billion do not have adequate sanitation.⁴ HIV/AIDS has been devastating in sub-Saharan Africa.

Deeper levels of integration have been accompanied by uncertainty and volatility, as shown by the widespread financial – and then broader economic – contagion after the collapse of Lehman Brothers in September 2008. This was followed in late 2009 by the start of a sovereign debt crisis in the eurozone. The crisis began when a new government in Greece revealed that its predecessors had concealed enormous deficits. The crisis spread across the Eurozone, with first Greece, then Ireland and Portugal, requiring financial support, leaving Italian and French banks particularly exposed. Within two years, the volume of world trade fell by a third as the crisis spread from country to country at staggering speed.

FIG 1.1 GLOBAL EQUALITY



Source: Branko Milanovic (2007) in Goldin and Reinert⁵

The recession has been most sharply felt in developed countries, but developing economies have also felt the effects of depressed growth. Unresolved global imbalances and austerity measures are affecting confidence and consumption worldwide. Central banks have used up their arsenals, while money pumped into the system has caused inflationary effects in emerging markets.

The challenge is identifying a path of recovery given the unknowns. No one knows for certain whether the European Union will evolve or finally break up, what China's growth trajectory will be and what the implications for Africa are. Economics helps us understand how recovery might happen when the problem lies in one country, not when all countries are affected.

Clearly though, the crisis seems to have affected those who can least afford it, threatening the achievement of the United Nations' Millennium Development Goals and weakening the middle classes. Global unemployment rose 6.6 percent in 2009, while youth unemployment saw the largest rise in decades. High youth unemployment and food-price increases tipped several countries in North Africa – and Syria in the Levant – into revolt against corrupt, authoritarian leaders, raising questions about stability in the neighbouring oil-rich Gulf states.

The fallout from the financial crisis was a sobering reminder of the weakness of governments and global institutions. As economic conditions worsened in the United States in 2010, and the European Union began to face its own crisis, the initial success of a synchronised approach faded. The inadequate response is partly due to the complex, systemic nature of the challenges. Neither governments nor the relevant international institutions are set up to monitor or assess the risk of systemic contagion, or to deal with systemic failure.

The widespread negative effects of the recession have increased doubts about the viability of the global economic order built over the past three decades, leading to growing pressure for more inclusive, secure and sustainable globalisation. Wealth and income disparities, both national and international, threaten economic development as well as social and political stability. Despite robust growth in some emerging economies, many are trapped in a cycle of poverty. About 1 billion people, mostly in sub-Saharan Africa and South and Central Asia, survive on less than 2 percent of the world's wealth.

Business and government leaders canvassed by the Harvard Business Review (2011) cited increasing economic inequality and the opaque and fragile global financial systems as possible sources of a serious breakdown in the system itself. Many agree, such as the demonstrators who occupied Wall Street, those who forced the closure of St Paul's Cathedral in London, those camping in the main squares and thoroughfares of Madrid and Barcelona, and those clashing violently with police in Athens. Around the world, people are indignant at the inequity of a system that passes the cost of failure on to taxpayers and those dependent on jobs, while the benefits of its success are disproportionately enjoyed by traders and senior financial executives.

The widespread effects of the financial crisis are only one example of a wider problem of global challenges whose workings are not fully understood. Many scientists believe that population pressures, urbanisation and rising consumption and waste are pushing planetary boundaries to breaking point with uncertain, but potentially catastrophic, consequences. The most familiar example is climate change, which poses huge environmental, social and economic risks to communities in different parts of the world, and potentially to humankind.

Other systemic crises are entirely possible. These include cyber-attacks that could cripple financial markets, electricity supplies, transportation networks, and supply chains; and the outbreak of a pandemic that could disrupt travel, tourism, trade, financial markets, and domestic and regional order.

The scales are tipping

Economic policies under review

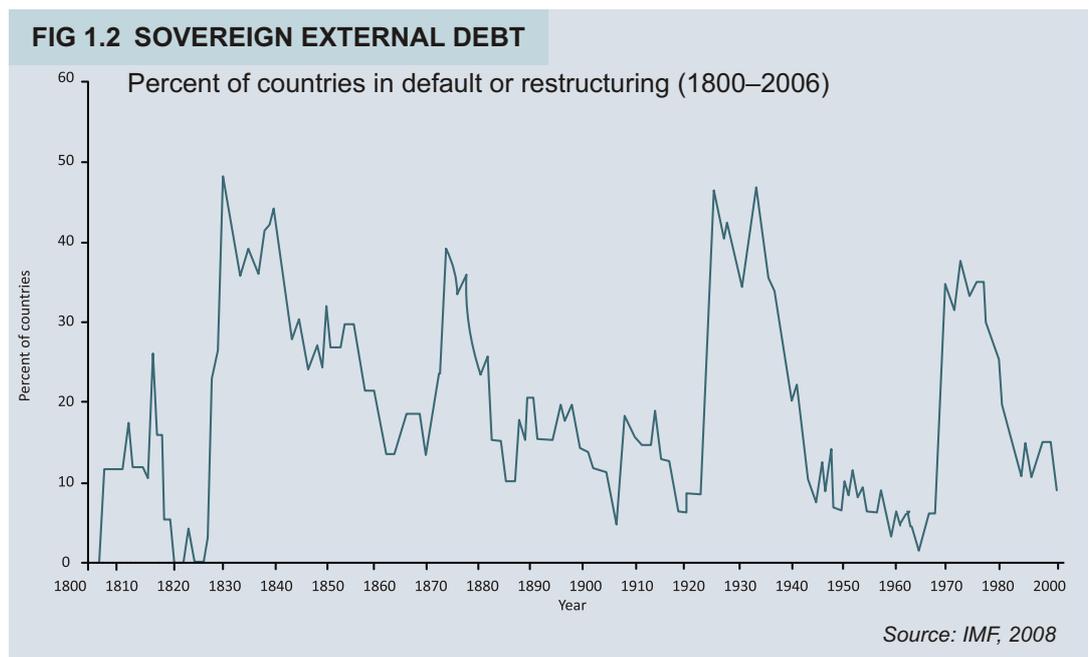
Laissez faire free-market doctrines have dominated global economic policy-making for 25 years. The era of rapid economic globalisation, against the backdrop of the collapse of the Berlin Wall in 1989, led many to believe in the triumph of a particular perspective or model, particularly in the relationship between the state, the market and the citizen. A "unipolar" view characterised by western (and particularly Anglo-Saxon) economic and political norms became dominant. But the global economic crisis has prompted a rethink.

The crisis has increased the focus on the role of government, and in particular on government failure to regulate and prevent systemic collapse. The "markets are efficient" mindset, which arose in the United States and Britain in the early 1980s and

spread rapidly worldwide over the next 25 years, asserted that freer markets are always better. Both traditional economic theory and experience show this is not correct.

Specific conditions make it possible for markets to work efficiently and market failure is common when these conditions are not satisfied. In a 2008 review of eight centuries of financial crises, former International Monetary Fund (IMF) chief economist Ken Rogoff and Carmen Reinhart showed that "serial default is a nearly universal phenomenon as countries struggle to transform themselves from emerging markets to advanced economies ... [and that] crises frequently emanate from the financial centres with transmission through interest rate shocks and commodity price collapses. Thus, the recent US financial crisis is hardly unique". The graph below highlights the experience of the past 200 years.

The crisis has encouraged the search for sound perspectives on economic policy. The most influential critics are not seeking to replace mainstream economics or eliminate the benefits of globalisation. They focus on the failure in the past



few decades of economists and governments to apply much of what used to be standard knowledge and practice about market failures. Rather than a policy lurch to another polar position, the call is for efficient market policies that also embrace principles of social justice, empowerment, and a balance between rights and responsibilities.

A common theme emerging in the debate is the need for a more nuanced balance among the roles of governments, the private sector and the market to achieve dynamic economic growth. Successful countries such as China and South Korea illustrate this.⁶

Credible and sustainable national policies should be based on the specific situation of each country, taking the global context into account. Economic policy-makers must recognise that institutional failures are endemic in the working of markets, and that it is not feasible to eliminate them.⁷ Policy-makers should anticipate the risk of failure, and both encourage transparent markets that offer an appropriate balance between risk and return, and be alert to distortions that are likely to lead to market failure.

Their refusal to abdicate government's responsibilities to the working of the financial markets protected countries such as Germany, Canada, Australia, India, Brazil, Turkey and South Africa from the worst effects of the financial crisis of 2007/08. China's unique blend of market economics and state direction steered it through the turbulent waters, albeit with high inflation and rising social discontent.

Balance of economic activity

The composition of global growth and wealth has changed dramatically since the 1990s. The recent economic and financial crisis in the United States and Europe and the increasing economic prominence of emerging market and developing

countries has contributed significantly to the changing balance of world economic power. China has become an especially dominant force in the global economy. In 2010, it outstripped Japan to become the world's second largest economy as measured in nominal GDP (about 40 percent as big as the United States economy), and was by far the biggest contributor to global GDP growth; its economy added US\$638 billion to growth in global nominal GDP, versus US\$497 billion added by the United States economy. By some forecasts, China will overtake the United States as the largest economy by 2025; others put the date at 2035, or even 2050.

Vibrant growth is also expected in India and South East Asia, as well as Eastern Europe, Latin America, parts of the Middle East, North Africa and sub-Saharan Africa. While the euro area, Japan, Britain and the United States will still play a major role in supporting growth in the decades ahead, global growth, demand and aggregate wealth are shifting toward the emerging economies. The World Bank suggests that by 2025, six major emerging economies – Brazil, China, India, Indonesia, South Korea and Russia – will account for more than half of all global growth, growing, on average, by 4.7 percent a year to 2025, by which time their share of global GDP will have grown from 36 percent to 45 percent. The advanced economies are predicted to grow by 2.3 percent over the same period.

As economic power shifts, emerging market economies are helping to drive growth in lower-income countries through cross-border investment and trade.⁸ Trading patterns are starting to reflect this. From 1990 to 2008, Asia's share of Africa's trade doubled to 28 percent, while Western Europe's portion shrank from 51 percent to 28 percent. Europe accounts for 30 percent of Africa's exports and China 17 percent – although

FIG 1.3 THE WORLD IN 2050

The top 30 in 2050

	Order in 2050 by size	Size of economy in 2050 (Bn, Constant 2000 USD)	Rank change between now and 2050	Income per capita (Constant 2000 USD)		Population (Mn)
				2050	2010	
1	China	24617	2	17372	2396	1417
2	US	22270	-1	55134	36354	404
3	India	8165	5	5060	790	1614
4	Japan	6429	-2	63244	39435	102
5	Germany	3714	-1	52683	25083	71
6	UK	3576	-1	49412	27646	72
7	Brazil	2960	2	13547	4711	219
8	Mexico	2810	5	21793	6217	129
9	France	2750	-3	40643	23881	68
10	Canada	2287	0	51485	26335	44
11	Italy	2194	-4	38445	18703	57
12	Turkey	2149	6	22063	5088	97
13	S. Korea	2056	-2	46657	16463	44
14	Spain	1954	-2	38111	15699	51
15	Russia	1878	2	16174	2934	116
16	Indonesia	1502	5	5215	1178	288
17	Australia	1480	-3	51523	26244	29
18	Argentina	1477	-2	29001	10517	51
19	Egypt	1165	16	8996	3002	116
20	Malaysia	1160	17	29247	5224	40
21	Saudi Arabia	1128	2	25845	9833	44
22	Thailand	856	7	11674	2744	73
23	Netherlands	798	-8	45839	26376	17
24	Poland	786	0	24547	6563	32
25	Iran	732	9	7547	2138	97
26	Colombia	725	13	11530	3052	63
27	Switzerland	711	-7	83559	38739	9
28	Hong Kong	657	-3	76153	35203	9
29	Venezuela	558	7	13268	5438	42
30	South Africa	529	-2	9308	3710	57

Source: HSBC, 2011

Europe will continue to be South Africa's biggest trading partner for some years to come, the gap with China is expected to narrow significantly.⁹

A number of drivers are behind the growth in emerging markets, including technological progress, better education and economic management, greater openness to international trade, changes in the use of land, and domestic migration from low-productivity to high-productivity sectors. However, demographic shifts and urbanisation (see chapter 2) stand out as key to improved economic performance.

Declining birth rates over the past decade are changing the demographic profile of most emerging market economies, leading to lower dependency ratios – on average, a working person will have fewer very old or very young dependants. Partly as a result of this, 70 million people (mostly in

emerging economies) are expected to cross the threshold to middle-class status with annual earnings of between US\$6 000 and US\$30 000 each year.

The second driver is the largest urban migration in history. Agricultural workers are leaving the land, where they were often engaged only in subsistence farming, for urban jobs. This is leading to the development of new mega- and mid-sized cities. This year, for the first time, more than half of China's 1.34 billion people were classified as urban residents.

Planning for these mass migrations will bring enormous pressures. Large slums are already a feature of the world's largest developing world cities. Traditional ideas of slum clearance have been challenged by radical new thinking, driven by the sheer scale of urbanisation and its economic

consequences. Architecture for Humanity, which has upgraded slums in Brazil, Kenya and South Africa, argues that modern city design should tolerate slums by learning from them.

The effects of urbanisation include growth in the wage-earning class (where jobs are available); higher demand for education, consumer goods, health care and transport; a new business class of entrepreneurs and managers; and gains in output per worker. As China and India become manufacturing and service powerhouses, labour productivity is growing at more than five times the rate of most western countries.

Emerging markets are becoming key areas of growth in consumption, production and, in some cases, innovation. The policies and strategies of all countries and companies will need to address the challenge of a global economy driven by low-cost, high-growth companies or innovation in many parts of the world. Governments will need to create enabling environments for their business sectors and develop strategic policy frameworks that exploit this reality.

Companies will have to develop new business models and products that match the needs and

wallets of the growing emerging market urban populations. Levels of income per capita will still be relatively low – these consumers will wield, on average, just 15 percent of the spending power, in real dollars, of their developed-world counterparts. China's income per capita today is just 6 percent of that in the United States. Even a predicted sevenfold increase by 2050 will bring it to only 32 percent of the United States figure. In India, income per capita is just 2 percent of that in the United States. To serve these customers, companies will need to focus on innovation and develop new business models.

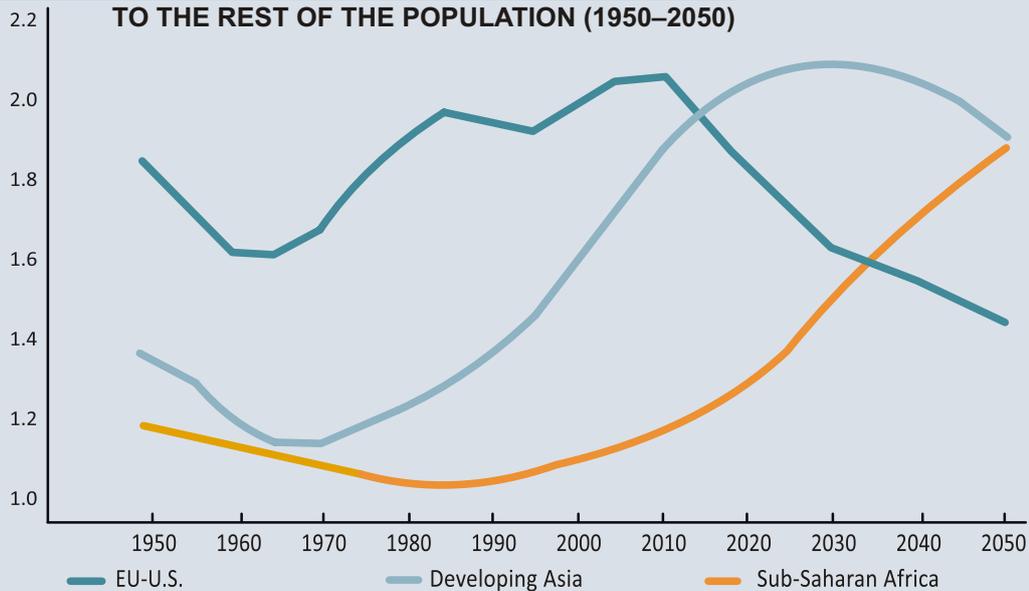
The expected global economic rebalancing depends on the ability of emerging market countries to maintain their current growth trends. This is not inevitable. Continued economic dynamism will depend largely on policy, steering economies away from low-productivity activities, such as subsistence agriculture and informal trading, to sectors that lift the country up the sophistication ladder.

This means wider and deeper investment in education and skills training, and enabling employment in high-value jobs. This is essential if developing economies are to reap the benefits of their favourable demographic make-up.

FIG 1.4 EMERGING MARKETS AND GLOBAL GROWTH



FIG 1.5 RATIO OF WORKING-AGE POPULATION (16–64) TO THE REST OF THE POPULATION (1950–2050)



Source: World Bank, 2011

Balance of global political power

Economic globalisation has outpaced political globalisation. The pillars of the international political order suffer from democratic deficiencies – their structure, which dates from the decade after World War II, primarily serves the interests of the advanced industrial countries. In the IMF, for example, quotas, which are the main determinant of the voting power of members, are allocated on an economic power basis that no longer reflects economic realities. A failure to shift quotas to dynamic emerging markets and developing countries undermines the Fund's relevance and legitimacy in promoting global growth and economic and financial stability.¹⁰

The inequitable distribution of power in global organisations such as the United Nations, the World Bank, the IMF and the World Trade Organisation has made them hostage to power blocs and particular economic policies, limiting their ability to take central roles in global problem-solving. Bodies such as the Group of Eight (G8), Group of 20 (G20) and Group of 77 (G77), have similar limitations. Big intergovernmental

conferences tend to be too ritualistic, long on declarations and short on implementation. The original model of the Group of Seven (G7) was exclusive and did not represent the new world economic order, but extending it has resulted in unwieldy gatherings where form trumps substance. The new institutions have been set up without an overarching structure, resulting in competition and an unbalanced distribution of responsibilities and power.

A review of the governance structures of many of these bodies and organizations is long overdue. The past four years have underscored the need for fundamental redesign. Developing countries, including South Africa, are in a strong position to advance a reform agenda that had impetus even before the financial crisis. These countries need to push for more balanced representation in global forums and for institutions that are attuned to the challenges of social and economic justice. Commenting on United States President Barack Obama's nomination of Jim Yong Kim as the next president of the World Bank, the Financial Times said: "Washington needs to reboot the World

Bank's legitimacy and relevance in the eyes of the poorest countries, which are increasingly turning to China and the private markets for investment and capital. If it continued to appear to be a preserve of the old rich club, the emerging world will continue to look elsewhere."¹¹

National institutions also need to be overhauled. While leading companies are forced to adopt management policies and styles that reflect their global reach, in most countries, the public sector is locked into outdated national models that do not allow governments to deal with global challenges. Most domestic regulators have only a national remit. Treaties and conventions take too long to negotiate, are often not ratified, and when they are, are rarely enforced.¹²

Over the next two decades, both governments and companies will need to adapt continuously as they address the risks and opportunities of the evolving global environment. National governments, especially those whose societies are characterised by high levels of inequality, such as South Africa, will need to introduce more equitable economic policies to hold on to domestic legitimacy and adjust to a changing and increasingly complex world.

Rise of Africa

Africa is the second most populous continent after Asia. Its current population of nearly 1 billion is expected to rise to 2.2 billion over the next 40 years. Between 2000 and 2010, GDP grew at 5.6 percent

a year, topping 7 percent in 2002, 2004 and 2007.¹³

Africa's poor economic performance began to improve in the mid-1990s. Macroeconomic reforms brought down inflation and opened economies to international trade. Led by the two largest economies, South Africa and Nigeria, many countries built prudent fiscal positions after 1995. Political and macroeconomic stability and micro-economic reforms consolidated the growth path.

Foreign debt as a percentage of GDP and debt-service obligations as a percentage of export revenues have both declined dramatically to levels comparable to those of other regions, and sovereign credit ratings in some countries have a positive outlook. More countries are now seen as "frontier emerging economies", with relatively developed financial markets, including Botswana, Cape Verde, Ghana, Kenya, Mauritius, Mozambique, Namibia, Nigeria, Seychelles, South Africa, Tanzania, Uganda and Zambia.

Foreign direct investment has increased dramatically, from US\$9 billion in 2000 to US\$62 billion in 2008. Total foreign capital flows into Africa rose from US\$15 billion in 2000 to a peak of US\$87 billion in 2007. Relative to GDP, that is almost as large as the flows into China. The rate of return on foreign investment in Africa is higher than in any other developing region.



In part, this is due to an improved business regulatory environment. A study of publicly traded companies operating in Africa between 2002 and 2007, mostly in manufacturing and services, found that average return on capital was about two-thirds higher than that of comparable companies in China, India, Indonesia and Vietnam. Similar trends were found in foreign direct investment, with American companies achieving a higher return on African investments than on those in other regions.

Interest in Africa's rich mineral resources accounts for much inward investment, but higher investment in infrastructure and better education have laid the foundation for other sectors as well. McKinsey's analysis indicates that all sectors contributed to the growth surge, including resources, finance, retail, agriculture, transportation and telecommunications. Natural resources contributed only 24 percent of GDP growth between 2000 and 2008.¹⁴

Average years of schooling are catching up with those of the rest of the world, after having increased more than fivefold since 1960. Nevertheless, education and preparation for employment are both poor in quality. Although primary school enrolment rates across sub-Saharan Africa have doubled in the last generation, completion rates are still under 70 percent, compared to over 90 percent for North Africa and East Asia.

Advances have not been uniform across the continent. Africa is highly diverse. The GDP of the 10 largest countries makes up more than 70 percent of the continent's total, and 34 of the world's 48 poorest countries are African. The average annual income south of the Sahara, excluding South Africa, is only US\$342, and more than 40 percent of the people in sub-Saharan Africa live on less than US\$1 a day.¹⁵

Opportunities

Minerals underpin the economic strength of many countries. Africa holds 95 percent of the world's reserves of platinum group metals, 90 percent of chromite ore reserves, 85 percent of phosphate rock reserves and more than half of the world's cobalt.

In addition, there may be a gap between the actual endowments and what has been identified and exploited. Substantial reserves could yet be found.¹⁶ So the future might bring a considerable increase in Africa's commodity exports, changing the economic map as new resource-rich countries emerge, and prolonging and deepening growth.

Most African countries have not used their commodity wealth to reduce poverty. The proceeds of oil or minerals extraction have largely been consumed, rather than invested in people and infrastructure. Ugly and costly political contest for control of revenues is still a serious problem in parts of the continent.

Over the next 20 years, other endowments will come to the fore, including a demographic profile that will potentially boost both productivity and consumption; infrastructure deficits that present investment opportunities; and suitable conditions for large-scale agricultural and agri-processing development, both for domestic consumption and for export.

Africa has the world's youngest population, and in less than 15 years it will be home to one quarter of the world's population under 25 years of age. Africa will benefit from a large, mostly youthful, working-age population that will have progressively fewer dependants to support as fertility rates fall further.

The current generation of young people can greatly expand the continent's productive workforce, but without education, skills and programmes to

promote job creation and entrepreneurship, it also poses a major risk. About 54 percent of Africa's youth are unemployed today, and nearly three quarters live on less than US\$2 a day. Unless this changes, the potential for political instability is great. Recent developments in North Africa have shown the consequences when young people do not find work and feel deprived of dignity.¹⁷

The rapid growth in the working-age population will be matched by a dramatic rise in the number of people living in cities. Analysts project that by 2030, over 50 percent of Africa's population will live in cities, many of which will be megacities.

Massive urbanisation will lead to a fundamental shift in the economic profiles of many African countries. Although 40 percent of Africa is urbanised today, agriculture accounts for 70 percent of employment and 15 percent of GDP. This balance will change, bringing the continent more in line with other developing economies. Agricultural output makes up 7 percent of GDP in Brazil and 12 percent in China. In the G7 countries, agricultural production

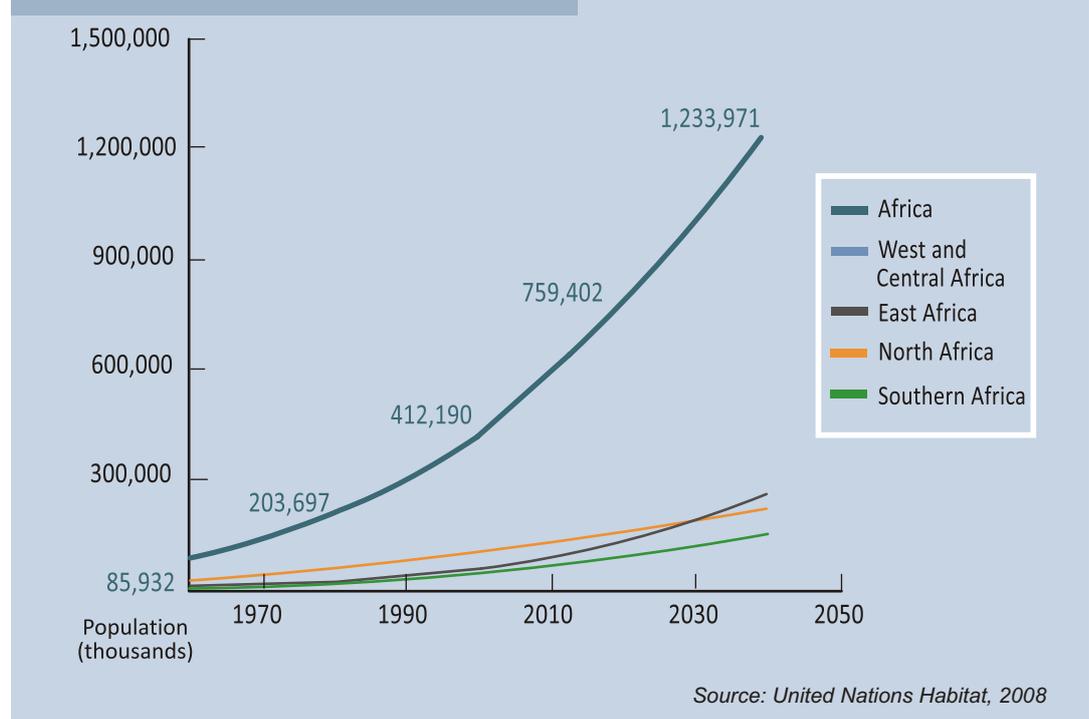
is now less than 3 percent of all goods produced.

Urbanisation not only reduces the number of people engaged in small-scale agriculture; it also facilitates economic diversification. The combined effects of lower dependency ratios and greater urbanisation ought to have a further significant impact on the productivity of the labour force. Productivity levels have been growing since 2000 at an average of 2.7 percent a year.

Africa will soon be the last remaining major low-wage region in the world. Per capita GDP in China is already above the global average. China is moving up the industrial ladder, shedding enough manufacturing jobs to double manufacturing employment in other low-income countries, particularly in Africa.

In addition, Africa's extensive coastline and proximity to European and North American markets puts Africa-based firms in a strong position to displace Asian competitors in labour-intensive manufacturing.

FIG 1.6 AFRICAN URBAN POPULATION



Employment and urbanisation will drive a huge increase in consumer spending. Over 80 million households in Africa now earn at least the equivalent of US\$5 000 annually – an increase of 80 percent in eight years. Between 2005 and 2008, consumer spending in Africa increased at a compound annual rate of 16 percent, well over twice the GDP growth rate. In all but two countries, GDP per capita increased. Many consumers have moved from the destitute level of income (less than US\$1 000 a year) to the basic-needs (US\$1 000 to US\$5 000) or middle-income (up to US\$25 000) levels.

Mirroring the pattern of urbanisation elsewhere in the developing world, the number of households with discretionary income is likely to rise by 50 percent over the next decade, to 128 million. McKinsey suggests that sub-Saharan Africa's top ¹⁸ cities could have a combined spending power of US\$1.3 trillion by 2030.¹⁹

This has particular implications for banks, telecommunications companies and manufacturers of fast-moving goods. McKinsey projects that four groups of industries – consumer-facing industries, agriculture, resources, and infrastructure – could collectively generate US\$2.6 trillion in revenue each year by 2020, US\$1 trillion more than in 2010.²⁰

The explosion in consumer demand is particularly evident in mobile telephony. In the past 10 years, the number of mobile subscriptions rose from 15 million to 500 million, and it is expected to increase to close to 800 million by 2015. Over the next five years, east and central Africa will have the highest mobile subscription growth rates in the world. Nigeria is already the world's tenth largest mobile market.

Internet use has also risen in Africa, to about

120 million users. The World Bank estimates that the industry attracted US\$56 billion in investment in the decade to 2008, despite challenging market conditions, including high connectivity costs, high usage charges and poor electricity supply. According to the International Telecommunications Union, the top five most expensive places in the world for fixed-line broadband in 2010 were all in sub-Saharan Africa.

New fibre-optic cables can reduce costs and extend connectivity. A range of mostly privately funded cables on Africa's east and west coasts will allow dramatically better connectivity and will lower costs for users if intra-regional networks are built. Already, Africa's international bandwidth capacity has increased 120 times to over 10 terabytes per second since 2008.

The continent's massive infrastructure deficit, though debilitating, also presents great opportunities. Africa has the weakest infrastructure in the world – average electricity costs of US\$0.18 per kilowatt-hour are about double those of other developing countries. The largest infrastructure gaps are in energy, with citizens in 30 of the 47 countries in sub-Saharan Africa facing regular power shortages and power interruptions. Power outages are responsible for a loss of between 1 percent and 6 percent of potential GDP every year. Road density is lower in Africa than in any other developing region, with 152 kilometres of road per 1 000 square kilometres of land area. Bridging the infrastructure gap will cost about US\$93 billion a year, with about 40 percent in the power sector.²¹ Poor infrastructure and tough market conditions force companies to develop business models and products for price-sensitive consumers. Innovation driven by necessity delivers solutions that may provide useful springboards into other markets. The pioneering work in mobile money transfers is one of the notable innovations in response to poor

infrastructure. Safaricom's M-Pesa system has led this sector with a model that combines using small traders and mobile technology. By 2010, 14 million Kenyans had transferred US\$7 billion through M-Pesa.

The breakthroughs in cell phone banking have not yet extended to easing money flows in and out of Africa, or between countries. The cost of sending remittances to sub-Saharan Africa averages almost 12 percent of a US\$200 transaction, compared with less than 8 percent for most other developing regions. The cost of cross-border remittances within Africa, if permitted at all, tends to be even higher.²²

Remittance flows into Africa, the largest source of net foreign inflows after foreign direct investment, have quadrupled in the past 20 years, reaching US\$21.5 billion in 2010 in sub-Saharan Africa.²³ These flows underscore the size and importance of migration both from and within Africa. About 30 million Africans, or 3 percent of the population, have migrated internationally, including within Africa.²⁴

Today, 500 million people in sub-Saharan Africa do not have access to electricity, which is a prerequisite for social development, and the ability to harness

technological opportunity and enable environmental sustainability. Renewable energy sources will become increasingly important. Sub-Saharan Africa is particularly well positioned to develop solar and hydro-energy, and to produce bio-fuels. The Grand Inga project could provide sufficient electricity for Africa and allow it to export energy through interconnecting links to southern Europe. This would require three major African interconnection projects: the northern highway (between Inga and Egypt), the southern highway (between Inga and South Africa) and the western highway (between Inga and Nigeria).

Angola, Mozambique and Tanzania, among other countries, have the potential to produce ethanol profitably from sugar cane on land that is not used for food crops. Africa also has the potential to reduce emissions by protecting its forests. The United Nations' programme to reduce emissions from deforestation and forest degradation is an attempt to create financial value for the carbon stored in forests by offering incentives for the sustainable management of woodlands.

Agriculture is another area of potential growth. Current output does not match Africa's agricultural potential. From being a net food exporter in the early 1960s, the continent is now a net importer.

The Greater Inga hydroelectric project has been under discussion for over four decades, with the first studies undertaken in the 1960s. The first phase involved the construction of three power stations in the Nkokolo valley in the Democratic Republic of Congo. The project includes Inga I (351 megawatts [MW]), which was commissioned in 1972, Inga II (1 424MW), which was commissioned in 1982, and Inga III (about 3 500MW). High-voltage lines transmit the power from Inga I and II to Zambia, Zimbabwe, South Africa and the Democratic Republic of Congo (Brazzaville). The Inga III project was to be developed by the western power corridor, a joint venture of the national power firms of the Democratic Republic of Congo, Angola, Namibia, Botswana and South Africa, but progress has stalled. The second phase addressed the development of the Grand Inga power station, with a total capacity of 39 000MW, to be equipped progressively with 52 power generators of 750MW.

While more than one-quarter of the world's arable land is in Africa, it generates only 10 percent of global agricultural output and is highly concentrated – Egypt and Nigeria alone account for one-third of total agricultural output on the continent. Over 60 percent of the world's unexploited cropland is in sub-Saharan Africa, compared with 31 percent in Latin America.

The barriers to raising production in Africa are well documented: inadequate infrastructure to bring crops to market – an annual additional investment of US\$50 billion is required in sub-Saharan Africa alone for transport and other kinds of infrastructure; perverse trade barriers and tax incentives; poorly regulated access to agricultural land by foreign private and state entities; highly fragmented production – 85 percent of Africa's farms occupy less than two hectares (in Brazil, Germany and the United States, only 11 percent or less work on this scale); and lack of technical assistance and finance for farmers, including access to high-quality seeds, fertiliser and other inputs suited to the continent's ecological conditions. If the continent is able to overcome these barriers, agricultural output could increase to US\$880 billion per year by 2030.²⁵

Given its vast untapped agricultural potential, Africa is well positioned to address some of the world's food challenges, especially in the well-watered area between the Tropics of Cancer and Capricorn. Demand for food is expected to grow by between 30 percent and 50 percent over the next two decades as the world population grows from 7 billion to 8 billion by 2030.²⁶ Apart from growth in numbers, hundreds of millions will be wealthier, and demanding a more varied, high-quality diet. Competition for land, water and energy will intensify as the effects of climate change become apparent, potentially increasing the scarcity and pollution of water, and accelerating soil erosion and degradation. Current climate models indicate that

more water will be available for agriculture in Asia and North America, but progressively less in sub-Saharan Africa, Latin America and the Caribbean, compounding present challenges and demanding innovative responses.

The Alliance for a Green Revolution in Africa, for example, is working to achieve food security for Africa by promoting sustainable agricultural growth through smallholder farmers. Recognising that smallholders – mostly women – produce most of Africa's food today with minimal resources and little government support, the alliance supports smallholders with good seeds and better soils, as well as access to markets, storage, transport and finance, while seeking to improve agricultural policies.

This focus is necessary. Hunger remains widespread. More than 900 million people lack access to sufficient carbohydrates, fats and protein, while 1 billion are thought to suffer from "hidden hunger", because vitamins and minerals are missing from their diet. In contrast, 1 billion people are eating substantially too much, spawning a new public health epidemic of chronic conditions such as type 2 diabetes and cardiovascular disease. The World Economic Forum's Global Risk Network estimates that non-communicable – or chronic – disease (heart disease, stroke, diabetes, some chronic lung conditions and preventable cancers) will increase by 27 percent in Africa, 25 percent in the Middle East, and 21 percent in Asia and the Pacific in the next decade, if not addressed effectively.²⁷

Other risks include the loss of the continent's best and brightest minds. Skilled migration rates are particularly high. In a survey of the top five students graduating from the top 13 high schools in Ghana between 1976 and 2004, three quarters had emigrated at some point between secondary

school and age 35.²⁸ The United Nations Economic Commission for Africa and the International Organisation for Migration estimate that 27 000 Africans left the continent for industrialised countries between 1960 and 1975. During the following decade, the number rose to 40 000. Since 1990, they estimate at least 20 000 have left the continent each year. In 2000, one out of every eight Africans with a university education lived in a country in the OECD, a rate exceeded among developing regions only by the Caribbean, Central America and Mexico.²⁹

The continuing recession in the United States and Europe has reversed the trend. According to a recent survey, Working in Africa, a third of professionals of African origin currently living abroad see better opportunities today in Africa to progress their careers than within developed economies. Africa's fortunes will depend largely on how the educated and skilled diaspora view personal opportunities, and domestic and foreign investors regard returns on investments. Both decisions – whether or not to stay and whether or not to invest – are strongly influenced by government policies. Reduced conflict, more transparent regulatory and legal systems, greater openness in trade, and higher

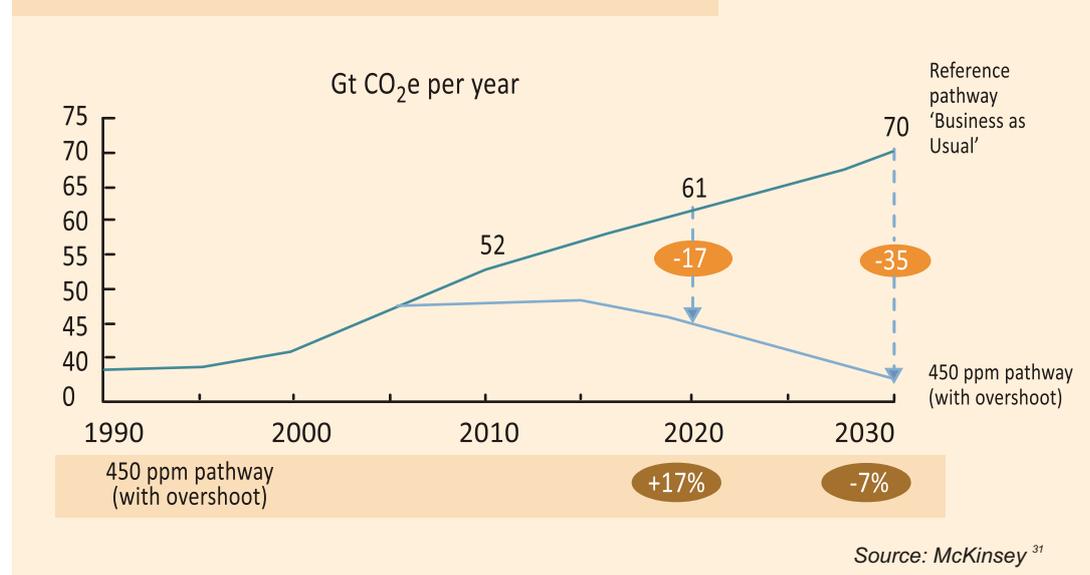
investment in infrastructure enabled the stronger economic growth of African economies in the first decade of this century. Future success depends on these trends being strengthened and accelerated. All successful countries are raising their game continuously and the recession is forcing companies to operate more efficiently, cost effectively and creatively.

The environment

Market and policy failures have resulted in the global economy entering a period of "ecological deficit", as natural capital (ground water, marine life, terrestrial biodiversity, crop land and grazing) is being degraded, destroyed, or depleted faster than it can be replenished. Waste and carbon-equivalent emissions per capita are climbing faster every year in an ecosystem with finite limits.

Human activity is warming the planet. For the past millennium, the earth's average temperature varied within a range of less than 0.7 degrees Celsius (°C). For the past 150 years, there has been an increase of nearly 1°C. By the end of this century, the earth could be 5°C warmer than in the 19th century. To put this into perspective: the planet has not been 3°C warmer than 19th century levels for 3 million

FIG 1.7 CARBON EMISSIONS PER YEAR: 1990–2030



years, or 5°C warmer in the last 30 million years. The business-as-usual scenario in Fig 1.7, suggests a probability of about 50 percent of warming of 5°C, or more, in the first part of the 22nd century. Even 4°C would transform the relationships between humans and the planet. Hundreds of millions would have to move, increasing the possibility of severe

Climate change is inequitable. High-income countries, with one sixth of the world's population, are responsible for nearly two thirds of the greenhouse gases in the atmosphere, but it is developing countries that will suffer most from the effects of extreme weather.³³



global conflict sustained over a long period. To have a 50 percent chance of containing the increase to 2°C, the world needs to reduce greenhouse gas emissions to no more than 44 billion tons per year of carbon equivalents by 2020 and 35 billion tons by 2030.³⁰

The effects of the planet's warming are felt mostly through water – storms, floods and inundations, droughts and desertification, and rising sea levels. Experts on the Intergovernmental Panel on Climate Change warn of radical disruption and instability in a very short space of time. Unless emissions are checked soon, development will be reversed in many parts of the world, bringing major economic decline. The risks of delay are also not well understood. Because carbon and other greenhouse gas emissions accumulate in the atmosphere and persist for very long periods, it is quite likely that within five or 10 years, any realistic chance of containing warming to 2°C will have been missed.³²

Since the threat to the world's environment and the challenge of poverty alleviation are closely intertwined, the debate should focus on ensuring that environmental policies are not framed as a choice between growth and mitigating climate change. A low-carbon future is the only realistic option, as the world needs to cut emissions per unit of output by a factor of about eight in the next 40 years. In fact, the energy-industrial revolution now under way offers exciting opportunities. As shown by the agricultural and industrial revolutions, as well as the current information and communication revolution, innovation, creativity and growth can shape quite different futures, with huge rewards for pioneers of new models. The new energy architecture and its relationship to the built environment will spur innovation, and potentially attain energy security and a cleaner and safer environment, while retaining greater biodiversity.

The political challenge in the next two decades will

be to develop policies and regulatory initiatives that prompt improved resource management and deliver substantial clean-technology industries. This will include policies that help people cope with new risks during the transition, adapting land and water

times the earth's diameter. In addition, 90 percent of edible fish stocks have already been fished out, while bigger fishing fleets are being built.³⁵

Industrialised food production contributes to



management to protect livelihoods and threatened natural environments, while transforming energy systems.

Although climate change is the chief ecological challenge, others closely linked also pose serious risks, such as water scarcity, pollution, food production and safety, and depleted fishing stocks. The earth and its atmosphere are an integrated ecosystem. Interaction among its different components is not well understood. As Johan Rockström of the Stockholm Resilience Centre has warned, humankind risks triggering dangerous inflection points if it transgresses planetary boundaries. Such points involve interactions among climate; fresh water; biogeochemical loading, affecting the nitrogen and phosphorus cycles; the destruction of biodiversity, and ocean acidification.³⁴

The amount of water being taken from the earth's underground reservoirs, or aquifers, which are essential for agriculture, is over 400 million tons a day more than is being replaced by rain. To quantify that another way: it would take 25 million water trucks to carry that amount of water – a convoy 30

climate change and the destruction of biodiversity. Damage to the environment includes soil loss due to erosion, loss of soil fertility, salination and other forms of degradation. In many places, water extraction for irrigation is exceeding rates of replenishment.

The threat of climate change has led scientists, academics and policy-makers to explore geoengineering, deliberate, large-scale intervention in natural systems to counteract global warming. Some vehemently oppose geoengineering research, fearing it will be an excuse to delay reducing emissions. Even supporters agree that new technology breakthroughs that can counter the effects, particularly of global warming, are no panacea. Instead, they carry potentially great risks, and should not be seen as an alternative to emission reductions.

Debates continue about managing ecological challenges. For most, the pace of change is dangerously slow and deeply worrying. A common understanding among countries is emerging that low-carbon growth is the desired end state. But this

involves investment, change and collaboration. There is still little evidence that the international will be there to overcome differences and conclude an effective global agreement. Change is more likely to be bottom-up, triggered by perceptions at a national or local level, and aggregated progressively in regional and global agreements.

Science and technology

Developments in science and technology are fundamentally altering the way people live, connect, communicate and transact, with profound effects on economic growth and development. Science and technology are key to equitable economic growth, because technological and scientific revolutions underpin economic advances, improvements in health systems, education and infrastructure.

The technology revolutions of the 21st century are emerging from entirely new sectors, based on microprocessors, telecommunications, biotechnology and nanotechnology. Products are transforming business practices across the economy, and the lives of all who have access to their effects.³⁶ The most remarkable breakthroughs may be expected to come from the interaction of insights and applications arising when these technologies meet.

Through breakthroughs in health services and education, these technologies have the power to better the lives of poor people in developing countries. Eradicating malaria, a scourge of Africa for centuries, is possible. Cures for other diseases endemic in developing countries are also possible, allowing people with debilitating conditions to live healthy and productive lives.

Access and application are critical. Science and technology are the differentiators between countries that are able to tackle poverty effectively by growing and developing their economies, and

those that are not. The extent to which developing economies emerge as economic powerhouses³² depends on their ability to grasp and apply insights from science and technology and use them creatively. Innovation is the primary driver of technological growth and drives higher living standards.

As an engine of growth, the potential of technology is huge, and still largely untapped in most developing economies. Less-developed countries not only lack skilled labour and capital, but also use these less efficiently. Inputs account for less than half of the differences in per capita income across nations. The rest is due to the inability to adopt and adapt technologies to raise productivity.³⁸

Computing, for example, through unlocking infrastructure backlogs and managing integrated supply chains, can transform economic performance by enabling affordable and accessible services in education and health. The combination of computers and the internet, and mobile devices and "cloud" technology, has transformed human experience, empowering individuals through access to knowledge and markets, changing the relationship between citizens and those in authority, and allowing new communities to emerge in virtual worlds that span the globe.

According to the International Telecommunications Union, by the end of 2010 there were an estimated 5.3 billion mobile cellular subscriptions worldwide, including 940 million subscriptions to 3G services. About 90 percent of the world's population can access mobile networks; three quarters of mobile subscribers live in developing economies. Cellular technology has allowed Africa to leapfrog the age of fixed-line telephony, bringing affordable access to millions of people.

However, the continued and equitable expansion of information and communication technology

depends on electricity. The real divide over the next 20 years will be between those who have access to reliable electricity to power these devices and those who do not.

Other technologies under development are interventions for cognitive enhancement, proton cancer therapy and genetic engineering. Revolutionary inventions include small underground nuclear power units called nuclear batteries that will be ultra-safe and maintenance-free; new types of photovoltaics that will make electricity from sunlight cheaper than that from coal; and myriad nanotechnologies, some of which lower the cost and increase the reliability of many products – even in the poorest areas of the developing world.

Managing technological revolutions poses challenges. Certain innovations and discoveries are likely to raise fraught bio-ethical issues, as genetic modification of food crops and cloning of human embryos have already done. There is a risk that their cost, particularly in the early stages of development, will worsen the present inequality by limiting access to wealthy individuals. This already happens in health care in certain G7 countries, where the demand for high-cost diagnostic equipment and surgical interventions enabling longevity and better quality of life for older wealthy people overstretches public health-care budgets, and lowers service quality in poor neighbourhoods. Finally, resource-intensive technologies focused on satisfying high-consumption demand – such as the demand for holidays abroad in coastal resorts, wilderness areas or iconic cities – increase carbon emissions and environmental damage.

Whatever the challenges, however, refusing to participate in the technological revolution is not an option. To promote technological advances, developing countries should invest in quality

education for youth, and continuous skills training for workers and managers, and should ensure that knowledge is shared as widely as possible across society.

In a world in which the internet makes information ubiquitous, what counts is the ability to use knowledge intelligently. Knowledge is the systemically integrated information that allows a citizen, a worker, a manager, or a finance minister to act purposefully and intelligently in a complex and demanding world. The only form of investment that allows for increasing returns is in building the stocks and flows of knowledge that a country (or company) needs, and in encouraging new insights and techniques.

Adopting appropriate technologies leads directly to higher productivity, which is the key to growth. In societies that have large stocks and flows of knowledge, virtuous circles that encourage widespread creativity and technological innovation emerge naturally, and allow sustained growth over long periods. In societies with limited stocks of knowledge, bright and creative people feel stifled and emigrate as soon as they can, creating a vicious circle that traps those who remain in a more impoverished space. Such societies stay mired in poverty and dependency.

The investment climate is crucial, as are the right incentive structures, to guide the allocation of resources, and to encourage research and development.

Successful countries have grown their ability to innovate and learn by doing, by investing public funding to help finance research and development in critical areas. There are many examples – the space programme, defence and aerospace in the United States; integrated value chains, just-in-time manufacturing and total quality management in Japan; high-tech manufacturing in Singapore; and

almost everything in China today. Everyone is involved – big and small, public and private, rich and poor. And these countries, and their leading companies, constantly benchmark, monitor, evaluate and adjust.

CONCLUSION

The 21st century presents humankind with exceptional opportunities and unprecedented risks. The systemic linkages between risks can either amplify the impact of harmful events or modulate and disperse their effects. Interconnected risks are shown by the links among food, fuel and water in the context of climate change; among illicit trade, organised crime, corruption and terrorism in the context of fragile states and cybercrime; and among global macroeconomic imbalances, wide disparities in the growth paths of developed and emerging economies, and weak systems of global governance. It would be a mistake to believe that South Africa is a captive of irrational and irresistible extraneous forces. The decisions and actions it takes to create or modify linkages, regulate and incentivise behaviour and adopt policies on global issues are greatly important.

The ability of governments to navigate these challenges will be determined by their insight into current circumstances, the foresight they develop about trends and possible futures, and the policies

they adopt to fit their countries and economies to purpose.

The unintended consequences of globalisation increase the pressure on government leaders to adjust global institutions to new realities, and to promote a more equitable global order. It is far from clear, however, that the structural tension between the accountability of all governments to their electorates will easily be reconciled with the need to address the challenges of the global commons in a responsible way. Times of austerity tend to narrow the vision of most people, and make them less inclined to accommodate the needs of others. There are signs of this across the developed world.

The next few decades will see a rebalancing of the world order, with the power of developed economies shrinking and that of developing economies rising. Africa will be able to play an important role in this transformation if its government, business communities and civil-society groupings cooperate to ensure that the successes of the last decade, in particular in reducing poverty, are maintained and widened.

Threats to the environment are real and growing, driving the world closer to a tipping point. Failure by world leaders to take urgent action to remedy current trends in carbon emissions will lead to dire consequences for future generations.



The benefits that are certain to flow from technological revolution in an increasingly connected and knowledge-intensive world will be seized by those countries and companies that are alive to the rapidly changing environment, and nimble enough to take advantage of the opportunities. Those that succeed will make substantial advances in reducing poverty and inequality. In mapping its path for the next 20 years, China draws the conclusion that countries that maintain an outward orientation – developing and high-income alike – will be among the successful ones during the coming decades, while an inward-

looking policy will increasingly prove self-defeating. South Africa needs to adjust its focus in light of the changing global economic landscape. This is particularly urgent in trade and industrial policy. South Africa should redirect its attention to pursuing niche export opportunities in the economic power-houses of the future, many of them emerging economies. These opportunities can only be exploited if industrial policy supports sectors and industries that can best produce the goods and services required of the new markets South Africa wishes to serve.

NOTES

1. Goldin I and Vogel T (2010). "Global governance and systemic risk in the 21st Century". *Lessons from the Financial Crisis Global Policy*, Vol 1, Issue 1, January 2010. University of Oxford.
2. McKinsey (2010). "The Market State". *McKinsey Quarterly*.
3. Milanovic B (2007). *Worlds Apart: Measuring International and Global Inequality*. Princeton University Press.
4. *ibid.*
5. Goldin and Reinert (2011). Presentation made to the National Planning Commission by the Oxford Martin School, Oxford University.
6. Lin JY (2011). From flying geese to leading dragons. New opportunities and strategies for structural transformation in developing countries. Mozambique: WIDER annual lecture.
7. Rodrik D (2009). *One economics, many recipes: Has (neo-classical) economics failed us?* Sir Arthur Lewis Distinguished Lecture, 26 March 2009.
8. World Bank (2011). *Securing the Present, Shaping the future*. East Asia and Pacific Economic Update, Vol 1. Washington, DC: World Bank.
9. McKinsey (2010). Africa's path to growth. *McKinsey Quarterly*.
10. Stiglitz J (2010). *Freelall: America, the markets and the sinking of the world economy*. New York: WW Norton & Company.
11. *Financial Times*. March 2012.
12. Rischard JF (2002). *High Noon: 20 Global Problems, 20 Years to Solve Them*. Basic Books: Perseus Books Group.
13. International Monetary Fund (2011). IMF Data Mapper. Available at www.imf.org/external/datamapper (accessed January 2012).
14. IMF, 2011.
15. McKinsey (2010). What's driving Africa's growth. *McKinsey quarterly*.
16. Collier P and Warnholz J (2009). "Now is the time to invest in Africa". *Harvard Business Review*.
17. Brenthurst Foundation (2011). *Putting Young Africans to work: Addressing Africa's youth unemployment crisis*. Discussion paper. Johannesburg: Brenthurst Foundation.
18. United Nations Habitat (2008). *The state of African cities*.
19. McKinsey (2010). *Lions on the move: The progress and potential of African economies*. McKinsey Global Institute.
20. *ibid.*
21. McKinsey, 2010.
22. World Bank (2011). "Securing the Present, Shaping the future". *East Asia and Pacific Economic Update*, Vol 1. Washington, DC: World Bank.
23. *ibid.*
24. World Bank, 2011.
25. McKinsey, 2010.
26. World Economic Forum (2011). *Global Risks 2011 Sixth Edition*. World Economic Forum, Geneva.
27. World Economic Forum, 2011.
28. International Bank for Reconstruction and Development/World Bank (2011). *Leveraging Migration for Africa: Remittances, Skills, and Investments*.
29. International Organisation for Migration (2010). *World Migration Report: The future of migration: building capacities for change*. International Organisation for Migration.
30. Stern N (2011). *How should we think about the economics of climate change?* London School of Economics, Leontief Prize Lecture, March 2011.
31. McKinsey (2009). McKinsey Global GHG abatement cost curves V2.0.
32. Stern, 2011.
33. World Bank (2010). Development and Climate Change. *World Development Report*. Washington, DC: World Bank.
34. Rockström J et al (2009). "Planetary boundaries: Exploring the safe operating space for humanity in the Anthropocene" in *Nature*, 461: 472–475. Nature Publishing Group.
35. Martin J (2006). *The Meaning of the 21st Century: A Vital Blueprint for Ensuring our Future*. Eden Project Books.
36. Hall P and Soskice D (eds) (2001). *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford University Press.
37. Rodrik D (2009). *One economics, many recipes: Has (neo-classical) economics failed us?* Sir Arthur Lewis Distinguished Lecture, 26 March 2009.
38. Canuto O and Giugale M (eds) (2010). *The Day after Tomorrow*.