The Challenges Posed by Demographic Change in sub-Saharan Africa: a Concise Overview

Abstract

The aim of this paper is to assess the implications of demographic change between 2015 and 2050 for progress in sub-Saharan Africa. Because of the slow fertility decline, the dominant demographic force will be continued growth in numbers of births, the school age and the working age population. The projected change in the dependency ratio will likely be too modest to act as a major influence on prospects. Population growth threatens human capital formation, food security, urban living conditions, and the creation of jobs and livelihoods to match the large increase in the labour force. None of these challenges represents insuperable barriers to progress but, considered jointly, they underscore the magnitude of the task ahead. It is likely that some states will prosper but that others will remain mired in poverty and hunger, due to Malthusian factors and poor governance. Mass migration within the continent should be anticipated.

(word count 148)

Introduction

"We do not really know what causes economic growth. We do have a good sense of what are the main obstacles to growth and what are the conditions without which an economy can't grow. But we are far less sure about what are the other ingredients needed to create and sustain growth" Francois Bourguinon, former chief economist of the World Bank quoted in Naim (2006).

The quotation above serves as a warning against confident predictions about the economic future of countries in sub-Saharan Africa (henceforth Africa). This paper will avoid straying into this dangerous territory. Its purpose is to outline as objectively as possible the challenges that demographic change poses over the next 35 years, challenges that will need to be overcome or circumvented if countries in this region are to make rapid social and economic progress. The stakes are undoubtedly high. In 1950 the population of Africa comprised about seven percent of the global total. By 2050, the equivalent contribution will be around 22 percent (UN Population Division 2015). What happens in Africa between now and mid-century will have global implications.

A further reason for caution about the future is the wide diversity of the region. It contains 42 mainland nation states (plus nine mostly very small island nations) with very different economies, ethnic compositions, natural resources, climates and political systems. No doubt, the future for some will be bright but not for others. To present a regional overview, we will have to ignore much of this national variability of circumstances. However, the central forces of demographic change will be broadly similar across the majority of countries and this similarity provides a justification for the regional perspective offered here. Moreover, poverty characterises the majority of countries. Out of the 42 mainland states, 30 are classified as being "least developed" compared with only 14 similarly classified from all other regions.

The paper starts with a brief summary of projected population change between 2015 and 2050. Projections exist beyond the mid-century point but the range of possibilities becomes very wide and increasingly speculative. For these reasons, long-term scenarios will not be discussed. The main sections of the paper discuss the challenges under the following headings: pressure on health and education provision; food security and agriculture; urban living conditions; employment and livelihoods; and intra-regional migration.

Demographic change, 2015-2050.

Table 1 presents the key demographic changes between 2015 and 2050. They are based on the medium projection of the 2014 World Population Prospects and the 2014 revision of World Urbanization Prospects, both produced by the United Nations Population Division (UN Population Division 2014, 2015). At a regional level and over a period of a few decades, the projections of the United Nations Population Division have a good track record of predictive validity (Bongaarts and Bulatao 2000). Thus there is no reason to believe that the projections for Africa up until mid-century are seriously misleading though the figures for specific countries will be subject to greater error.

The dominant feature of Table 1 is one of continued growth, albeit at uneven paces across age bands and urban-rural strata. Total population is expected to more than double in size. Figure 1 shows the degree of inter-country variability. Niger stands out as having by far the greatest proportionate increase in population though, as discussed below, this outcome is most improbable. Other countries with projected increases of over 150 percent are Zambia, Angola, Uganda, Mali, Tanzania, Burundi, and Democratic Republic of Congo. At the other end of the spectrum are the countries of Southern Africa with increases of less than 50 percent. The arguments in this paper are much less relevant to Southern Africa than to other sub-regions.

Despite fertility decline, the expected number of births per year in the whole region will rise by 49 percent from around 35 million in 2015 to 53 million in 2050 and the relative increase of infants and young children will be somewhat larger. The number of children of primary and secondary school age, 5-19 years, will increase from 359 to 668 million, a rise of close to 90 percent. Men and women in the prime productive ages of 20-64 years will increase at a faster pace. The potential work force will be 2.6 times larger in 2050 than in 2015. The largest proportionate increase will occur among those aged 65 years or more though this increase in absolute numbers is modest.

Table 1 and fig 1 here

The single most significant expected change in population structure over these 35 years will be the urban-rural balance. The urban population is expected to expand three-fold from 346 to 1,137 million while the rural population will grow more modestly by 58 percent. In 2015, urban inhabitants comprised 37 percent of the total and by 2050 this will have increased to 55 percent. The changes in age structure will be less pronounced. The population aged under 20 years will shrink from 53 to 43 percent and the over 65s will grow from 3 to 5 percent, while the share of population in the prime working ages will expand from 43 to 52 percent.

These changes in age structure are classically represented by the total dependency ratio, the number of those aged less than 15 or over 64 per hundred aged 15-64. Over the next 35 years this ratio will fall from 86 to 62, a drop of 28 percent. To put this change into global

perspective, Figure 2 shows long-term trends in the dependency ratio for Africa compared with trends in other regions. It is immediately apparent that the fall in the ratio has been, and will continue to be, slower in Africa than elsewhere in the developing world and will persist for a longer period.

Figure 2 here

Much has been written about the prospect of accelerated economic growth that may arise from falling fertility and declining dependency ratios though it is widely agreed that it is contingent on other factors, notably appropriate policies. Other papers address in detail the prospects of a demographic dividend in Africa but there are at least three reasons for caution.

First, as shown above, the change in age structure is slow and thus it is unlikely that the demographic stimulus by itself will be sufficiently sharp to provoke rapid socio-economic progress. Indeed, modelling by a World Bank team estimates only a modest boost to income per head resulting from faster growth in the labour force than in the entire population and from increased savings and investment. Between 2011 and 2030, the effect is estimated to be an increase of 0.4 percentage points in the real GDP per capita growth rate for the region as a whole (Ahmed et al. 2014). A similarly modest effect of an exogenous decline in the total fertility rate of 0.5 births per woman was estimated for Nigeria (Ashraf, Weil and Wilde 2013). After 20 years, GDP per head would be higher by 5.6 percent, increasing to nearly 12 percent after 50 years. Over the 50-year period, the rate of growth in GDP per head would be raised by only 0.2 percent. Larger effects are found in the simulation model of Canning, Karra and Wilde, reported in this volume. However, given the limited understanding of the alchemy of factors that drive economic growth and the unpredictability of world trends and policy directions, the results of all economic models of this type must be regarded as illustrative possibilities rather than predictions.

The second reason for caution originates in the simplifying dichotomy, assumed in many discussions and nearly all economic modelling of the demographic dividend, between a working population in the 15-64 age band and a dependent population outside these age limits. Labour force surveys show that the real situation is more complex and boundaries are blurred. For instance, the 2013 Ethiopian Labour Force Survey shows that, in rural areas, 64 percent of 10-14 year olds were economically active and worked on average for 28 hours in the past week (Ethiopia, Central Statistical Agency 2014). The corresponding figures for those aged 20-64 years were 89 percent and 34 hours. So the expected difference is present but it is not large, though, of course, children are not as productive as adults. In urban Ethiopia by contrast, only 21 and 42 percent of 10-14 and 15-19 year olds, respectively, are economically active compared with 81 percent of those aged 20-64 years, a reflection no doubt of greater urban than rural school participation and diminished opportunities for urban children to contribute to domestic enterprises. These Ethiopian data suggest that, as urbanization and secondary schooling increase in Africa, the direct contribution to GDP of 15-19 year olds will diminish, thereby diluting the immediate advantage of changing age structure.

A third reason for caution concerns the productive potential of women who, as family sizes fall, have enhanced opportunities to seek employment. This link between demographic change and production by women may be an important theme in the demographic bonus narrative for Asia but is less plausible for Africa. Again the Ethiopian labour force survey is revealing. It shows that economic activity and hours worked among women is just as high in the peak reproductive ages of 20-29 as at other ages, thus buttressing a long literature showing that production and reproduction are compatible in the largely agricultural and family-based economies of Africa. Moreover, an analysis of the work-fertility relationship showed no link between declining fertility in Africa between the early 1990s and 2005 and increased employment of women (Baschieri et al. 2009).

The preceding paragraphs are not intended to deny the advantages of declining fertility and changing age structure but rather to warn against naively optimistic expectations. However the modest the short-term gains of declining fertility may be, continuation of current fertility levels, in the absence of a mortality resurgence, would result in an implausibly large end-of-century population in Africa of 16 billion (UN Population Division 2014). Continued fertility falls in this region are indispensable for a sustainable future and faster falls would be more beneficial than slower falls.

Population pressure on human capital formation

It is widely held that improvement of human capital, notably health and education, is the key to social and economic progress. The importance of education has been argued most recently by Wolfgang Lutz and colleagues (Lutz, Butz and KC 2014: Cuaresma, Lutz and Sanderson 2014). African countries have achieved marked improvements in primary school enrolments (UNESCO 2009). Between 1999 and 2009, net primary enrolment rose from below 60 percent to close to 80 percent and the gap between Africa and other regions narrowed (Fig 3). In 2011, there were an estimated 3.2 million primary school teachers in Africa. To achieve universal primary schooling and cope with increased numbers of children, set to rise by 9.5 million between 2011 and 2030, an extra 2.1 million teaching posts will be needed (UNESCO 2013).

Improvements have also been recorded in secondary school enrolments but on this dimension Africa lags well behind other regions and the gap is not narrowing (Fig 4). Because of growing numbers graduating from primary schools, demand for secondary school places is increasing rapidly. Secondary schooling is more expensive than primary schooling and the budget allocations of many governments are insufficient to meet demand with the consequence that attendance requires financial contributions from families. UNESCO (2013) estimates that the number of secondary school teachers will have to rise from one million in 2011 to 3.5 million by 2030 to achieve universal lower secondary school education.

Figs 3 and 4 here

To close the gap with other regions, particularly in secondary schooling, thus will require a major rise in expenditure on school buildings and teachers. Population increase will serve to make the task more formidable. The school age population (broadly 5-19 years) in Africa will increase by 8.8 million, or 2.5 percent, each year on average between 2015 and 2050.

Pursuit of enrolment targets may further erode the quality of schooling. In 2007, 18 percent of grade 6 students, on average, were rated to be illiterate in 14 East and Southern African countries with a range of 1.4 percent in Swaziland to 44 percent in Zambia (Hungi et al. 2010). Innumeracy was worse with an average of 31 percent rated innumerate. Poor cognitive progress among school pupils is a greater source of illiteracy and innumeracy than failure to reach grade 6 (Spaull and Taylor 2015). As shown by the OECD's Programme for International Student assessment (PISA), over three-quarters of eight- and ninth-graders in South Africa and Ghana did not surpass the lowest measure of proficiency in mathematics, compared with an international mean of 25 percent (Filmer and Fox 2014). Quality of teaching will matter but is jeopardised by the large increase in the school-aged populations

Similar considerations apply to health. The maternal mortality ratio in Africa is estimated to be 510 in 2013, far higher than in any other developing region. Skilled attendance at delivery is the key remedy and slow progress has been made. The proportion of attended births rose from 40 percent in 1990 to 53 percent in 2012 (UN Statistical Office 2014). Most African countries are not training enough physicians, nurses and midwives. A detailed examination of 12 countries found that six were not training sufficient health staff at all three levels to maintain existing absolute numbers and only three were training sufficient nurses and midwives to replace those leaving the labour force. Four countries were on track to increase numbers but not sufficiently to match population increase. Only two countries were likely to improve the ratio of staff to population (Kinfu et al. 2009). Inevitably, the steady increase in number of births, from 35 to 53 million per year over the next 35 years, will be an obstacle to maternal health improvements. Similarly, the 59 percent projected increase in the number of infants and young children will pose a strain on health budgets and staff. It is estimated that the health work force would need to increase by 10 percent per year to meet demand for health care between now and 2030, a rate of growth far higher than in other developing regions (WHO 2015).

Of course, population increase does not make rapid improvements in human capital formation impossible but it does imply diversion of funds, by governments and by families, away from investments in the modernisation of agriculture or industrialisation, as argued decades ago by Coale and Hoover (1958).

Food security, agriculture and climate change

Despite increased consumption of meat and dairy products, driven by affluence, four crops account for 65 percent of global food intake: wheat, maize, rice and potatoes. For much of the past century international prices for these staples have remained stable or even fallen. Since 2002, however, prices have risen and become more volatile, partly because of crop failures in major producing areas and because of the diversion of land to bio-fuel

production. This development is seen by many experts as a signal of a new era of uncertainty in meeting demand for food (von Braun 2007; Godfray et al. 2010. This demand, set to increase by 70 to 100 percent between 2010 and 2050, is driven by population growth and change in diets. In a seminal paper, the challenges of eliminating hunger and meeting demand in an environmentally sustainable way were described as a "perfect storm" (Godfray et al. 2010).

These global considerations matter for Africa both because the continent has been importing increasing amounts of food and because under-nutrition remains widespread. Since the 1970s Africa has been a net importer of food; between 1980 and 2007, net imports in real terms grew at 3.4 percent per year (Rakotoarisoa, Iafrate and Paschali 2011). Population growth, and changing dietary preferences among the urban population, rather than increased consumption per head, accounts for most of this trend. While richer countries, such as Botswana and Gabon, import more per head of population than poor countries, all but a handful of poorer African countries are net importers. On average, 31 percent of cereals consumed in 2008 were imported (African Development Bank Group 2009). Recent estimates of the total value of food imports range between US $30 and 50 billion per year.

Increased food imports coexist with widespread under-nutrition. While there has been modest improvement since the early 1990s, it is estimated that 25 percent of Africa's population was undernourished 2011-13, higher than any other developing region (FAO 2013). Most of countries with alarming measures on the global hunger index are in Africa (IFPRI 2014). As shown in Figure 5, nutritional gains have been sharper in Southern, South-Eastern and Eastern Asia than in Africa.

Fig 5 here

Though under-nourishment in the general population and stunting in children are not always closely related, the two indicators give a similar impression. In South-Central Asia, stunting prevalence fell from 61 percent in 1990 to 36 percent in 2010. By contrast prevalence remained unchanged over this period at 38 percent in Western Africa, changed from 48 to 45 percent in Eastern Africa and from 45 to 39 percent in Middle Africa (de Onis, Blossner and Borghi 2012).

Africa is a predominantly rural, agricultural region. About two-thirds of employment derives from agriculture. Yet dependence on food imports has increased and hunger remains widespread. The reasons for this disastrous conjunction are manifold and have been widely analysed. Whereas most Asian countries benefitted from the Green Revolution that transformed agricultural yields, no such leap forward occurred in Africa; yields per hectare have remained static and domestic production has barely kept pace with population increase by extending cropland. Between 1985 and 2005, cereal production grew by 65 percent but population increased by 71 percent (Jane et al. 2010a). Little research has been done into genetic improvement of some key African crops, such as sorghum, millet, and teff. Use of fertilisers, irrigation and mechanisation are extremely low. Rural infrastructure is poor and thus marketing of surplus production is difficult. Access to credit for farmers has

been very limited. Only in the last decade has it been acknowledged that agriculture has been scandalously neglected in development policies (World Bank 2007).

Africa now faces a further doubling of population in the next 35 years. Food availability will have to increase to a similar degree just to maintain existing nutritional standards and by more if hunger is to be reduced. Though food availability does not guarantee reduced hunger, particularly in the urban population where affordability is crucial, it is an essential precondition. Nor do the nutritional needs of growing populations necessarily have to be met by domestic production but the costs of escalating food imports would be a severe and probably unsustainable burden on all but the few wealthier countries.

The big question is therefore whether agricultural production in Africa can more than double between now and mid-century. Baseline yields are so low that addressing the barriers mentioned above provide a potential for rapid improvements. Taking into account availability of virgin land and assuming a doubling of yields, Alexandratos (2005) calculated that the majority of 11 African countries with particularly high population growth could increase cereal production per head by 2050. However, three major and less tractable obstacles to progress can be identified.

First, the rural population will continue to increase. Arable land per cultivator has already declined. In some countries virgin land can be brought under cultivation but in many others such extension is impossible. Soil in much of Africa has a bedrock of granite and gneiss and low inherent fertility. It has a low clay content and is thus prone to water and wind erosion. About two-thirds of arable land already suffers from degradation and lowered soil fertility and increased production depends on organic or mineral additions (Montpellier Panel 2014). Population pressure poses an obvious risk of over-cropping and over-grazing of fragile ecosystems, leading to further soil degradation and erosion.

Second, about 95 percent of African agriculture is rain fed and thus extremely vulnerable to climate change. Little is known with confidence about the nature and threats of future climate change in sub-regions of Africa but the strongest prediction of climate scientists is that extreme weather events will become more frequent, including droughts and floods (Conway 2009). Better water capture and storage is essential but the scale of needed investment is daunting and, at least in the short term, vulnerability to erratic rainfall will persist. In addition, many crops in Africa are grown close to their limits of thermal tolerance. Most estimates of effects of temperature increase predict serious losses in production. One such study anticipates losses by mid-century of 22, 17, 17, 18, and 8 percent for maize, sorghum, millet, groundnut and cassava, respectively (Schlenker and Lobell 2010).

Third, farm sizes are small and security of tenure often lacking. Average farm size in Africa is 1.8 hectares and falling (World Bank 2012). In six countries of East and Southern Africa, the ratio of cultivated land to the agricultural population has halved since the 1960s. In Kenya, Zambia, Malawi and Mozambique, at least 25 percent of smallholder farms control less than half a hectare and are thus approaching landlessness (Jane et al. 2010a). The situation is even more acute in Rwanda and Ethiopia. Small farms tend to have higher yields per hectare but lower productivity per worker than large units. In many settings, such small units are

insufficient for subsistence, let alone the production of a surplus for sale, and economies of scale, such as mechanisation, are difficult to achieve. Using survey data from five East and Southern African countries, Jayne, Mather and Mghenyi (2010b) calculate that about half of small-scale farmers have no surplus staple grain to sell but rather have to buy. Moreover, small family farmers have no cushion against adversity and cannot afford the risk of innovation. Increasingly, small farmers will have to rely on off-farm income or turn to high value crops, such as fruit and vegetables. Collier and Dercon (2014) argue that the conventional emphasis on smallholder farms as the key to poverty-reduction and increased output, epitomised by the World Bank's 2008 World Development Report, may be mistaken because larger more commercial farms have critical advantages in terms of access to new technologies and finance and in trading, marketing and storage.

A related concern is insecurity of ownership or tenure. It is estimated that ownership of only 10 percent of land is registered, leaving many farmers open to land expropriation and abuse by corrupt officials (Byamugisha 2013). Moreover, insecurity of tenure acts as a disincentive to invest for the long term, such as terracing or tree planting. In Ethiopia and Rwanda land registration programmes that gave farmers greater security had significant impacts on willingness to invest in soil and water improvements, thereby raising productivity, though no similar gains were found in Zambia (Byamugisha 2013; Sitko, Chamberlin and Hichaambwa 2014)).

Rapid urbanisation without industrialisation

Urbanisation is an integral part of economic modernisation and typically characterised as a structural shift from low productivity agricultural work to higher productivity activities in manufacturing and services. Some commentators have argued that Africa would benefit from higher rates of rural-urban migration (De Brauw, Mueller and Lee 2014). Similarly, cities are often the engine of economic growth and innovation (Glaeser 2011), though it is doubtful that this characterisation applies in Africa where urbanisation is occurring in the absence of major industriali sation. Large and growing concentrations of young people willing to work at low (by international standards) wages could act a magnet for foreign capital investment and represents an opportunity.

Whether or not this optimism is justified, the dismal living conditions of the majority of Africa's urban inhabitants is well documented and has been slow to improve. The percent of urban population using an improved sanitation facility has remained unchanged since 1990 at 41 percent. Similarly, the percent living in slum conditions has fallen only slightly from 70 percent in 1990 to 62 percent in 2012, where slum conditions are defined by lack of at least one of four conditions: access to safe water and improved sanitation, a dwelling made of durable materials, and two or less persons per room (UN Statistical Office 2014). By comparison, the percent of urban population living in slum conditions is 35 percent in Southern Asia and 33 percent for all developing regions. The gap between Africa and elsewhere is stark.

A detailed account of factors that have contributed to this unsatisfactory state of affairs is given by Collier and Venables (2013). They include: the high cost of raw materials for dwelling construction; lack of skilled construction workers; confused legal ownership of urban and peri-urban land; lack of appropriate credit institutions; and reluctance of political elites to encourage rural-urban migration by investing in infrastructure and low-cost housing programs. As a net result, the typical urban

dweller lives in a shack in a shanty town without roads, electricity or sewerage. The dwelling will either be rented from a slum landlord or self-built and self-financed. Collier and Venables argue that the failure to create a formal and regulated urban housing market in Africa is a significant missed opportunity. Elsewhere, the era of rapid urbanisation has generated high levels of employment for unskilled as well as skilled workers in the building of affordable houses.

Thanks to the surveillance system of the African Population and Health Research Centre in two Nairobi slums, more is known about slum dwellers in this city than elsewhere in Africa. Most inhabitants were born in rural areas and came to Nairobi because of limited rural opportunities (Zulu et al. 2011). A minority are long-term residents who have flourished, saving enough for education of children and investing in rural homesteads. For the majority, spatial mobility is very high and life is precarious. Half of all households are classified as food insecure. Injuries make a large contribution to overall mortality and morbidity and half of these are intentional. Road traffic accidents are the next largest contributor to this cause of death.

Africa's urban population is projected to grow at about 3.5 percent per year for the next 20 years, a rate of increase that implies a doubling in size every 20 years. At present about 37 percent of the region's population is urban but this is projected to reach 55 percent by mid-century, and 66 percent in West Africa. The population pressure on urban housing, environment and infrastructure will be relentless. In the absence of rapid economic growth and radical changes in policy priorities and urban governance, the prospect is one of continued large increases in the number of Africans who live in urban localities that lack most basic amenities with high levels of violence and insecurity. The threat to social cohesion of increasing numbers of slum dwellers living close to small affluent urban elites is obvious.

Employment and livelihoods

" There are virtually no examples of mass dollar poverty reduction since 1700 that did not start with sharp rises in employment and self-employment income due to higher productivity in small family farms" Lipton 2005 pVII

"Job generating industrialisation has, up to now, been the only reliable way out of national poverty" Collier 2015 p39.

"Over the next 10 years at best only one in four of Sub-Saharan Africa's youth will find a wage job…..The employment challenge is therefore not just to create jobs in the formal sector….but to increase the productivity of the workforce who will be in the informal sector" Filmer and Fox 2014 p5

Wage and salaried jobs account for about 10 percent of employment among African men in the formal public or private sector, with legal contracts and a degree of protection. Another 15 percent comprise waged jobs in the less formal sector. These proportions are lower for women. The bulk of work takes the form of self-employment, family employment and micro-enterprises in agriculture or other activities. Commerce, or petty trading, accounts for 50-70 percent of non-agricultural activities, followed by manufacturing, food, and other services, typically based at home or on the street. A tiny minority evolve into larger enterprises but most are destined to remain at a precarious and low income level (World Bank 2012). Unemployment levels are very low, simply because poor people cannot afford the luxury of inactivity. However, underemployment is pervasive. The evidence for Ethiopia is probably representative. Over one-quarter of rural people complained of under-

employment and about 50 percent of employed urban youth wished to work longer hours (Broussar and Tekleselassie 2012).

Against this context of an abundance of labour eking out precarious livelihoods on family farms or small-scale trading, Africa now faces further very large increases in the adult population. The number of men and women aged 20-64 years will grow two and a half fold in the next 35 years, with an average annual increase of 19.5 million. The fact that the prime working age population will increase faster than the less productive age bands represents a small boost to GDP per head provided that productivity does not decline (Eastwood and Lipton 2011). The fall in fertility and family sizes is also an advantage because families with many dependents are more likely than others to slip into poverty and less likely to escape. The clear danger, however, is that the large increase in the labour force will simply swell the ranks of the self-employed with precarious livelihoods on farms and in petty trading.

Most African countries today are primarily agrarian in terms of employment but are rapidly urbanising. As illustrated by the quotations above, they are faced with the daunting and triple challenge of achieving both agricultural improvement, industrialisation and improving productivity in the informal sector.

Increased agricultural productivity is essential not only for food security but also to energise the entire rural economy. The creation of off-farms jobs in sales, services and agro-processing depends on growing prosperity among farmers. As the barriers were outlined earlier, the focus of this section is on prospects for the non-agricultural sector.

If Paul Collier is right, at least in the longer term, Africa's future depends to a large extent on the creation of jobs in labour-intensive manufacturing. By comparison, extractive industries, responsible for much of Africa's GDP growth in recent years, generate few jobs and do not deliver inclusive growth. Thus far, Asia has reaped the benefit of globalisation, specifically the movement of capital and dismantling of trade barriers, and become the world's factory. Africa's record of growth in manufacturing is poor and its share of global manufacturing has declined.

Can Africa gradually replace Asia as the world's centre for labour-intensive, semi-skilled manufacturing? Africa's rapidly growing labour force is sometimes seen as big advantage when set against declining labour forces in China and elsewhere. However, the population aged 15-64 years in Africa's competitors of Southern Asia and the low wage economies of South-East Asia (Cambodia, Laos, Myanmar, and Vietnam) will continue to grow from 1.3 billion in 2015 to 1.7 billion in mid-century (UN Population Division 2014). Global trends in the number of manufacturing jobs are disputed. World Bank (2012) estimates a fluctuating total of 160-200 million between 1990 and 2008, with a modest underlying upward trend and envisages future stability or even decline, largely because of productivity gains. By incorporating very approximate estimates of manufacturing in the informal economy, UNIDO (2013) concludes that the number of people involved in manufacturing has risen from 300 to nearly 400 million over the same time period. To the extent that the World Bank's prognosis is correct, Africa's growing population is not a great advantage.

The answer to the question posed above depends on many other factors. One analysis compared manufacturing firms in Africa with firms in other low income countries and concluded that the poor performance in Africa could be largely attributed to inadequate infrastructure and lack of access to finance, factors that could be rectified in a reasonable time span (Harrison et al. 2014). Below we consider other factors, the most important of which are relative wage costs, productivity, skills of

the working population, financial capital formation and institutional capital, including political stability.

Relative wage costs versus productivity and cost of raw materials

African wage and non-wage costs of labour in manufacturing cannot be compared to the costs elsewhere because of lack of reliable data. However, a detailed comparison of Ethiopia, Tanzania and Zambia with China and Vietnam is revealing. Wages for skilled and unskilled workers in China, averaged across six light manufacturing sectors, are higher than in the other countries (Dinh et al. 2012). This differential reflects the trebling of real wages in East Asia between 2000 and 2011, compared with an 18 percent growth in Africa (ILO 2014). However, Vietnam and Tanzania had similar wage levels while Zambian wages were higher than Vietnam's. Only Ethiopia had a large cost advantage compared with Vietnam. It cannot be assumed that most African countries enjoy a wage-cost advantage over future competitors that, in addition to Vietnam, include Bangladesh, India, Nepal and Cambodia.

Unfortunately, any wage-cost advantage disappears when productivity and cost of raw materials are taken into account. For instance, in furniture production, Chinese workers produce 4.5 chairs per day, Vietnamese 1.9 and Ethiopians 0.3 (Dinh et al. 2012). Furthermore the costs of most raw materials, such as timber, steel, cotton are higher in Africa than in East Asia, because of poorly developed primary industries and high import tariffs.

Labour force skills

The skills and productivity of the labour force are probably more important for industrial development than wage levels. Generic cognitive skills in literacy, mathematics and problem solving are an indispensable foundation, learnt in formal schooling. According to the central education projections produced by the Wittgenstein Centre, the proportion of the adult population in the sub-regions of Africa with at least some secondary or higher schooling will approximately double between 2015 and 2050, except in Southern Africa where this fraction is already high (www.wittgensteincentre.org/dataexplorer). As shown in Figure 6, two-thirds of adults in Middle and Western Africa, 90 percent in Southern Africa and 45 percent in East Africa are projected to have reached secondary school or higher by mid-century. This bodes well for human capital though, as mentioned earlier, number of years in school does not necessarily translate into cognitive attainment

Figure 6 here

Matching systems of education and training to labour force needs is one of the most difficult aspects of socio-economic development policy. If the supply of well-educated young men and women exceeds market demand, disaffection and unrest may result. Conversely, a shortage of skills can stifle development. If the future of Africa is contingent on the expansion of labour-intensive manufacturing, vocational and technical skills will be needed but African school systems have been criticised for neglecting such preparation for the job market (ILO 2009,2012). According to the World Bank (2012), the track record of training

farmers through agricultural extension schemes and technical and vocational programmes in the non-agricultural sector is mixed partly because curricula are too divorced from every day realities. Perhaps a greater emphasis on apprenticeships is needed.

Capital formation and investment

The modernisation of agriculture and industrialisation require capital, for which there are three main sources: domestic savings, foreign direct investment (FDI) and remittances. Increased domestic savings, whether caused by declines in dependency ratios or not, has been an important contributor to accelerated economic growth in Asia. As shown in Figure 7, Africa's net savings expressed as percentage of gross national income fell between the late 1970s and the late 1990s but has risen sharply in the past decade. However, it is below the levels recorded in South Asia and well below the East Asian level , though not much different from Latin America. High transaction costs and an inefficient banking system may have been responsible for the historically low savings levels in Africa. These are improving and it appears that savings are responding to a more conducive environment.

Figure 7

Net FDI trends for developing countries in Africa are also encouraging, showing a 17-fold increase from about US$ 2206 million per year in the early 1990s to $36700 million for 2010-2013. However, the developing countries in East Asia and the Pacific, and to a lesser extent Latin America, still capture the lion's share of net inward investment (Figure 8). Moreover, much recent FDI in Africa has been directed towards extractive industries with little effect on job creation.

Figure 8

Remittances to Africa are relatively small, estimated to comprise only four percent of all remittances to developing countries (Gupta et al. 2009). In most countries, they amounted to three percent or less of GDP in 2000-6, the main exceptions being Lesotho, Gambia, Guinea-Bissau, Togo and Senegal.

Despite positive trends in domestic savings and FDI, Africa is not investing the 25 percent of GDP thought to be necessary to sustain an economic growth rate of seven percent. Specifically investment (gross fixed capital formation) in Africa (including North Africa) was 17.7 percent of GDP in the period 1990-1999 rising slightly to 18.7 percent in 2000-2011 (UNCTAD 2014). The average for all developing countries for the more recent period was 26 percent.

Institutional capital

A skilled labour force and adequate financial capital will fail to lead to improved employment in the absence of institutional capital. This term covers a broad range of components including: political stability with the prospect of peaceful transitions of power; appropriate economic policies; a reasonably efficient state bureaucracy; and effective financial and legal systems. One analysis concluded that Africa's poor economic

performance was mainly due to low institutional quality, including lack of trade openness. (Sachs and Warner 1997). The existence of political leaderships who are genuinely committed to improving the welfare of the population at large rather than serving the interests of small elites, is the factor of paramount importance, though impossible to quantify. The stellar recent economic performance, including job creation, of Ethiopia and Rwanda supports the Sachs-Warner conclusion. Both countries are landlocked and lack mineral resources yet have recorded rapid improvements under regimes that are clearly determined to improve general living standards.

By general consent policy frameworks have improved greatly in the past decade or so, symbolised by the endorsement by heads of states of a New Partnership for Africa's Development (NEPAD) and the Africa Union's Agenda 2063. But huge problems remain. The international assessment of the legitimacy and effectiveness of national governments classifies 22 African countries to be among the world's 28 highly fragile states (Marshall and Cole 2014). Similarly, the World Bank's assessment of business environments ranks 12 African countries, including two of most populous (Nigeria and Democratic Republic of Congo), as among the worst 10 percent of 189 countries (World Bank 2015). Of the mainland states only South Africa, Rwanda, Ghana, Botswana and Namibia, appear in the higher performing 50 percent.

Diverse socio-economic pathways and population mobility

The socio-economic pathways of African countries are diverging. Consider the progress of Ghana and the regress of the Central African Republic or Rwanda versus Burundi. Divergence will undoubtedly continue. Some countries will graduate from least developed to middle income status. Others, however, will be overwhelmed by rapid population increase and may face a Malthusian future where populations cannot be sustained. And yet others may be trapped into continuing poverty and hunger by inept governments and civil strife, a scenario exacerbated by population growth but not necessarily caused by it.

Of the former group of problem countries, those in the Sahel figure prominently. The combined populations of Chad, Mali and Niger are projected by the United Nations Population Division to grow from around 50 million in 2015 to close to 150 million by mid-century. All three countries have fragile governments, problems of internal security, face periodic food shortages and are extremely vulnerable to climate change (Potts, Henderson and Campbell 2013). It is improbable that agricultural production will be able to match population increase or that exports will be sufficiently buoyant to fund massive imports of food. International assistance will be unable to cope with such vast numbers in need. If this prognosis is valid the predictable response will be emigration. A very few individuals will have the courage and funds to escape to Europe but the majority will cross adjacent borders, to Nigeria for instance.

A likely, but rarely discussed, trend in Africa between now and mid-century is increased intra-regional movement, involving not thousands but possibly millions. A key question is whether or not cross-border migration will invoke violence. When a common culture and language unites both migrants and the host community, as with Fulani speakers in Northern

Nigeria and adjacent countries, the prospects are good; when this source of cohesion and solidarity is lacking, they are potentially alarming.

Concluding comments

Because the fertility decline in Africa has been so slow, the dominant demographic force for the next 35 years will be continued growth in numbers of births, young children, the school age population, and the adult population. To be sure, growth of the adult population will outstrip that of the younger age groups. This change in age structure is a positive development but the demographic signal is too weak to be a decisive influence on socio-economic progress.

This paper has outlined the implications of continued population growth on: pressure on health and education services; the need to feed a population that will double in size; the danger that rapid urbanisation will outstrip efforts to improve dismal living conditions; the challenges of employment and productivity for an adult population that will be two and a half times larger in 2050 than today; and the prospect of mass migration within the region due to Malthusian factors or chronic failure of some nations . None of these implications represent insuperable barriers to progress but, considered together, they underscore the magnitude of the task ahead.

Improved agricultural production is perhaps the most tractable challenge. Yields are so low in much of Africa that the investment in infrastructure and technology should pay high dividends. Demand from an increasing urban population will help, at least for farmers with good access to towns and cities. A concern is further fragmentation of farm sizes due to population increase but the main threat is climate changes. Most farmers will remain extremely vulnerable to erratic rainfall and, in the longer term, temperature rises could spell disaster.

The least tractable challenge concerns employment and livelihoods. The impressive economic growth of the past decade has not been driven by any significant increase in manufacturing. Instead, the growing labour force has been absorbed into farming and the service sector, predominantly in the form of household enterprises. The structure of African economies has hardly changed since 1980 and manufacturing has declined as a percentage of GDP since the 1990s. It is doubtful that most African countries can maintain progress in the long term without a rapidly growing industrial base, of which there is yet little sign. The global number of formal sector jobs in manufacturing is not growing rapidly so the mere increase of Africa's labour force is not an advantage. Africa will to compete with other low wage regions and countries for international capital and expertise. Success will have to be hard won.

It is probable that some countries will have a bright future but that other, mainly landlocked, states will remain mired in poverty and hunger due to Malthusian factors or poor governance. Anticipation of mass migration within the next 35 years is justified and whether or not this can occur without civil strife is one of the big uncertainties for the region.

(Word count 7206)

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Table 1 Sub-Saharan Africa Demographic Changes (2015-2050)

Age group/indicator	Population size (millions)		Absolute change 2015-2050	Percent change 2015-2050 (%)	Percent distribution (%)	
	2015	2050			2015	2050
0-4	157	251	93	59	16	12
5-19	359	668	309	86	37	31
20-64	416	1100	684	164	43	52
65+	30	104	75	251	3	5
Total	962	2123	1161	121	100	100
Urban	360	1137	782	215	37	55
Rural	590	938	344	58	63	45
Births	35	53	17	49	---	---
Growth rate (%)	2.71	1.90	-	-	---	---
Dependency ratio	86	62	-24	-28	---	---

Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision, DVD Edition.

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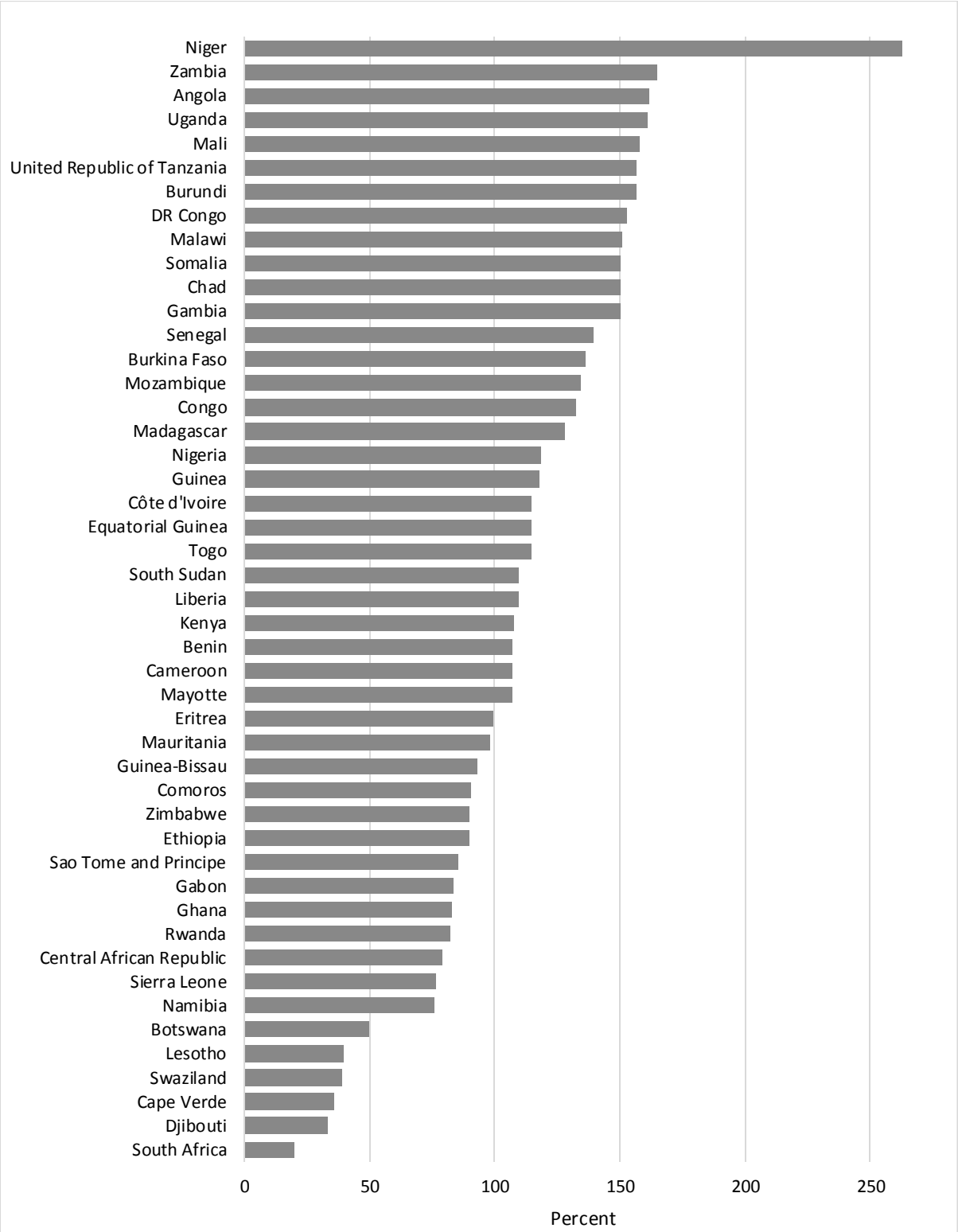
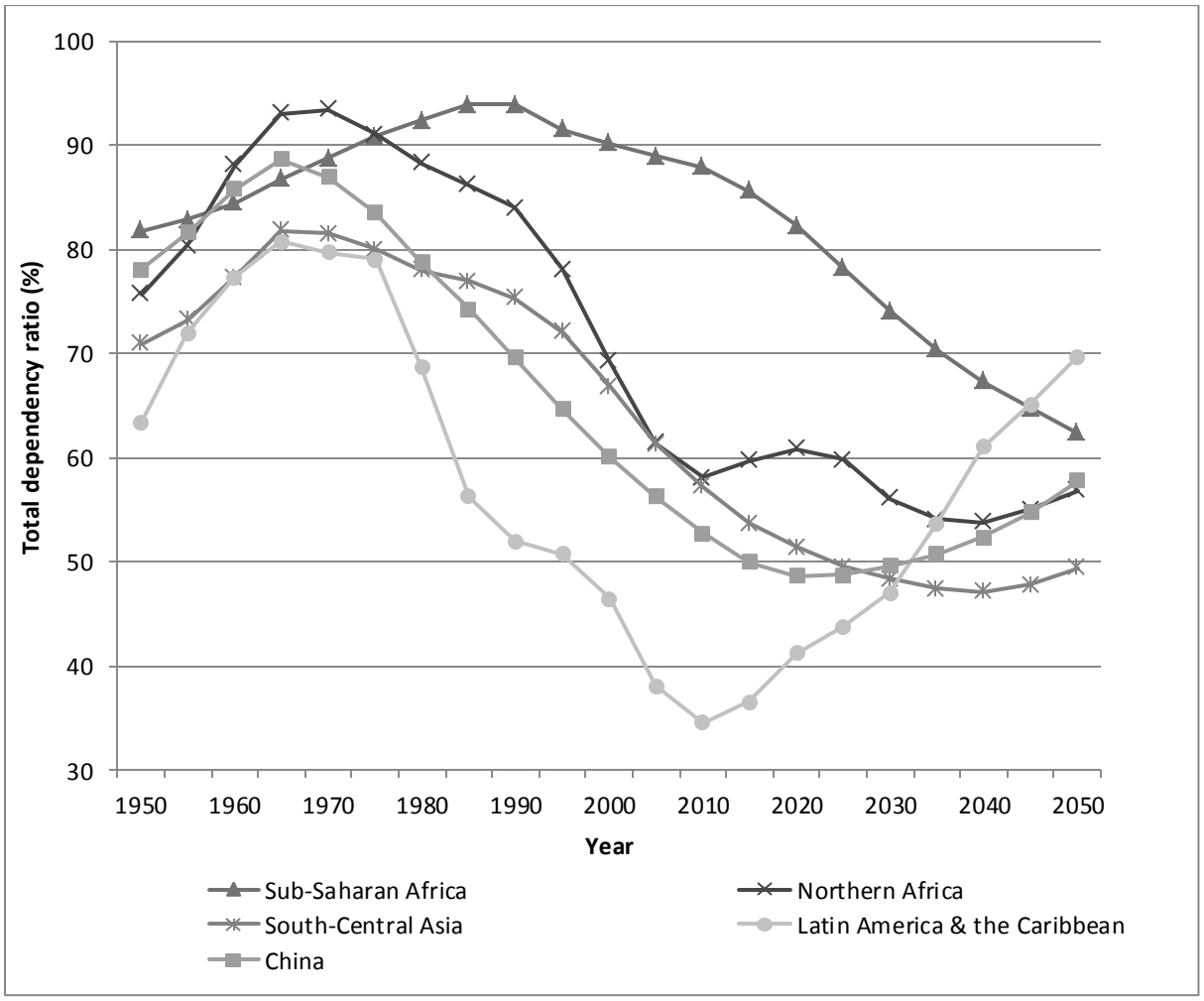
Figure 1: Percent increase in population between 2015 and 2050 in sub-Saharan Africa



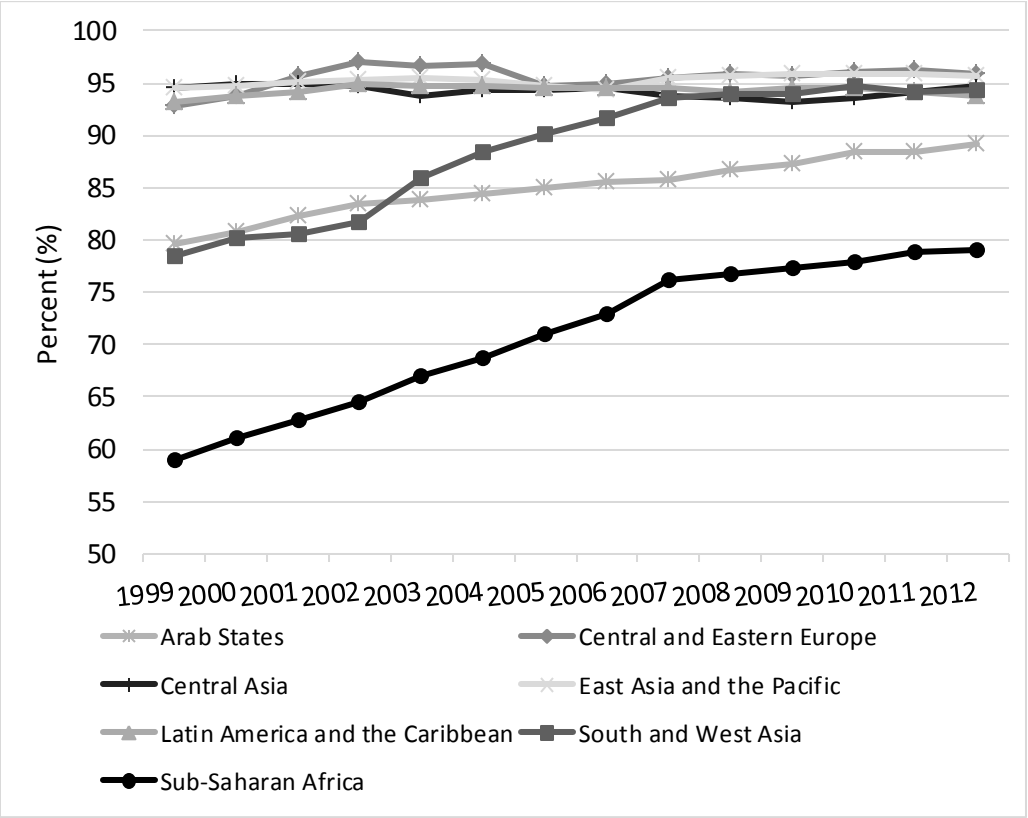
Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2014 Revision, DVD Edition.

Figure 2: Total dependency ratio, 1950-2050



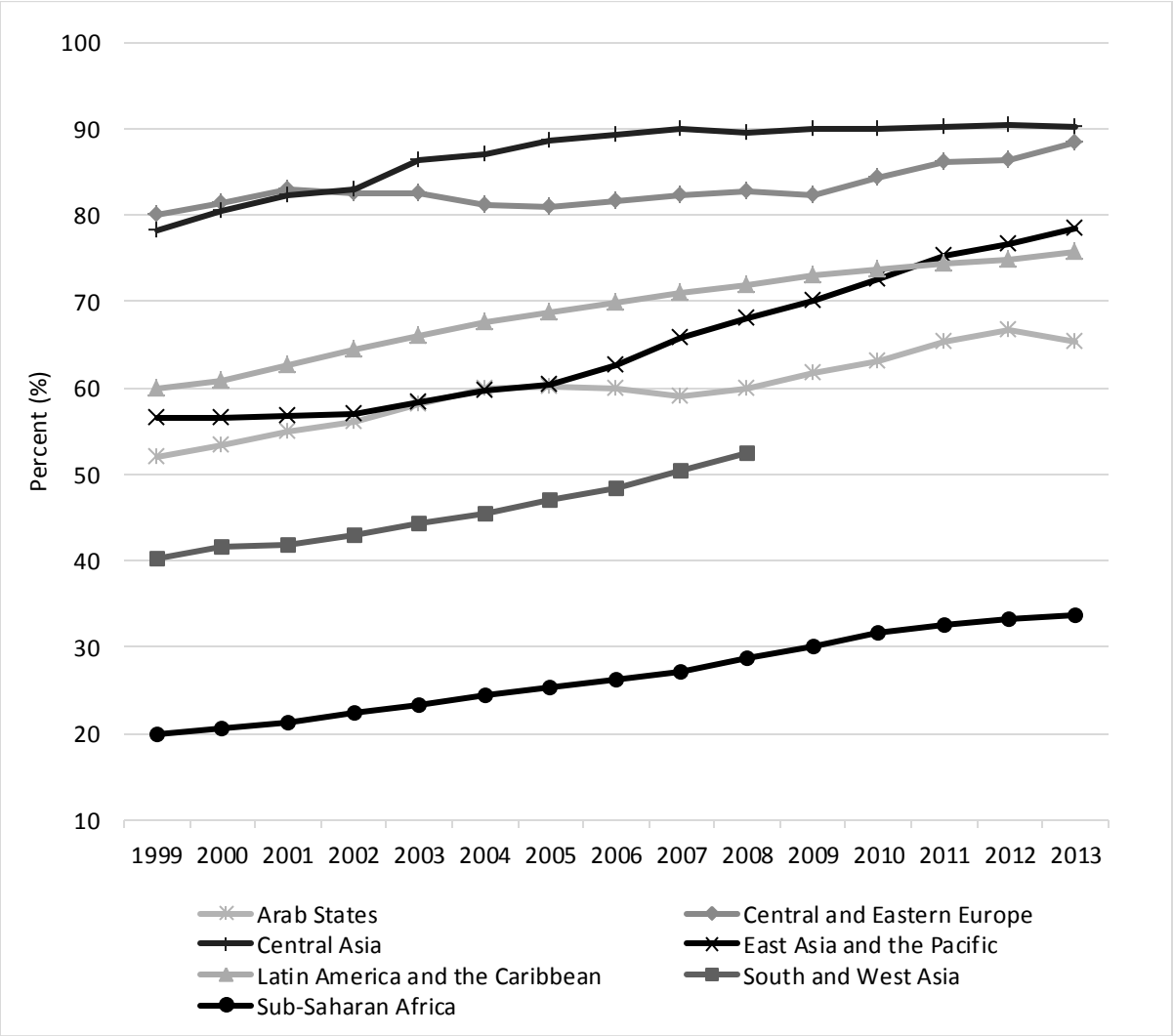
Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2014 Revision, DVD Edition.

Figure 3: Adjusted net enrolment rate (NER) for primary education, 1999-2012



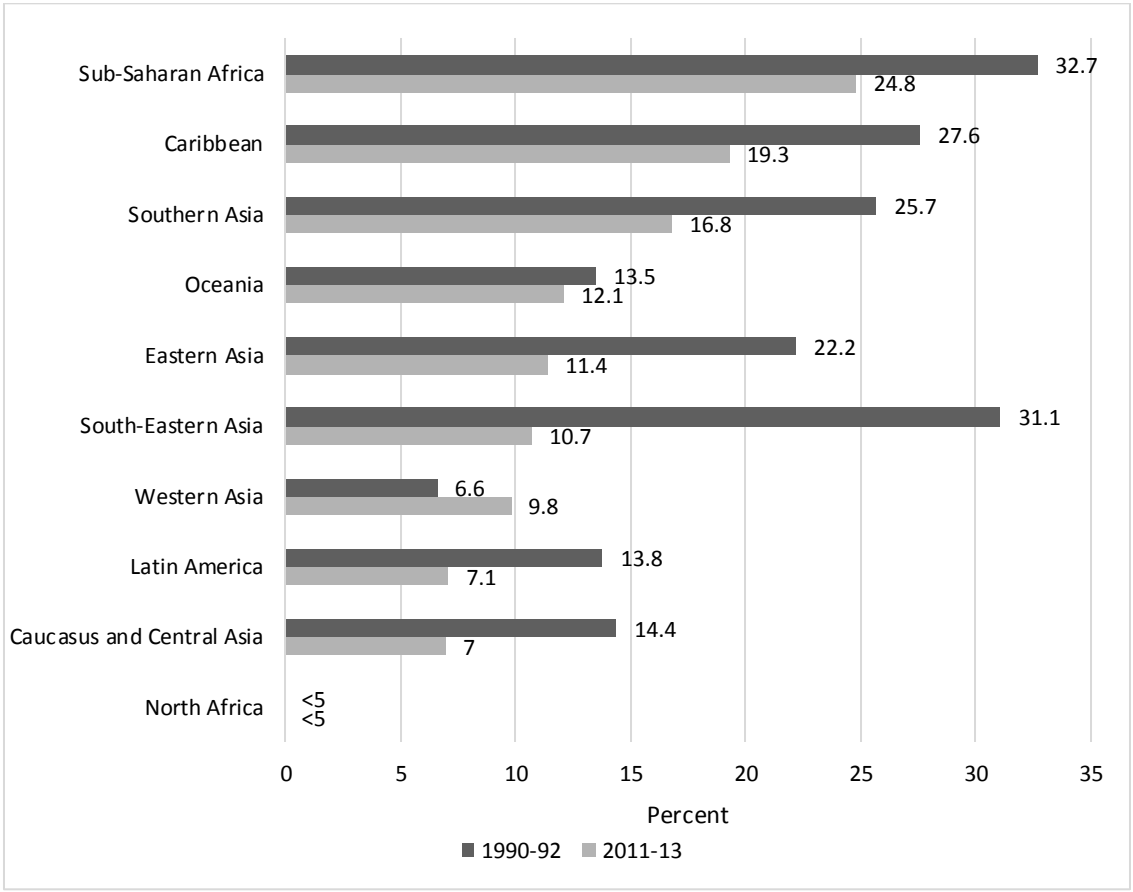
Source: UNESCO Institute for Statistics. data extracted on 10 May 2015 22:55 UTC (GMT).

Figure 4 : Net enrolment rate (NER) for secondary education, 1999-2013



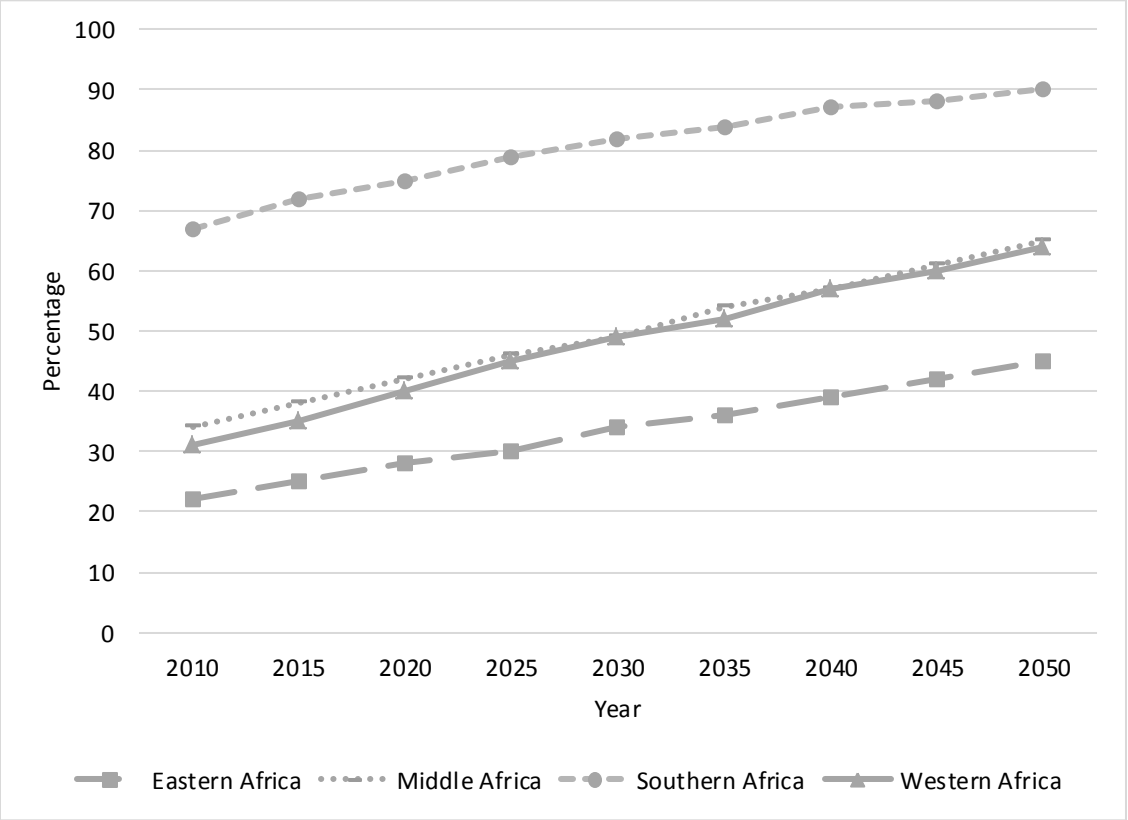
Source: UNESCO Institute for Statistics. data extracted on28 September 2015.

Figure 5: Prevalence of undernourishment (%)



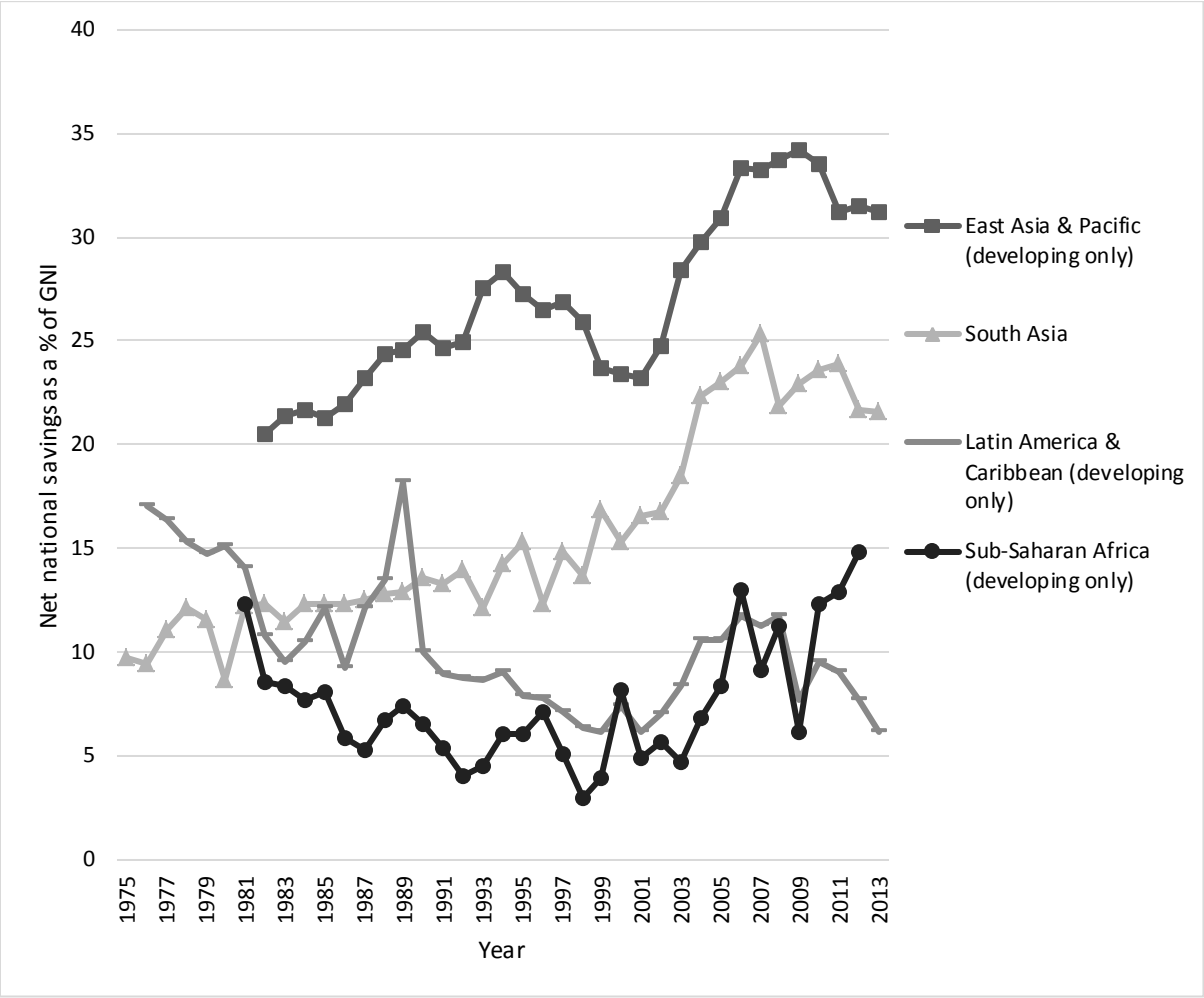
Source: FAO. The state of Food Insecurity in the World. 2013

Figure 6: Percentage of population with some secondary or higher education, both sex, 2010-2050, sub-Saharan Africa



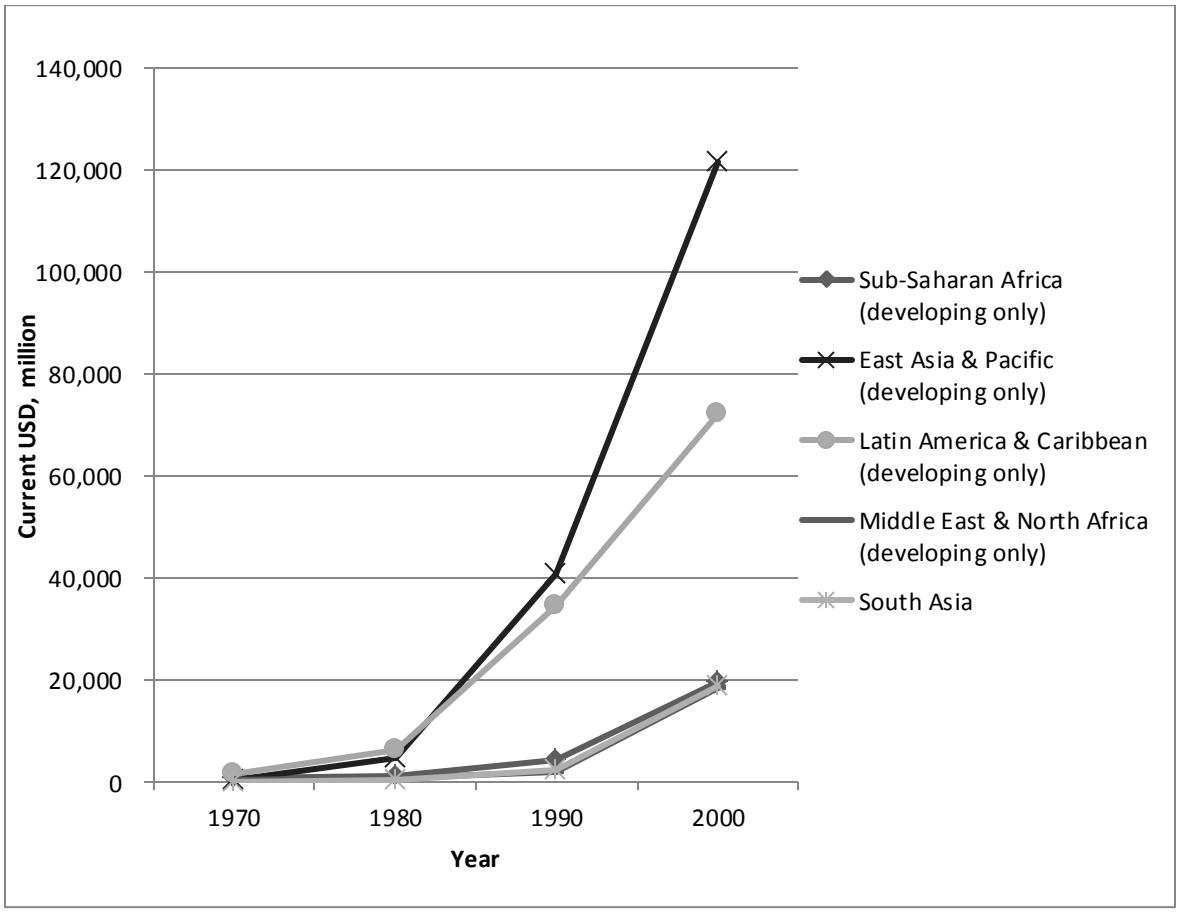
Source: Wittgenstein Centre for Demography and Global Human Capital (2015). Wittgenstein Centre Data Explorer Version 1.2.

Figure 7: Net national savings (% of GNI), 1975-2013



Source: World Bank. 2015. World Development Indicators. Washington DC. http://data.worldbank.org/data-catalog/world-development-indicators

Figure 8: Foreign direct investment, net inflows (BoP, current US$), 1970-2000



Source: World Bank. 2015. World Development Indicators. Washington DC: http://data.worldbank