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Accelerating the demographic transition to maximize the demographic dividend in the least developed countries in sub-Saharan Africa

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Abstract

Governments in the least developed countries (LDCs) in sub-Saharan Africa have set ambitious development goals by harnessing the demographic dividend. However, many of these countries still experience persistently high fertility rates and rapid population growth. The current slow pace of fertility decline may not generate a demographic dividend large enough to produce rapid socioeconomic progress. It is desirable for these countries to reduce fertility rates to lower levels to accelerate the demographic transition. Consequently, both governments and households with fewer children can significantly increase investments in human capital formation and job creation to accommodate the still-growing school- and working-age populations.

Using the latest data from the United Nations, World Bank, and National Transfer Accounts project, this paper explores the relationship between the pace of fertility decline and age structure change in sub-Saharan African LDCs as a whole and in six selected countries, namely Angola, Ethiopia, Lesotho, Niger, Rwanda, and the United Republic of Tanzania, based on their current stage of demographic transition and fertility levels. To maximize the demographic dividend, the paper recommends that LDCs continuously increase investments in sexual and reproductive health, including family planning, as well as in education and health, to speed up the demographic transition.

Key words: population and development, population policy, fertility, demographic dividend

* *Views expressed in this paper are those of the authors and do not necessarily represent those of the United Nations*.

Introduction

The global population has undergone a profound transformation since the mid-20th century, shifting from high to low levels of mortality and fertility, a process known as the demographic transition. This historical transition, observed across many countries, has often coincided with significant economic and societal changes, including industrialization, urbanization, improved health and education outcomes, and rising standards of living (Kirk, 1996; Dyson, 2004).

As countries progress through the demographic transition, they typically experience a period during which the proportion of the working-age population (15–64 years)[1] grows more rapidly than that of dependents. This shift creates a favorable age structure that can accelerate economic development, provided that supportive policies in health, education, and employment, among others, are put in place (Bloom, Canning, and Sevilla, 2003; Lee and Mason, 2006). This phenomenon—often referred to as the demographic dividend—was first observed in several East Asian economies between the 1960s and 1990s, including the Republic of Korea, Singapore, and Taiwan Province of China. It has since been noted in in more countries experiencing rapid fertility decline in the Asia-Pacific and other regions, with notable examples such as China and Ireland.

The demographic dividend arises from changes in age structure—termed the "accounting effect" by Bloom and Canning (2008)—as well as from "behavioral effect", such as increased human capital, higher female labor force participation, and rising savings. Within the framework of the National Transfer Accounts (NTA) project, the direct impact of age structure change is referred to as the first demographic dividend.[2] This is complemented by the second demographic dividend, which stems from increased savings and asset accumulation, and the gender dividend, all of which have great potential to support sustained and inclusive economic growth if properly managed (Mason et al., 2017; Lee and Mason, 2019).

For many low- and middle-income countries still in the early stages of the demographic transition, the demographic dividend represents a critical window of opportunity to develop economically to address both existing and emerging challenges, before the onset of inevitable population aging in the long run (Mason et al., 2017; United Nations, 2023). While East Asian countries are often cited as success stories in leveraging the demographic dividend (Mason, 2001), experiences in Latin America and the Caribbean suggest that domestic policy deficiencies and unfavorable international conditions can diminish its impact (Bloom and Canning, 2008).

In the coming decades, most African countries are expected to enter the demographic dividend phase, which have generated significant interest among researchers, governments, and development partners (AFIDEP and UNFPA, 2015; Bloom, Kuhn, and Prettner, 2017). In response, the African Union released a roadmap in 2017 focused on harnessing the demographic dividend through investments in youth (African Union, 2017). All 31 least developed countries (LDCs)[3] in sub-Saharan Africa have incorporated demographic dividend strategies into their national

[1] In this report, working-age population is defined as are those aged 15-64 years for international comparison purpose. Prime working-age population refers to those aged 25-64 years.
[2] This report focuses on the first demographic dividend or the accounting effect arising from changing age structure and the term of demographic dividend is used interchangeably with first demographic dividend.
[3] As of January 1, 2025, there are 44 countries and areas recognized by the United Nations as the least developed countries (LDCs), the "poorest and weakest segment" of the international community (UN-OHRLLS, 2025). The list of the least developed countries (LDCs) can be found from: https://www.un.org/ohrlls/content/list-ldcs.

development plans. Some, like Rwanda, have set ambitious goals, such as achieving upper-middle-income status by 2035 (Government of Rwanda, 2020). The Doha Programme of Action (DPoA), adopted at the Fifth United Nations Conference on the Least Developed Countries (LDC5) in 2022, urged Member States to "work together to support the acceleration of the demographic transition, where relevant," to harness the dividend (United Nations General Assembly, 2022).

Despite these promising prospects, there is a reality check for the anticipated economic boom arising from the demographic dividend, as in most LDCs, persistently high fertility and rapid population growth remain major challenges. Several studies have highlighted both the opportunities and the obstacles (Canning, Raja, and Yazbeck, 2015; Groth and May, 2017), with some arguing that a slow demographic transition may not yield a sufficiently large dividend to drive rapid socio-economic progress (Cleland and Machiyama, 2017).

Most discussions on harnessing the demographic dividend focus on the growing youth population and the need for investments in health, education, and employment, alongside continued support for family planning. However, less attention has been paid to the dividend itself, including its magnitude, duration, and potential contribution to economic growth (Mason et al., 2017). Key questions remain. For example, how long can a country benefit from the demographic dividend? What is the annual contribution of the dividend to economic growth? How does the pace of fertility decline influence the size and timing of the dividend?

This paper seeks to examine the relationship between the pace of fertility decline and the magnitude of the demographic dividend. Specifically, it explores how an accelerated demographic transition in sub-Saharan African LDCs can help maximize the dividend for development. Following this introduction, the paper outlines the data sources and methodology used to estimate the first demographic dividend under the NTA framework. It then presents a theoretical discussion on the relationship between the stage of demographic transition, the pace of fertility decline, and the size of the demographic dividend at global and regional levels. The paper reviews the prospect of fertility decline in sub-Saharan African LDCs as a whole and provides an in-depth analysis of six selected countries, namely Angola, Ethiopia, Lesotho, Niger, Rwanda, and the United Republic of Tanzania, based on their current stage of the demographic transition and levels of fertility. It concludes with a discussion of the findings and their policy implications.

Data sources and methodology for estimation of the demographic dividend

This report uses demographic and family planning data from the *World Population Prospects* and *Family Planning Indicators* database of the Population Division of the United Nations Department of Economic and Social Affairs (United Nations, 2024a; 2024b), demographic dividend data from the National Transfer Accounts (NTA) project database (NTA, 2025), and economic indicators from the World Bank's *World Development Indicators* database (World Bank, 2025).

Key demographic indicators, including total population and population by age group, total fertility rate, life expectancy at birth, and dependency ratio, are sourced from *World Population Prospects 2024*. This is the twenty-eighth edition of the official estimates and projections of the global population published by the United Nations since 1951. The 2024 revision presents population estimates from 1950 to the present for 237 countries or areas, and population projections to the year 2100, reflecting a range of plausible outcomes at the global, regional, and national levels. All

data for *World Population Prospects 2024* are available at: https://population.un.org/wpp/. Data for the contraceptive prevalence rate and unmet need for family planning, are from the *Family Planning Indicators* database available at: www.un.org/development/desa/pd/data/family-planning-indicators.

Data for economic growth, income status, education, and employment are primarily from the *World Development Indicators* database, which compiles relevant, high-quality, and internationally comparable statistics about global development and the fight against poverty. The database contains 1,400 time series indicators for 217 economies and more than 40 country groups, with data for many indicators going back more than 50 years. The database can be accessed at: https://databank.worldbank.org/source/world-development-indicators.

The NTA project aims to improve understanding of how population growth and changing population age structure influence economic growth, gender and generational equity, public finances, and other important features of the macro-economy. The NTA data quantifies how people at each age acquire and use economic resources to meet their current material needs, to share with others and to provide for the future and consists of economic flows for one or more recent years measured in nominal terms in the currency of each country. More information is available at the project website: https://ntaccounts.org/web/nta/show/Time%20Series%20Indicators.

Within the NTA framework, the economic support ratio is calculated as the ratio of effective producers to effective consumers, taking into account the population age structure and country-specific age patterns of production and consumption (United Nations, 2013). This approach arguably more accurately represents economic dependency than those simply based on age distributions. The first demographic dividend is defined as the growth rate of the economic support ratio. Given income per effective worker, an increase in the support ratio by 10 per cent raises income per effective consumer by 10 per cent (Mason and others, 2017: 6). For each country in a particular year, the economic support ratio is calculated using age-specific profiles of production and consumption. Nonetheless, for time series indicators, the changes are essentially those of the population age structure, as the age-specific profiles of production and consumption are held constant. Time series indicators of the economic support ratio and first dividend are available from: https://ntaccounts.org/web/nta/show/Time%20Series%20Indicators.

The stage of demographic transition, fertility decline and demographic dividend

The demographic transition is universal but occurs with varying timing and speed across countries. As a result, all countries can be roughly classified into early, intermediate, and late stages, according to levels and paces of decline in mortality and fertility rates. Following recent publications of the Population Division (United Nations, 2021, 2023), a country with a total fertility rate (TFR) higher than 4 births per woman and a life expectancy at birth lower than 65 years is considered in the early stage of transition. A country with a TFR between 2.1 (the replacement level of fertility) and 4 births and a life expectancy between 65 and 75 years is in the intermediate stage, while a country with a TFR below 2.1 births and a life expectancy of 75 years or higher is in the late-transition stage. Early-transition countries are typically low-income countries, while mid-transition countries are more likely to be in the low- and lower-middle-income group (World Bank, 2016).

Differences in the pace of mortality and fertility decline result in changes in the age structure with significant economic and social implications. In the early-transition stage, the delay of fertility decline following the mortality decline leads to rapid population growth, alongside a large increase in children in successive cohorts and hence a significant rise in youth dependency. At the mid-transition stage, the accelerated decline of fertility brings about a continuous decrease in the size of birth cohorts, leading to a rising share of the working-age population in the total population in comparison to those of dependents. Other things being equal, this change in age structure can boost economic growth on a per capita basis, i.e., roughly one percentage point increase in the labor force equivalent to an increase of one percentage point in per capita income, which is called the "accounting effect" of the demographic dividend (Bloom and Canning, 2008) or the first demographic dividend under the NTA framework (Lee and Mason, 2006).

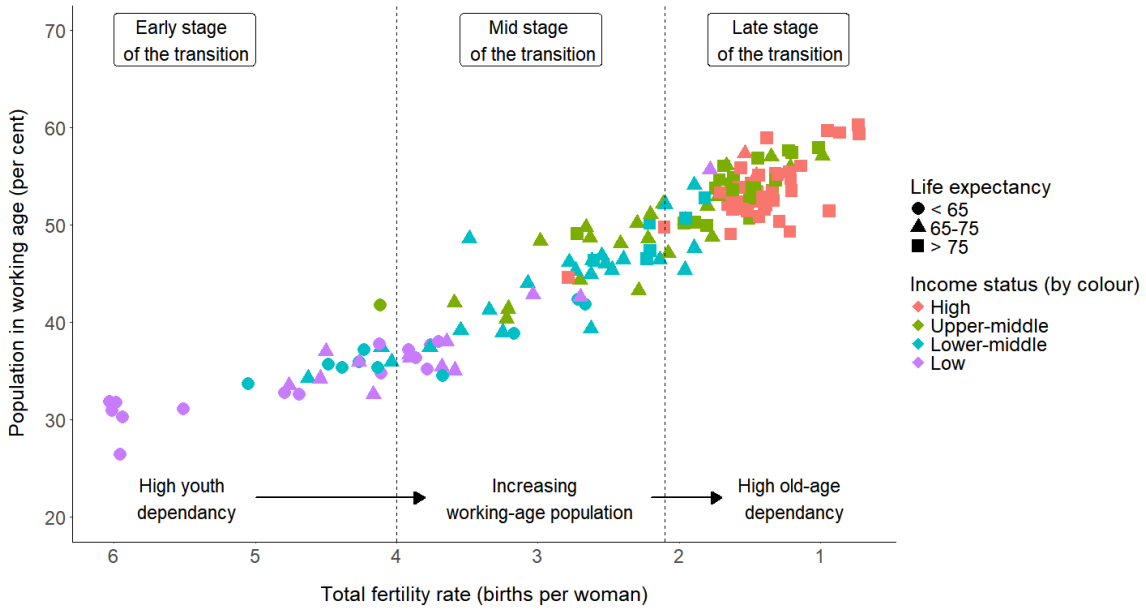
The demographic dividend offers a window of opportunity rather than a guarantee of improved standards of living (Lee and Mason, 2006). However, the actual outcome is determined by how well a country performs in improving human capital while producing decent and productive employment for the continuously growing school- and working-age populations. In addition, a favorable global economic environment, peace and security, supplemented by sustained development assistance, technical cooperation, and capacity-building support are also important. If properly managed, the total realized demographic dividend can be as much as triple that realized from only the changing age structure itself (Canning, 2010). However, if not properly managed, the large share and rapidly increasing number of young people can lead to significant social and economic challenges (Canning, Raja, and Yazbeck, 2015; Growth and May, 2017).

As shown in Figure 1, there is a close association between the level of fertility, share of the working-age population, income status, and life expectancy for countries across different stages of the demographic transition. Although it represents a cross-sectional relationship, it also illustrates the relationship between these variables as a country moves through different stages of the demographic transition. When a country moves to the intermediate stage following fertility falling below 4 births, the share of the prime working-age population increases from about 35 per cent to about 55 per cent, conducive to accelerated economic development. Intuitively, only with fewer children per woman can both the government and households significantly increase investments in human capital formation and job creation for sustained and sustainable economic development. Economic modeling has demonstrated that fertility decline is closely associated with both the increase of investments in human capital and rising female labor force participation (Bloom et al., 2009; Lee and Mason, 2010).

Table 1 presents key indicators of the first dividend for the eight Sustainable Development Goal regions. The total dividend is the ratio of the economic support ratio of the start year to the end year, during which the support ratio positively grows. The annual dividend is the average growth rate of the economic support ratio while the maximum annual dividend refers to that occurred in the year experience the largest increase in the support ratio. Following the approach by Mason et al. (2017), regional support ratios and dividends are calculated as the average of values at the country level within each region. However, this simple average could hide significant variations regarding the onset and duration across countries. Caution is also required when interpreting Europe and Northern America's dividends, as their fertility rates were already low before 1950, and the dividend shown resulted from the post-war baby boom (Mason et al., 2017). Except for

sub-Saharan Africa, which started its first dividend period in the late 1990s, all regions began their dividend periods in the 1970s. While Latin America and the Caribbean, and Central and Southern Asia have dividend periods extending for 60 years or more, other regions have shorter periods varying between 33 years in Australia and New Zealand to 49 years in Oceania, with 46 years in Eastern and South-Eastern Asia and Northern Africa and Western Asia.

Figure 1 Changing age structure across the stages of demographic transition, selected countries, 2024



Source: *World Population Prospects 2024* (United Nations, 2024a) and *World Development Indicator* database (World Bank, 2025).
Notes: Data include 154 countries or areas with population of at least 1 million in 2024, excluding 6 Gulf countries with high levels of labour migrants, namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

Table 1 First demographic dividend by Sustainable Development Goal Regions, 1960-2100

Region	Start year	End year	Duration (year)	Total dividend (percentage)	Average annual dividend (percentage)	Maximum annual dividend (percentage)
Europe and Northern America	1969	2007	38	5.8	0.16	0.42
Eastern and South-Eastern Asia	1970	2016	46	27.0	0.58	0.98
Australia and New Zealand	1971	2004	33	12.2	0.38	0.64
Latin America and the Caribbean	1971	2031	60	27.8	0.46	0.77
Oceania*	1972	2021	49	19.1	0.4	0.73
Northern Africa and Western Asia	1973	2019	46	28.5	0.61	0.77
Central and Southern Asia	1978	2043	65	24.7	0.37	0.94
Sub-Saharan Africa	1998	2094	102	31.5	0.31	0.55

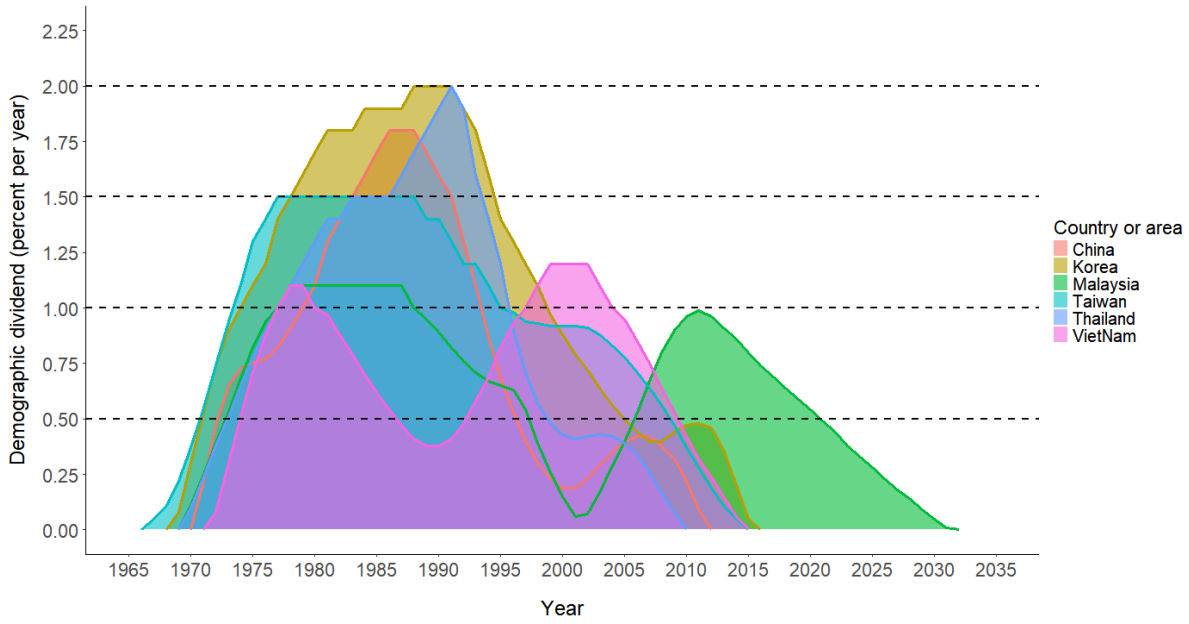
Source: National Transfer Accounts project database (NTA, 2025).
Note: The annual gain is the average annual growth rate of the support ratios while the maximum annual gain is the value when the support ratio experiences the largest growth. * Oceania excludes Australia and New Zealand.

In general, regions with shorter durations are more likely to have a higher average annual dividend and reach a higher maximum annual dividend. In contrast, while sub-Saharan Africa has the

highest total gain and the longest dividend period of over 100 years, its annual gain is rather small, and its maximum annual gain is also very low.

Eastern and South-Eastern Asia as a region enjoyed a demographic dividend with higher annual gains than most regions, achieving the highest maximum annual gain. This is closely associated with the rapid fertility decline and fast demographic transition in this region. In fact, the concept of the demographic dividend was developed based on the successful development stories from countries and areas in this region, including the Republic of Korea and Taiwan Province of China (Bloom, Canning, and Sevilla, 2003). Figure 2 presents the demographic dividend in six selected countries or areas, namely China, Malaysia, the Republic of Korea, Viet Nam, Taiwan Province of China, and Thailand. These countries or areas all experienced rapid fertility decline and quickly completed their demographic transition, despite having diverse socioeconomic and cultural situations and family planning programs. They typically started their dividend period around 1970 and ended in the early 2010s, with a duration lasting four to five decades. One exception is Malaysia, where the dividend period ends in 2035, lasting for 61 years. Accordingly, these countries enjoyed a large demographic dividend, with the maximum annual gain reaching 2 percentage points in the Republic of Korea and Thailand. Even for Malaysia and Viet Nam, their maximum annual dividend contributed over 1 percentage point to their domestic economic growth.

Figure 2 Demographic dividend in selected countries or areas in Eastern and South-Eastern Asia, 1965-2035



Source: National Transfer Accounts database (NTA, 2025).
Note: The demographic dividend values are the annual rates of change of the economic support ratio (percentage per year). These values are positive when the support ratio rises.

The pace of fertility decline and time taken to complete the demographic transition significantly affect both the overall size of the dividend and the maximum annual dividend each country will have. For example, China's first dividend period lasted only 40 years (1971-2011), with fertility declining from 5.5 to 1.7 births during this period. However, its average annual gain and total gain reached 0.85 percentage points and 34 percentage points, respectively. For the Republic of Korea,

its dividend period lasted for 46 years (1969-2015), with an average annual gain of 1.13 percentage points and a total gain of 52 percentage points (annex table A.2).

Table 2 further shows some demographic and economic indicators for these countries and areas when their dividends reached their peak. For China, over a period of 14 years (1979-1993), its fertility declined from 2.8 to 1.7 births per woman, while the corresponding annual dividend contributed on average 0.85 percentage points to economic growth, with the maximum contribution reaching 1.8 percentage points (1986-1988). During this period, its average GDP growth rate reached nearly 10 percent per year. For the Republic of Korea, over an extended period of 24 years (1974-1998), South Korea enjoyed an average annual dividend of 1.13 percentage points, reaching its maximum annual gain of 2 percentage points from 1988 to 1991. Meanwhile, its total fertility rate quickly declined from 3.6 to 1.5 births per woman, and its average GDP growth rate also reached nearly 10 percent per year. Note that the demographic dividend is only one factor contributing to the rapid economic growth in South Korea.

Table 2 Demographic and economic indicators for the period of reaching the peak dividend in selected countries in Eastern and South-Eastern Asia

Country or area	Duration of peak dividend period (year, start and end years)	Average annual dividend (percentage)	Magnitude of fertility decline (births per woman, TFRs of start and end years)	Average annual GDP growth (per cent)
Republic of Korea	24 (1974-1998)	1.13	2.1 (3.6-1.5)	9.7
Taiwan Province, China	21 (1974-1995)	0.96	1.3 (3.1-1.8)	NA
Malaysia	11 (1977-1988)	0.65	0.8 (4.3-3.5)	6.1
Thailand	18 (1977-1995)	0.97	1.2 (3.9-1.9)	7.9
China	14 (1979-1993)	0.85	1.1 (2.8-1.7)	9.8
Viet Nam	9 (1996-2005)	0.73	0.6 (2.5-1.9)	6.9

Source: National Transfer Accounts database (NTA, 2025), *World Population Prospects 2024* (United Nations, 2024a) and *World Development Indicators* database (World Bank, 2025).
Note: The peak demographic dividend period refers to the period when a country reached the highest values of dividend and remained at this level for at least five years in this paper.

Fertility trends and demographic dividend in the LDCs in sub-Saharan Africa

According to the medium scenario of population projections from *World Population Prospects 2024*, the 31 sub-Saharan African LDCs, with a total population of 778 million in 2025, represent just over half of the African population and over 60 per cent of the population in sub-Saharan Africa. Persistently higher levels of fertility and lower levels of survival characterize these countries' demographic situation compared to their counterparts in other regions. The total fertility rate ranges from around 2.5 births per woman in Djibouti and Lesotho to a high level close to 6.0 births in Chad (5.94), Somalia (5.91), and the Democratic Republic of the Congo (5.90). Life expectancy ranges from as low as 55.4 years in Chad to just over 69 years in Eritrea and Senegal. The under-5 mortality rate is still higher than 100 deaths per 1,000 live births in Niger, Nigeria, and Somalia (United Nations, 2024a). While 15 countries are moving to the mid-transition stage in 2025, another 16 countries are still in the early-transition stage (Table 3). To accelerate the demographic transition in LDCs, as recommended by the DPoA, requires both speeding up the

decline of fertility and significantly reducing infant, child, and maternal mortality to improve life expectancy.

Fertility in sub-Saharan Africa did not start to decline until the late 1980s and this decline has been slower than in other regions. This trend has been closely associated with low levels of socioeconomic development, cultural factors, and weak family-planning programs (Bongaarts and Casterline, 2012; Bongaarts, 2020). Fertility decline slowed in many sub-Saharan African countries in the early 2000s (Schoumaker, 2019), due possibly to disruptions in women's education in the 1990s (Kebede, Goujon and Lutz, 2019). However, more recent surveys have reported resumed fertility declines in several countries in the region (The Economist, 2023). Figure 3 presents the projected fertility rates for the 31 countries in 2025 and 2050, respectively. None of these countries reach replacement-level fertility, and even for Lesotho and Djibouti, the two countries with fertility below 3 births, they are still decades away from reaching replacement fertility. On the other hand, among the 16 countries in the early stage of demographic transition, 6 countries still have fertility levels higher than 5 births in 2025.

It is expected that all these countries will move to the mid-transition stage with fertility falling below 4 births per woman by 2050. Only Djibouti is projected to reach below replacement fertility, while Lesotho is approaching the replacement level by 2050. Of these countries, 11 still have fertility levels above 3 births, and the rest of the countries are expected to have their fertility levels falling closer to the replacement level.

Table 3 Sub-Saharan African LDCs by stage of demographic transition and fertility levels, 2025

Countries at the early stage (16)		Countries at the intermediate stage (15)	
TFR >=5 births	**TFR between 4 and 5 births**	**TFR between 3 and 4 births**	**3 births>TFR>2.1 births**
Chad	Angola	Zambia	Lesotho
Somalia	Burundi	Madagascar	Djibouti
Democratic Republic of the Congo	Mozambique	Ethiopia	
Central African Republic	Mauritania	Gambia	
Niger	United Republic of Tanzania	Liberia	
Mali	Benin	Comoros	
	Togo	Senegal	
	Uganda	South Sudan	
	Guinea	Guinea-Bissau	
	Burkina Faso	Eritrea	
		Sierra Leone	
		Rwanda	
		Malawi	

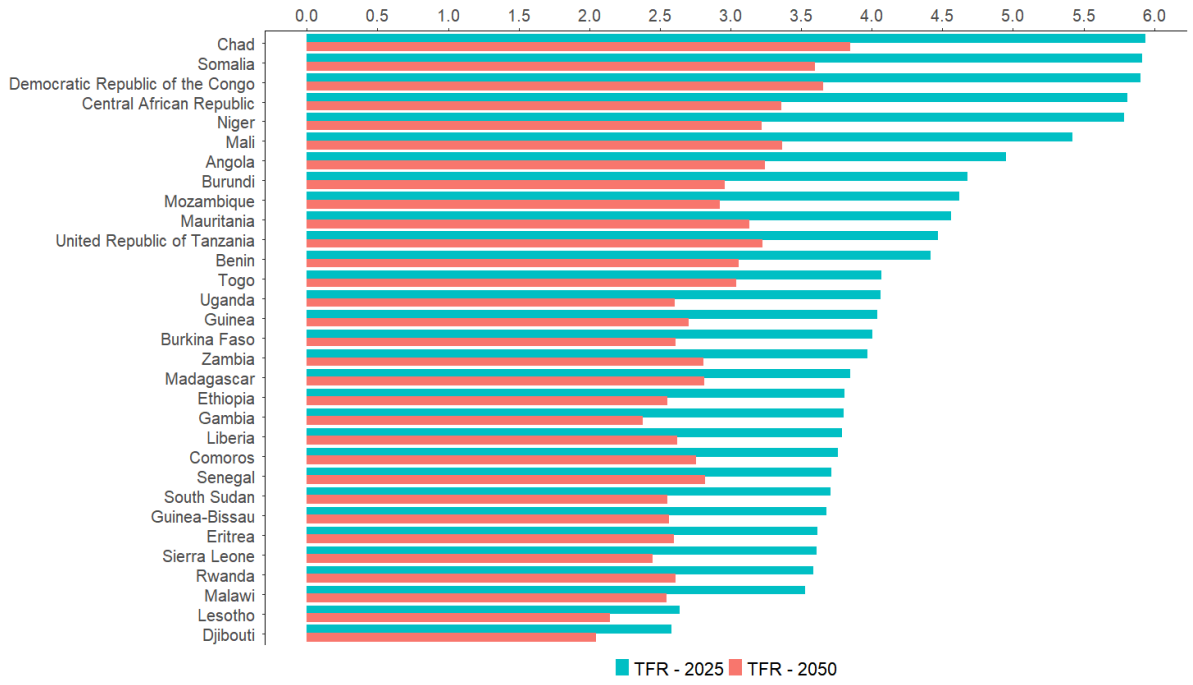
Source: *World Population Prospects 2024* (United Nations, 2024a).

Note: Countries are listed in order of their TFRs for the year 2025.

The current high fertility and slow pace of decline in these countries inevitably impact on their prospects for harnessing the demographic dividend. Figure 4 presents the average size of the demographic dividend for early-transition and mid-transition countries, respectively. For the 15 mid-transition countries, the dividend period started in the mid-1990s and is expected to end in the

early 2080s, with an extended dividend period of 90 years, with a maximum annual gain of just over 0.5 percentage points per year that lasted for only a short period of time before it dropped. For the 16 early-transition countries, the dividend period started just before the turn of the last century but is expected to extend well beyond 2100. Its maximum annual gain is slightly higher than that of the mid-transition countries, reaching between 0.6 and 0.7 percentage points per year from 2030 to 2055. For both groups of countries, their dividend periods are much longer than those of the selected Eastern and South-Eastern Asian countries; however, the average size of their annual gain is much smaller than their Asian counterparts. Caution is required as longer projection horizons increase the uncertainty for the projection outcomes (United Nations, 2024a).

Figure 3 Fertility trends in sub-Saharan African LDCs, 2025 and 2050



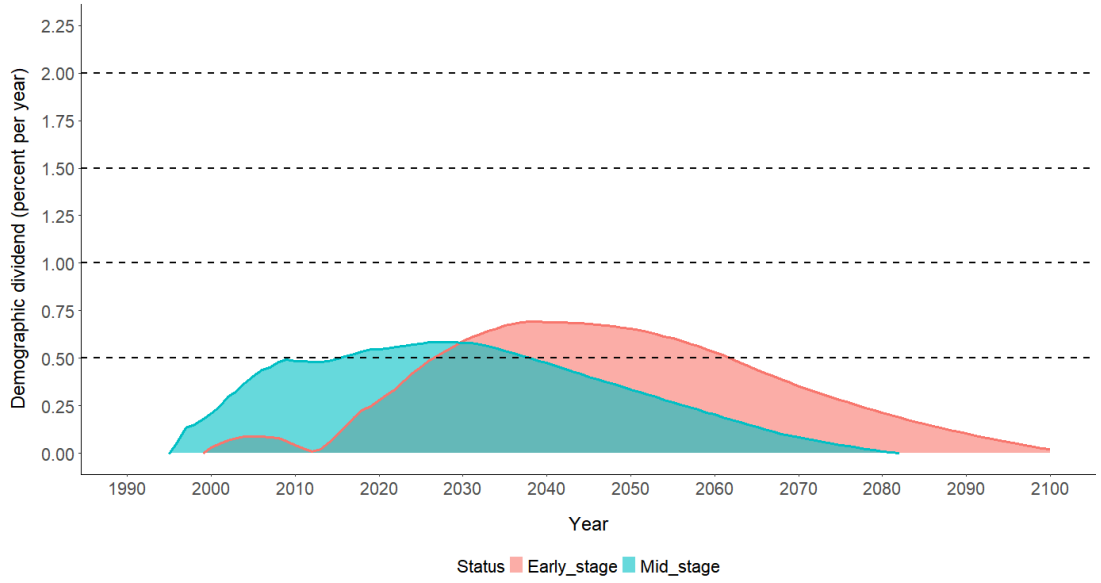
Source: *World Population Prospects 2024* (United Nations, 2024a).

One significant disadvantage for sub-Saharan African LDCs in terms of the demographic dividend is that their high total gain has been diluted by an extended dividend period. With persistently high levels of fertility and rapid population growth, the continuously growing population of children and youth prevents both governments and households from significantly increasing investments in health, education, and job creation. In addition, with growing cohorts of school-age children, it is a challenge to increase enrolment while rather limited to no resources are available to improve quality education. As a result, the small dividend can hardly make meaningful contributions to accelerating economic and social development.

While many factors may contribute to the persistently high fertility in sub-Saharan Africa, high fertility has been closely associated with the low contraceptive prevalence rate in this region (United Nations, 2024b). Bear in mind that the large cohorts of women of reproductive age also suggests that a large size of women are not practicing contraception. As shown in Figure 5, early-transition countries tend to have lower contraceptive prevalence rates, but even in many mid-

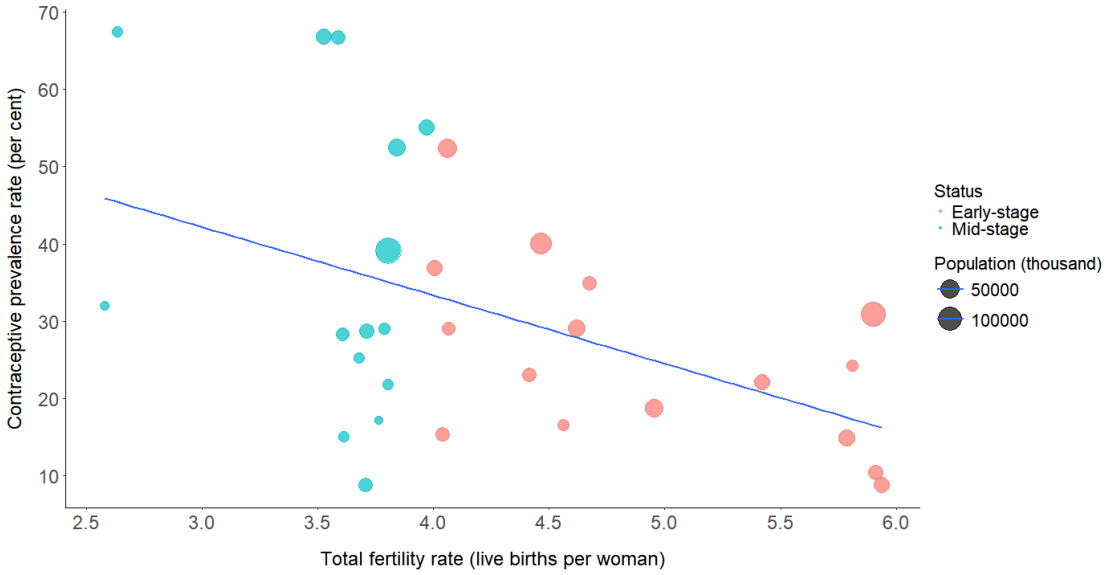
transition countries, these rates are also very low. There is accumulating evidence that both family planning programs and women's education contribute to fertility decline (Bongaarts, 2020; Liu and Raftery, 2020). If sub-Saharan African LDCs can make significant progress in these two aspects, together with progress in further improvement in infant/child and maternal health and job creation, there is still room for a faster fertility decline in the coming decades (Wang, 2017).

Figure 4 Demographic dividend in sub-Saharan African LDCs, by stage of the demographic transition, 1990-2100



Source: National Transfer Accounts project database (NTA, 2025).
Note: Authors' own calculations. The dividends for these two groups are simple average across countries within each group.

Figure 5 Relationship between the contraceptive prevalence rate and total fertility rate in sub-Saharan LDCs, 2025



Source: *World Population Prospects 2024* and *Family Planning Indicators 2024* (United Nations, 2024a, 2024b).

Demographic transition in Sub-Saharan African LDCs: Why Acceleration Matters—Country Case Studies

Based on the stage of their demographic transition and their current level of fertility, six countries were selected to illustrate the relationship between the pace of fertility decline and the size of the demographic dividend expected in LDCs in sub-Saharan Africa. These countries include three early-transition countries: Angola, Niger, and the United Republic of Tanzania, and three mid-transition countries: Ethiopia, Lesotho, and Rwanda. Their fertility levels and share of population by broad age group from 2000 to 2075 are provided in annex figures A.1 and A.2. It is important to note that the demographic transition and the related demographic dividend are shaped by the history, culture, economic and social development of the respective countries, but this analysis focuses on the demographic aspect. Examples of country case studies can be found in the report of the Population Division (United Nations, 2023).

Niger's current fertility rate is 5.8 births per woman. While the country has already seen a significant drop by more than 2 births from nearly 8 births in 2000, Niger is projected to only reach the replacement level towards the end of this century. Angola's fertility is close to 5 births in 2025, but with a slow decline, it is projected to reach replacement fertility well beyond 2100. The fertility rate in the United Republic of Tanzania is about 4.5 births but the country is also expected to reach the replacement level only well beyond 2100.

One common feature of these three countries is the very high youth dependency ratio, the share of children aged 0-14 years in the total population. It is as high as over 40 per cent in 2025, which is projected to gradually drop to about 35 per cent in 2050 and continue to fall to just under 30 percent in 2075. On the other hand, the share of the working-age population will increase from just over 50 per cent of the total population in 2025 to over 60 per cent in 2050 and to about two-thirds in 2075. All these countries are experiencing the dual challenges to accommodate the ever-growing school-age and working-age populations resulting from rapid population growth by expanding investments in health, education, and employment. Another challenge facing these LDCs is the progressive aging of their populations: initially reflected in the absolute number of older persons today, but increasingly in their rising share of the total population in the coming decades. Although the proportion of people aged 65 years and over remains relatively low in many LDCs, some countries, such as Ethiopia and the United Republic of Tanzania, already have sizable older populations, a trend that is expected to accelerate after mid-century (United Nations, 2023).

For the three mid-transition countries, Ethiopia and Rwanda have experienced significant fertility reductions in recent decades, with women having 2.8 and 2.4 fewer births reaching levels of 3.8 and 3.6 births during 2000-2025, respectively. In-spite of these declines, both countries are still expected to take another 50 years to reach replacement-level fertility. Even in the case of Lesotho, where fertility is currently (2025) 2.6 births per woman, it will still take another three decades to reach replacement-level fertility.

The youth dependency ratio in these three countries is lower than that of their counterparts in the early-transition stage, around 38 per cent lower in both Ethiopia and Rwanda and 34 per cent in Lesotho. This share is expected to further reduce to below 30 per cent in 2050 and continue to fall below 25 per cent in 2075. Correspondingly, the share of the working-age population will grow to about two-thirds of the total population by 2050.

Table 4 presents the key indicators for the demographic dividend in the six selected LDCs. All these countries are expected to have an extended period for the first dividend, for example, over 80 years for Lesotho, while extending much longer well beyond 2100 for Angola and the United Republic of Tanzania. Nonetheless, the different levels of fertility and the speed of decline affect the differentials in the size of the dividend. In general, the three early-transition countries have larger dividends due to longer durations compared to those in the mid-transition stages (figure A.3). Since the dividend period in both Niger and Angola is expected to extend well beyond 2100, it is not possible to obtain complete estimates. However, for the period with data available (until 2100), Angola has a longer duration, but smaller annual gain compared to Niger (0.31 versus 0.60 percentage points).

For the three mid-transition countries, it appears that both the total and annual gain are negatively associated with the duration of the dividend period. Although Lesotho has a lower level of fertility and is expected to reach replacement fertility earlier than Rwanda, its longer period does not help it benefit more from the demographic dividend, with an average annual gain of 0.3 percentage point versus Rwanda's 0.45 percentage point. In addition, Rwanda's maximum can reach as high as 1.30 percentage points, similar to the level of countries in the Eastern and South-Eastern Asia region. Compared to Ethiopia, with 77 years of dividend period, Rwanda's shorter duration also leads to more dividend it can enjoy.

Table 4 Indicators for the first demographic dividend, selected sub-Saharan African LDCs, 1990-2100

Country or area	Fertility level		First demographic dividend			
	Total fertility rate in 2025	Year reaching replacement fertility	Duration and timing of the first dividend (year, start and end years)	Maximum annual gain (percentage, year)	Average annual dividend (percentage)	Total dividend (percentage)
Niger	5.8	2092	74 (2026-2100) *	0.91 (2053)	0.60	44.5
Angola	5.0	Beyond 2100	98 (2002-2100) *	0.63 (2042)	0.31	30.0
United Republic of Tanzania	4.5	Beyond 2100	106 (1990-2096)	0.65 (2040)	0.33	35.1
Ethiopia	3.8	2074	77 (2004-2081)	0.68 (2024)	0.37	28.5
Rwanda	3.6	2077	67 (1997-2064)	1.30 (2000)	0.45	30.0
Lesotho	2.6	2054	81 (1991-2072)	0.83 (2011)	0.30	24.7

Source: *National Transfer Accounts* project database (NTA, 2024); *World Population Prospects 2024* (United Nations, 2024a).
Note: ***** The first dividend period in Niger and Angola is expected to extend well beyond 2100, and the calculation of average annual gain is affected by this truncation.

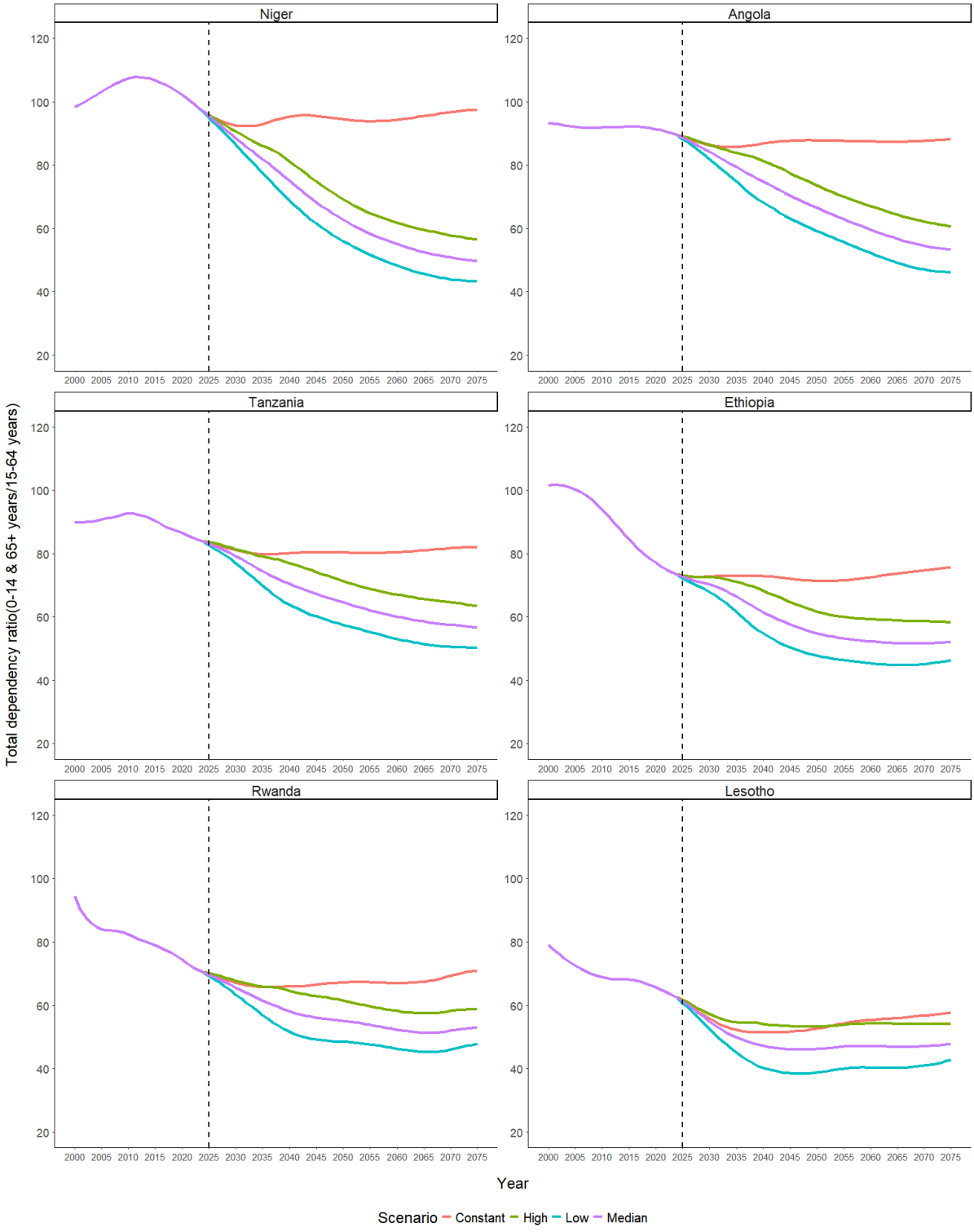
It is well recognized that countries need to increase investments in youth in particular in health and education, including early and advanced education and job training, to harness the demographic dividend. One significant challenge for countries in the early-transition stage is that high levels of fertility and slow decline will produce successive cohorts of similar size and subsequently growing school-age populations, exerting increasing pressure on the education systems. For example, for Niger, Angola, and the United Republic of Tanzania, their school-age populations are expected to increase in the next 25 years by more than 45 per cent for those aged 6-11 years, corresponding to primary education, and 65 per cent for those aged 12-17 years, corresponding to secondary education (annex table A.3). Although sub-Saharan African countries

have made significant progress in improving the primary school enrollment rate, a significant gap remains for the secondary enrollment rate. For example, in Niger in 2017, the net secondary enrollment rate was merely 20 per cent (World Bank, 2025). In addition, it is also a significant challenge to maintain the completion rate and the quality of education.

For the three mid-transition countries, the pressure to increase investments in education is smaller than that in early-transition countries. However, except for Lesotho, which will experience a decline in school-age populations by 2050, both Ethiopia and Rwanda are expected to see more than a 25 per cent increase in the absolute numbers of school-age population between 6 and 11 years and more than a 30 per cent increase for those aged 12-17 years. Again, significant efforts are required to improve the secondary school enrollment rate as well as to enhance the quality of the education provided, as these rates are still very low, e.g., 31 per cent in Ethiopia in 2015 and 36 per cent in Rwanda in 2018 (World Bank, 2025). On the other hand, all these countries have a high share of young people aged 15-24 years not in education, employment, or training (NEET), for example, as high as 21 per cent in Angola, 25 per cent in Lesotho, and 28 per cent in Rwanda in 2023 (World Bank, 2025).

Population projections in *World Population Prospects 2024* also provided illustrative outcomes under different fertility scenarios. These scenarios can help us better understand what would happen to the population size and age structure in each country if the speed of fertility decline were to accelerate or decelerate in the future. Figure 6 presents various total dependency ratios, the ratio of the population aged 0-14 years and 65 years and over to those aged 15-64 years, in the six selected countries under four fertility scenarios: the medium variant, high fertility variant, low fertility variant, and constant fertility variant. In all countries, the low-fertility scenario, i.e., 0.5 fewer births per woman than the fertility level in 2024, would result in a lower dependency ratio. In contrast, the high-fertility scenario, i.e., 0.5 more births per woman than the fertility level in 2024, would result in a higher dependency ratio, except for Lesotho, which already has lower fertility. However, because all these countries are expected to have continuous fertility decline, the constant fertility variant would lead to the highest total dependency ratio. All these scenarios clearly demonstrate that the faster the fertility decline, the lower the dependency ratio, particularly the youth dependency, which can help countries enjoy more demographic dividend in a shorter span to provide more boost to economic development.

Figure 6 Total dependency ratio under different fertility scenarios, selected sub-Saharan African LDCs, 2000-2075



Source: *World Population Prospects 2024* (United Nations, 2024a).

Discussions and policy implications

Countries going through the demographic transition will experience stages where the population age structure is dominated by high youth dependency ratio in the beginning and population aging in the end, with an intermediate stage characterized by a concentration of the population in the working ages, favorable for accelerated economic development for several decades. While all countries will be presented with a demographic dividend to varying degrees, not every country can successfully harness this window of opportunity. Success depends on how well a country improves human capital while producing employment to accommodate the growing school- and working-age populations. For example, many countries or areas in Eastern and South-Eastern Asia achieved remarkable economic development, but most countries in Latin America and the Caribbean missed this opportunity due to domestic policy deficiencies and unfavorable international conditions (Bloom and Canning, 2008).

It is desirable for low- and lower-middle-income countries to maximize the dividend to develop economically, which also helps them better prepare for the inevitable population aging in the long run. Governments of sub-Saharan African LDCs have produced roadmaps with ambitious development goals supported by holistic policies in education, employment, and health. Nonetheless, less attention has been given to the dividend itself, such as its potential annual boost to economic growth and the duration of this favorable period. These questions are crucial in sub-Saharan Africa as its fertility transition started later and at a slower pace compared to other regions.

This paper shows a close association between the stage of the demographic transition, the pace of fertility decline, and demographic dividend at both regional and country levels. Regions with a longer duration for the dividend will have an overall larger dividend but a smaller annual gain, and vice versa. Eastern and South-Eastern Asia and sub-Saharan Africa represent two extremes. Some countries, such as China and the Republic of Korea, reached very high dividends close to 2 percentage points per year for a certain period due to fast fertility decline while achieving rapid economic growth. For LDCs in both the early- and mid-transition stages, the long dividend period arising from slow fertility decline leads to a small dividend of merely 0.35 percentage points annually. This fact has made some demographers concerned that the slow demographic transition in sub-Saharan Africa may not significantly contribute to economic growth in many countries (Canning, Raja, and Yazbeck, 2015; Cleland and Machiyama, 2017).

The case studies of six selected sub-Saharan African LDCs further illustrate the necessity for accelerating the demographic transition, not only in fertility reduction through investing in sexual and reproductive health and family planning but also in survival improvement, including reducing infant and child mortality and maternal mortality to improve life expectancy. Despite continuous fertility decline projected into the future, even the country with the lowest fertility in this group, Lesotho, is still three decades away from reaching replacement level fertility. For all countries reviewed in this paper, particularly those in the early-transition stage, continuously growing youth cohorts and school-age population will parallel the rising share of the working-age population. As a result, governments in sub-Saharan African LDCs constantly face dual challenges: investing in human capital formation and employment opportunities as well for the continuously growing school-age and working-age populations. However, it is equally important for these countries to continuously invest in family planning to increase contraceptive prevalence to provide couples with the means to determine the timing, number and spacing of births. The projected total

dependency ratios under different fertility scenarios for these countries clearly illustrate the significant impact of fertility decline on the changes in age structure. There is cumulative evidence that both education and family planning programmes contribute to fertility decline, which enable women and their partners to determine the timing, number and spacing of their children and have the means to do so. Governments in sub-Saharan African LDCs still have much room to speed up fertility decline and maximize the demographic dividend for accelerated economic development.

There has been concern that it may be tempting for some governments to strengthen family planning programs through setting targets to speed up fertility decline for economic justification only (Hilbig, Loichinger, and Köppen, 2022; Foley, 2022). However, the adoption of the Programme of Action of the International Conference on Population and Development by 174 Member States in Cairo, Egypt, in 1994 represents a paradigm shift in international family planning programmes, for which all countries agreed that it must be people-centered, human rights-based, and protect individuals' autonomy. In fact, the high level of fertility in sub-Saharan African LDCs reflects the continued need for advancement of women through education, participation in the labour market, among others, the slow progress in empowering women and achieving gender equality, and insufficient progress in ensuring universal access to sexual and reproductive healthcare services, including family planning as set in the SDG target 3.7. Government policies to address all these challenges will help women and their partners realize reproductive preferences, and in the long run, help reduce fertility and at the country level, help accelerate the demographic transition to maximize the demographic dividend.

With a favourable age structure, all LDCs can benefit from multiple opportunities to advance their economies and improve living standards. Examples are the mechanization of agricultural production and the development of value-added industries and manufacturing which contribute to faster economic growth. Trade, regional integration and incentives for foreign direct investment can further support development while investment in infrastructure and support for entrepreneurship can create jobs and foster innovation. Strengthening governance and the rule of law can lay a foundation for building trust with domestic and foreign investors. In addition, international support and partnerships with donor countries and multilateral development agencies play an important role in advancing the economic and social development of LDCs.

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Appendix

Table A.1 Key demographic indicators for sub-Saharan African LDCs, 2025-2050

Country or area	Total population (thousands)		Total fertility rate (births per woman)		Contraceptive prevalence	Unmet need for family planning (per cent)	Life expectancy at birth (years)		Share of working-age population (15-64 years)	
	2025	2050	2025	2050	2025	2025	2025	2050	2025	2050
Angola	39,040	74,295	4.95	3.24	18.8	35.9	65.0	68.8	52.8	61.1
Burundi	14,390	24,132	4.68	2.96	34.9	29.7	64.0	67.6	52.8	62.7
Central African Republic	5,513	10,617	5.81	3.36	24.3	30.5	57.9	63.4	48.8	61.9
Chad	21,004	38,858	5.94	3.85	8.8	25.5	55.4	59.2	51.8	60.1
Comoros	883	1,308	3.76	2.76	17.2	36.1	67.2	72.1	58.4	64.0
Democratic Republic of the Congo	112,832	218,246	5.90	3.66	30.9	37.9	62.2	66.0	50.9	60.2
Benin	14,814	24,434	4.42	3.06	23	33.3	61.1	64.9	55.3	62.9
Ethiopia	135,472	225,022	3.81	2.55	39.1	21.8	67.9	73.3	57.7	65.2
Eritrea	3,607	5,696	3.61	2.60	15	28.9	69.2	74.2	57.7	65.3
Djibouti	1,184	1,531	2.58	2.05	32	25.7	66.4	70.8	66.0	67.1
Gambia	2,822	4,302	3.80	2.38	21.8	25.3	66.3	70.2	56.7	66.8
Guinea	15,100	23,405	4.04	2.70	15.3	23.5	61.1	64.7	55.6	65.2
Lesotho	2,363	2,993	2.64	2.15	67.4	14.2	58.2	66.0	61.6	68.1
Liberia	5,731	8,911	3.79	2.62	29.1	30.9	62.5	65.8	57.2	65.5
Madagascar	32,741	53,185	3.85	2.82	52.4	20.1	64.0	68.3	57.3	64.0
Malawi	22,216	37,362	3.53	2.55	66.8	14.6	67.7	71.7	56.7	65.2
Mali	25,199	46,154	5.42	3.37	22.1	23.9	60.9	65.4	51.5	61.2
Mauritania	5,315	9,416	4.56	3.14	16.6	31.3	68.9	73.5	54.1	62.4
Mozambique	35,632	63,531	4.62	2.92	29.1	26.2	64.0	67.8	52.8	63.2
Niger	27,918	52,514	5.79	3.22	14.9	20.6	61.7	66.5	50.8	62.8
Guinea-Bissau	2,250	3,439	3.68	2.56	25.2	19.6	64.4	68.0	58.0	65.8
Rwanda	14,569	22,708	3.59	2.61	66.6	17.2	68.2	72.8	58.7	64.9
Senegal	18,932	30,365	3.71	2.82	28.7	20.4	69.2	73.8	58.2	64.6
Sierra Leone	8,820	12,948	3.61	2.45	28.3	23.6	62.2	66.0	58.7	66.9
Somalia	19,655	37,207	5.91	3.60	10.5	34	59.1	62.6	50.8	60.7
South Sudan	12,189	18,342	3.71	2.55	8.8	29.8	57.9	60.8	58.1	66.1
Togo	9,722	15,585	4.07	3.04	29	31.2	63.1	67.4	57.3	62.6
Uganda	51,385	85,431	4.06	2.61	52.3	26	68.7	73.4	54.3	65.4
United Republic of Tanzania	70,546	129,621	4.47	3.23	40.1	26.1	67.4	71.8	54.4	61.5
Burkina Faso	24,075	37,304	4.01	2.61	36.8	17.9	61.5	65.5	55.5	65.9
Zambia	21,914	38,083	3.97	2.81	55	19.4	66.7	70.5	56.6	63.8

Source: *World Population Prospects 2024* and *Estimates and Projections of Family Planning Indicators 2024* (United Nations, 2024a, 2024b).

Note: Unmet need for family planning refers to any modern method to married in union women aged 15-49 years.

Table A.2 Duration and size of the demographic dividend in selected countries or areas in Eastern and South-Eastern Asia, by the year reaching replacement fertility, 1965-2035

Country or area	Year reaching replacement fertility	Duration of dividend period (year, start and end years)	Total dividend (percentage)	Average annual dividend (per centage)	Maximum annual dividend (per centage)
Republic of Korea	1983	46 (1969-2015)	51.9	1.13	2.0
Taiwan Province, China	1984	47 (1967-2014)	45.1	0.96	1.5
Thailand	1990	39 (1970-2009)	37.8	0.97	2.0
China	1991	40 (1971-2011)	34.4	0.85	1.8
Viet Nam	1998	42 (1972-2014)	30.7	0.73	1.2
Malaysia	2013	61 (1969-2031)	39.2	0.65	1.1

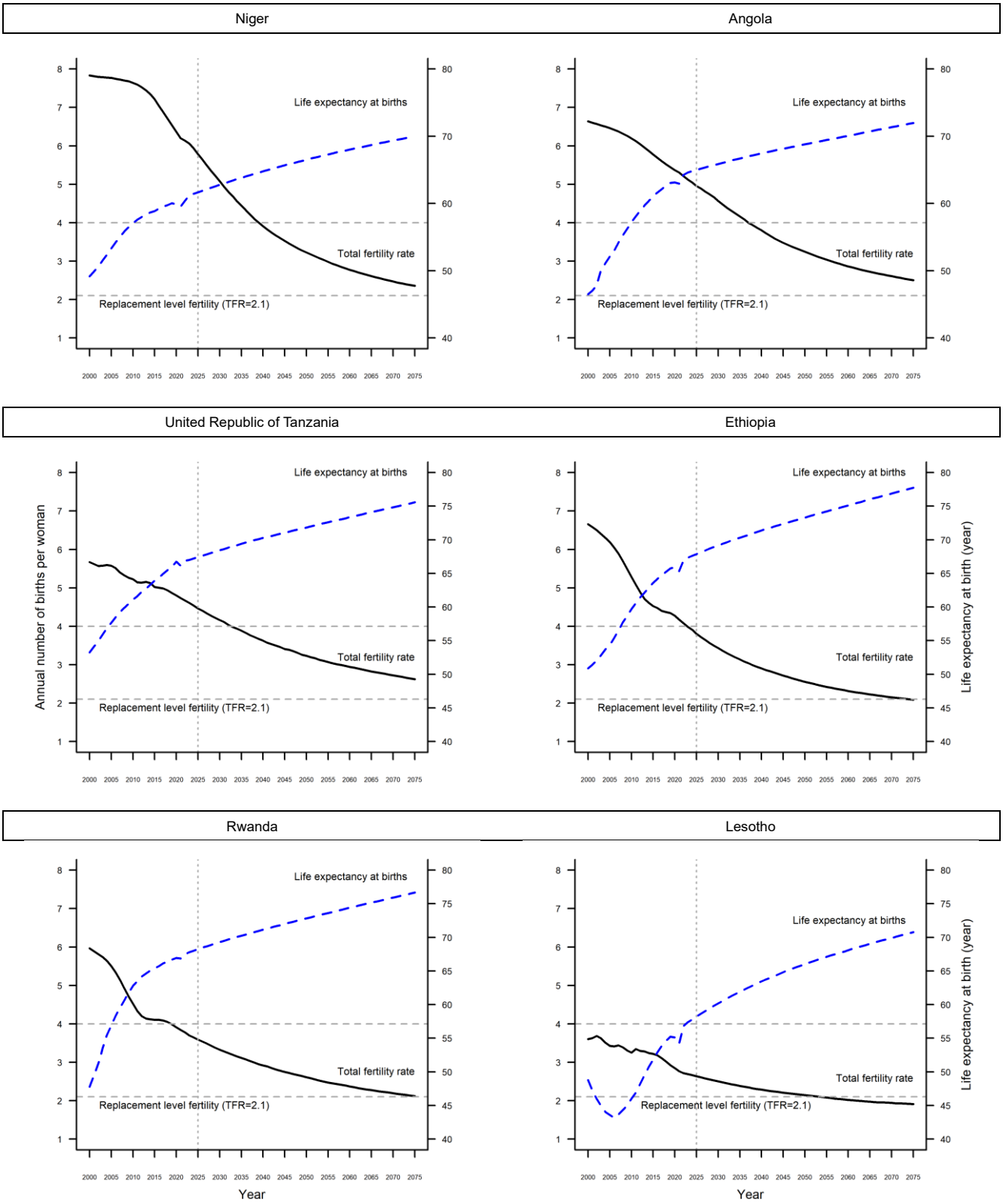
Source: National Transfer Accounts database (NTA, 2025).
Note: The total dividend is the cumulative growth rates of economic support ratios from the beginning to the end of the dividend period. The average annual dividend is the annualized growth rate of the economic support ratio over the dividend period.

Table A.3 Projected number of school-age and working-age populations (in thousands) in selected sub-Saharan African LDCs, 2025-2075

Country	2025	2050	Absolute change 2025-2050	Per cent change 2025-2050
School-age population between the ages of 6 and 11 years				
Niger	4,933	7,219	2,286	46.3
Angola	6,624	10,479	3,855	58.2
United Republic of Tanzania	11,537	17,680	6,143	53.2
Ethiopia	20,044	26,737	6,693	33.4
Rwanda	2,132	2,661	529	24.8
Lesotho	330	309	-21	-6.4
School-age population between the ages of 12 and 17 years				
Niger	4,167	6,854	2,687	64.5
Angola	5,525	9,600	4,075	73.8
United Republic of Tanzania	9,666	16,215	6,549	67.8
Ethiopia	18,056	25,601	7,545	41.8
Rwanda	1,934	2,551	617	31.9
Lesotho	312	308	-4	-1.3
School-age population between the ages of 18 and 23 years				
Niger	4,167	6,854	2,687	64.5
Angola	5,525	9,600	4,075	73.8
United Republic of Tanzania	9,666	16,215	6,549	67.8
Ethiopia	18,056	25,601	7,545	41.8
Rwanda	1,934	2,551	617	31.9
Lesotho	312	308	-4	-1.3

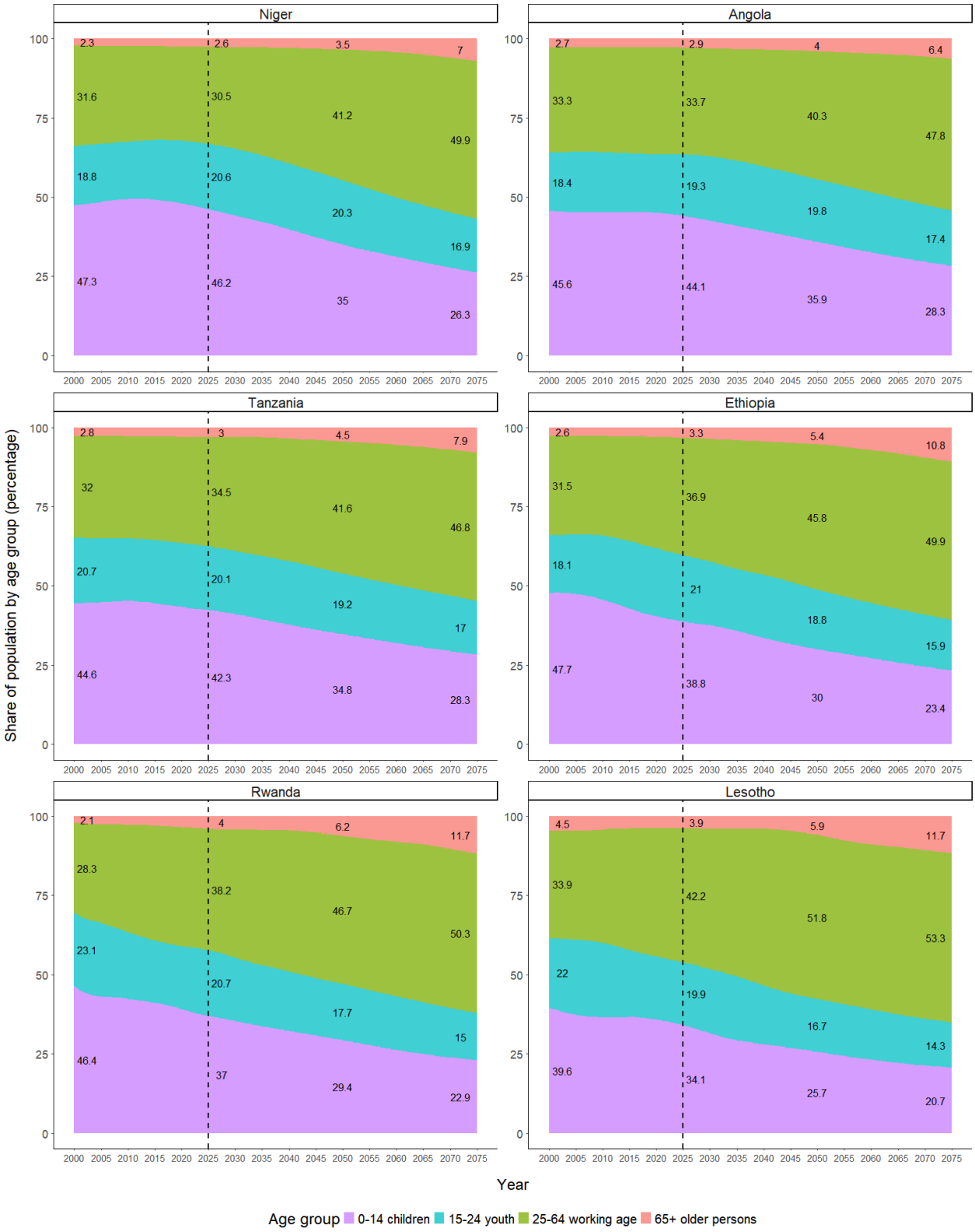
Source: *World Population Prospects 2024* (United Nations, 2024a).

Figure A.1 Total fertility rate in selected sub-Saharan LDCs, 2000-2075



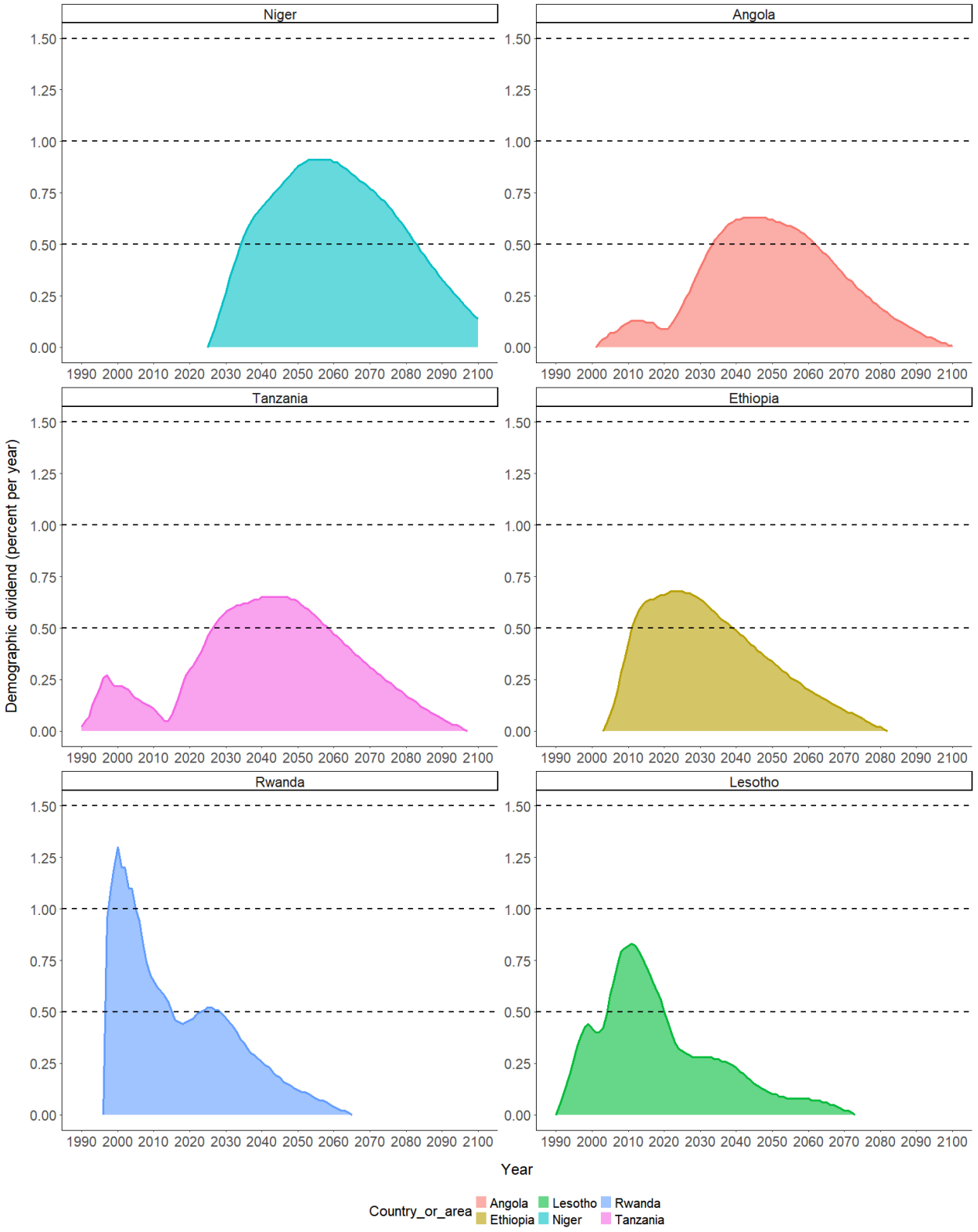
Source: *World Population Prospects 2024* (United Nations, 2024a).

Figure A.2 Share of population by broad age group in selected sub-Saharan LDCs, 2000-2075



Source: *World Population Prospects 2024* (United Nations, 2024a).

Figure A.3 Demographic dividend in selected sub-Saharan LDCs, 1990-2100



Source: *National Transfer Accounts* database (NTA, 2025).