

Global Demographic Trends and their Implications for Employment

BACKGROUND RESEARCH PAPER

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Employment**

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Introduction

The population of the world reached 7 billion in 2011, an addition of 4 billion people since 1960. According to United Nations projections, another 1.4 billion people will be added by 2030. This paper discusses global demographic trends with a focus on their implications for the size and rate of growth of the labor force. We draw on estimates and projections in the U.N.'s *World Population Prospects: 2010 Revision* (United Nations Population Division 2011).

We begin with an overview of the world's dramatic demographic history of the last 60 years. Understanding the rapid changes in mortality and fertility, with resulting rapid changes in population growth rates and age structure, is important in understanding what will happen to the working-age population in the next few decades. We then discuss the growth and composition of the working-age population (age 15-64) for the world as a whole and for separate countries and regions. For the world as a whole the working-age population will continue to grow, increasing by 20% between 2010 and 2030. This is a slower rate of increase than in previous decades, however, with the growth rate continuing to fall in the coming decades. We discuss the rapid changes in age distribution that will be observed in all regions, with the older population growing faster than children and youth. The youth component of the working-age population (age 15-24) will increase by only 3% between 2010 and 2030, while the population aged 45-64 will increase by 42%.

Overview of World Demographic Trends

In order to understand how world demographic trends will affect the size and composition of the working-age population in coming decades, it is important to understand the key factors that shape the current demography of the world. Since we are interested in the aging of the labor force and the expected rates of retirement in coming decades, it is useful to go back as far as 1950, the year at which the United Nations' Population Division's estimates begin. The

1950 birth cohort will reach the milestone age of 65 in 2015, moving them out of the working-age population as conventionally defined. Looking at all cohorts born since 1950, then, provides a comprehensive view of the working-age population in the post-2015 world.

Figure 1 shows that total population of the world grew from 2.5 billion in 1950 to 6.9 billion in 2010. According to the UN's Medium Variant Projection, the world population will increase to 8.3 billion by 2030. The population of the more developed countries has grown very little, falling from 32% of the world in 1950 to 16% of the world in 2030. Population in other regions has grown much faster, with the proportion in countries currently classified as "least developed" (main sub-Saharan Africa) rising from 8% in 1950 to 15% in 2030.¹

Figure 2 shows the annual population growth rate for the world and major regions. The world's population growth rate hit a peak of just over 2% per year in the mid-1960s, falling to 1.1% in 2010 and projected to fall further to 0.7% in 2030. Growth rates have differed greatly by region. Latin America and Asia had growth rates of around 2.5% per year in the 1960s, followed by steady declines that have driven the decline in the world's growth rate. Sub-Saharan Africa reached growth rates of 2.8% per year around 1980, falling slowly to 2.5% in 2010 and projected to fall to 2% in 2030. A 2% annual growth rate implies a population doubling time of 35 years; sub-Saharan Africa is projected to have had growth rates above this level for the entire period from 1950-2030. In subsequent sections we will see that this has important implications for the size and composition of the working-age population.

The Demographic Transition

The increase in population growth rates in the 1950s and 1960s was mainly driven by rapid declines in death rates, especially infant and child mortality, across the developing world (Lee 2003, Lam 2011). Since birth rates were still at high levels, the increasing gap

¹ The UN population projections for individual countries (and therefore for separate regions) include international migration, assuming that net migration will continue at rates similar to recent experience.

between birth rates and death rates caused an increase in population growth rates. Figure 3 shows estimates of the crude birth rate, and the rate of natural increase for the world and three major regions, Asia, Latin America, and sub-Saharan Africa. The crude birth rate (CBR) and the crude death rate (CDR) are defined as the number of births or deaths in a year divided by the total mid-year population, typically expressed per 1000 population. The rate of natural increase (the population growth rate not including migration) is the difference between the CBR and the CDR. As shown in the first panel of Figure 3, for the world as a whole the CDR had already fallen to about 20 per 1000 (2% per year) by 1950, while the CBR was about 38 per 1000, creating a population growth rate of 18 per 1000, or 1.8% per year. The CDR fell slightly faster than the CBR during the 1950s and 1960s, generating the growth rate of over 2% per year in the 1960s shown in Figure 2. The crude death rate leveled off at around 8 per 1000 in the 1970s, while continuing declines in the birth rate caused steady declines in the population growth rate.

The transition from a regime of high birth and death rates to a regime of low birth and death rates, with a period of population growth in between, is what demographers call the demographic transition. As seen in Figure 4, the process has been similar in Latin America, Asia, and sub-Saharan Africa, although Africa is not as far through the transition. One of the important lessons from looking at the separate components of population growth is that it demonstrates why we are unlikely to ever again see population growth rates of 2% per year for Latin America, Asia, or the world as a whole. The crude death rate has dropped below 1% per year in these regions, and has leveled off or increased as the population ages (in spite of continuing increases in life expectancy). As a result there is almost no margin for increasing the population growth rate through further declines in mortality. Any increases in the population growth rate will have to come through rising birth rates. A return to an annual

population growth rate of 2% per year would require that the crude birth rate increase to 30 per 1000, a rate last seen in Latin America and Asia around 1980 (Lam 2011).

Figure 4 shows the rapid declines in the total fertility rate (TFR) for major regions. This is a better measure of fertility behavior than the crude birth rate, since it is not affected by the age structure of the population. It is a measure of how many children a woman would have over her lifetime if she experienced the age-specific fertility rates observed in a population in a given year. The TFR for the world was about 5.0 births per woman in 1950. It began to decline in the 1960s, falling steadily to 2.5 in 2010. Declines for Latin America and Asia are even faster than for the world as a whole. Sub-Saharan Africa's fertility decline is later and slower, with a TFR of 4.8 in 2010.

One way of understanding the implications of these rapid demographic changes for the working-age population is to look at how the size of birth cohorts has changed since 1950. The size of birth cohorts is determined by a combination of the fertility rate, the infant mortality rate, and the number of women of childbearing age, itself a reflection of earlier population growth. Figure 5 shows the number of children aged 0-4 from 1950 to 2030 according to the UN Population Division's Medium Variant projections. The size of birth cohorts grew rapidly from 1950 to 1990, a reflection of rapidly falling infant mortality and the rapid increases in the number of women of childbearing age. Even after fertility began its rapid decline in the 1960s, the size of birth cohorts continued to increase due to the continued growth of the childbearing-age population.

The number of children age 0-4 in the world stopped growing around 1990 as rapid fertility decline finally overtook the growth of the childbearing-age population. Remarkably, while the world will add 1.4 billion people between 2010 and 2030, the number of children in the world will be almost constant. The fact that birth cohorts essentially stopped growing around 1990 has important implications for the growth and composition of the world's

working-age population in the coming decades. As with all of the patterns we will analyze, there are important differences across regions. In China the number of children age 0-4 will fall by 18 million from 2010 to 2030, a 22% decline, while in the least developed countries the number of children aged 0-4 will increase by 31 million, a 25% increase.

Growth of the Working-Age Population

The rapid demographic changes of the last 60 years have produced dramatic changes in the size and composition of the working-age population. Figure 6 shows the size of the working age population – defined here as age 15-64 – from 1950 to 2030, based on the U.N. medium variant projections. The working-age population for the world tripled from 1.5 billion in 1950 to 4.5 billion in 2010. The working-age population will continue to grow in the coming decades, rising from 4.5 billion in 2015 to 5.4 billion in 2030 (see Table 1). While the addition of 900 million working-age people in 20 years, an increase of 20%, sounds daunting (World Bank 2012), it is important to note that the world added 1.3 billion people to the working-age population in the 20 years between 1990 and 2010, an increase of 40%. As is clear in Figure 6, the world's labor force grew at a considerably faster rate in the 1980s than it is growing today. From the peak growth rate of 2.2% per year in 1985, the growth rate will fall to 1.1% per year in 2015 and 0.7% per year in 2030.

As shown above, differences in the pace and timing of fertility and mortality declines have led to large differences in population growth rates across regions. Figure 6 shows that the growth rate of the working-age population will also vary considerably between rich and poor countries. The group of countries classified as “more developed” in Figure 6 and Table 1 is projected to have a 5% decline in its working-age population from 2010 to 2030, while the working-age population in the “least developed” group will grow by 64%, from 470 million in 2010 to 769 million in 2030. The three middle bands in Figure 6 are the “less developed minus least developed” group, with China and India shown separately. Collectively this

group will have continued growth, but will level off around 2030. China's working-age population will begin to decline around 2015, while India's labor force will keep growing by more than 1% per year up until 2030, surpassing China at a projected size of around 1 billion in 2025. India will add 245 million people to its working-age population between 2010 and 2030, roughly 1 million people per month.

Looking at the breakdown by geographic regions in Panel C of Table 1, Asia's working-age population will reach 3.3 billion by 2030, an 18% increase from 2010. Europe will experience a 9% decline in its working-age population, falling below the working-age population of Latin America. North America will have modest positive growth, rising 5.8% from 2010 to 2030. Sub-Saharan Africa will be the region with by far the fastest growth of its working-age population, rising from 466 million in 2010 to 793 million in 2030, a 70% increase. Sub-Saharan Africa will add 1.1 million people per month to the working-age population in 2010-2015, rising to 1.6 million per month in 2025-2030.

Components of labor force growth

To understand the future growth of the working-age population it is useful to decompose the growth into three components – entry of new young workers, exit of older workers, and exit due to death of working-age individuals. Figure 7 shows this decomposition for sub-Saharan Africa, Asia, and Latin America and the Caribbean. The left panels show the annual change in the number of people in the working-age population. The right panels show the annual growth rate. The year 2015 is indicated as a reference on each panel.

Sub-Saharan Africa will have about 21 million people entering the working-age population as 15-year-olds in 2015, up from 15 million in 2000.² Offsetting these new entrants are 3 million people who exit by turning age 66 and 4 million working-age people

² We follow the international literature in using 15 as the lower bound of the working-age population. If we use an alternative age such as 18 the patterns in Figure 7 are very similar, since the number of new 18-year-olds in a year will be 7 close to the number of new 15-year-olds. A similar point applies to the age 65 cutoff.

who die. The net addition, then, will be 14 million people in 2015. This will rise to 21 million per year by 2030 as the number of entrants grows much faster than the number of exits. The top right panel shows that the number of annual entrants is 4.1% of the labor force in sub-Saharan Africa in 2015, down from the peak entry rate of 4.4% in 1995. About 0.6% will age out of the working-age population in 2015, and about 0.8% will die. Net growth, then, will be about 2.7% in 2015, down from the peak of 2.9% in 1995. This is projected to decline to 2.6% by 2030.

Asia's experience differs from that of sub-Saharan Africa in several ways. The number of new entrants has been declining in Asia since 2005, a reflection of rapid fertility decline starting decades earlier. The number aging out of the working-age population has been increasing as the population ages. The net effect is that the 35 million people added to Asia's working-age population in 2015 is 10 million fewer than were added in 2005. The growth rate of Asia's working-age population will be about 1.2% per year in 2015, down from a peak of 2.7% in 1985, with the rate continuing to fall until it is projected to reach 0.5% around 2030.

Latin America looks similar to Asia, with the annual growth rate of the working-age population falling steadily from its 1980 peak of 2.9%. Comparing Africa with Asia and Latin America, it is worth noting that Africa's current growth rate of 2.7% per year is not unusual – Asia and Latin America had similar growth rates in the 1980s. The difference is that in Asia and Latin America the growth rate only briefly reached that level, falling rapidly soon after the peak. Africa's growth rate is falling slowly, but is projected to stay at over 2% per year for several more decades, leading to the large increase in the working-age population shown in Figure 7.

Figure 8 shows a simpler decomposition for 20 large countries in 2015, with exits from death and aging combined into a single exit rate. Annual growth rates of the working-age population vary from -1% in Japan to over 3% in Ethiopia. Nigeria, Kenya, and Ethiopia all

have entry rates around 4%, offset by exit rates around 1%. An interesting feature of Figure 8 is that exit rates are quite similar, around 1%, for all the developing countries in 2015. The net growth rates vary mainly due to variation in entry rates, reflecting variation in the growth of the youth labor force (and, in turn, variation in fertility decline). Germany, Russia, and Japan will have negative growth of the working-age population in 2015. Their high exit rates reflect population aging, with the number of 66 year-olds exceeding the number of 15 year-olds each year.

The right panel of Figure 8 shows that most of these growth rates are projected to decline substantially by 2030, the result of continuing decline in fertility and population aging. The important exception is the African countries, especially Nigeria and Kenya, which will still have almost 3% annual growth of the working-age population in 2030.

The Changing Age Composition of the Working-Age Population

The dramatic population dynamics of the last 60 years lead to rapid changes in the age composition of the working-age population. Figure 9 shows how the growth of the working-age population of the world from 1950 to 2030 varies by three age subgroups – youth aged 15-24, a middle group aged 25-44, and older workers aged 45-64. The most striking feature of Figure 9 is that the youth component of the working-age population has had little growth since around 2005. As shown in Panel D of Table 1, the number of 15-24 year-olds in the world will only increase by 3% between 2010 and 2030, even though the working-age population will increase by 20%. The 25-44 year-old group is still growing, and will increase by 17% between 2010 and 2030. Most of the growth in the working-age population is now concentrated in older workers, with the number of 45-64 year-olds increasing by 42% between 2010 and 2030, double the rate of growth of the total working-age population.

The relative growth rates of different age groups in the working-age population differ substantially across regions. Figure 10 shows the percentage change in the size of the three

age groups – youth, middle, and older – for major geographic regions between 2010 and 2030. In Europe only the 44-64 age group will have positive growth between 2010 and 2030, a modest 2% increase. In most other regions all three groups will grow, but with the highest rates of growth in the 44-64 group. In Asia the number of 15-24 year-olds will decline by 7%, an important factor explaining why this age group only grows by 3% for the world as a whole over this period. Even in Africa, which has rapid growth of all three age groups, the most rapid increase is in the older age group. The number of 45-64 year-olds in Africa will increase by 60% between 2010 and 2030, compared to 39% for 15-24 year-olds.

The youth bulge

The “youth bulge” has received considerable attention in discussion of youth unemployment and political unrest in Africa and the Middle East. Figure 11 shows three different measures of the youth labor force for five countries – Brazil, Egypt, India, Indonesia, and Nigeria. The left panels show the absolute size of the 15-24 age group. The middle panels show the growth rate of this group, while the right panels show the 15-24 age group as a proportion of the working-age population (15-64).

The youth labor force recently hit a peak in Brazil and Indonesia, like many countries that have had rapid fertility decline (World Bank 2006, Lam 2006). This is one sense in which there is a “youth bulge.” From an economic perspective the growth rate of the youth labor force is more important than the absolute size, however, since it is rapid entry of young workers that is most likely to put pressure on the labor market. Looking at the middle panels in Figure 1, Brazil, Egypt, India, and Indonesia all have much slower growth of the youth labor force today (close to zero) than they did in the 1970s, when the youth labor force grew at over 4% per year. The youth proportion of the working-age population has also fallen, from around 35% in the 1970s to around 25% today. Egypt, where the youth bulge has been linked to unemployment and political unrest, looks similar to the Asian and Latin American

examples, with roughly zero growth of the youth labor force after 2005 and with steady declines in youth's share of the working-age population since the 1970s. In many ways it is hard to see evidence of a current youth bulge in the first four countries in Figure 11. While the youth populations are large, they were growing much faster and were a larger share of the labor force (and population) 30-40 years ago. Most other Latin American and Asian countries look quite similar to these four countries (Lam, 2006).

Sub-Saharan Africa, represented in Figure 11 by Nigeria, once again looks much different than the rest of the world. While the other countries in Figure 11 will have little or no growth in the youth labor force in coming decades, Nigeria's youth labor force will grow from 35 million in 2015 to 51 million in 2030. The growth rate has fallen from its 1995 peak of 3.4%, but will stay around 2% until 2030. The youth share of the working-age population is falling, but at a much slower rate than in the other countries. Youth will still be above 1/3 of the labor force in 2030.

As was noted for the working-age population, it is important to note that neither the growth rate of the youth labor force nor the youth share of the working-age population that we see in Nigeria are out of the ordinary. Similarly high rates can be seen in the other four countries in Figure 4 in the 1970s and 1980s. We would find similar patterns if we looked at a wide range of other countries in the world. The unusual thing about the African case is that these rates show very little decline. While they have dropped from their peak levels, they are still very high and are projected to remain high for the next several decades. This is because of the slow pace of fertility decline in Africa (Bongaarts, 2008).

Dependents and the Working-Age Population

While the focus of this paper is on the working-age population, it is important to consider future changes in the size of the dependent-age population. Table 2 shows the size of the population in three key age groups, 0-14, 15-64, and 65 plus, in 2010 and 2030. As

previously shown in Figure 5, the number of 0-4-year-olds in the world has been fairly constant since around 1990, with declines projected from 2018. Not surprisingly, then, the number of 0-14-year-olds in the world will only increase by 3% between 2010 and 2030. The number of 0-14 year-olds will be constant or falling in Asia, Europe, and Latin America. It will increase by 11% in North America, and will increase by 40% in sub-Saharan Africa, an addition of 146 million children.

The population aged 65 and over will increase substantially in all regions. The world as a whole will add 450 million elderly between 2010 and 2030, an 86% increase to a total of 976 million. The elderly population in Asia and Latin America will more than double. Although Europe's total population will be the same in 2030 as in 2010, Europe's elderly population will increase by 39%.

Table 3 shows the proportional age distribution and one useful summary measure – the ratio of the number in the working age population (age 15-64) to the number in non-working ages (0-14 and 65+). The proportion of the world population under the age of 15 will fall from 26.8% to 22.9% between 2010 and 2030, while the proportion over 65 will increase from 7.6% to 11.7%. Interestingly, the proportion in the working ages of 15 to 64 will remain roughly constant at 65%, although we have seen in Table 1 that the working-age population will shift substantially toward the older ages. The proportion of Europe's population in the 65+ age group will increase from 16.2% to 22.4%. Sub-Saharan Africa's proportion aged 65+ is much smaller, only 3.2% in 2010, rising to 3.8% by 2030.

One of the important economic implications of the age distribution of the population is the extent to which the population is concentrated in the working ages. Fertility decline eventually causes the proportion of children in the population to decline and the proportion in the working age to increase. This “demographic dividend” has been argued to have played an important role in Asian economic growth (Bloom and Williamson 1998; Bloom, Canning, and

Malaney 2000), although it appears to have had less impact in Latin America. One interesting feature of Table 3 is that the percentage of the population in the working ages for the world as a whole is almost identical in 2010 and 2030. The total “dependency burden” (the proportion of children and elderly) remains constant, but there is a substantial shift from child dependency (falling from 26.8% to 22.9%) to elderly dependency (rising from 7.6% to 11.7%). The ratio of the working-age population to the non-working-age population remains at 1.9, or just under two workers for every dependent. One way to think of this is that to generate one dollar for every dependent in the population (children plus the elderly), the working-age population would need to be taxed at 52 cents per person. A similar pattern holds for Asia, where the percentage in the working age is almost identical in 2010 and 2030. The ratio of working-age to non-working age is 2.1, or 48 cents per working-age person to provide one dollar for every dependent.

There are larger changes in the proportion in the working age in other regions. The proportion in working ages will decline in Europe and North America, with the ratio of working-age to non-working-age falling from 2.2 to 1.7 in Europe and from 2.0 to 1.6 in North America. The proportion in working ages will rise slightly in Latin America as they experience the last stages of the demographic dividend. The proportion in working ages in sub-Saharan Africa – 54.4% – is the lowest of all regions in 2010, rising to 58.6% in 2030. Sub-Saharan Africa will be beginning to experience the increase in the proportion in working ages associated with the demographic dividend, although the dependency burden remains high. The ratio of working-age to non-working-age was only 1.2 in 2010, implying that \$1 of support to each dependent requires 84 cents per working-age person. This ratio will increase to 1.4 in 2030, which will still be the lowest ratio of all regions. The dependency burden in sub-Saharan Africa is driven almost entirely by children – 42.4% of the population was under age 15 in 2010, falling to 37.6% in 2030.

Sensitivity of Estimates to Alternative Projections

In projecting the working-age population beyond 2010 we have used the UN Population Division's Medium Variant Projections. These projections assume that countries with high fertility will experience fertility decline, with the rate of decline based on the initial level and recent trends. They assume that life expectancy will continue to increase, and they assume that net international migration flows into countries will follow trends similar to recent experience. Details of the assumptions are provided on the UN Population Division web site. The UN's projections also include several alternative variants that make different assumptions about fertility, mortality, and migration. The "low variant" assumes faster fertility decline, the "high variant" assumes slower fertility decline, and the "constant fertility variant" assumes that fertility remains at 2010 levels. A "constant mortality" variant assumes that mortality rates will stay constant at 2010 levels. A "zero migration" variant assumes that there will be zero international migration beginning in 2010. Table 4 shows the projected size of the working-age population in 2030 for major regions of the world under the six alternative projections.

The size of the working-age population from now until 2030 is not very sensitive to alternative assumptions about fertility decline. Everyone who will be age 15-64 from 2010 to 2025 was already born when the UN's projections were made in 2010. Only those in the 15-19 age group beginning in 2025 will be born after the projections were made, and are therefore sensitive to the assumptions about fertility. As seen in Table 4, the working-age population for the world will be 5.5 billion under the high fertility variant, 5.3 billion under the low fertility variant, and 5.4 billion under the medium variant, relatively small differences.

Assumptions about mortality and migration are potentially more important for projections of the working-age population to 2030. As seen in Table 4, however, the projected working-age population in 2030 does not vary substantially with the alternative assumptions. Under

constant mortality the working-age population of the world is 5.3 billion instead of 5.4 billion. Mortality rates tend to be low in the working ages, so alternative mortality assumptions have only small effects. Assuming zero migration has noticeable effects on the projections for Europe and North America. Europe's working-age population is projected to be 443 million without migration, compared to 461 million with migration. North America's working-age population is projected to be 225 million without migration, compared to 245 million with migration. Latin America, sub-Saharan Africa, and Asia are all projected to have larger working-age populations in 2030 in the absence of international migration.

In general the projections we have used for our analysis are not very sensitive to alternative assumptions. Since our focus is on the population over the age of 15, and since we are only using projections to 2030, most of the population we are considering has already been born, making fertility assumptions unimportant. While assumptions about mortality and migration are potentially more important, in practice the projections are not very sensitive to alternative assumptions.

Summary Points

- The working-age population of the world is projected to grow by 900 million between 2010 and 2030, an increase of 20%. This increase can be put in context by noting that it grew by 1.3 billion between 1990 and 2010, an increase of 40%. The annual growth rate of the working-age population has fallen from a peak of 2.3% in 1985 to 1.1% in 2015, with a projected decline to 0.7% in 2030.
- Growth of the working-age population will vary greatly by region and level of economic development. Europe and China will experience declines in their working-age population between 2010 and 2030, while many low-income African countries will have growth rates of over 2% year. Sub-Saharan Africa will add over 1.1 million people per month to the working-age population in 2010-15, rising to 1.6 million per month in 2025-2030.
- Differences in labor force growth rates across countries are due mainly to differences in the growth of the youth labor force, a reflection of differences in rates of fertility decline.

In many African countries new entrants add 4% per year to the working-age population, offset by about 1% that exit through death or aging beyond working age.

- The youth labor force (age 15-24) is currently reaching a peak in many countries that have experienced rapid fertility decline. While these youth populations are large, they have stopped growing in many countries, with annual growth rates having fallen from peaks of around 4% in the 1970s to roughly zero today. The important exception is Africa, where growth rates for the youth labor force have fallen slightly, but will remain close to 2% for several decades.
- The 20% increase in the working-age population of the world between 1990 and 2010 is highly uneven across age groups. The number of 15-24 year-olds will only increase by 3%, while the number of 45-64 year-olds will increase by 42%.
- The working-age population was roughly 2/3 of the world population in 2010, with an almost identical proportion projected for 2030. The age composition of the 1/3 who are dependents will change substantially, however, with a decline in the proportion under age 15 and an increase in the proportion age 65 and over.
- Sub-Saharan Africa had the lowest percentage of its population in working ages of all major regions, 54.4% in 2010, with 42.4% of its population under age 15. The proportion in working ages will increase to 59% in 2030, but will still be lower than other regions.

References

- Bongaarts, John (2008) “Fertility Transitions in Developing Countries: Progress or Stagnation, *Studies in Family Planning*, 39(2):105–110.
- Bloom, David, David Canning, and Pia Malaney. 2000. “Population Dynamics and Economic Growth in Asia.” *Population and Development Review* 26 (Supplement): 257—90.
- Bloom, David, and Jeffrey Williamson. 1998. “Demographic Transitions and Economic Miracles in Emerging Asia.” *World Bank Economic Review* 12 (3): 419–55.
- Lam, David (2006) “The Demography of Youth in Developing Countries and its Economic Implications,” World Bank Policy Research Working Paper #4022, October 2006
- Lam, David (2011) “How the World Survived the Population Bomb: Lessons from Fifty Years of Extraordinary Demographic History,” *Demography*, 48(4): 1231-1262.
- Lee, Ronald (2003) The Demographic Transition: Three Centuries of Fundamental Change. *Journal of Economic Perspectives*, 17, 167–190.
- United Nations Population Division. (2011) *World Population Prospects: The 2010 Revision* [Database].
- World Bank (2006) *World Development Report: 2007: Development and the Next Generation*, Washington, D.C.
- World Bank (2012) *World Development Report: 2013: Jobs*, Washington, D.C.

Figure 1. Size of the world's population, 1950-2030

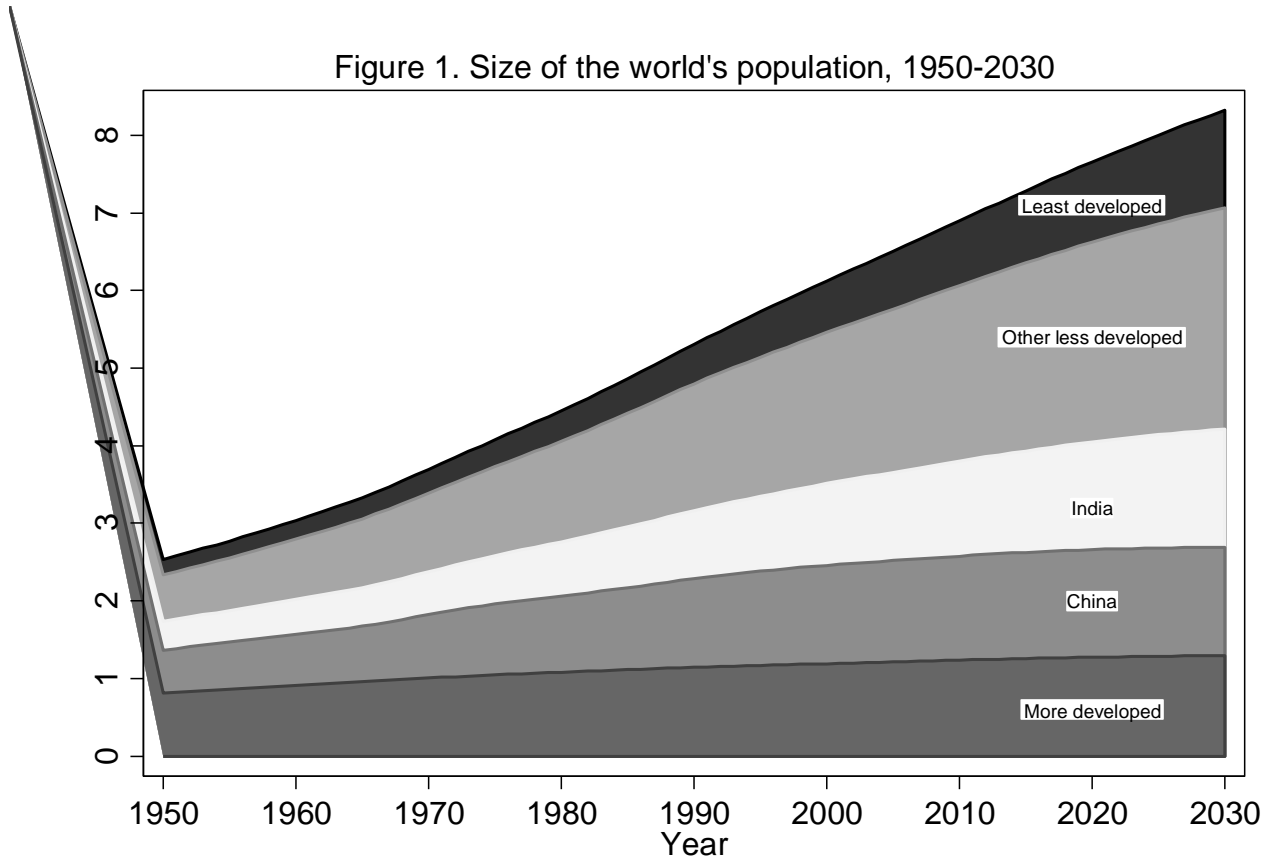
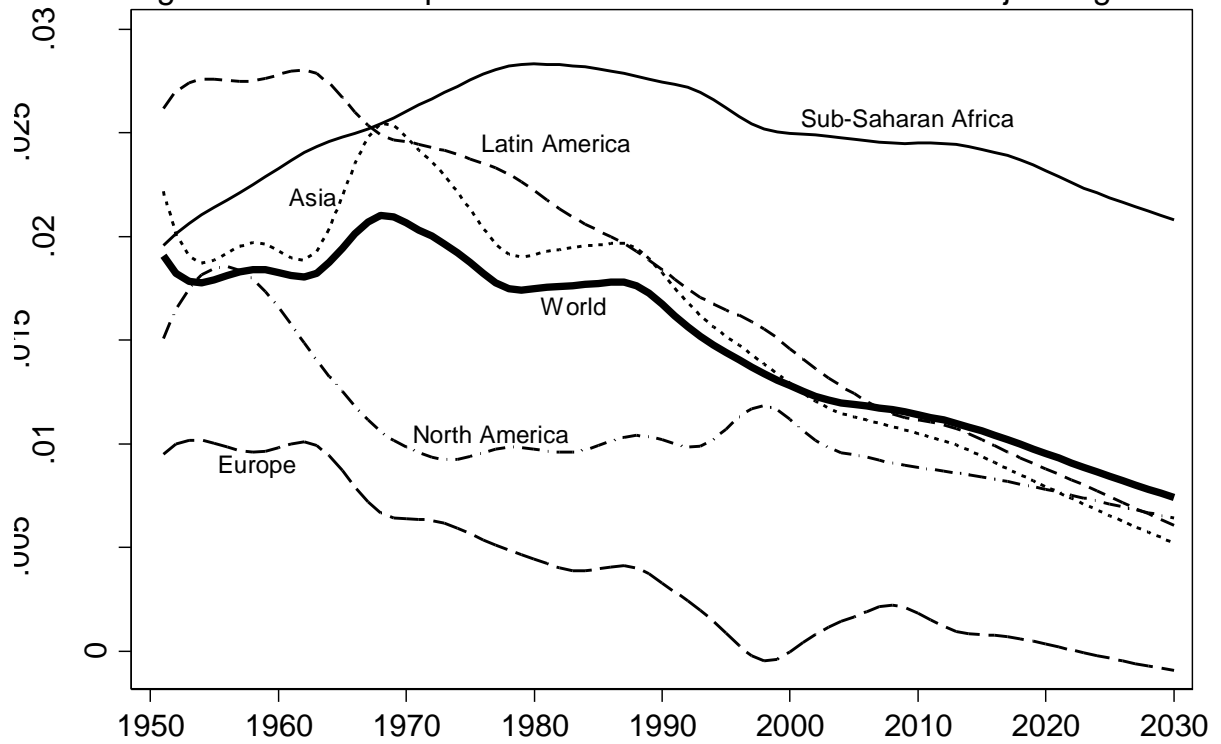


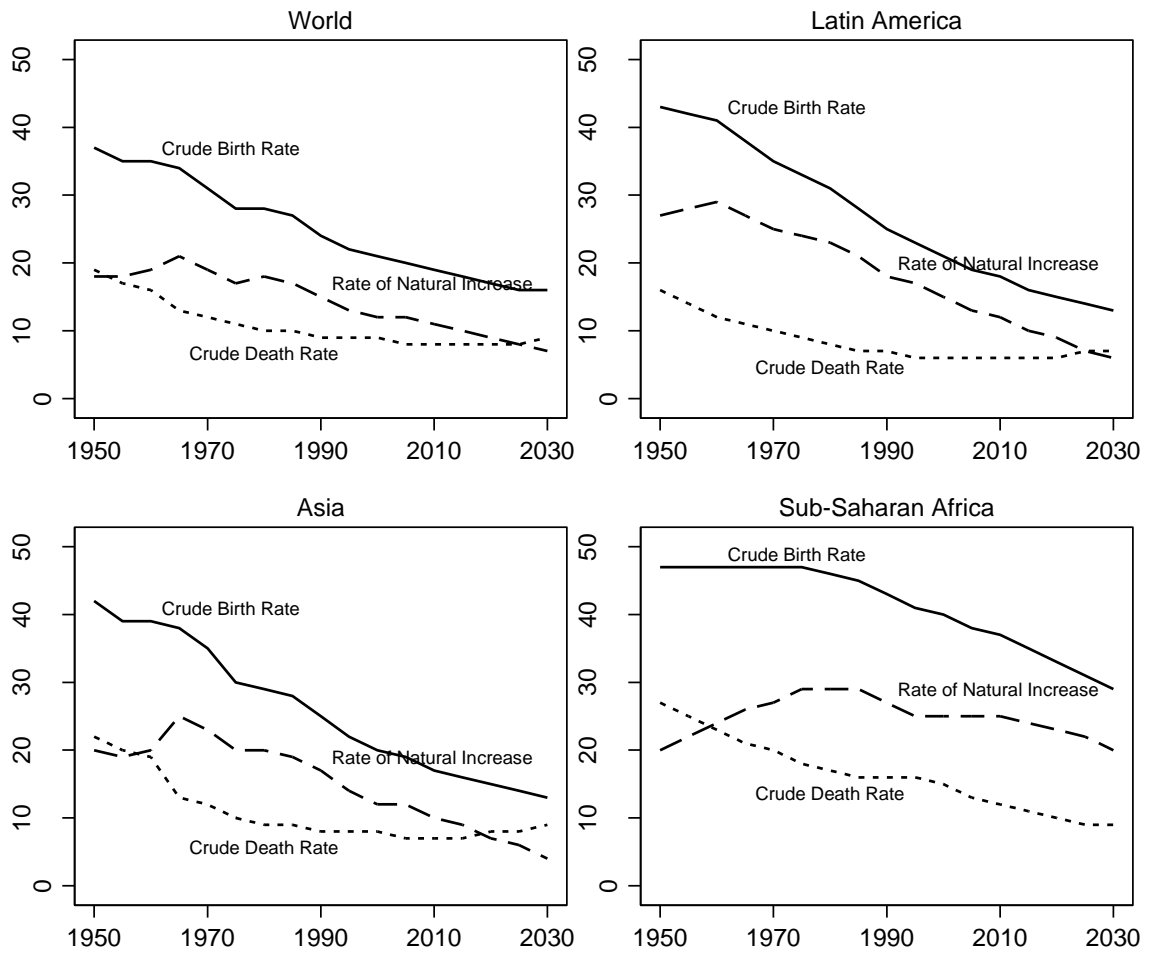
Figure 2. Annual Population Growth Rate for World and Major Regions



Source: UN Population Division 2010, Medium Variant

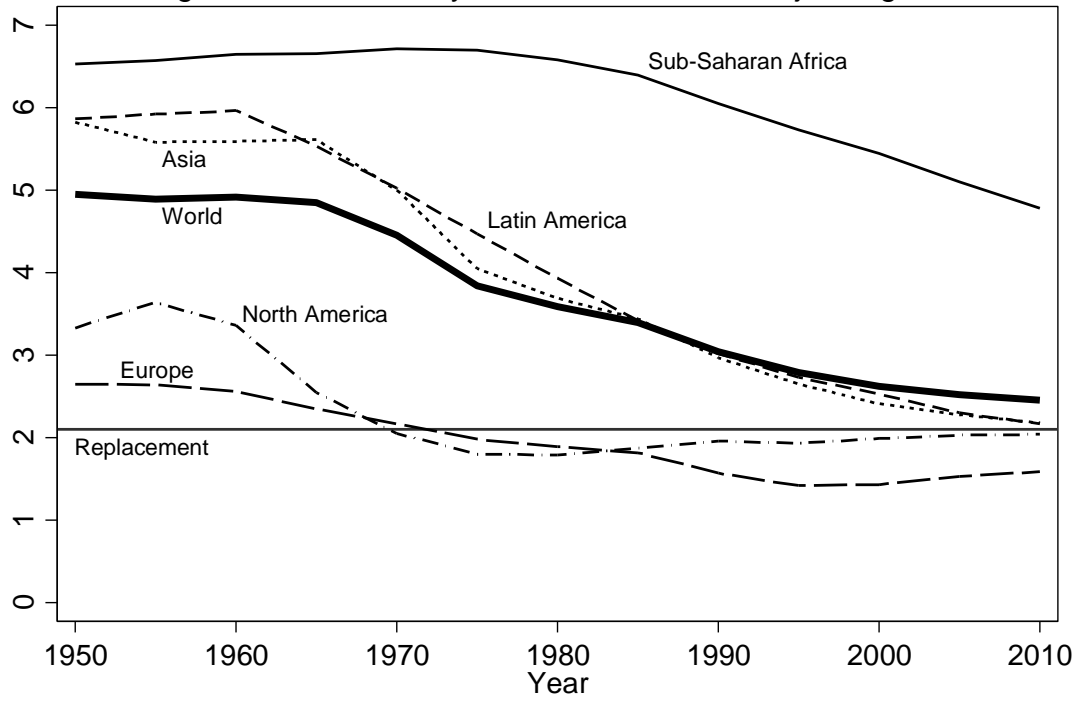
Figure 3. Crude Birth Rate, Crude Death Rate, and Rate of Natural Increase, 1950-2030

(Rates per 1000 population)



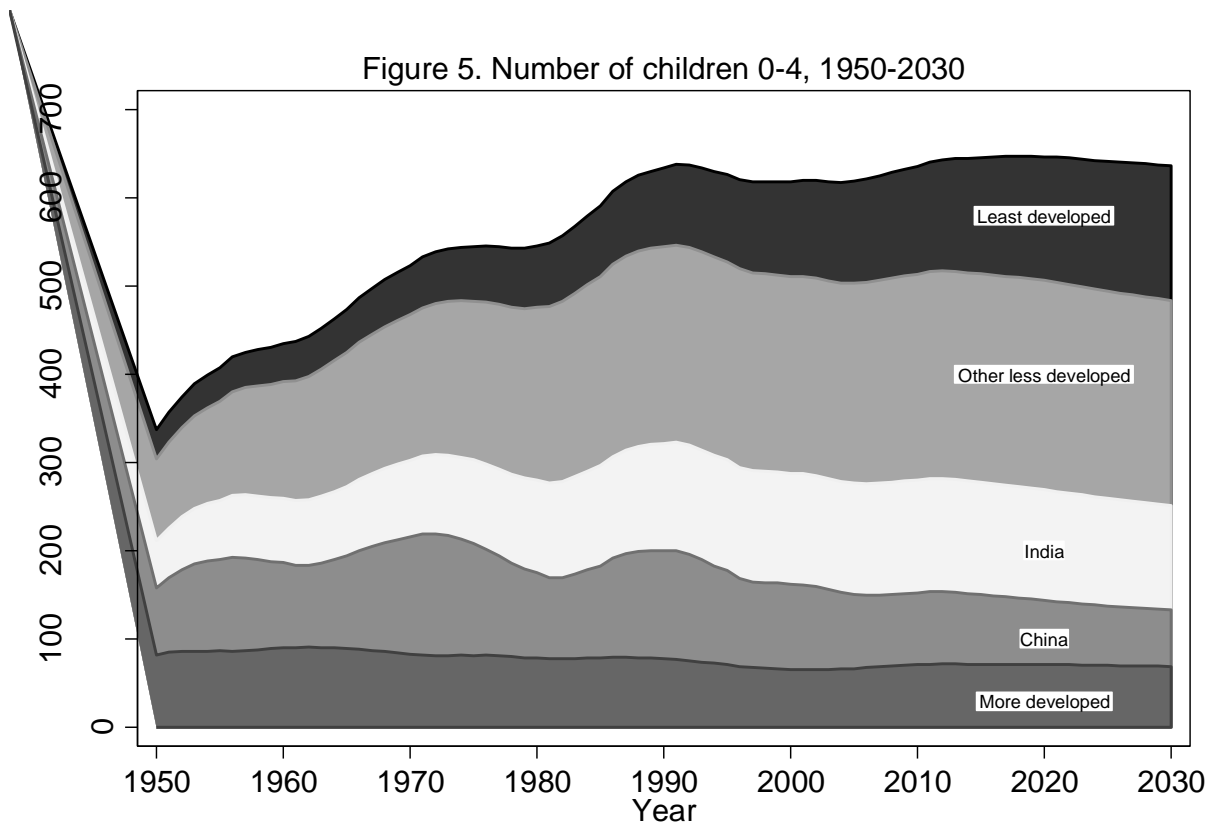
Note: World Population Prospects: 2010 Revision, Medium Variant

Figure 4. Total Fertility Rate for World and Major Regions



Note: World Population Prospects: 2010 Revision

Figure 5. Number of children 0-4, 1950-2030



Note: World Population Prospects: 2010 Revision, Medium Variant

Figure 6. Size of the world's working-age population, 1950-2030

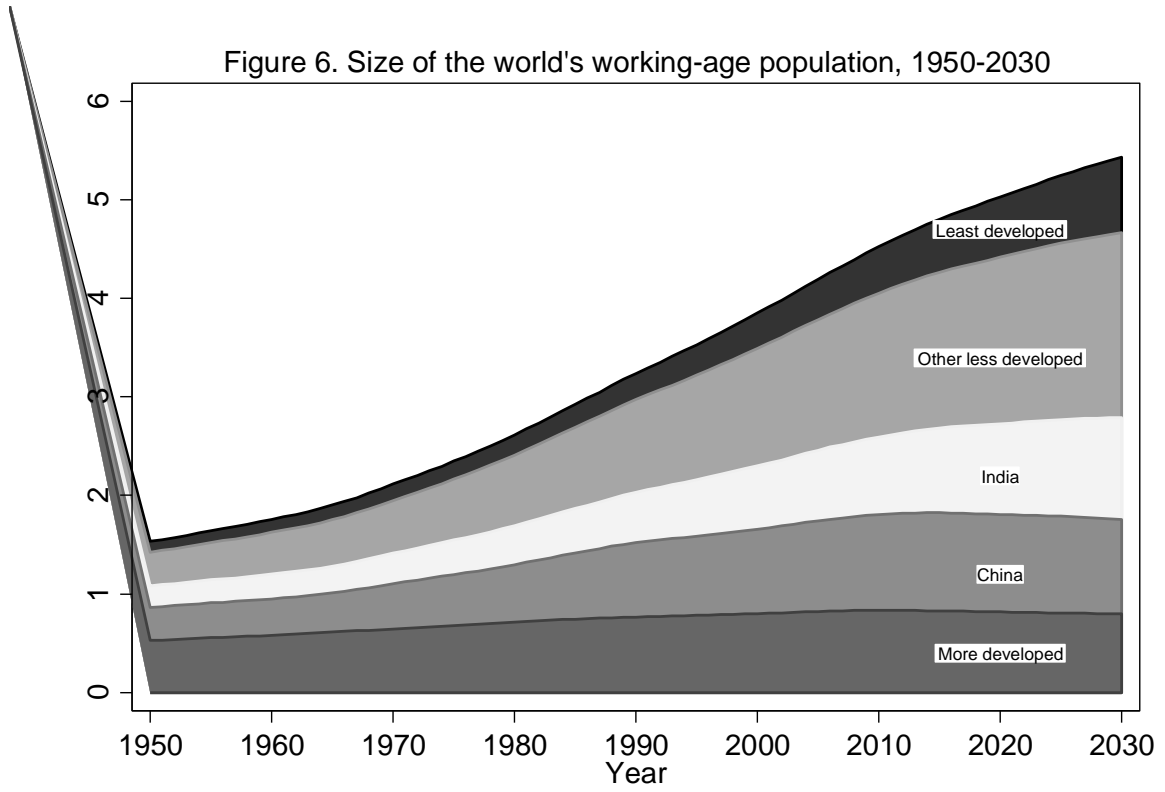


Figure 7. Annual growth of working-age population, by components, 1960-2030

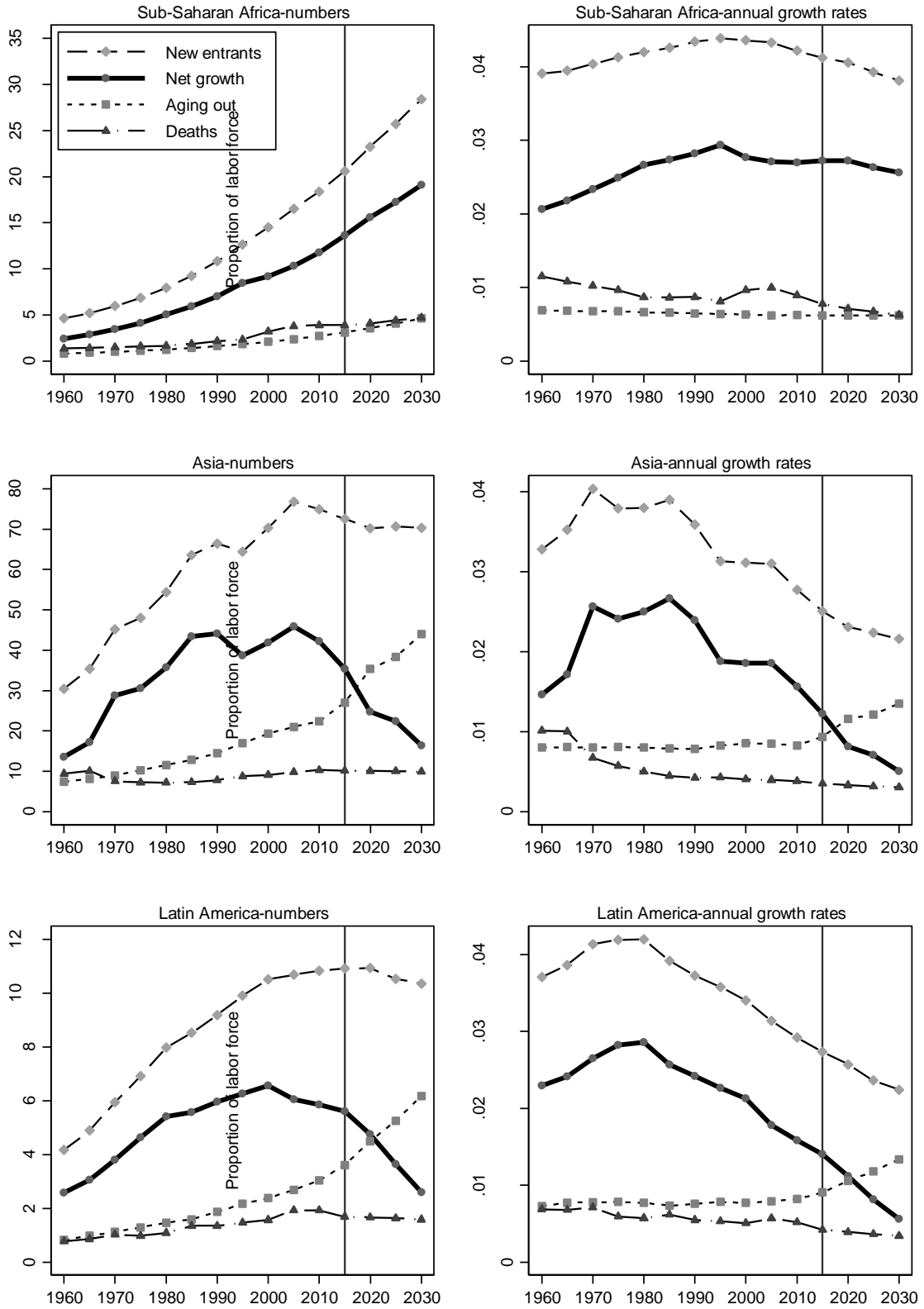
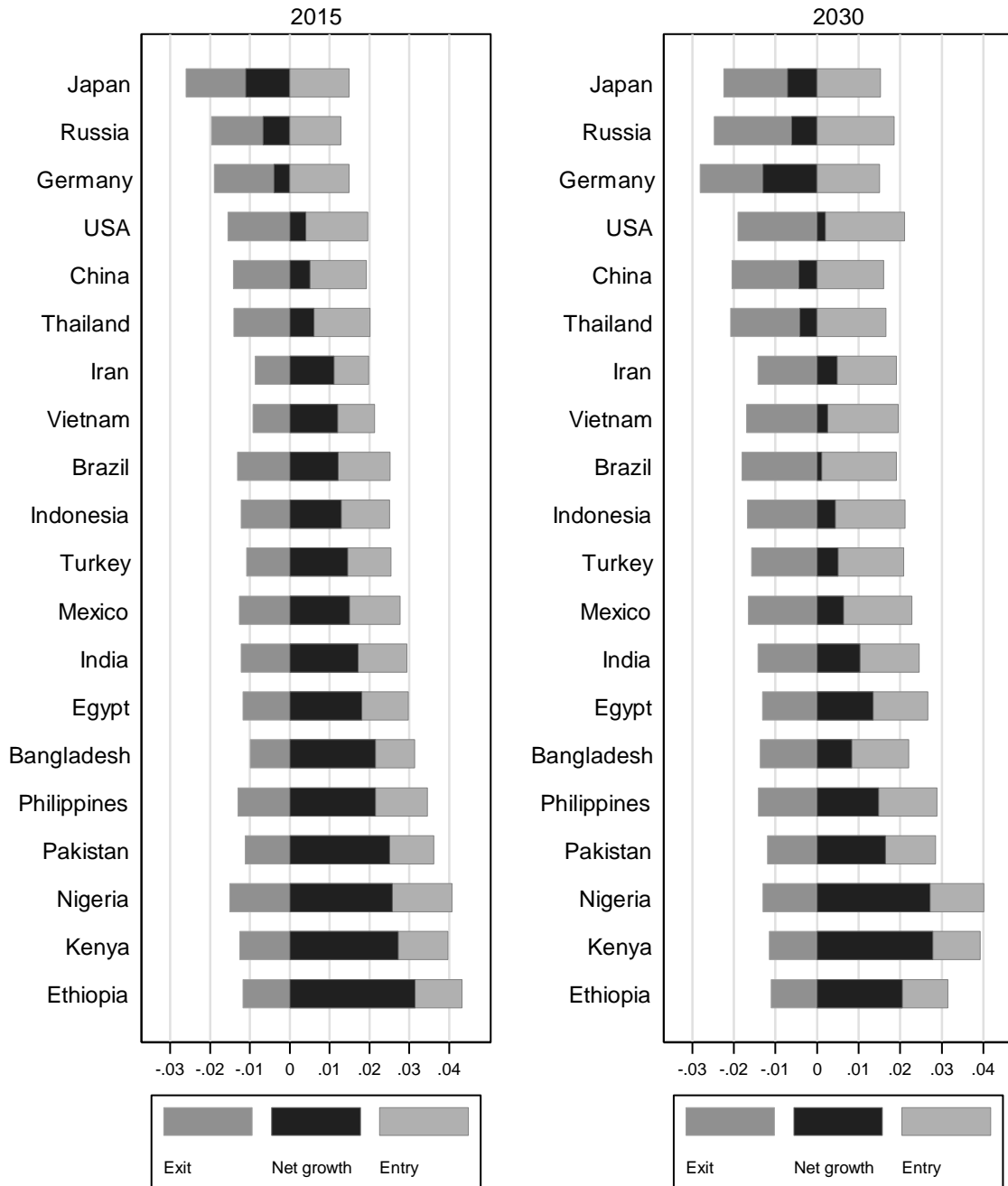
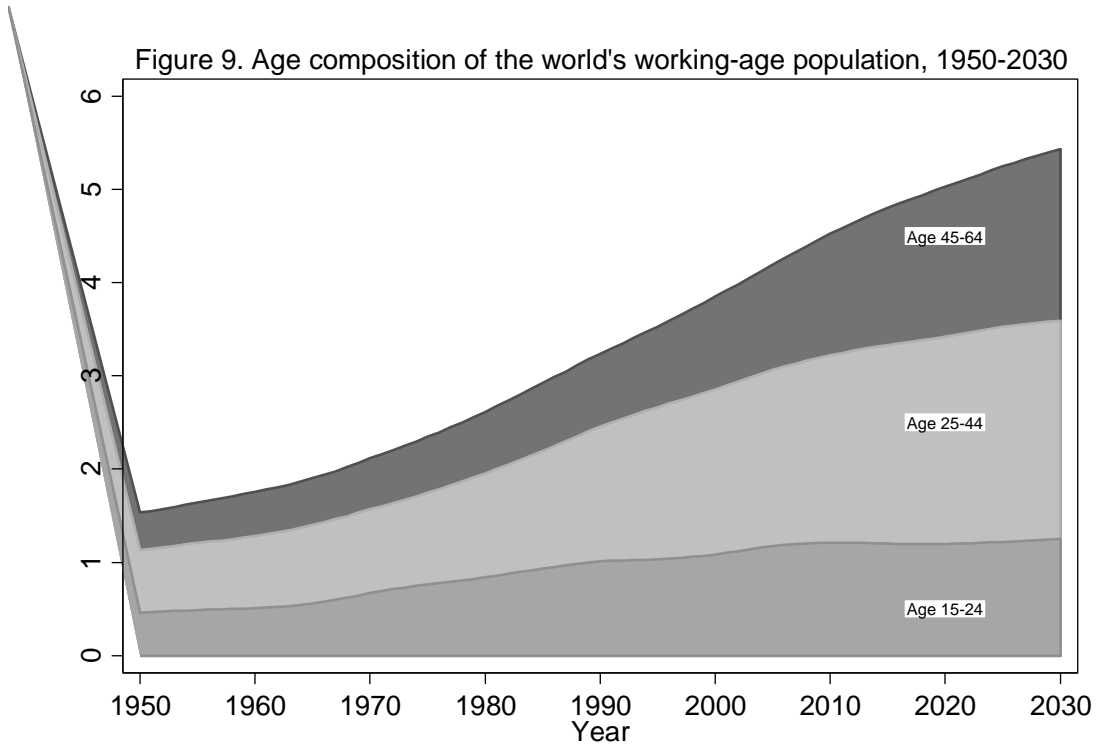


Figure 8. Projected annual growth rate of working-age population, 2015 and 2030



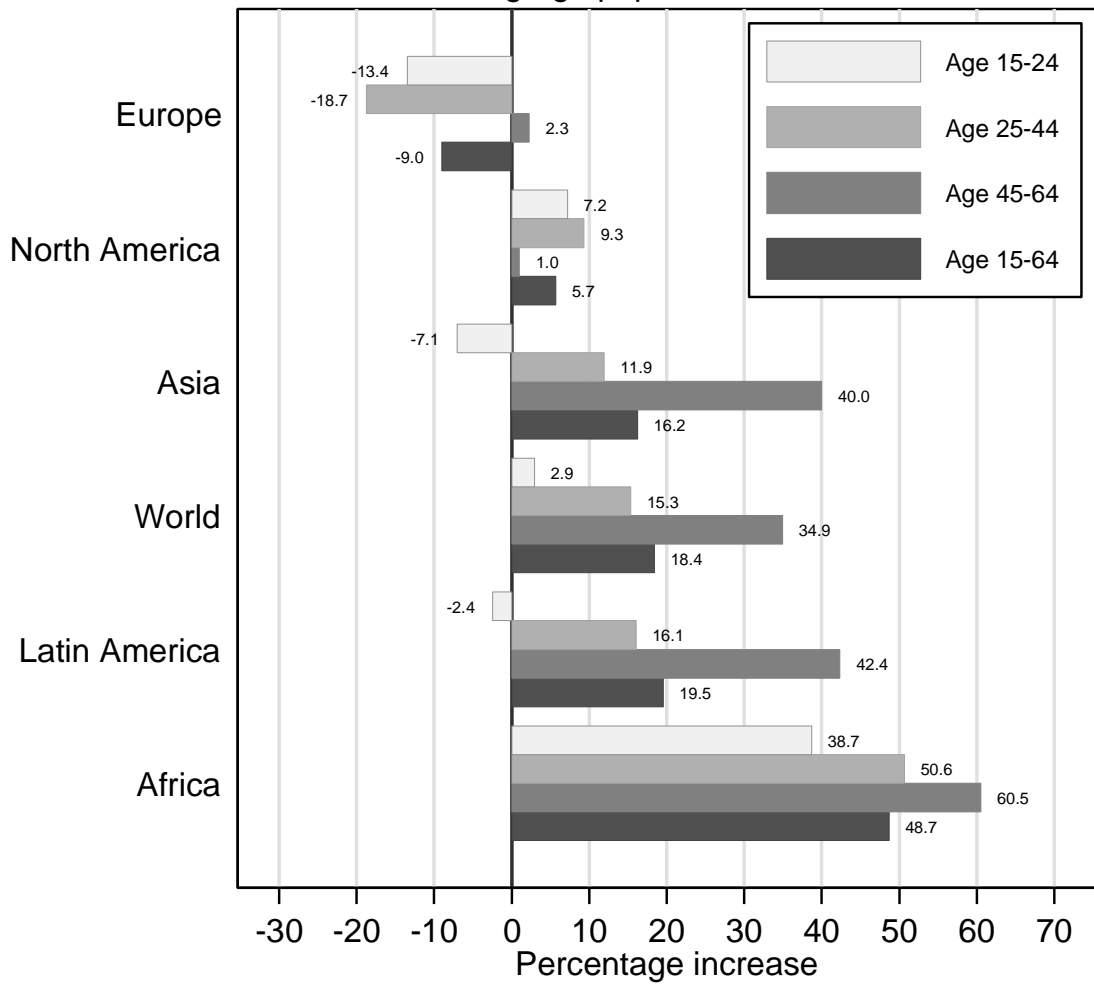
Population aged 15-64, UN Population Prospects: 2010 Revision, Medium Variant Projections

Figure 9. Age composition of the world's working-age population, 1950-2030



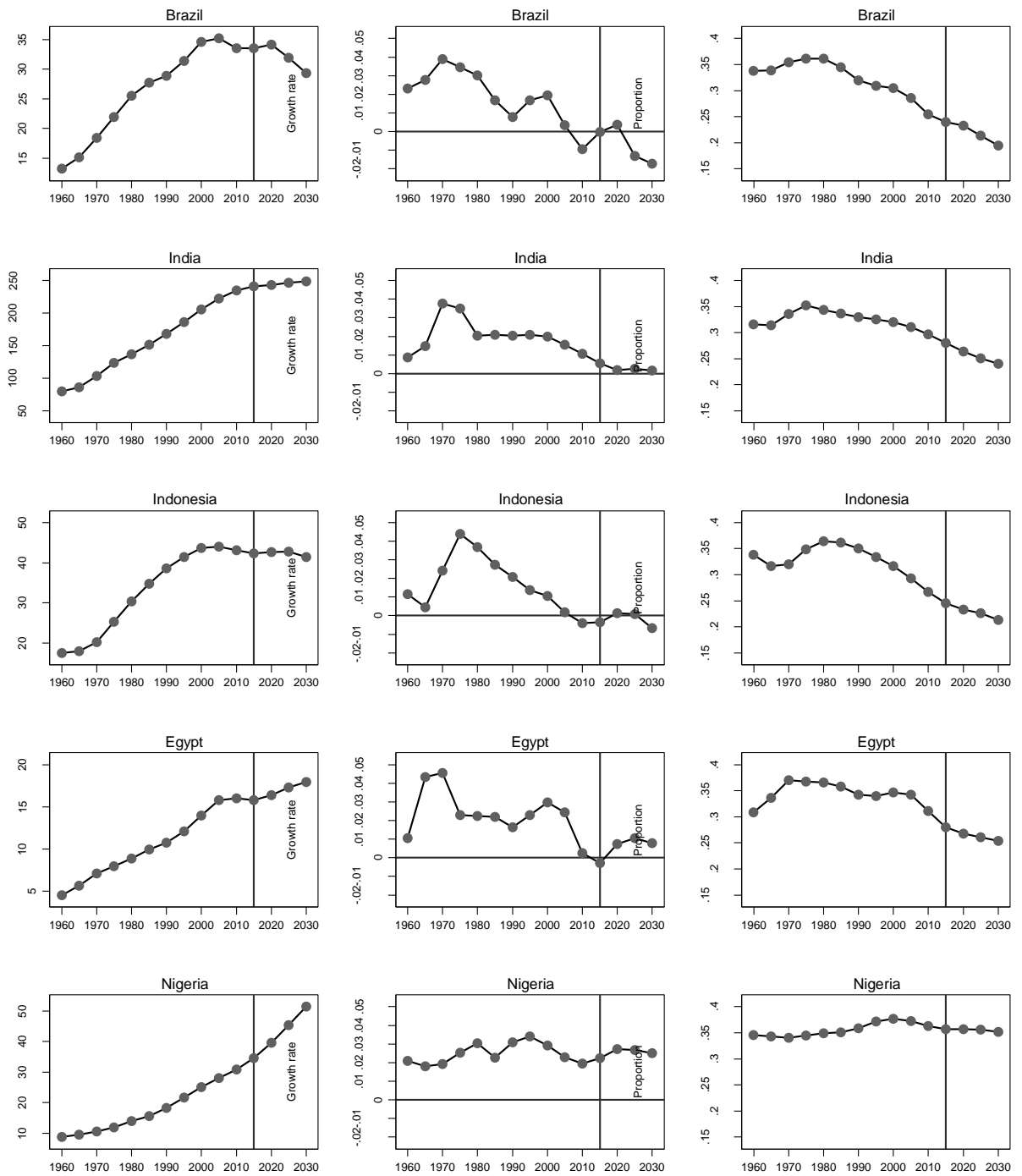
Note: World Population Prospects: 2010 Revision, Medium Variant

Figure 10. Percentage increase in size of age groups in working-age population, 2010 to 2030



Source: World Population Prospects: 2010 Revision, Medium Variant

Figure 11. Youth population (age 15-24), 1960-2030
 Size, annual growth rate, and proportion of labor force



Source: UN Population Prospects: 2010 Revision, Medium Variant Projections

Table 1. Size of Working-Age Population for World and Subgroups, 2010-2030
Population aged 15-64 (Millions)

	Year					Change	% Change
	2010	2015	2020	2025	2030	2010-2030	2010-2030
A. World	4,524.8	4,804.4	5,031.8	5,248.6	5,438.0	913.2	20.2%
B. Economic regions							
More Developed	834.9	827.7	817.2	806.7	795.2	-39.7	-4.8%
<i>Less Developed:</i>							
China	970.5	995.8	988.9	981.3	960.1	-10.5	-1.1%
India	789.7	861.1	923.0	981.7	1,034.3	244.6	31.0%
Other Less Developed	1,459.7	1,581.1	1,690.2	1,790.3	1,879.6	419.9	28.8%
Least Developed	470.0	538.7	612.4	688.7	768.9	298.9	63.6%
C. Geographic regions							
Asia	2,805.4	2,982.4	3,106.2	3,218.1	3,299.9	494.5	17.6%
Europe	504.8	496.3	484.4	473.0	461.2	-43.5	-8.6%
Latin America	385.0	413.0	436.8	455.0	468.0	83.0	21.6%
North America	231.3	236.1	240.0	242.5	244.8	13.5	5.8%
Sub-Saharan Africa	465.8	533.8	611.7	697.9	793.3	327.5	70.3%
D. Age groups							
Age 15-24	1,213.0	1,201.0	1,197.8	1,219.4	1,249.0	36.0	3.0%
Age 25-44	2,010.3	2,131.0	2,224.2	2,305.6	2,343.2	333.0	16.6%
Age 45-64	1,301.6	1,472.4	1,609.8	1,723.7	1,845.8	544.2	41.8%

Source: UN World Population Prospects 2010 Revision, Medium Variant Projections

Table 2. Age Distribution of Population for World and Major Regions, 2010 and 2030

	2010				2030			
	Age 0-14	Age 15-64	Age 65+	Total	Age 0-14	Age 15-64	Age 65+	Total
	<i>Population (Millions)</i>							
Asia	1,080	2,805	279	4,164	1,002	3,300	566	4,868
Europe	114	505	119	738	114	461	166	741
Latin America	164	385	41	590	149	468	85	702
North America	68	231	45	345	76	245	81	402
Sub-Saharan Africa	363	466	27	856	509	793	51	1,354
World	1,847	4,525	524	6,896	1,907	5,438	976	8,321
	<i>Percentage change 2010-2030</i>							
Asia					-7%	18%	103%	17%
Europe					0%	-9%	39%	0%
Latin America					-10%	22%	109%	19%
North America					11%	6%	79%	17%
Sub-Saharan Africa					40%	70%	86%	58%
World					3%	20%	86%	21%

Source: UN World Population Prospects 2010 Revision, Medium Variant Projections

Table 3. Percentage Age Distribution and Ratio of Working Age to Non-Working Age, 2010 and 2030

	Percentage			Working age/non-working age	Percentage			Working age/non-working age
	0-14	15-64	65+		0-14	15-64	65+	
Asia	25.9%	67.4%	6.7%	2.06	20.6%	67.8%	11.6%	2.10
Europe	15.4%	68.4%	16.2%	2.16	15.4%	62.2%	22.4%	1.65
Latin America	27.9%	65.2%	6.9%	1.88	21.2%	66.7%	12.1%	2.00
North America	19.7%	67.1%	13.2%	2.04	18.8%	60.9%	20.2%	1.56
Sub-Saharan Africa	42.4%	54.4%	3.2%	1.19	37.6%	58.6%	3.8%	1.42
World	26.8%	65.6%	7.6%	1.91	22.9%	65.4%	11.7%	1.89

Source: UN World Population Prospects 2010 Revision, Medium Variant Projections

**Table 4. Projected Population Aged 15-64 in 2013 for
Alternative Variants in UN Projections (Millions)**

Region	Medium Variant	Low Variant	High Variant	Constant Fertility	Constant Mortality	Zero Migration
Asia	3,300	3,259	3,341	3,326	3,250	3,320
Europe	461	455	468	459	455	443
Latin America	468	462	474	471	463	479
North America	245	242	248	245	243	225
Sub-Saharan Africa	793	786	801	803	764	798
World	5,438	5,372	5,504	5,476	5,345	5,438

Source: UN World Population Prospects 2010 Revision