Demographic Transformation and Socio-Economic Development 6

Roberta Pace
Roberto Ham-Chande *Editors*

Demographic Dividends: Emerging Challenges and Policy Implications

Springer

Demographic Transformation and Socio-Economic Development

Volume 6

Editors-in-chief: Yves Charbit and Ian Pool

This dynamic series builds on the population and development paradigms of recent decades and provides an authoritative platform for the analysis of empirical results that map new territory in this highly active field. Its constituent volumes are set in the context of unprecedented demographic changes in both the developed—and developing—world, changes that include startling urbanization and rapidly aging populations. Offering unprecedented detail on leading-edge methodologies, as well as the theory underpinning them, the collection will benefit the wider scholarly community with a full reckoning of emerging topics and the creative interplay between them.

The series focuses on key contemporary issues that evince a sea-change in the nexus of demographics and economics, eschewing standard 'populationist' theories centered on numerical growth in favor of more complex assessments that factor in additional data, for example on epidemiology or the shifting nature of the labor force. It aims to explore the obstacles to economic development that originate in high-growth populations and the disjunction of population change and food security. Where other studies have defined the 'economy' more narrowly, this series recognizes the potency of social and cultural influences in shaping development and acknowledges demographic change as a cause, as well as an effect, of broader shifts in society. It is also intended as a forum for methodological and conceptual innovation in analyzing the links between population and development, from finely tuned anthropological studies to global, systemic phenomena such as the 'demographic dividend'. Reflecting the boundary-blurring rapidity of developing nations' socio-economic rise, the editors are actively seeking studies relating to this sector, and also to Russia and the former Soviet states. At the same time as addressing their underrepresentation in the literature, the series also recognizes the critical significance of globalization, and will feature material on the developed world and on global migration. It provides everyone from geographers to economists and policy makers with a state-of-the-art appraisal of our understanding of demographics and development.

More information about this series at http://www.springer.com/series/8813

Roberta Pace • Roberto Ham-Chande
Editors

Demographic Dividends: Emerging Challenges and Policy Implications

Springer

Editors
Roberta Pace
Università degli Studi di Bari "Aldo Moro"
Bari, Italy

Roberto Ham-Chande
Department of Population Studies
El Colegio de la Frontera Norte
Tijuana, Baja California, Mexico

Demographic Transformation and Socio-Economic Development
ISBN 978-3-319-32707-5 ISBN 978-3-319-32709-9 (eBook)
DOI 10.1007/978-3-319-32709-9

Library of Congress Control Number: 2016945254

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG Switzerland

Contents

Introduction

This book aims at presenting different approaches to the study of demographic dividends (DemDiv). Globally, demographic transitions are associated with diverse socio-economic contexts and timing, thus resulting in different DemDiv paths.

Fertility decline impacts on age structures, thereby increasing the proportion of the population in working age. Changes in projected age structures potentially reduce the economic burden of the population ageing, thus suggesting a demographic window of opportunity to improve socio-economic development. The largest effect of changes in age structure for the coming decades will not be the decrease of young population (aged 0–14) and the rise of elderly population (aged 65 and over), but rather the increased share of population aged 15–64. Initially, this proxy of the demographic window dynamics results both in a decrease of the population aged 0–14 due to a fall in fertility rates and in an increase of the population aged 15–64 due to higher survival rates. Additionally, there is an expected high participation of the elderly population (aged 65 and over).

However, such a window of opportunity has a time limit related to an anticipated age distribution that is leading to increasingly ageing societies. Because of its temporary presence, this window becomes a *demographic bonus* only if society and government truly commit to taking advantage of it from the DemDiv. Otherwise, if the window closes without proper improvements, the social and economic structure will not be able to meet the needs due to unavoidable demographic ageing.

- DemDiv are divided in two parts. The first is achieved through the appropriate education, healthcare and employment of a large portion of population in working age provided by the demographic window. It should include the generation of savings and investments intended to create social and economic infrastructures to warrant sustainable economic growth, social progress and health improvement.

- The first dividend does not depend solely upon the age structure. It requires the existence and updating of basic socio-economic conditions, the main one of them being education. Only an educated and well-trained population might build the required economic and social setup.[1]
- The second dividend depends on the success of the first and aims at strengthening the economic, social and political structure by allowing long-term sustainability. In this second dividend, it is crucial to consider the demands and costs of the growing and irreversible trend of ageing population.
- This scheme is a call for those societies that are in an earlier stage of the demographic transition (DT), suggesting strategies and policies that might facilitate their socio-economic development and increase their capability of coping with a future demographic ageing. Where the DT has been completed (such as in developed countries) or is in an advanced stage (as it is occurring in middle-income countries), the potential of the DemDiv is not always clear, sometimes to the point that the DemDiv has been, or is being, wasted.

Complexities might take another step. For example, in the case of socio-economic heterogeneity, it is usual for multiple DTs to occur simultaneously. In Chap. 6 of this book, Jackson illustrates the earlier DT of the European-origin population in New Zealand as compared to the late DT of the minority indigenous Maori, which provides an opportunity to introduce the concept of a collateral DemDiv.

Since the simple demographic window does not guarantee a DemDiv, attention should now be focused on the ability of each nation or society to implement conditions required by the DemDiv, which are not different from regular development policies.

- A first task would be to determine the stage of the DT. The greatest potential is in late-DT countries, and this potential vanishes as DT advances if the first DemDiv is not developed.
- In building the first DemDiv, an essential strategy is the promotion of education and health of the young population. Such interventions should include prenatal and maternal care.
- Saving should not be restricted to speculative finance or public debt, but should consist of economically wise investments designed to promote employment and productivity.
- In order to achieve long-term sustainability, savings, investments and policy making should consider technological changes and the equitable distribution of wealth.
- Although the demographic dividend is simple and straightforward, it actually requires actions not easy to be accomplished. In middle-income countries, important resources are being diverted from the appropriate investments because of tax evasion, financial greed, labour union perks and political pressures.

[1] Crespo Cuaresma, Jesús, Wolfgang Lutz, and Warren Sanderson. 2014. Is the Demographic Dividend an Education Dividend? *Demography* 51:299–315.

- Intergenerational transfers are the core of the DemDiv. The dynamics of population age structures should be complemented by clear social and economic relationships with the potential to be sustainable.
- The DemDiv requires economic growth, but in its current format economic growth exerts a pressure on the environment. Such important constraints urgently necessitate taking into account the limits to growth. The rationale most surely will require curbing growth and changing consumption styles in order to allow fairness in wealth distribution.
- The second DemDiv attempts to obtain the best for the long-term future. Short-term projections should describe feasible enough futures to be practical in terms of programmes and budgeting. For the long term, it is always wise to take into consideration the unpredictability of the future. In any case, the approach is not about forecasting but rather pondering scenarios as a function of hypotheses, using variables that can be controlled and that have clear consequences in the long term.

It follows that countries should capitalise on DemDiv opportunities first by reducing fertility if it remains too high. The strategy should be to invest heavily in education programmes, training programmes for the population in working age, health programmes and the creation of accessible healthcare systems. Education and training programmes, however, do not necessarily create the conditions for an increase in the employment rate of the population. Similarly, the increase of labour productivity does not necessarily imply an increase in total factor productivity and amount of wealth created. It is known that the intensification of girls' education is not neutral with respect to changes in fertility and, consequently, in the age structure, as it is reported by Miller et al. in Chap. 2. Moreover, the development of an efficient healthcare system that results in increased life expectancy depends on the age of the main beneficiary groups. In any case, any policy adopted is far from being without effect on the long-term evolution of the age structure.

The dynamics of the world's economic changes have been particularly significant in the last two decades. This period has been characterised by rapid growth and sustained improvements in economic, demographic and health factors in middle-income countries.

A focus on India as one of the BRICS countries (Brazil, Russia, India, China and South Africa) – whose economies are particularly relevant also because they are expected to continue to expand in the foreseeable future – is offered by Anrudh Jain in Chap. 1. He reflects on the power of policies that contribute to fertility transition and create the right kind of environment to profit from the DemDiv. He outlines that the assimilation of an increasingly youthful population into the workforce requires a heavy investment in education, while maintaining productivity levels. India has become an archetypal case where the opening of the demographic window depends heavily on fertility decline, which passed from a total fertility rate of about 6–2.4 between 1960 and 2011. However, both the timing and pace of such a decline have not been homogeneous across Indian States. Indeed, in the South, earlier investments made in social development have stimulated earlier fertility transitions and

now this area can count on a better-educated labour force that propels the region into a faster track of economic growth. On the other hand, Jain asserts that the Northern States did not invest adequately in social development and are now lagging behind in both fertility transition and labour force quality. This implies that Indian Northern States do not have a DemDiv to reap.

Turning to Latin America as another huge and heterogeneous area, Tim Miller, Paulo Saad and Ciro Martínez propose a very interesting approach in Chap. 2. They found a very close relationship between, on the one hand, demographic dynamics and changes in reproductive behaviour, and on the other, a noticeable increase in the number of women participating in economic activities. It is enlightening to read the comparisons with some northern European countries that have achieved higher levels of gender equality in their labour markets, with a female-to-male participation rate bordering on 90 %. This chapter is an attempt to raise awareness and knowledge in Latin America to properly assess the economic impact of demographic changes and incorporate a gender-based approach to sustainable development and poverty reduction policies. Differential analyses, as in the case of gender, offer an important contribution to the DemDiv debate, since its major axioms are based on a population divided into age groups dealing with different economic and social roles and expectations.

Isalia Nava-Bolaños and Roberto Ham-Chande in Chap. 3 focus their analysis on Mexico, proposing that children require intensive investments in healthcare, nutrition and education; prime-age adults need jobs that provide surplus income to create savings; and the elderly need support for healthcare and retirement income. In this sense, an age structure with a concentration of prime-age adults reduces the dependency ratio and can be regarded as the opening of the demographic window. This chapter describes the life-cycle income, consumption and saving patterns of Mexican households following a structure of the life-cycle divided into three major phases defined by biological and physical features of childhood, adulthood and old age. This three-stage scheme depicts an age profile of income, consumption and saving that change at each step of the life cycle, giving special attention to links between demographic dynamics and savings in the aggregate economy.

A long-term perspective is given by Yoonjoung Choi in Chap. 4 across projected changes in the population age structure through the year 2100 in Sub-Saharan Africa. Different age structure patterns determine the pre-conditions for the DemDiv. There is an interesting comparison among different patterns of changes in the age structure that can be observed in other less-developed regions all over the world. The measures used are the estimation of demographic windows in terms of opportunities for investment and for benefiting from an economically favourable age structure. In order to capitalise the potential DemDiv, immediate opportunities are identified which will allow health and education improvements, as well as developing and implementing economic policies to respond to the increasing size of the population in working age.

Noteworthy insights emerge from a long-term analysis reported by Maria Carella and Alain Parant in Chap. 5. The focus is on the Mediterranean, considering simultaneously countries that have experienced dissimilar transitional processes and the

demographic transformation in age structure. It is an analysis of the evolution of the population dynamic components (fertility, mortality and migration) over the past 60 years. For each country, estimates are made regarding the opening and closing timing of the demographic window, including feasible future demographic windows for countries with a delayed DT.

A fresh and original approach based on the concept of potential DemDiv has been tackled by Natalie Jackson in Chap. 6. It includes demographic key features of indigenous and non-indigenous populations. In this case, the differential in the age structure is the result of different stages of the DT. The comparison is conducted inside the three Anglo-Celtic Settler countries of New Zealand, Australia and Canada. The idea of 'collateral dividend' is introduced when relatively youthful minority populations, such as Maori, and Australian and Canadian Aboriginals, co-exist alongside the mainstream and older European-origin populations, who are already old and are heading for retirement, and are thus in need of the second DemDiv.

Finally, Chap. 7 by Roberta Pace and Nadia Mignolli represents a long-term historical analysis. It submits a different interpretation of the implications that the DemDiv might suggest for a country that completed its demographic transition at the beginning of 1970s. The empirical evidence is on Italy where the transition from stagnation to a period of sustained growth, common to all developed countries, can be explained by the DT. The transitional pathways observed in the four Italian geographical areas (North-west, North-east, Centre and the so-called *Mezzogiorno* corresponding to the South and the two main Italian Islands) lead to an interpretation according to the different economic developments that have always characterised the different regions of the country. Through the examination of some of the great changes that took place during the nineteenth and twentieth centuries, which determined the passage from a rural society to the start of a progressive industrialisation, it can be seen how demographic transition has played an important role in these epochal changes.

Acknowledgement English text revision by Laura Peci, technical expert of the Italian National Institute of Statistics – ISTAT.

Università degli Studi di Bari "Aldo Moro" Roberta Pace
Bari, Italy
Colegio de la Frontera del Norte Roberto Ham-Chande
Tijuana, Mexico

Chapter 1
The Common Link Between Policies Conducive to Both the Demographic Dividend and Fertility Transition

Anrudh K. Jain

1.1 Introduction

Sustained fertility decline in a country changes its age structure by reducing the proportion of population in the young dependent ages and increasing the proportion of the adult population of productive ages. Demographic dividend refers to the faster economic growth made possible by these changes, especially by the increase in the proportion of adults of productive ages (Bloom et al. 2003). It might be useful to think of the demographic dividend as a two-step process. First, a window of opportunity is created by sustained fertility decline; second, this opportunity is translated into fast economic growth. Similarly, it might be useful to distinguish between policies that help to create the window of opportunity through fertility decline and policies that help to transform this opportunity into faster economic growth. Bloom et al. (2003) noted that the realization of the demographic dividend requires the right kind of environment in the areas of public health, family planning, education, and economic policies. Interestingly, some of these policies have to be in place in order for fertility decline to occur in the first place.

Early investment in education and health appears to be the common link between policies conducive to both fertility reduction and the realization of the demographic dividend. Figure 1.1 illustrates this common link. As discussed below, such policies contribute to fertility decline by creating a favorable social setting for girls when they enter their reproductive ages and also contribute to the realization of demographic dividend by improving the quality of the labor force when the window of opportunity is created.

Fertility has declined and can decline under various conditions, i.e., there is no unique set of prerequisite conditions necessary for fertility to decline. We know that

A.K. Jain (✉)
Distinguished Scholar, Population Council, New York, USA
e-mail: ajain@popcouncil.org

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9_1

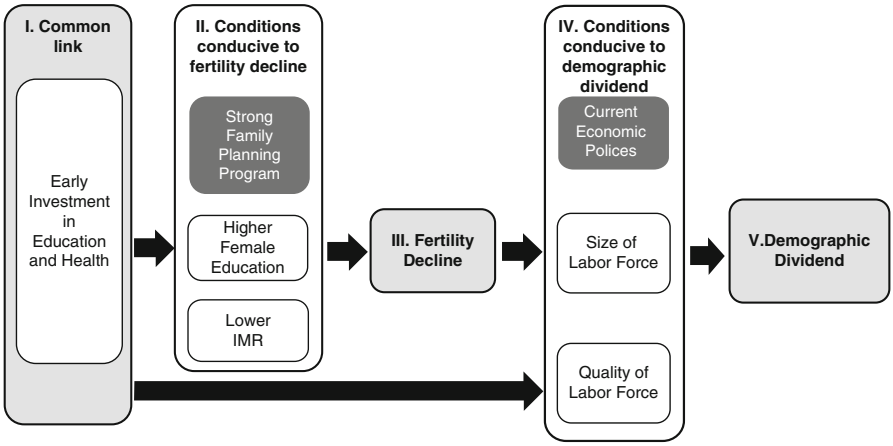


Fig. 1.1 Common link between policies conductive to fertility decline and demographic dividend

economic development in the long term, for example, is expected to lead to fertility decline as it did in North America and Western Europe. We also know that a strong family planning program can lower fertility even in very poor countries, as it did in Bangladesh and Ghana (see Phillips et al. 1988; Debpuur et al. 2002). However, many macro-level studies have indicated that fertility declines fastest and furthest when a strong family planning program is implemented under favorable social conditions (see for example, Jain and Ross 2012; Bongaarts et al. 1990; Jain 1985; Cutright 1983; Mauldin and Berelson 1978; Freedman and Berelson 1976). While many indicators to reflect a favorable social setting have been used, the two that stand out are low infant and child mortality and high female education. This means that conditions conducive to fertility decline include a strong family planning program that offers information and services of good quality, and a favorable social setting that is reflected by low infant and child mortality and high female education at least through the primary school level (see Fig. 1.1). Public policies conducive to fertility reduction thus include current investment of resources in family planning programs to make contraceptives easily available at low cost, and investments in education and health beginning at least 10 years ago when the girls now entering their reproductive period were of school going age in order for them to be well educated and experience conditions of low infant and child mortality.

Conditions conducive to the realization of the demographic dividend include an increased proportion of the population in the labor force (size), better education and technical skills of the labor force (quality), and ample opportunities available to workers to use their skills productively (see Fig. 1.1). While an increase in the relative size of the workforce is an automatic outcome of sustained fertility decline, the other two conditions are not. The extent to which this opportunity is realized by rapid economic growth depends on the quality of the labor force when the window of opportunity is created and on economic opportunities that allow them to be

productive. While the availability of economic opportunities depends upon current economic policies, the quality of the population entering the labor force depends upon the public policies and programs in the education and health sectors implemented at least 10 years ago when these people were of school going age.

The effect of changes in age distribution resulting from sustained fertility decline on economic growth in East Asian countries was estimated to be substantial (Bloom et al. 2003; Mason 2001). The demographic dividend in these counties was realized in part because of the economic policies that enabled the labor force to be fully productive, and in part because of investment in education and health made prior to fertility decline, which contributed to fertility decline and to the size and quality of the labor force. While this investment in education and health was not made specifically to lower fertility, this investment along with family planning programs accelerated fertility decline in the late 1960s and 1970s. For example, Hong Kong, Singapore, South Korea, and Taiwan were classified as having high social setting and strong family planning program in the early 1970s (Freedman and Berelson 1976). The continuation of this investment produced a better-educated and more highly skilled labor force, which also contributed to the realization of demographic dividend in these countries.

1.2 Purpose and Scope

This chapter illustrates the common link between policies that contribute to fertility decline and those that contribute to the quality of the labor force when the window of opportunity is created. We consider state-level differences in the onset and pace of fertility decline, the size and quality of the labor force, and factors associated with fertility differences among states. It is important to consider these state-level differences because state governments are primarily responsible for improving the population's education and health conditions by adequate investment in these sectors. In addition, states are likely to benefit from any potential savings in these resources resulting from a declining burden of the young population.

We demonstrate that those states that made early investment in social development also experienced early fertility transition. Consequently, they now have a better-educated labor force and are reaping the benefits of the demographic dividend by transforming the window of opportunity into faster economic growth. By contrast, those states that did not make adequate investments in social development are also lagging behind both in fertility transition and in the quality of the labor force. These state-level differences have important implications for national-level trends as well.

The rest of the paper is divided in to five sections: Sect. 1.3 briefly describes national-level trends; Sect. 1.4 describes state-level differences in the timing and pace of fertility decline and assesses factors contributing to fertility differences among states; Sect. 1.5 describes state-level differences in the size and quality of the labor force and in their ability to benefit from the demographic dividend; Sect. 1.6

describes the future prospects for achieving the demographic dividend; and Sect. 1.7 draws some conclusions from this analysis.

1.3 Context and National Trends

India, with a population of 1.2 billion in 2011, has been growing at the rate of about 1.64 % per year. Administratively, the country is divided in 29 states and 6 union territories—varying in population size, administrative and political structures, and social and economic conditions. The central government transfers financial resources to the state governments through a planned budget included in successive 5-year development plans. Health and education are the responsibility of state governments. Consequently, the progress in these areas varies by states.

India was the first country to initiate an organized family planning program in 1952 within the context of reducing the population growth rate and thereby improving the prospects for economic development. The program gained momentum in 1966 with the creation of the Department of Family Planning within the Ministry of Health and Family Planning. It has gone through many changes since then. However, it remained a centrally sponsored and financed program, but implemented by the state governments. The central government determines program strategies, patterns of services, and contraceptive methods to be stressed; the state governments implement these strategies, recruit staff, and offer contraceptive services. Recommended guidelines follow a uniform pattern. However, the implementation of these guidelines varies across states and districts because of differences in the availability of human resources as well as of issues related to governance. Consequently the progress made by the family planning program also varies by states.

1.3.1 National-Level Fertility Decline, the Window of Opportunity, and the Demographic Dividend

The total fertility rate (TFR) in India prior to the 1960s was universally high; it started declining around 1966 (Adlakha and Kirk 1974; Rele 1987; Jain and Adlakha 1982; Bhat et al. 1984; Guilmoto and Rajan 2001). The Panel on India constituted by the Committee on Population and Demography of the U.S. National Research Council, for example, estimated the TFR at 5.7 births per woman during 1961–1971 and at 5.6 during 1970–1972 (Bhat et al. 1984). Since then the TFR[1] has declined by more than three births per woman to 2.9 in 2004 and 2.4 in 2011 (Fig. 1.2).

[1] Fertility data are available from Sample Registration System (SRS) and three rounds of National Family Health Surveys (NFHS). SRS, a dual record system, was initiated in 1964–1965 on a pilot basis and became fully operational in 1969–1970. It provides annual estimates of vital rates at the national and state levels (RGI 2009, 2013). The fertility estimates from NFHS are based on the

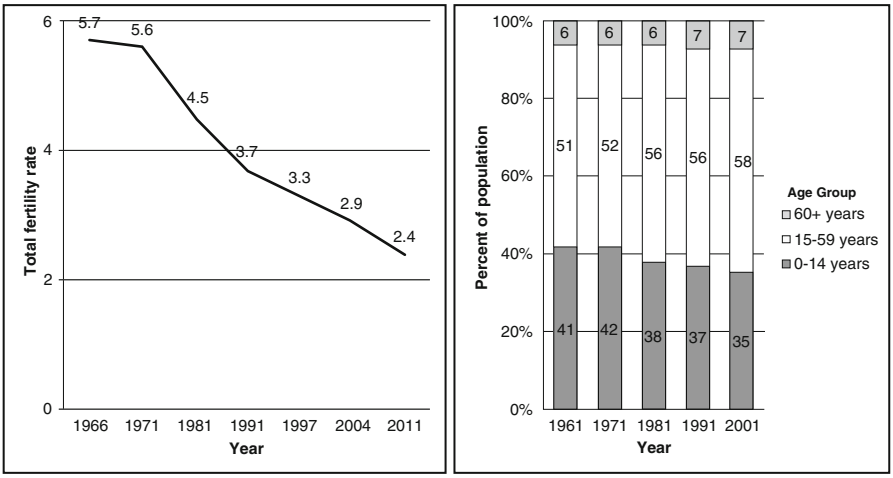


Fig. 1.2 Total fertility rate according to sample registration system and percent of population in three broad age groups according to Indian censuses by year

Consequently, the age distribution at the national level has started changing. The age composition was quite stable up until 1971 because of previously high fertility: about 41–42 % of the population was between 0 and 14 years of age; about 5–6 % over the age of 60 years; and the remaining 52–53 % in the working ages of 15–59 years (Fig. 1.2). The effect of subsequent fertility decline on the age composition is apparent: the percent of the population aged 0–14 years decreased from 42 % in 1971 to 35 % in 2001, and there was a corresponding increase in the working-age population from 52 % in 1971 to 58 % in 2001.[2] Consequently, the young-age dependency ratio (the ratio of the population aged 0–14 years and the population aged 15–59 years) declined from 0.81 in 1971 to 0.61 in 2001, whereas the old-age dependency ratio (the ratio of the population aged 60 years or more and the population aged 15–59 years) remained around 0.11 between 1971 and 2001. These changes in age structure have been estimated to be associated with a substantial demographic dividend in terms of the growth in annual per capita income during the economic liberalization period of the 1980s and 1990s (Aiyer and Mody 2011).

This national experience masks important differences among major states in India. Moreover, the population is still characterized as young with considerable potential for further aging. However, the future pace of change in age composition and the level of the demographic dividend experienced at the national level will depend upon the pace of fertility transition in many of the major states, especially in large northern states.

retrospective data on birth dates of children born during 3 years prior to the survey (IIIPS 1995, 2000, 2007). We have used TFR estimates from SRS for the period 1990 onwards because the accuracy of the estimates has improved overtime to the extent that estimates for 1990 onward can be used without further adjustment (Bhat 1998a). Moreover, NFHS estimates are affected by recall lapse whereas SRS estimates are not. SRS estimates of TFRs are slightly higher than those based on NFHS (0.3 for 1991, 0.5 for 1997, and 0.2 for 2004).

[2]The SRS data indicate that the percent of adult population may have increased to about 63 % in 2012 (RGI 2013). Similar data from 2011 census are not yet available.

1.4 State-Level Fertility Differences

1.4.1 Onset and Pace of Fertility Decline

The timing and pace of fertility decline have not been uniform throughout the country. The current TFR is below the replacement level of 2.1 births in seven major states, it is between 2.2 and 2.5 in four states, and it is above 3.0 in the remaining four northern states[3] (Table 1.1). Fertility started to decline earlier and at a faster pace in southern states. For example, the TFR in Kerala and Tamil Nadu had already declined to 4.7 by 1966 even before the reorganization of the family planning pro-

Table 1.1 Total fertility rate and percent fertility decline by states in India: 1971–2011

	Total fertility rate (TFR)							
	India panel	Sample registration system[b]				Percent decline in TFR		
State	1971	1991	1997	2004	2011	1971–1991	1991–2011	1971–2004
Southern								
Andhra Pradesh	4.8	3.0	2.5	2.1	1.8	−38	−40	−63
Karnataka	5.5	3.1	2.5	2.3	1.9	−44	−39	−65
Kerala	4.5	1.8	1.8	1.7	1.8	−60	0	−60
Tamil Nadu	4.6	2.2	2.0	1.8	1.7	−52	−23	−63
Northern								
Bihar	5.6[a]	4.6	4.4	4.3	3.4	−18	−26	−39
Madhya Pradesh	6.2	4.7	4.0	3.7	3.1	−24	−34	−50
Rajasthan	6.4	4.5	4.2	3.7	3.0	−30	−33	−53
Uttar Pradesh	6.5	5.2	4.8	4.3	3.3	−20	−37	−49
Other large								
Assam	6.4	3.4	3.2	2.9	2.4	−47	−29	−63
Gujarat	6.0	3.2	3.0	2.8	2.5	−47	−22	−58
Haryana	6.6	3.9	3.4	2.9	2.3	−41	−41	−65
Maharashtra	4.9	2.9	2.7	2.2	1.8	−41	−38	−63
Orissa	5.5	3.3	3.0	2.6	2.2	−40	−33	−60
Punjab	5.6	3.1	2.7	2.2	1.7	−45	−45	−70
West Bengal	5.9[a]	3.2	2.5	2.2	1.7	−46	−47	−71
India	5.6	3.7	3.3	2.9	2.4	−34	−35	−57

Sources: India Panel (Bhat et al. 1984); SRS (RGI 2009, 2013)
[a]TFR for Bihar and West Bengal are for 1966; 3 years moving averages (e.g. TFRs for 2011 are averages of TFRs for 2010, 2011, and 2012)

[3] Similar regional differences between northern and southern states also exist in contraceptive use (Jain and Jain 2012).

gram, and reached replacement level by 1991. In contrast, fertility started to decline later and at a slower pace in the northern states. Nevertheless, fertility since 1971 declined in all 15 major states; it declined by at least 58 % in 11 states. Even in the northern states the decline ranged from 39 % in Bihar to about 50 % in Uttar Pradesh (UP), Madhya Pradesh (MP), and Rajasthan.[4]

1.4.2 Factors Contributing to Fertility Differences Among States

Demographers have been interested in explaining fertility differences among countries as well as among states in India. For example, many earlier studies indicated that fertility differences among developing countries can be explained by differences in their social settings (literacy, life expectancy, and income) and the strength of their family planning programs (see e.g. Mauldin and Berelson 1978; Cutright 1983; Bongaarts et al. 1990). A more recent analysis of 40 developing countries also showed that fertility differences among these countries can be explained by differences in female education, infant mortality, and family planning services (Jain and Ross 2012).

A similar analysis was conducted to assess the factors contributing to state-level fertility differences in India. We estimated the time lag effects of the infant mortality rate (IMR) and female education at five time points: 1971, 1991, 1997, 2004, and 2011.[5] In Model I we tested the effect of IMR in 1972 and female education[6] in 1971 on TFR for all five time points. In Model II we used IMR in 1991 and female education in 1991 to explain differences in TFR for 1991, 1997, 2004, and 2011. In Model III we used IMR, female education in 2001, and 2003 data on indicators of availability of services[7] and poverty[8] to assess their effects on TFR in 2004 and 2011. Table 1.2 presents correlation coefficients and beta coefficients from this analysis for four time periods; data for 1997 are not shown because the results were not different.

[4] Bihar includes Jharkhand, Madhya Pradesh includes Chhattisgarh, and Uttar Pradesh includes Uttaranchal.

[5] TFR in 1971 represent the fertility level just after the reorganization of the family planning program in 1966; 1991 represent the period before the elimination of the targets, 1997 just after the abolition of the targets, 2004 represent the levels corresponding to the NFHS III, and 2011 represents the current level.

[6] Female education is measured by percent of females 15–19 years old with at least primary level education.

[7] Availability is measured by the percent of rural population living in villages with a government health facility (sub-centre, primary health centre, community health centre or referral hospital, government hospital, and government dispensary within the village).

[8] Poverty is measured by the percent of rural households with low standard of living, which is based on source of drinking water, type of housing material, type of toilet facility, source of lighting, source of cooking material, and ownership of consumer durables (IIPS 2005).

Table 1.2 Regression analysis of the effect of social factors on total fertility rates during 1971 and 2011 among major states in India

	Model I (N = 13)			Model II (N = 15)			Model III (N = 15)				
	IMR 72	≥Prim 71	R^2	IMR 91	≥Prim 91	R^2	IMR 01	≥Prim 01	Availability 03	Poverty 03	R^2
TFR 1971											
r	0.546[a]	−0.624[*]									
β	0.148	−0.583[a]	0.480								
TFR 1991											
r	0.758[**]	−0.859[***]		0.689[**]	−0.863[***]						
β	0.344	−0.606[*]	0.770	−0.034	−0.890[**]	0.774					
TFR 2004											
r	0.779[**]	−0.806[***]		0.589[*]	−0.799[***]		0.651[**]	−0.786[**]	−0.546[*]	−0.575[*]	
β	0.459[a]	−0.468[a]	0.723	−0.176	−0.941[**]	0.648	0.043	−0.844[*]	−0.270	−0.300	0.666
β								−0.693[**]	−0.173		0.639
β								−0.869[**]		−0.107	0.622
β							0.160	−0.668[*]			0.629
TFR 2011											
r	0.735[**]	−0.752[**]		0.547[*]	−0.739[**]		0.605[*]	−0.744[**]	−0.472	0.558[*]	
β	0.447	−0.421	0.635	−0.155	−0.865[*]	0.554	0.067	−0.754[a]	−0.172	−0.140	0.572
β								−0.691[**]	−0.100		0.561
β								−0.795[*]		−0.065	0.556
β							0.126	−0.652[*]			0.561

Sources: TFR 1991, 2004, IMR 1991, and IMR 2001 data are obtained from Sample Registration System; TFR 1971 comes from India Panel Report (Bhat et al. 1984); Education data are obtained from different censuses; IMR 1972 from special survey on infant mortality RGI (1983: 28); data on availability and poverty are taken from DLHS-2 (IIPS 2006)

r correlation coefficient, *β* standardized regression coefficient, R^2 variance explained, *N* number of states

[a]$p < 0.10$; [*]$p < 0.05$; [**]$p < 0.01$; [***]$p < 0.001$

Health and education differences among states in 1970 continued to influence TFR differences among states through 2011. Female education was the strongest predictor for state-level variations in TFR in all models. Female education in 1971 influenced state-level variations in TFR in 1971, 1991, 1997, 2004, and 2011, female education in 1991 influenced state-level variations in TFR in 1991, 1997, 2004, and 2011 (data not shown for 1997), and female education in 2001 also influenced state-level variations in TFR in 2004 and 2011. The correlation coefficients between availability of services and TFR as well as between poverty and TFR were statistically significant in both 2004 and 2011. However, neither of the two indicators showed any significant effect on TFR in 2004 or 2011 after controlling for female education.[9]

The lack of effect of the availability of services on fertility is not surprising because services are uniformly distributed according to population density; and services for sterilizations are primarily provided through camps organized in various neighborhoods, further diluting the effect of geographic availability of services through health centers. For these reasons, the direct effect of family planning program inputs on contraceptive use and fertility has been difficult to establish empirically in India. For example, Srinivasan et al. (1991) also failed to establish any relationship between indicators of services and acceptance of IUDs and sterilization in Karnataka, Maharashtra, Tamil Nadu, and West Bengal. Nevertheless, the importance of the family planning program is reflected by the fact that fertility has declined in all major states since the 1970s (Table 1.1).

The effects of IMR, female education, and poverty on fertility differences observed in this study are consistent with those observed by Drèze and Murthi (2001) for 1981 and 1991. Moreover, early fertility transition in Kerala has been attributed to more equitable achievement in female education and health or social development (see Nag 1984; Krishnan 1998 for additional information). While fertility decline in Tamil Nadu has been attributed to the social reform movement of power transfer to lower-caste individuals in the 1920s and 1930s, the movement itself was attributed to increasing literacy in the state (Bhat 1998b). There is also ample literature to demonstrate the effect of female education and IMR on fertility behavior at the individual level.

A decline in infant mortality creates demographic pressures on couples because more of the children born survive. Other mechanisms include the phenomenon of child replacement, insurance, and changes in the practice of post-partum amenorrhea and abstinence. Under conditions of high mortality, couples tend to have extra births to ensure the survival of the desired number of children. They also tend to replace a deceased child sooner. Moreover, birth intervals following an infant death are usually shorter than intervals following a live birth that survives its infancy. A decline in infant mortality thus lowers fertility by changing the macro-level health environment, perceptions about mortality conditions, and potential survival of children, as well as the micro-level conditions including differences in post-partum

[9] We recognize the limitation on the analysis placed by the small number of units included.

Table 1.3 Infant mortality rate per 1,000 live births for India and selected states: 1970–1972 to 2010–2012

Period	Source	India	Kerala	Tamil Nadu	Uttar Pradesh	Bihar
1970–1972	SRS	132	58	120	174	–
1980–1982	SRS	110	36	89	152	118
1990–1992	SRS	80	17	58	98	72
1996–1998	SRS	72	14	53	85	70
2003–2005	SRS	59	12	40	74	61
2010–2012	SRS	45	12	22	56	44

Table 1.4 Percent girls of 15–19 years of age who have completed at least primary school level education for India and selected states: 1971–2005

Period	Source	India	Kerala	Tamil Nadu	Uttar Pradesh	Bihar
1971	Census	31	71	42	19	13
1981	Census	37	85	56	24	19
1991	Census	50	95	61	36	32
2001	Census	64	97	77	53	41
2005	NFHS	76	99	92	72	53

amenorrhea and abstinence associated with a live birth that survives infancy versus one that does not.

Similarly there are many mechanisms through which rising female education lowers fertility. First, women with better education tend to marry later, which in turn decreases their fertility. Second, higher education exposes women to a wider world, which in turn lowers desired family size. Third, higher education helps women achieve their small family size desire through better use of contraception. Fourth, mass education of children increases the cost of having large families and thus reduces parental fertility.

In addition, a strong family planning program lowers fertility across various social strata by improving access to quality services and lowering the direct and indirect cost of contraception. Thus, while fertility declined under various conditions, factors conducive to fertility decline include higher female education, lower infant mortality, and a strong family planning program.

The differential timing and pace of fertility decline among states in India suggest the important role played by the early investment in social development in the southern states. Fertility started to decline earlier and declined faster in southern states than in northern states. Southern states also invested in health and education early on, while northern states did not. Southern states also had lower infant mortality and higher female education in 1971 (Tables 1.3 and 1.4). For example, the IMR in Uttar Pradesh in 2010–2012 was at the same level as achieved by Kerala in 1970–1972, and the female education in Uttar Pradesh in 2005 was at the same level achieved by Kerala in 1971.

1.5 State-Level Differences in Factors Conducive to the Demographic Dividend

1.5.1 Window of Opportunity

State-level variations in the timing and pace of fertility decline are reflected in differentials in changing age structure among states. As an illustration, the age composition of four states—Bihar and Uttar Pradesh in the north, and Kerala and Tamil Nadu in the south—are compared in Fig. 1.3. The age structures of these four states were comparable and stable up until 1961: about 42 % between 0 and 14 years of

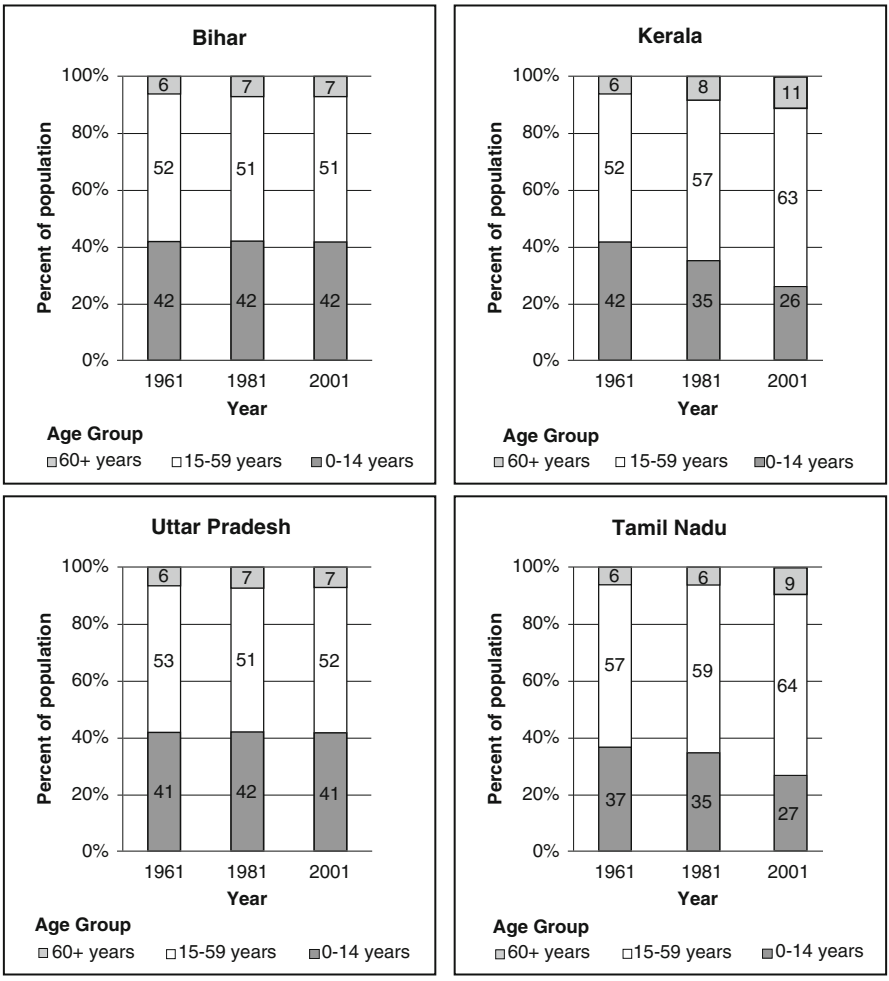


Fig. 1.3 Percent of population in three broad age groups for selected states according to Indian censuses: 1961–2001

age; 52 % between 15 and 59 years of age; and 6 % over age 60. For 40 years the age distribution in Bihar did not change, and showed only minor fluctuations in Uttar Pradesh. However, the age composition of the population in the southern states of Kerala and Tamil Nadu changed dramatically during this period. The proportion of the population aged 0–14 years in Kerala declined from 42 % in 1961 to 26 % in 2001 and in Tamil Nadu from 37 % to 27 % during the same period.

The proportions of the working-age population during these 40 years increased from 52 to 63 % in Kerala and from 57 to 64 % in Tamil Nadu (Fig. 1.3). Consequently, a window of opportunity due to fertility decline exists in Kerala and Tamil Nadu but not in Bihar and Uttar Pradesh.[10] Moreover, the dependency ratio of the young population declined remarkably—by about 50 %—in both Kerala and Tamil Nadu. In comparison, the dependency ratios in northern states of Bihar and Uttar Pradesh in 2001 were similar to the rate in Kerala 40 years earlier (1961).

1.5.2 Quality of the Workforce

We now illustrate state-level differences in the preparedness of young adults (15–24 years of age) to enter the workforce. We focus on this group because of its relative size, approximately 18 % of the total population. These young adults are in a transitional phase in their lives contemplating further education, livelihoods, marriage, and family formation. Because these young adults are entering both the workforce and their reproductive years, what happens to them will influence future demographic trends as well as economic growth. There are both positive and negative implications of this youth bulge, and these implications differ by state. This point is illustrated by comparing selected indicators for unmarried males and unmarried females aged 15–24 years from youth surveys conducted in the northern states of Bihar and Jharkhand (Jharkhand state until recently was a part of Bihar state) with those from the southern state of Tamil Nadu (Table 1.5).

Youth across states and communities may begin to share similar aspirations and expectation as a result of increased exposure to media (TV, cinema, cell phones, and internet) and urban and metropolitan environments. However, inequality remains in their skills and in available opportunities. While exposure to TV among unmarried males and females in Bihar was similar to levels in Tamil Nadu, the percent of unmarried males and females who completed at least eight grades of schooling in Bihar was lower than in Tamil Nadu (60 % vs. 81 % for males; 38 % vs. 84 % for females). Therefore unmarried males and females in Bihar are likely to be less employable than those in Tamil Nadu. For example, 48 % of unmarried males and 23 % of unmarried females in Bihar engaged in paid work in the 12 months prior to

[10] The SRS data show that the proportion of the adult population in 2012 has increased to 56 % in Bihar and 60 % in Uttar Pradesh (RGI 2013) because fertility has also started to decline in these northern states. The data from 2011 census need to confirm these changes in the age distributions.

Table 1.5 Situation of unmarried youth of 15–24 years of age in selected states: 2006/2007

	Unmarried males 15–24			Unmarried females 15–24		
Selected indicator	Bihar	Jharkhand	T.N.	Bihar	Jharkhand	T.N.
Have completed 8 years of schooling	60	65	81	38	49	84
Engaged in paid work in last 12 months	48	49	56	23	31	34
Often watch T.V.	12	11	10	13	14	11
Involved in physical fight in last 12 months	15	19	9	4	5	3
Sample size	1492	2607	1666	3188	3174	3001

Sources: Youth in India Situation and Needs Study 2006–2007 (IIPS 2009a, b, c)

survey, in comparison to 56 % of unmarried males and 34 % of unmarried females in Tamil Nadu (Table 1.5). These data also support the notion that young people who have limited opportunities to effectively use their skills may be more likely to use their talents in less productive ways. A higher proportion of unmarried males in Bihar were involved in physical violence during the year prior to the survey than were those in Tamil Nadu (15 % vs. 9 %).

State-level differences in the education and skills of the people now entering the labor force reflect the investments made by these states at least 10 years ago when these people were of school going age. As shown above, these investments also contributed to fertility differences among states. For example, early investments in education and health in southern states contributed to the early timing and faster pace of fertility transition in these states.

1.5.3 Demographic Dividend

In sum, southern states like Kerala and Tamil Nadu that made earlier investments in education and health could also realize savings in public and private expenditures[11] on education and health. These and similar states can also benefit from the potential demographic dividend by investing these savings to improve the quality of education and health services and by creating further opportunities for the working-age population. For example, southern states like Andhra Pradesh and Karnataka are

[11] In addition to the potential saving in government resources, fertility decline may also stimulate higher savings at the household level because everything being equal smaller families will require fewer resources for raising children including expenditure on food, clothing, education, and health. Parents could use this saving to improve the education of their children and also save some resources for the future. In this fashion, fertility decline could also add to capital accumulation at the national level. Prior demographic analyses focused on this potential benefit of fertility decline. However, such savings are possible only in places with almost universal education and low infant and child mortality, i.e. without any backlog in these two sectors. This is not the case in the northern states.

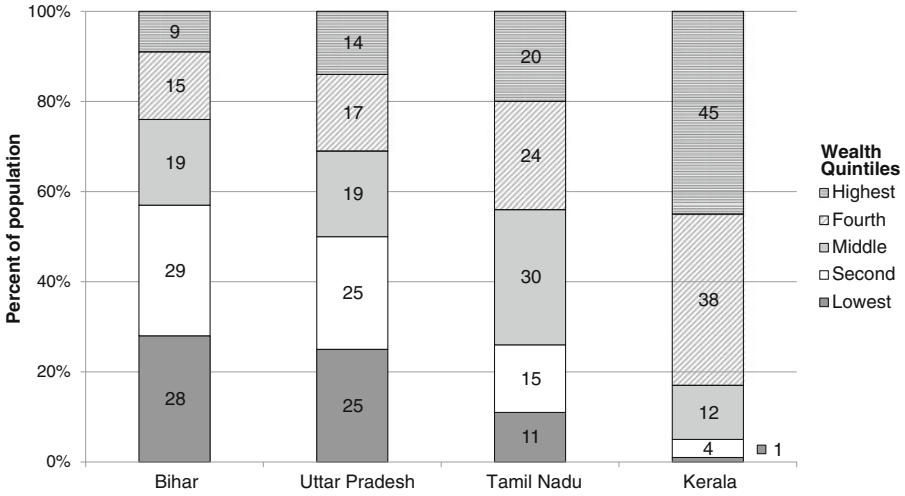


Fig. 1.4 Percent of population in selected states by national level wealth quintiles according to the third NFHS: 2005/2006

already benefiting from investments in technology hubs in Hyderabad and Bangalore.

In comparison, there has been no decline in the young-age dependency ratio in northern states like Bihar and Uttar Pradesh, and many young children in these states remain without adequate education and health services (Tables 1.3 and 1.4). These states will continue to require resources and political commitment to improve the educational and health status of their young population. Furthermore, no potential savings is anticipated in the near future in public or private expenditures required for this purpose. Young adults in these northern states are less employable and less likely to realize their aspirations.

Economic analyses have also documented the differential effect of the demographic dividend on annual growth in per capita income. For example, Aiyer and Mody (2011) estimated that the demographic dividend contributed substantially during 1980s and 1990s to growth in the annual per capita income of states like Tamil Nadu, Karnataka, and Gujarat; but had little or no effect in states like Bihar, Madhya Pradesh, and Uttar Pradesh. The positive impact of the demographic dividend on economic conditions for individuals living in southern state of Kerala and Tamil Nadu is also reflected by the wealth quintiles defined at the national level (Fig. 1.4).

Eighty three percent of the population in Kerala belongs to the two top wealth quintiles in comparison to 24 % in Bihar. Fifty percent of the population in the northern states of Bihar and Uttar Pradesh belong to the two bottom wealth quintiles in comparison to 26 % in the southern state of Tamil Nadu and 5 % in Kerala. A recent report of an expert group constituted by the Planning Commission to review the methodology for measuring poverty confirmed these state-level differences in

economic conditions. According to this report, 11 % of the population in Kerala and 17 % in Andhra Pradesh were classified as being below the poverty line, in comparison to over 40 % in Bihar, Madhya Pradesh, and Uttar Pradesh (GOI 2014). Admittedly, not all of these improved economic conditions can be attributed to the demographic dividend. However, the direction of these differences is consistent with the expected effects of the changing age distribution. Presumably, in comparison to the northern states, the southern states were better able to benefit from the economic liberalization policies because of the larger size and higher quality of the labor force at the time of liberalization. Moreover, better-educated people from Kerala were able to find employment outside the state or abroad and contributed to the better economic conditions of people living in Kerala by sending money home.

1.6 Future Prospects for the Demographic Dividend

Many Indian states have started to benefit from the demographic dividend and will continue to do so for some time to come. Consequently, the benefits of the demographic dividend have also started to appear at the national level. Further changes in the population age distribution at the national level are expected because of the anticipated fertility decline in the northern and other states. The duration of the window of opportunity at the national level, however, would be extended due to staggered fertility decline experienced by different states. Another consequence of the staggered fertility decline is that by the time the northern states experience the window of opportunities, the southern states would face the rising burden of the old-age population.

A technical group on population projections constituted under the National Commission on Population assumed that TFR at the national level would decline from 2.9 births in 2001–2005 to 2.0 births in 2021–2025 (RGI 2006). Of the four northern states, Bihar and Rajasthan have been assumed to achieve replacement-level fertility by 2021, Madhya Pradesh by 2025, and Uttar Pradesh by 2027. Consequently, while the young-age dependency ratio in Kerala is anticipated to decline from 0.41 in 2001 to 0.30 in 2026, the old-age dependency ratio is anticipated to increase from 0.17 in 2001 to 0.29 in 2026 (see Fig. 1.5). In comparison, the young-age dependency ratio in Uttar Pradesh is likely to decrease from 0.77 in 2001 to 0.47 in 2026 and the old-age dependency ratio is likely to increase only slightly from 0.12 in 2001 to 0.17 in 2026 (Fig. 1.5).

The medium-variant U.N. projections assumed a slower pace of fertility decline from 2.76 in 2000–2005 to 1.86 during 2030–2035 (U.N. 2009). Consequently, the national age distribution according to the RGI projections is anticipated to change faster than according to the U.N projections. For example, the proportion of the working-age population is anticipated to increase to about 64 % by 2016 according to the RGI projections; whereas this level of 64 % is expected to reach by 2020–2025 under the U.N. projections. Even assuming a slower pace of fertility decline according to the medium variant, the proportion of the working-age population is

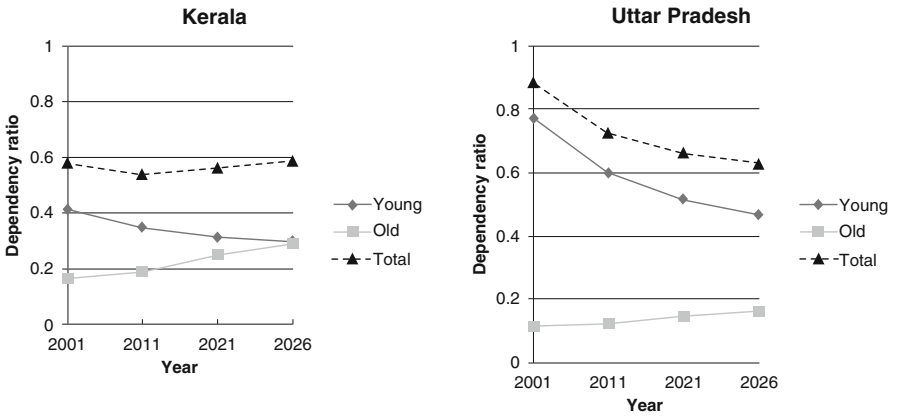


Fig. 1.5 Dependency ratios in Kerala and Uttar Pradesh states of India: 2001–2026

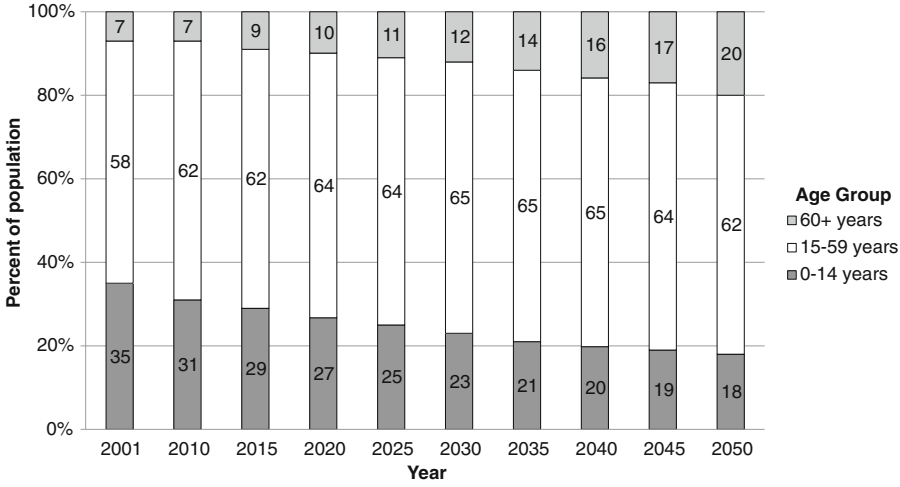


Fig. 1.6 Percent of India's projected population in three broad age groups: 2001–2050 Source: Computed from U.N.'s population projections (U.N. 2009)

projected to increase to 65 % in 2030, to remain constant at this level until 2040, and then decline to 62 % in 2050 (Fig. 1.6). A continuous decline in the young population is projected, from 35 % in 2001 to 18 % in 2050, with a corresponding increase in the proportion of the elderly population, from 7 % in 2001 to 20 % in 2050. Consequently, the dependency ratio of the young population (0–14 years of age) is projected to decrease steadily from 0.61 in 2001 to 0.29 in 2050, whereas the dependency ratio of the elderly population (60 years or more) is expected to increase from 0.14 in 2001 to 0.32 by 2050 (data not shown).

This means that under the assumption of a medium pace of fertility decline, the optimal period for reaping the benefits of the demographic dividend at the national level is expected to lie between 2020 and 2045, when the working-age population is projected to account for around 65 % of the total population and the overall dependency ratio is anticipated to be the smallest at about 0.56.

These anticipated national-level trends, however, will be determined by the future pace of fertility decline in the four large northern states with a total population of 503 million, or about 42 % of India's total. Fertility has declined in all these states; the TFR, however, remains relatively high at around 3.0 in Madhya Pradesh and Rajasthan, and 3.4 in Bihar and Uttar Pradesh. These states also made some progress in recent years in their social indicators, such as increased female education and decreased infant mortality rates. Yet the social indicators in these northern states appear to be at a level already seen in southern states like Kerala and Tamil Nadu 30 years ago[12] (See Tables 1.3 and 1.4). It is not surprising then that while fertility has declined in these northern states, the current level of TFR is at a level observed in Kerala and Tamil Nadu about 30 years ago. What happens in these four northern states will determine what happens to the national-level trends in fertility, education, and infant mortality. For example, fertility decline trends in these four states will largely determine the pace of fertility decline at the national level, and improvements in female education and reductions in infant and child mortality will determine when India will achieve MDGs two and four.[13]

An increased investment in social development along with the expansion of the family planning program in these northern states will accelerate the pace of future fertility decline, speed the onset of the window of opportunity, improve the quality of the labor force, and, therefore, enable these states to begin experiencing the demographic dividend earlier. Several national programs, e.g. the National Rural Health Mission and Janani Suraksha Yojna, are already disproportionately allocating financial resources for health to these northern states. Furthermore, many donors are focusing on these states to improve their health conditions. In the education sector, the country made a significant commitment in 2009 to educate all children 6–14 years of age up to the primary level through the Right of Children to Free and Compulsory Education Act. These are steps in the right direction. However, the next decade remains critical for the country as continued investments in education, health, and family planning programs are required for continuous fertility decline and the realization of the demographic dividend more uniformly. Otherwise, the economic gap between the north and the south is likely to widen further.

While the cost of these investments may seem high, the eventual cost of not investing now would be even higher. The relative size of the workforce is certain to

[12] Satia and Jejeebhoy (1991) also noted that northern states were lagging behind the rest of India in similar indicators. Bose (1985) identified northern states as most backward in the country and deserving special attention. He also coined a term – BIMARU – literally meaning sick to collectively refer to these states. Chhattisgarh, Jharkhand, and Uttaranchal were also part of these four states.

[13] MDG 2: Achieve universal primary education; MDG 4: Reduce child mortality.

increase with further declines in fertility.[14] Aspirations of young adults are also likely to rise with further spread of TV, internet, and cell-phones. If these rising aspirations are not met, negative consequences may include increased unemployment, increased migration across states and districts, and increased alcohol use, violence, and unrest, which may not remain confined to community, district, or state boundaries.

1.7 Conclusion

Social development, fertility decline, and the demographic dividend are closely interlinked, but the actual experience varies from state to state in India. A window of opportunity for faster economic growth has to be created first before a country can experience the demographic dividend. While the creation of this window of opportunity is an automatic outcome of fertility transition, the realization of this opportunity requires a qualified labor force and ample opportunities for them to be productive. India's experience suggests that there is a common link between the quality of the labor force and the timing and pace of fertility decline. This link appears to be early investment in social development (education and health). A similar link was also suggested by the experience of fertility decline and demographic dividend in East Asian countries.

Early investment in social development contributes to the realization of demographic dividend by creating conditions conducive to fertility decline and thus to growth in the size of the labor force and improvements in its quality. Those countries and states that are successful in investing in social development prior to fertility decline will have better-educated and healthier young adults entering the workforce as the widow of opportunity for demographic dividend is created. At this time they will also have better educated and healthier young children and will have very little backlog in this area. The decline in the young-age dependency ratio will also result in potential savings in resources required for the education and health sectors.

What would happen if fertility declines in the absence of investment in education and health? A window of opportunity would be created, but young adults entering the labor force would lack the education and skills to be highly productive. There is some disagreement in the Indian literature about the importance of the quality of the labor force for the realization of the demographic dividend. Chandrasekhar et al. (2006), for example, argued that deficits in education and health reduce the employability of the growing working-age population and as such adversely affect the con-

[14] Another alternative is that the fertility decline in the absence of such investment could stall in these states, which would imply a higher rate of population growth and larger population. Even if fertility declines in the absence of such investment, these states will not be able to realize the demographic dividend because the people entering the labor force will lack the education and skills to be fully productive.

version of labor force size into the demographic dividend. James (2008) subsequently argued that the increase in the working-age population can have a positive effect on economic growth even when other conditions are not ideal.

This argument cannot be resolved completely because in majority of countries and states in India progress in education and health, and fertility decline go hand in hand. Intuitively, however, an increase in the size of the workforce would increase total output if per capita output increases or even if it remains the same, i.e., provided per capita output does not decline. A decline in per capita output is possible; however, if there is an increase in unemployment or under-employment among the population of labor force age. This could happen if the people entering the workforce do not have adequate education and skills or if they do not have adequate opportunities to use their skills productively. In this case, the demographic dividend could turn into demographic burden because of rising unemployment and under-employment. Moreover, the demand for resources to improve the education and health of young children would remain high.

People entering the workforce will have adequate education and skills as long as governments and parents invest adequate resources to educate children of school-going age. Support for this argument is provided by a recent international study in which Cuarsema et al. (2014) argued that the demographic dividend is an education dividend. While policies to improve education and health are important in their own right, they reduce fertility as well as improve a country's ability to realize demographic dividend.

In sum, progress made in achieving universal primary education and reducing infant and child mortality, in addition to the progress made in strengthening the family planning program especially in four large northern states, will contribute to the future pace of fertility decline at the national level and create the conditions conducive to experiencing the demographic dividend more uniformly. This is a winning combination because of the mutually reinforcing effects of investments in education, health, and family planning programs on achieving MDGs, reducing fertility, and realizing the demographic dividend. The same, perhaps, can also be said about many other developing countries, especially in sub-Saharan Africa, that have high fertility, poor social setting, and a weak family planning program.

References

Adlakha, A., & Kirk, D. (1974). Vital rates in India 1961–71 estimated from 1971 census data. *Population Studies, 28*(3), 381–400.

Aiyer, S. & Mody A. (2011). *The demographic dividend: Evidence from the Indian states* (IMF Working Paper 38). http://www.imf.org/external/pubs/ft/wp/2011/wp1138.pdf.

Bhat, P. N. M., Preston, S. H., & Dyson, T. (1984). *Vital rates in India, 1961–81. Committee on population and demography*. Washington, DC: National Academy Press. Report No. 24.

Bhat, P. N. M. (1998a). Contours of fertility decline in India: An analysis of district-level trends from two recent censes. In M. George, M. Das Gupta, & L. C. Chen (Eds.), *Reproductive change in India and Brazil*. Delhi: Oxford University Press.

Bhat, P. N. M. (1998b). Regional differences in Indian fertility. In M. George, M. Das Gupta, & L. C. Chen (Eds.), *Reproductive change in India and Brazil*. Delhi: Oxford University Press.
Bloom, D. E., Canning, D., & Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change*. Santa Monica: Rand.
Bongaarts, J., Mauldin, W. P., & Phillips, J. F. (1990). The demographic impact of family planning programs. *Studies in Family Planning, 21*(6), 299–310.
Bose, A. (1985). Demography beyond decimal points, presidential address delivered at the tenth annual conference of the Indian association of population, Bangalore. In: Bose A. (Ed.), 1988. From population to people. New Delhi: B. R. Publishing Corporation.
Chandrasekhar, C. P., Ghose, J., & Roychowdhury, A. (2006). The 'Demographic Dividend' and young India's economic future. *Economic and Political Weekly, 41*(49), 5055–5064.
Cuaresma, J. C., Lutz, W., & Sanderson, W. (2014). Is the demographic dividend an education dividend? *Demography, 51*, 299–315.
Cutright, P. (1983). The ingredients of recent fertility decline in developing countries. *International Family Planning Perspectives, 9*(4), 101–109.
Debpuur, C., Phillips, J. F., Jackson, E. F., Nazzar, A., Ngom, P., & Binka, F. N. (2002). The impact of the Navrongo Project on contraceptive knowledge and use, reproductive preferences, and fertility. *Studies in Family Planning, 33*(2), 141–164.
Drèze, J., & Murthi, M. (2001). Fertility, education, and development: Evidence from India. *Population and Development Review, 27*(1), 33–63.
Freedman, R., & Berelson, B. (1976). The record of family planning programs. *Studies in Family Planning, 7*(1), 1–40.
Government of India (GOI). (2014). *Report of the expert group to review the methodology for measurement of poverty*. New Delhi: Planning Commission. http://planningcommission.nic.in/reports/genrep/pov_rep0707.pdf. Accessed on 14 July 2014.
Guilmoto, C. Z., & Irudaya Rajan, S. (2001). Spatial patterns of fertility transition in Indian districts. *Population and Development Review, 27*(4), 713–738.
International Institute for Population Sciences (IIPS). (1995). *National family health survey 1992–1993*. Bombay: IIPS.
International Institute for Population Sciences (IIPS). (2000). *National Family Health Survey (NFHS-2) 1998–1999*. Bombay: IIPS.
International Institute for Population Sciences (IIPS). (2005). *Facility survey (under reproductive and child health project phase—II, 2003)*. India: IIPS.
International Institute for Population Sciences (IIPS). (2006). *District level household survey (DLHS-2), 2002–04*. Mumbai: IIPS.
International Institute for Population Sciences (IIPS). (2007). *National Family Health Survey (NFHS-3) 2005–2006*. Bombay: IIPS.
International Institute for Population Sciences (IIPS) and Population Council. (2009). *Youth in India situation and needs study 2006–2007, Bihar*. Mumbai: IIPS.
International Institute for Population Sciences (IIPS). (2009a). *Youth in India situation and needs study 2006–2007. Jharkhand*. Mumbai: IIPS.
International Institute for Population Sciences (IIPS). (2009b). *Youth in India situation and needs study 2006–2007, Tamil Nadu*. Mumbai: IIPS.
Jain, A. K. (1985). The impact of development and population policies on fertility in India. *Studies in Family Planning, 16*(4), 181–198.
Jain, A. K., & Adlakha, A. L. (1982). Preliminary estimates of fertility decline in India during the 1970s. *Population and Development Review, 8*(3), 589–606.
Jain, A. K., & Jain, A. (2012). Family planning and fertility in India. In Z. Wasim, H. Masnin, & J. Loftus (Eds.), *Family planning in Asia and the pacific: Addressing the challenges*. Selangore: International Council on Management of Population Programmes (ICOMP).
Jain, A. K., & Ross, J. (2012). Fertility differences among developing countries: Are they still related to family planning program efforts and social settings? *International Perspective on Sexual and Reproductive Health, 38*(1), 15–22.

James, K. S. (2008). Glorifying Malthus: Current debate on 'Demographic Dividend' in India. *Economic and Political Weekly, 43*(21), 63–69.

Krishnan, T. N. (1998). Social development and fertility reduction in Kerala. In M. George, M. Das Gupta, & L. C. Chen (Eds.), *Reproductive change in India and Brazil*. Delhi: Oxford University Press.

Mason, A. (Ed.). (2001). *Population change and economic development in east Asia: Challenges met, opportunities seized*. Stanford: Stanford University Press.

Mauldin, W. P., & Berelson, B. (1978). Conditions of fertility decline in developing countries, 1965–1975. *Studies in Family Planning, 9*(5), 90–147.

Nag, M. (1984). Fertility differentials in Kerala and west Bengal: Equity fertility hypothesis as explanation. *Economic and Political Weekly, XIX*(1), 33–41.

Phillips, J. F., Simmons, R., Koenig, M. A., & Chakraborty, J. (1988). Determinants of reproductive change in a traditional society: Evidence from Matlab, Bangladesh. *Studies in Family Planning, 19*(6), 313–334.

Registrar General, India (RGI). (1983). *Survey on infant and child mortality 1979*. New Delhi: RGI.

Registrar General, India (RGI). (2006). *Population projections for India and states 2001–26. Report of the technical group on population projections constituted by the national commission on population*. New Delhi: RGI.

Registrar General, India (RGI). (2009). *Compendium of India's fertility and mortality indicators based on the Sample Registration System (SRS): 1971–2007*. New Delhi: RGI.

Registrar General, India (RGI). (2013). *Sample registration system: Statistical report 2012*. New Delhi: RGI.

Rele, J. R. (1987). Fertility levels and trends in India, 1951–1981. *Population and Development Review, 13*(3), 513–530.

Satia, J. K., & Jejeebhoy, S. J. (Eds.). (1991). *The demographic challenge: A study of four large Indian states*. Bombay: Oxford University Press.

Srinivasan, K., Saxena, P. C., Roy, T. K., & Verma, R. K. (1991). Effect of family planning program components on contraceptive acceptance in four Indian states. *International Family Planning Perspective, 17*(1), 14–24.

United Nations. (2009). *World population prospects, the 2008 revision* (Comprehensive Tables. Department of Economic and Social Affairs. Population Division, Vol. 1). New York: United Nations Publications.

Chapter 2
Population Ageing, Demographic Dividend and Gender Dividend: Assessing the Long Term Impact of Gender Equality on Economic Growth and Development in Latin America

Tim Miller, Paulo Saad, and Ciro Martínez

2.1 Introduction

The demographic transition in Latin America, as in other developing regions, is occurring more rapidly than that historically experienced by currently developed countries. In the past four decades, this process of demographic change has spread to all countries of the region, and has accelerated, so that today the majority of countries in the region are in the more advanced stages of this process, while only a few still remain in a moderate stage of demographic change (ECLAC 2008).

It is clear that a process of this magnitude is profoundly transforming the demographic landscape of the region. The decline in fertility and mortality, especially infant mortality, has certainly been notable in Latin America. The change in the age structure of the population warrants serious attention given its current and future social and economic implications and the necessity of considering population change within sustainable development policies. Indeed, currently, the region as a whole and most countries are in the stage of demographic dividend, exceptionally favorable for economic and social advancement. The situation is certainly heterogeneous and in some countries this favorable stage is just beginning, in others this stage is ending and reaching a turning point from which population ageing will become the dominant demographic phenomenon.

The demographic transition has also created favorable conditions for another phenomenon whose positive impact on the economies of the region may be equal or even superior to the impact of the demographic dividend; this is the increase in female labor force participation. Fertility decline and the transformation of the age structure along with other interrelated factors such as advances in education, female

T. Miller • P. Saad (✉) • C. Martínez
United Nations Economic Commission for Latin America and the Caribbean (ECLAC), Santiago, Chile
e-mail: paulo.saad@cepal.org

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9_2

autonomy and the gradual process of overcoming the archaic distribution patterns of productive and reproductive roles within households are among the many factors that have promoted the increase of such participation. Indeed, in Latin America, as in many developing countries, a marked and sustained increase of female labor activity has been observed, parallel to the demographic transition process. Despite the importance of this change, the study of its economic, social and equality impacts has only recently begun. Defined broadly, the gender dividend refers to the increase in per capita economic output that is generated as progress is made towards equality between women and men in the labor market, which implies overcoming discriminatory barriers against them that exist both inside and outside of this market. This is why the study of the gender dividend is closely linked with the analysis of gender equality in labor participation and, more importantly, with the need, feasibility and advantages stemming from the adoption of state policies to promote progress towards equality.

Gender equality in labor participation, as a fundamental factor in achieving female economic autonomy (as they are able to obtain their own income), has been set as a priority topic within global development agendas. Proof of this is the inclusion of gender equality indicators in the MDGs and also in the main assessment and follow-up systems such as the Human Development Index (HDI) and EUROSTAT. The present study aims to present a general overview of the demographic transformations and trends in female labor force participation in Latin America and, on this basis, to provide conceptual and methodological elements for analyzing the economic impact of the demographic and gender dividends in the region.

In this context, the second section of this paper reviews trends in the demographic transition in the region as a whole and in different countries, as well as its main impacts on the age structure and on dependency rates, including the resulting demographic dividend. Further, it examines an alternative measure of dependency based on the economically active population. The importance of increasing female labor force participation is noted in the more beneficiary trajectory of dependency measured by economically-active population rather than by traditional demographic measures of the dependent population. In the third section, female participation trends in labor force in Latin America are discussed, and results from two indexes of gender equality in labor markets are compared. One is a population-based measure of the ratio of female to male economic participation rates. The second is a synthetic cohort measure of the ratio of female to male length of working life. The fourth section makes more progress in estimating the economic impact of the gender dividend, compared to the impact stemming from the demographic dividend, based on a simple accounting decomposition of GDP growth. Finally, the conclusion briefly highlights the main research findings.

2.2 The Profound Demographic Transformations in Latin America

2.2.1 The Demographic Transition

Like other developing regions, Latin America is going through the period of demographic transition, in which mortality and fertility rates decrease from very high to substantially lower levels (Fígoli and Wong 2003; ECLAC 2008). Population growth is low at both ends of the process, but tends to increase as the process unfolds and mortality rates decline, and then to decrease again when fertility rates come down. In Latin America, the fact that the onset of the decline of the mortality and fertility rates did not coincide produced a relatively short period of rapid population growth in the middle of the twentieth century that substantially altered the age structure of the population.

During the initial stage of the demographic transition – in which mortality, especially among children, falls, but fertility remains high – the region's population remained quite young and even became somewhat younger as a result of the growing proportion of children. Beginning in the mid-1960s, the joint effect of the decline in fertility and sustained increase in life expectancy gave rise to a gradual process of population aging that tends to intensify in the future as the larger generations born during the initial stage of the transition progress through the life cycle.

Despite the diversity of demographic situations among countries in the region, Latin America can be said to have undergone a rapid process of demographic transition compared with that experienced by industrialized countries. Whereas the demographic transition lasted over a century in developed countries, similar changes are occurring at a much faster pace in Latin America, due in part by the greater availability of means for controlling fertility and reducing mortality in more recent times. In a period of approximately 30 years, between 1960 and 1990, fertility levels in Latin America decreased from among the world's highest to considerably below the global average. Consequently, changes in the age structure of the population, particularly aging, are occurring faster in Latin America than they did in the industrialized countries, which call for the implementation of innovative measures to tackle the challenges and take advantage of the opportunities raised by these demographic changes.

2.2.1.1 Trends in Mortality and Fertility

During the first half of the twentieth century, mortality declined slowly in Latin America. During 1950–1955, life expectancy at birth in the region was only 52 years, and infant mortality was 128 per thousand births (see Table 2.1). From then on, life expectancy started increasing significantly, first due to the decline in infant mortality – mainly due to improved control over infectious and parasitic and respiratory diseases - and then as a product of declining mortality across the entire

Table 2.1 Life expectancy at birth and infant mortality rate, Latin America, 1950–2050

Five-year period	Life expectancy (years)	Infant mortality (per 1000 births)
1950–1955	51.8	128.4
1970–1975	61.2	81.5
1990–1995	69.1	38.5
2010–2015	74.3	18.6
2030–2035	77.6	11.6
2050–2055	80.5	7.8

Source: CELADE/ECLAC population estimates and projections, 2013 revision

Table 2.2 Total fertility rate and annual births, Latin America, 1950–2050

Five-year period	Total fertility rate (children per woman)	Annual births (thousands)
1950–1955	5.9	7,421
1970–1975	5.1	10,529
1990–1995	3.0	11,583
2010–2015	2.2	10,679
2030–2035	1.9	9,556
2050–2055	1.8	8,259

Source: CELADE/ECLAC population estimates and projections, 2013 revision

population. As a result, life expectancy in the region has increased by 22 years, on average, over the last 60 years, reaching 74 years in 2010–2015. This means life expectancy is 6 years longer than the average for developing regions and 2 years shorter than the average life expectancy in Europe.

Currently, there is a significant variation among Latin American countries in terms of life expectancy, ranging from 62 years in Haiti and 67 in Bolivia (Plurinational State of) to more than 78 years in Chile, Costa Rica and Cuba. Although it indicates a clear convergent trend, some important differences still exist among countries and are expected to remain at least until the middle of this century (Table 2.1).

Despite the impressive decline in mortality, the decline in fertility has been the main factor affecting population size and age structure in Latin America. Over the last six decades, total fertility rate in the region has dropped from 5.9 children per woman during 1950–1955 to 2.2 children per woman during 2010–2015. For the next four decades, it is expected to remain below the replacement level of 2.1 children per woman.

Between 1950–1955 and 1990–1995, the annual number of births in the region increased from 7.5 million to 11.5 million, and then started decreasing as a consequence of the continuing decline in fertility. According to the most recent projections, a steady decrease in the annual number of births is expected in the future (see Table 2.2). If fertility falls more rapidly than expected (which is not unlikely), the decline in the number of births in the region would be even steeper.

Although fertility rates in all countries are expected to gradually converge at low levels over the projection period, current rates still show important variations, ranging from 1.5 children per woman in Cuba and 1.7 in Costa Rica to 3.1 children per

woman in Haiti and 3.7 in Guatemala. In addition, decline in fertility has shown to be uneven not only among countries but also within countries among social and ethnic groups as well as sub national areas, particularly between urban and rural areas (ECLAC 2005).

2.2.1.2 Age Structure

The Latin American population has been growing at declining rates. In 1950, the average annual population growth rate in the region was 2.8 %. Currently, the growth rate has dropped to 1.1 %, and by 2050 population is expected to be growing at a rate of approximately 0.7 %.

In absolute numbers, the population increased 3.8 times over the last 64 years – from 162 million in 1950 to 607 million in 2014 – and is projected to increase an additional 20 % over the next 36 years, to reach 734 million in 2050. Population is expected to start declining in the region during the second half of this century.

Considerable variation exists among different age groups. While the young population (0–19 years old) increased 2.7 times between 1950 and 2014 and is expected to decline by around 19 % between 2014 and 2050, the adult population (20–64 years old) expanded 4.6 times in the former period and is projected to increase an additional 33 % by 2050. Yet, the most significant change concerns the older population (65 years and over), which increased by eight times between 1950 and 2014, and will more than triple between 2014 and 2050 (see Table 2.3).

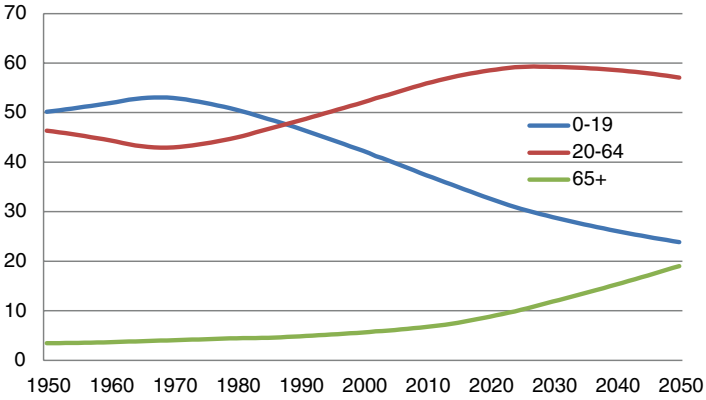
Although in absolute terms the youth population started declining in 2006, its share of the total population has been declining since 1968, and is expected to continue declining. The share of the adult population, which has been increasing since 1970, is expected to start declining slowly after 2030 even though its magnitude will continue to expand until 2045. Whereas the share of the adult and specially the youth populations are predicted to decrease, the share of the older population is expected to increase steadily into the future (see Fig. 2.1).

In fact, between 1950 and 2000, the proportion of population aged 65 and over increased only moderately in Latin America, from 3.5 to 5.6 %. Over the following 50 years, however, it is expected to rise from 5.6 to 19 %, which means, in absolute terms, an increase from around 6 million to 140 million in the course of a century. In any case, population aging will not be a homogeneous process across countries in the region. In many countries, the young and working-age populations will still play a major role in population growth well into this century.

2.2.2 The Economic Impact of Demographic Changes

2.2.2.1 Trends in Demographic Dependency Ratio

Since people's economic behavior is strongly associated to the stage they are at in the life cycle, changes in age structure tend to have a major impact on economic development. A high proportion of economically dependent persons in the



Source: CELADE/ECLAC population estimates and projections, 2013 Revision

Fig. 2.1 Population by major age groups, Latin America, 1950–2050 (%)

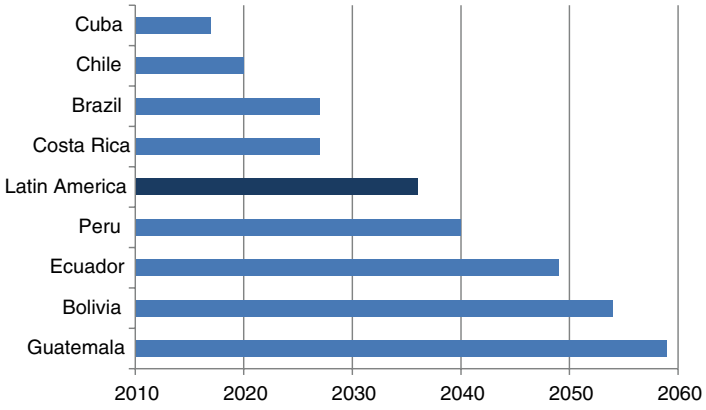
population (children and older persons, in general) usually constrain economic growth, because a significant portion of resources is allocated to attend their needs. In contrast, a large share of working-age people can boost economic growth, owing to both a larger proportion of workers in the population and a lower level of spending on dependent persons which could be invested in capital deepening (both human and physical capital).

In this regard, the demographic dependency ratio – which relates the number of people in dependent age groups (under age 19 and over age 64, in this study) to that of people in the working-age group (20–64 in this study) – is a valuable indicator of the potential effects of demographic changes on socioeconomic development. In general, the demographic dependency ratio is expressed in terms of the number of people in dependent age groups for every 100 people of working age.

Between 1950 and 1970, the demographic dependency ratio in Latin America increased due to the relative increase in the child and youth population, until reaching a maximum value of 133 dependents per 100 people of working age. Following the decline in fertility rates in the mid-1960s, the demographic dependency ratio started a steady decline, which is expected to last until 2035, when the ratio will reach its minimum value of 70 before increasing again, due to the growing proportion of older persons. Although, in general, Latin American countries coincide with this model in terms of shape, there are huge variations from one country to another in terms of timing, according to the stage of the demographic transition.

2.2.2.2 The Demographic Dividend

The demographic dividend refers to the period in which the demographic dependency ratio drops substantially as the share of the working-age population grows relative to the dependent-age population. During this period, the situation is



Source: Authors'calculations based on CELADE/ECLAC population estimates and projections, 2013 Revision

Fig. 2.2 Time left of demographic dividend, Latin America and selected countries

particularly favorable for development as it expands the possibilities for increasing rates of economic growth per capita and hence for higher levels of well-being of the population (Bloom et al. 2003; Wong and Carvalho 2006).

The recent history of many Southeast Asian countries shows that the combination of a large pool of young workers with high job skills and a relatively small contingent of dependent older people creates a situation that is highly favorable for economic growth. The increase in productivity observed in these countries was due to a large extent to the considerable investments made in the education of young people during the period of the demographic dividend (UNFPA 1998; Mason 2002).

While the countries of the region show little difference as regards the onset of the demographic dividend, the extent of this period varies significantly. Generally speaking, countries more advanced into the demographic transition have a shorter period of dividend left than countries that are behind in the process. For example, the dividend is expected to come to an end very soon in Cuba, close to 2020 in Chile, just before 2030 in Brazil and Costa Rica, around 2040 in Peru, and close to 2050 in Ecuador. In some countries the dividend should last beyond the middle of the century, as in the cases of Bolivia (Plurinational State of) (2054) and Guatemala (2059) (see Fig. 2.2). Eventually, the dividend will be replaced by a period of intense population ageing in all countries of the region.

It is important, however, to take into account the limitations of dependency ratios expressed in terms of age ranges. First, in most populations, people do not automatically cease to be economically active at a specific age. In addition, not everyone in the working-age group is economically active, particularly among the female population (despite the increasing participation of women in the labor market). Similarly, as professional training becomes longer, a growing number of young adults remain in the education system and outside the labor market longer, thereby extending the

period of dependence at younger ages. These limitations suggest that trends in demographic dependency ratios examined in this section offer only an approximate estimate of the real economic impact of age structural changes.

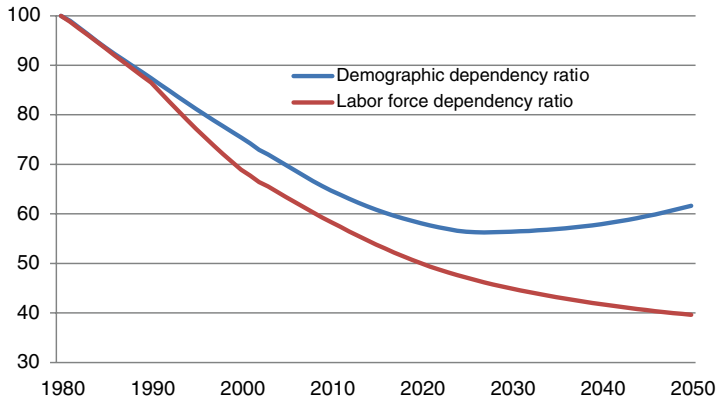
2.2.2.3 The Labor Force Dependency Ratio

An alternative way to estimate the economic impact of changes in age structure is through the labor force dependency ratio, defined as the ratio between the population that does not participate in economic activities (is outside the labor force) – the economically inactive – and that which participates – the economically active population (those that are in the labor force). In this case, both demographic factors (i.e., the population's age structure) as well as economic factors (i.e., people's participation in the labor market) are considered when estimating the favorable economic period (ECLAC 2008).

In fact, as generally highlighted in studies on the demographic dividend, the benefits associated with this period do not accrue automatically. They are subject to the adoption of macroeconomic policies that promote a stable social and economic environment conducive to sustained development, encourage productive investment, and in particular increase employment opportunities (Adioetomo and others 2005; Bloom et al. 2006). If enough job positions are not created; if families do not save enough or education is not improved for new generations, demographic change would not only cease to be an opportunity, but it would also entail social problems such as the increase of unemployment rates and levels of youth violence. On the contrary, if throughout the period of demographic dividend, countries make progress towards social protection, invest in education and health and promote the creation of productive and well-paying jobs, economic achievements resulting from such policies may contribute to reducing the "burden" produced by the proportional increment of older persons (Saad and others 2012; Hakkert 2007).

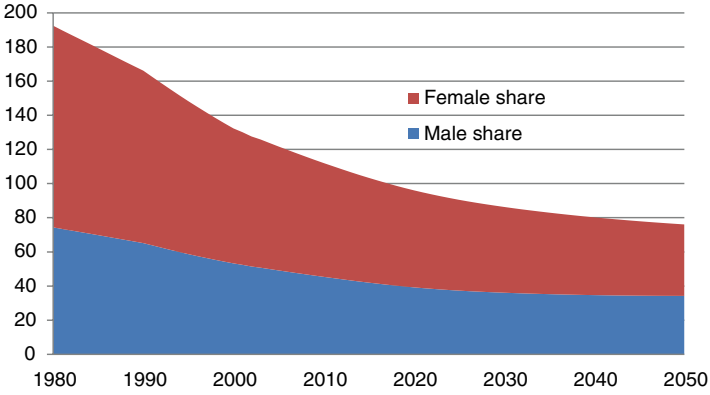
If more recent estimations and projections of the economically-active population in Latin America made by CELADE are taken as a base, one observes that the labor force dependency ratio (calculated using labor participation) has a favorable period (in which dependency declines), lasting beyond that which corresponds to the demographic dividend (calculated using demographic dependency ratios) as seen in Fig 2.3. This is true in all countries of the region (data not shown). This highlights the possibility of boosting the favorable impact of the demographic dividend through an increase in labor force participation.

Taking into account that male labor force participation rates in the region are generally high, and that they are well above female participation rates, this projected increase in labor force participation would be almost entirely dependent on greater female insertion in the labor market. For instance, Fig. 2.4 shows the decisive role of growing female participation in productive activities with regards to the extension of the favorable economic period (in which economic dependency continues to fall) beyond that which is indicated by demographic changes alone. In the figure, recent and future trends of the labor force dependency ratio in Latin



Source:Authors'calculations based on CELADE/ECLAC population estimates and projections, 2013 Revision

Fig. 2.3 Demographic dependency ratio and labor force dependency ratio, Latin America, 1980–2050



Source: Authors' calculations based on CELADE/ECLAC population estimates and projections, 2013 Revision

Fig. 2.4 Labor force dependency ratio, disaggregated into male and female contribution to inactivity, Latin America, 1980–2050

America are broken down according to the contribution of female and male economic inactivity.

It is clearly observed that the decrease in female economic inactivity (that is, the increase in the proportion of women in the economically active population) contributes significantly more than men to reducing economic dependency. This means

that while the favorable period in which economic dependency is falling is driven by an increase in the proportion of the population in the working-ages, the scale of this decline in dependency could be strengthened and its scope extended due to the growing participation of women in economic activity. Therefore, in so far as the growing female labor participation can become a direct contribution of women to the countries' economic growth, it is possible to refer to this process as a gender dividend, which complements and amplifies the demographic dividend.

2.3 Increasing Female Participation and Gender Inequality in Latin American Labor Force

2.3.1 Trends in Female Labor Force Participation

The important transformations in age structure mentioned above (a large reduction in the proportion of youth, a considerable concentration of working age population and the beginning of an ageing process) have generated favorable circumstances for the increase of women participation in economic activities. First, the female population is also becoming more concentrated in the working ages; this means there is a higher number of women available to participate in the labor force. Secondly, fertility's sustained decrease is directly translated into a reduction of the "child-raising burden" that women have to face in their homes – given the existing unequal distribution of reproduction tasks between genders – which "frees" part of the time they devote to carrying out these tasks (especially while the proportion of dependent older persons has not increased considerably due to ageing), time which women could use to participate in the labor market. In effect, diverse studies have confirmed there is a clear positive impact related to having a fewer small children in households on the increment of women participation in the labor force (Alvear 2011; Martínez 2012; ECLAC 2009, 2010).

Along with demographic circumstances, a number of other factors have been playing a role to determine a trend to increase the women's participation in the labor market. Among those that could be highlighted is the important increase of women's access to education – which is also interrelated with fertility reduction – that has lead to an equalization of enrollment rates of men and women, at least at primary and secondary levels. In addition, Latin American women have made significant progress towards their empowerment and autonomy in the physical, political and economic realms (Arriagada 2004).

Due to the aforementioned factors, female participation rates have increased considerably in the region during the last decades. This growth has been particularly important during the last two decades of the last century, period in which female labor force participation increased by 50 %. On the other hand, male participation rates have maintained constant throughout this period (see Tables 2.3 and 2.4). As a result of these trends, there is a clear convergence in female participation toward the male's participation levels, even though the gap between them is still significant.

Table 2.3 Population by major age groups, Latin America, 1950, 2014, and 2050

	Population (thousands)		
Age group	1950	2014	2050
Total	161,566	606,507	734,110
0–19	81,038	215,197	175,308
20–64	74,903	346,474	419,021
65 and over	5,625	44,836	139,781

Source: CELADE/ECLAC population estimates and projections, 2013 revision

Table 2.4 Labor force participation rates by sex, Latin America, 1980–2014

	Labor force participation rates (ages 15+)		Total change (%)		Annual change (%)	
Year	Men	Women	Men	Women	Men	Women
1980	81.9	31.8				
2000	79.9	47.9	–2.4	50.5	–0.1	2.5
2014	79.6	54.0	–0.5	12.7	0.0	0.9

Source: Author's calculations based on CELADE/ECLAC population estimates and projections, 2013 revision

Likewise, after observing advances in female economic participation in the different countries of the region (not shown), it can be suggested there is certain association between the behavior of these rates and the degree of progress in the demographic transition. In a general way, countries that have experienced faster progress within this process are those that show higher increases in their female participation rates, hence confirming the important role played by the decrease in fertility, as a facilitator of higher female participation in economic activity.

2.3.2 Gender Inequality in Labor Force Participation

2.3.2.1 The Gender Equality Index of Labor Force Participation

Currently, the importance of making progress towards gender equality as a part of the comprehensive way to achieve development goals is widely known. As a consequence, several indicators of gender equality have been elaborated and integrated into the major systems of measurement and monitoring of global development. For instance, the third Millennium Development Goal (MDG), referred to the promotion of gender equality and the empowerment of women, includes among its indicators, the percentage of women in non-agricultural paid employment.[1] In addition,

[1] See Economic Commission for Latin America and the Caribbean (ECLAC), "Statistics and indicators for monitoring MDGs in Latin American and Caribbean countries", [online], http://www.eclac.cl/cgibin/getProd.asp?xml=/mdg/noticias/paginas/4/35574/P35574.xml&xsl=/mdg/tpl/p18f-st.xsl&base=/mdg/tpl/top-bottom.xsl#indicadoresODM3.

the human development index (HDI) of the United Nations Development Programme (UNDP) establishes three areas of gender inequality: reproductive health, empowerment, and labor markets. The indicator measuring this last area is participation of men and women in the labor force (UNDP 2011).[2] Likewise the Gender Equity Index (GEI) developed by Social Watch (2012) and the one developed by the European Institute for Gender Equality (EIGE)[3] include, as a basic component, ratio measurements of female and male labor force participation.

Advances in the more developed countries in terms of gender equality with regards to labor force participation are impressive, though it is important to highlight that none of them have reached complete equality in this regard. According to Eurostat data, Nordic countries (Norway, Finland, Sweden, Iceland and Denmark), have achieved higher levels of gender equality in their labor markets, with the ratio of female participation to male participation bordering on 90 %. This result has not been achieved without effort: Nordic countries have stood out for decades for having introduced specific measures for equalization of opportunities between men and women in the labor market, such as work schedule flexibility, so that men or women, at their discretion, can assume child-raising tasks.

Most Latin American countries register low or intermediate values for the gender equality index of labor force participation (ratio between female and male participation rates). Even countries in the region with relatively higher human development index and which are in more advanced stages in the demographic transition, such as Argentina and Uruguay, show moderate equality indicators, at around 70 %. Several countries, such as Chile, Costa Rica and Mexico, show still very low equality indicators at around 60 %. On average, the region shows an indicator of 68 % (see Table 2.5).

2.3.2.2 The Gender Equality Index of Expected Working Life

Generally, crude labor force participation rates have various limitations when they are used as a base to calculate equality indicators. In the first place, they are influenced by the age structure of the population. In addition, some women that are part of the labor force are currently unemployed; using the labor force participation rate overestimates the real level of economic activity. Finally, as transversal indicators, they do not take account of the discontinuity over the life cycle of labor force participation and employment, which mainly affects women in different stages of their life cycle. A better equality indicator, which is not affected by age structure and

[2] The HDI also includes a gender development index one of whose components is the ratio between male and female labor income.

[3] See [online], ‹http://europa.eu/legislation_summaries/employment_and_social_policy/equality_between_men_and_women/c10938_es.htm›.

Table 2.5 Labor force participation rates by sex and gender equality index of labor force participation, selected countries, circa 2014

	Participation rate[a]		Gender equality index of labor force participation
	Women	Men	
Country	(1)	(2)	(1)/(2)
Iceland	77.6	83.7	0.93
Norway	68.3	73.7	0.93
Sweden	60.5	68.1	0.89
Denmark	58.6	66.2	0.89
Finland	55.5	63.0	0.88
Brazil	59.5	81.4	0.73
Uruguay	53.5	74.5	0.72
Argentina	52.5	75.0	0.70
Chile	45.8	74.1	0.62
Costa Rica	47.4	79.4	0.60
Mexico	46.4	79.8	0.58
Latin America	54.0	79.6	0.68

Sources: Authors' calculations based on Eurostat, labor market database [online]: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_argan&lang=en; CELADE/ECLAC population estimates and projections, 2013 Revision

[a]Estimates refer to the year 2014 in the case of Latin American countries, and to the year 2013 for the European countries

therefore could potentially better record the differential impact of fluctuations in labor market participation throughout the life cycle can be calculated using the ratio of female to male active work life expectancy.[4]

Working life expectancy is calculated by adding up the age-specific labor force participation rates. It expresses the length of work life of a cohort if, during its working life cycle, it had experienced the labor force participation rates by age that are currently observed. The gender equality index of expected working life (which could also be called a synthetic index of gender equality in labor market participation) gives us a more precise idea on the actual difference in the length of time men and women spend participating in the labor market during their life cycle.

In order to make this calculation, data on labor force participation rates by age and sex obtained from projections of the labor force elaborated by CELADE were used and for countries in Europe information was obtained from the Eurostat Consultation System. In Table 2.6, levels and trends of indexes of gender equality

[4] It is important to note that this indicator refers to labor force participation and therefore it includes both the time in which people are working and that in which they are unemployed.

Table 2.6 Gender equality index of expected working life, selected countries, 2000, 2005, 2010 and 2014

Countries	Gender equality index of expected working life			
	2000	2005	2010	2014[a]
Finland	0.93	0.94	0.94	0.95
Norway	0.89	0.91	0.92	0.93
Sweden	0.93	0.92	0.91	0.93
Iceland	0.88	0.88	0.89	0.92
Uruguay	0.69	0.71	0.73	0.76
Argentina	0.58	0.64	0.68	0.71
Brazil	0.62	0.65	0.68	0.71
Chile	0.48	0.53	0.57	0.61
Costa Rica	0.42	0.47	0.53	0.57
Mexico	0.42	0.47	0.51	0.55
Latin America	0.55	0.59	0.62	0.65

Sources: Authors' calculations based on Eurostat, Consultation System, [online], http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_argan&lang=en/, CELADE/ECLAC population estimates and projections, 2013 revision

[a]Estimates refer to the year 2014 in the case of Latin American countries, and to the year 2013 for the European countries

of expected working life are presented for select countries in Latin America and those with highest gender equality in Europe.

As it can be observed, in countries with higher levels of gender equality in economic participation, the gender equality index of expected working life remains the same or increases in comparison to the gender equality index of labor force participation presented in Table 2.5. This result indicates that the population age structure in these countries was giving relatively more weight to those ages in which women were particularly disadvantaged relative to men. The life cycle measure shows a more favorable picture.

In several countries in Latina America however, the gender equality index of expected working life is lower than the gender equality index of labor force participation. This means that the population age structure in these countries is weighting those age groups in which women are less disadvantaged relative to men. The life cycle measure which weights all periods of life equally shows women to be more disadvantaged. This indicates the presence of important periods of disadvantage to women over the life cycle, perhaps a reflection that the functioning of the labor market – and of society in general – establishes some restrictions to the continuity of women's participation. Exceptions to this rule occur in Argentina and Uruguay, where the equality outlook improves when the gender equality index of expected working life is applied – likely due to their older age structure which gives more weight to the older ages where women's economic disadvantage is more pronounced.

Although the level of gender equality in Latin America is far from reaching the levels of more developed regions, the increasing trend of the gender equality index of expected working life observed in all countries of the region is encouraging.

2.4 The Economic Magnitude of the Gender Dividend and the Demographic Dividend

We now turn to identify the economic impact of these trends in female labor force participation in the region. In this section, we present a simple model to assess the relative economic impacts of the two transformations noted earlier: the increasing concentration of the population in the working ages and the increasing labor market participation of women. The economic impact of the former trend is the well-known demographic dividend. To this we add a second dividend: the gender dividend, defined as the economic impact of women achieving parity with men in labor markets.

Lacking precise data, we resort to using a simplified method for estimating these two dividends for two 30 year periods representing the recent past and the near future: 1980–2010 and 2010–2040. We define GDP per capita as the product of four factors[5]:

$$\begin{aligned}(\text{GDP / capita}) = {} & (\text{Output per worker}) * (\text{Population in ages } 20 \text{ to } 64) \\ & * (\text{Labor force participation rate of population ages } 20 \text{ to } 64) \div (\text{Population})\end{aligned}$$

Hence, the growth rate of GDP per capita would be equal to the sum of the growth rates in these four factors[6]:

$$\begin{aligned}(\text{Growth rate of GDP / capita}) = {} & (\text{Growth rate of output per worker}) \\ & + (\text{Growth rate of population in ages } 20 \text{ to } 64) \\ & + \begin{pmatrix} \text{Growth rate of labor force participation} \\ \text{rate of population ages } 20 \text{ to } 64 \end{pmatrix} \\ & - (\text{Growth rate of population})\end{aligned}$$

[5] Our simplification assumes no economic output by the population below age 19 and above age 65. In addition, we assume no variation by age in labor force participation rates or in productivity between the ages of 20–64. A more general formula would be $Y = £ x\, y(x) * p(x) * l(x) / P$; where Y = GDP per capita, y(x) = output per worker at age x, p(x) = population at age x, l(x) = labor force participation rate at age x, and P = total population.

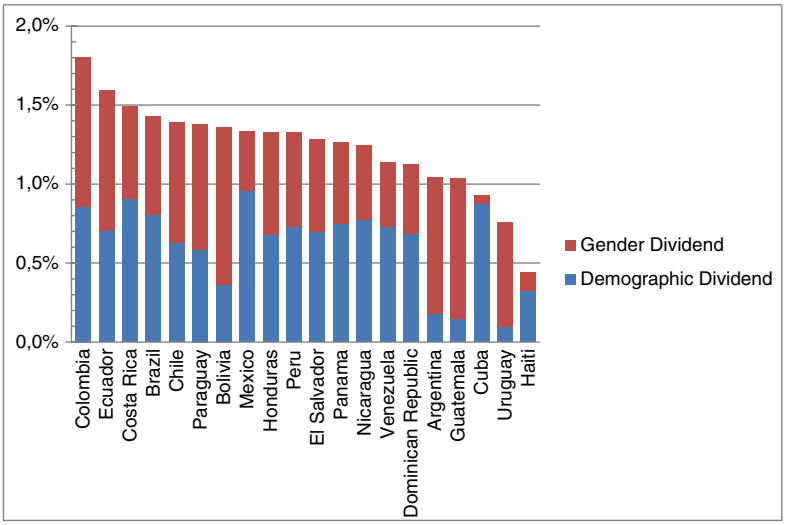
[6] The equation is exact if each factor is growing exponentially, but otherwise a close approximation.

We measure the contribution of the demographic dividend to the growth of GDP per capita as the difference between the growth rate of the population in the working ages (20–64) and the growth rate of the total population. For example, in the case of Brazil, the working age population grew at an annual rate of 2.2 % over the period 1980–2010 (from 55.9 million in 1980 to 108.9 million in 2010). The total population grew at a slower rate of 1.6 % annually from 1980 to 2010 (from 121.7 million to 194.9 million). This more rapid growth of the working age population than the total population raised GDP per capita by 0.6 % annually over the period.

We measure the contribution of the gender dividend to growth of GDP per capita as the growth rate of labor force participation in the age 20–64. As was shown in the preceding section of the paper, most of the growth rate of labor force participation in the recent past (and in the near future) is due to growth in female labor supply. For this reason, we can easily approximate the contribution of women's labor force participation by using changes in total labor force participation. In Brazil, the labor force participation rate rose from 65.4 % in 1980 to 78.6 % in 2010, or an annual increase of 0.6 % over the period. Hence, the gender dividend played as large a role as the demographic dividend in supporting Brazil's recent economic growth.

There are two key limitations in our assessment of the magnitude of the gender dividend. First, as women enter the labor market, they may enter into jobs with below-average labor productivity. But our calculation assumes that new labor force entrants take jobs at the average level of labor productivity currently observed in the economy. To the extent this assumption is violated, we are likely to overstate the impact of the gender dividend. Second, we are measuring the economic gains as women assume jobs in the formal labor market but we are not measuring the economic costs due to the loss of the non-remunerated economic activity of women. This also leads us to overstate the impact of the gender dividend. Here we note that this is a general problem in the way in which GDP is measured – and that our calculation, though flawed, is an accurate measure of the impact of the gender dividend on GDP per capita as it is currently measured in National Accounts. That is, our measure of the gender dividend is completely consistent with National Accounts.

A more accurate measurement of the impact of the gender dividend will be possible once non-remunerated activities like caring for children, caring for elderly parents, and housework are properly measured. Currently, the Counting Women's Work project (Donehower 2013) is developing National Time Transfer Accounts (NTTAs) as a means for valuing these non-remunerated activities – measuring the value of time transfers between individuals. These NTTAs are being developed for many countries and for many years. International comparisons of this data will yield a rich source of information not only about the magnitude of the gender dividend but also about changes in gender specialization in economies over time, progress toward gender equality, and measurement of the hidden "care economy" – most especially the provision of time-intensive transfers to young children and elderly. While we await the results made possible by those efforts in the coming years, this paper attempts a preliminary estimation of the magnitude of the gender dividend with respect to the demographic dividend. Our calculations are admittedly crude but will serve to estimate the general size and trend of these dividends.

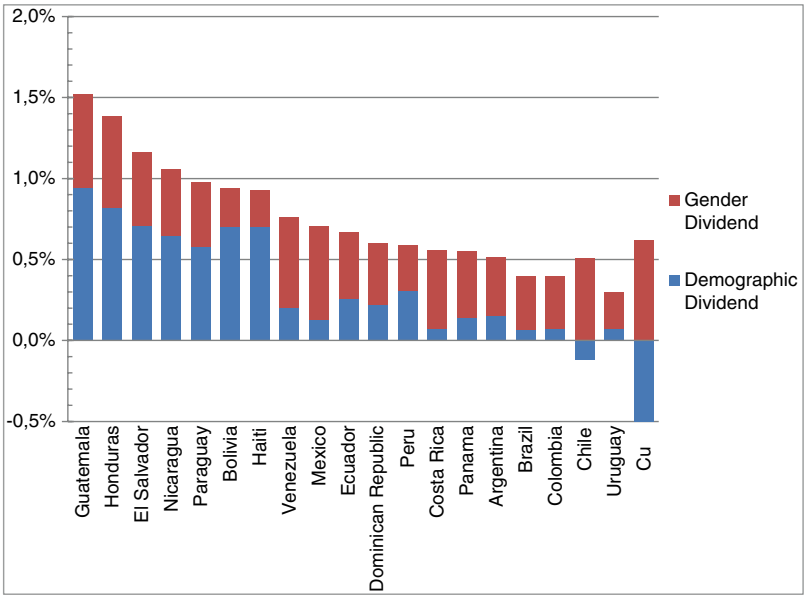


Source: Authors' calculations based on model described above using CELADE/ECLAC population estimates and projections, 2013 Revision

Fig. 2.5 Annual contribution of gender dividend and demographic dividends to growth in GDP per capita: 1980–2010

Figure 2.5 shows the annual contributions of the two dividends combined (demographic and gender) to annual economic growth for 20 Latin American countries. The estimated impact of growth in GDP per capita is sizeable: with virtually all countries showing a contribution of more than 1 percentage point per year to growth (with the exception of Cuba, Uruguay, and Haiti). The country with the greatest combined dividend during the recent past was Colombia where the combine impact of the dividends contributed 1.8 percentage points to GDP per capita growth. The contributions of the gender dividend and the demographic dividend were roughly equal in Colombia. Looking across countries, we find that on average the gender dividend was about as large as the demographic dividend during this period. On average, the gender dividend contributed about 0.6 percentage points to annual GDP per capita growth and the demographic dividend also contribute about 0.6 percentage points to GDP growth. That the gender dividend is about as large as the demographic dividend is a key finding of this study.

However, we note substantial variation among the countries. Bolivia, Colombia, Guatemala, Argentina, and Ecuador all had above-average gender dividends (contributing in excess of 0.8 percentage points per year to GDP per capita growth). While other countries showed below-average gender dividends such as Cuba and Haiti (with contributions below 0.2 percentage points). A similarly large variation is in evidence for the demographic dividend during the recent past. Mexico, Brazil, Costa Rica, Colombia, and Cuba showed above-average demographic dividends during the period (contributions in excess of 0.8 percentage points per year to GDP per capita growth). Other countries such as Uruguay, Argentina, and Guatemala



Source: Authors' calculations based on model described above using CELADE/ECLAC population estimates and projections, 2013 Revision

Fig. 2.6 Annual contribution of gender dividend and demographic dividends to growth in GDP per capita: 2010–2040

showed below-average gender dividends – where the demographic dividend contributed less than 0.2 percentage points to annual GDP per capita growth (Fig. 2.6).

Looking to the near future, we present estimates of the combined impact of the demographic and gender dividends for the period 2010–2040 in 3.6. Here we find evidence of change among the countries. Colombia, which had the highest combined dividend for the recent past (at 1.8 percentage points), is projected to have among the lowest dividend in the near future (at 0.4 percentage points). Haiti, which had the lowest combined dividend in the recent past (at 0.4 percentage points), is projected to have a combined dividend of 0.9 percentage points in the near future. Several countries are projected to have combined dividends in excess of 1 percentage point per year: Guatemala, Honduras, El Salvador, and Nicaragua.

Compared to the recent past, we see declines in the size of the demographic dividend in the majority of countries in the region (16 of 20). On average, the contribution of the demographic dividend to GDP per capita growth falls from 0.6 percentage points to 0.3 percentage points. The contribution of the gender dividend to economic growth also declines from 0.6 percentage points to 0.4 percentage points. Therefore, on average, the gender dividend will be more important than the demographic dividend in our region in the near future. We project that in 12 of the 20 countries, the gender dividend exceeds the demographic dividend.

2.5 Conclusions

The study shows how in Latin America, as in much of the developing world, a substantial and sustained increase in female economic participation rates is underway leading toward a convergence of female participation towards male participation (which has remained relatively constant). Among the main factors related to the increasing female participation, we highlighted the decline in fertility associated with the demographic transition process, as well as a series of interrelated transformations such as the reduction in household size and change in households' structure, the increase in the educational level of women, and their undoubted progress in achieving greater autonomy.

However, the difference in labor force participation between genders is still very high and even the most advanced countries in this regard in the region show a considerable gap in gender equality in labor participation, compared to European countries that have achieved very high levels of equality. The use of more refined indicators that take into account the duration of the active life of men and women emphasize the differences. These results suggest that in the region, there are still cultural conditions and other barriers in the labor market that not only hinder access and retention of women in employment, but also imply that they receive lower wages than men. It means there still exists in the region a large potential to take advantage of the gender dividend, which could generate a significant increase in economic per capita output, to the extent that progress towards equality between women and men in the labor market is made.

The study of the relative magnitude of the gender and demographic dividends yielded several notable findings: the magnitude of the combined dividend (gender dividend plus demographic dividend) was important in the recent past, when it contributed more than 1 percentage point a year to per capita GDP growth and, although it will decline, the impact will remain important in the near future in a number of countries in the region. Moreover, and perhaps the most important conclusion of the study, the gender dividend has been as important as the demographic dividend in the region in the last years, and is likely to be higher than the demographic dividend in the near future, though with very heterogeneous situations among the countries. Finally, another very important conclusion is that in those countries in which the demographic dividend will decline or become negative (as in the case of Cuba), the gender dividend will continue to exert a strong positive influence on economic growth.

These results imply that countries in the region are faced with the challenge and the opportunity to advance in the implementation of policies to encourage female participation on equal terms with men. As demonstrated in several studies, progress in women's autonomy has a high positive impact on their possibilities for economic participation. Consequently, countries of the region should implement and

strengthen policies and actions favoring women's empowerment and their presence in all spheres of social and economic life, while implementing measures aimed to transform structural and cultural factors related to the traditional distribution of productive and reproductive roles and their reflection in discriminatory practices within labor markets.

References

Adioetomo, S., Beninguisse, G., Gultiano, S., Hao, Y., Nacro, K., & Pool, I. (2005). Policy implications of age-structural changes. *CICRED Policy Papers Series*. Paris: Committee for International Cooperation in National Research in Demography.

Alvear, M. E. (2011). *Estructura del hogar y su efecto sobre la participación laboral de las mujeres y las decisiones de fecundidad en Colombia*. Bogotá: Universidad Nacional de Colombia, tesis presentada para optar al título de Magíster en Economía.

Arriagada, I. (2004). *Transformaciones sociales y demográficas de las familias latinoamericanas* (Papeles de Población, N° 40). Toluca: Universidad Autónoma del Estado de México.

Bloom, D., Canning, D., & Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change*. RAND Population Matters Program, N° MR-1274. Santa Monica.

Bloom, D., Canning, D., & Sevilla, J. (2006). *Growth and the demographic transition* (NBER Working Papers 6). Cambridge, MA: National Bureau of Economic Research.

Donehower, G. (2013). *Incorporating gender and time use into NTA: National time transfer accounts methodology*. Manuscript, University of California at Berkeley, http://www.ntaccounts.org

ECLAC (Economic Commission for Latin America and the Caribbean). (2005). *Social panorama of Latin America, (LC/L.2288-P/E)*. Santiago: United Nations Publication. Sales No. E.05. II.G.161.

ECLAC (Economic Commission for Latin America and the Caribbean). (2008). *Demographic transformations and their influence on development in Latin America and the Caribbean*. [LC/G.2378 (SES.32/14)], Santiago: United Nations Publication.

ECLAC (Economic Commission for Latin America and the Caribbean). (2009). *The demographic dividend: An opportunity to improve coverage and progression rates in secondary education. Social Panorama of Latin America, 2008* (LC/G.2402-P), Santiago: United Nations Publication.

ECLAC (Economic Commission for Latin America and the Caribbean). (2010). *Gender and paid and unpaid work: Links in the chain of discrimination and inequality. Social Panorama of Latin America 2009* (LC/G.2423-P), Santiago.

Fígoli, M., & Wong, L. (2003). *El camino hacia la estabilización demográfica y el proceso de envejecimiento en América Latina: una ilustración a partir de algunos países seleccionados. Papeles de población* (35). México, D.F.: Centro de Investigación y Estudios Avanzados de la Población.

Hakkert, R. (2007). *The demographic bonus and population in active ages*. Research Paper, N° 7. Proyecto RLA5P201, Brasilia, Fondo de Población de las Naciones Unidas (UNFPA) e Instituto de Investigación Económica Aplicada (IPEA).

Martínez, C. (2012). Descenso de la fecundidad, participación laboral de la mujer y reducción de la pobreza en Colombia, 1990–2010. *Estudios a Profundidad de la ENDS*, Bogotá, Profamilia (in press).

Mason, A. (2002). *Population change and economic development in East Asia: Challenges met, opportunities seized*. Palo Alto: Stanford University Press.

Saad, P., Miller, T., Martínez, C., & Holz, M. (2012). *Juventud y bono demográfico en Iberoamérica. (LCL/L.3575)*. Santiago de Chile: CEPAL.

Social Watch. (2012). *Social watch report 2012: The right to a future*. http://www.socialwatch.org/report2012

UNDP (United Nations Development Programme). (2011). *Human development report 2011:* "*Sustainability and Equity: A better future for all*." New York: Palgrave Macmillan.

UNFPA (United Nations Population Fund). (1998). Shift to smaller families can bring economic benefits. News features, at: http://www.unfpa.org/swp/1998/newsfeature1.htm. United Nations.

Wong, L., & de Carvalho, J. A. (2006). Age-structural transition in Brazil: Demographic bonuses and emerging challenges. In I. Pool & L. R. Wong (Eds.), *Age-structural transitions: Challenges for development*. Paris: Comité para la Cooperación Internacional en las Investigaciones Nacionales sobre Demografía (CICRED).

Chapter 3
Demographic Dividends and Households Saving in Mexico

Isalia Nava-Bolaños and Roberto Ham-Chande

3.1 Introduction

Demographic transition means the passage from high mortality and high fertility to low levels in both variables. For each variable, the path is different since mortality forestalls fertility thus altering age structure in a way in which the proportion of the population in typically working ages increases and then decreases the dependency ratio, albeit just for a limited time. This well-known process is termed as a Demographic Window (DW) since it has suggested a theory in which the largest share of the population in potentially productive ages offers a unique opportunity to yield higher Gross Domestic Product (GDP) with a chance to increase per capita income. This has been described by Lee and Mason (2006) as the *First Demographic Dividend* (First DemDiv) provided that while this *window* is open effectively a large part of the population in active ages have a higher level of economic output allowing saving improving prospects for investments for economic growth, educational and health infrastructure to benefit the present and sustain the future. They also refer to a *Second Demographic Dividend* (Second DemDiv), which starts at the end of the intermediate stage of the demographic transition and extends to the last stage. As life expectancies lengthen retirement, ageing is expected to be accompanied along with assets accumulation with positive effects on income. It should be stressed that the Second DemDiv requires a good performance of the First DemDiv. This implies that in order to create and profit from the *Demographic Dividends* (DemDiv)

I. Nava-Bolaños (✉)
Instituto de Investigaciones Económicas (IIEc), UNAM, Ciudad de Mexico, Mexico
e-mail: inava@colmex.mx

R. Ham-Chande
Department of Population Studies, El Colegio de la Frontera Norte,
Tijuana, Baja California, Mexico

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9_3

policies must be planned and designed early to meet the future demands of the entire population, including the elderly.

One of the means most relevant to shape an economically successful DemDiv is the economic effects from savings or deferred consumption. A higher concentration of population in adult ages suggests increases in the aggregate saving rates. However, it is not an automatic fact since there are different factors involved in the capacity for postponed consumption. Some of them are related to the job offer, income, job formality and access to social security. The structure of financial institutions, personal behavior and future expectations also play a role (Bloom et al. 2003).

In Mexico, the *Total Dependency Ratio* (TDR)[1] reached a 104.3 maximum in 1970 to start a falling mainly due to higher numbers for the population between the ages 15–64 and lower for younger than 15, hence forwarding the possibility of DemDiv configuration. By 1990, TDR was 75.6 and in 2010, it was 55.8. The most recent projections of the Consejo Nacional de Población (CONAPO) show that TDR might reach its lowest in 2024 estimated to be 51.2. From this moment, the DW will start shutting up and the TDR growing within quite different circumstances. Dependency will be due less and less from children and teen-agers, and more and more from the elderly. Regrettably, this period from 1970 to nowadays has been of scarce use of the DW. Hernández-Laos (2004) reports than between 1970 and 2000 the DW contributed only half a percentage point to the 3.9 % growth rate of the Gross Domestic Product (GDP). Giorguli et al. (2006) found that the regional age structures are heterogeneous and are the product of the socio-economic inequalities to the interior of the country. They note that while the DW is part of the Government's Agenda, policies are not coordinated and not effective to profit from the demographic advantage. Nevertheless this background, this paper considers that the DemDiv concept offers an approach for a broader analysis on demographic change and economics, focusing on household savings.

Research on the relationship between demographic change and income not used for immediate consumption in Mexico is sparse. The most explanatory study is on cross-section profiles of individual income and expenditures based on the National Accounts of Transfers (NTA) project (Lee and Donehower 2010; Mejía 2008, 2011; Mejía et al. 2010). In contrast, this chapter is about households aggregate saving dynamics over time through the study of life-cycle profiles. DemDiv approach appears as one of the central mechanisms of savings configuration, thus forming part of the analytical framework.

The specific item in this research is to analyze the life-cycle households saving in a context of the first DemDiv considering income, consumption expenditures and saving. To save means consuming less out of a given amount of resources in the present in order to deferred consumption. The analytic tool is the construction of 11 synthetic cohorts using the annual National Household Income and Expenditure Survey (Encuesta Nacional de Ingresos y Gastos de los Hogares, ENIGH) from 1994 to 2012, carried out by the Instituto Nacional de Estadística y Geografía (INEGI). It especially seeks to identify if saving can be regarded as the usual up-

[1]Youth dependency ratio plus old age dependency ratio.

side down U shape throughout the life-cycle and if there is a relationship between the aggregate saving rate and the construction of DemDiv.

The first section of this chapter is a background on the subject, in particular dealing with the relationship between life-cycle and savings explained as a mechanism of the DemDiv. The second section describes data, variables and the methodology of pseudo-panels. Results are presented in the third section. Last section is on discussion and conclusions.

3.2 Savings and the Life-Cycle

The human lifespan is composed by successive periods of age-related behaviors, activities, social roles and key events that are designated as life-cycle. In its simplest conceptualization the life-cycle is divided into three major phases defined by biological and physical features: childhood, adulthood and old age. Within this pattern, the expectations are that the first stage of life would be a time of dependency. It is when life begins, social relations rules are learned and physical and mental growth takes place through individual development and education. The second stage is adulthood, characterized by independence, the acquisition and the exercise of responsibilities, the time for economic and social productivity and the aptitude for the formation and rise of a family. This is the leg when economic productivity is higher allowing fundamental support for family and social reproduction. In this stage, every generation should contribute to build and strengthen social and economic sustainable infrastructure that will support future demands for goods and services. Finally, the old age stage occurs before the end of life characterized by losses in physical and mental health causing retirement from job, diminishing social roles, lowering family participation activity. Old age thus produces a return to dependency.

It is necessary to realize that actual life-cycles are most complex in meaning and expression than these three stages previously described. In addition to biological and physical factors and depending on each person and socio-economic context there are other factors affecting the life-cycle, even adding or canceling stages. In the case of Mexico, children may begin to work at a very early age; working elderly are common; not all those adults in working ages have a job; non-income women occupations require new concepts and accounting (Ham and Nava 2008).

For the life-cycle economic analysis some variables become relevant, in particular those related to saving behavior. By 1952 and 1954 Modigliani and Brumberg established the first framework about work and saving as the *Life-Cycle Hypothesis* (LCH). In their LCH simplified version, the resources that a person allocates for consumption at any age depend on available revenues, mainly the present value of job income plus other sources. Consumption patterns are determined by needs and choices arising throughout the life-cycle. Given the possibility for asking and granting loans, income fluctuations do not influence consumption. If income is low at the beginning of life, it is expected to increase later on, there is no need to postpone consumption increase since today's borrowing (dissaving) will be paid by future

income (Modigliani 1986). Later, during adulthood active life the best levels of income are achieved, previous debts are paid, it is possible to accumulate assets and funds (saving) to cover the gap income-expenditure anticipation of the future. Finally, accumulated assets and funds reduce gradually once the retirement occurs (dissaving). Under this path there are two periods of dissaving throughout life, during the first and the last life cycles, with a deferred consumption period in the middle years. Thus saving is described by an inverted U-shaped curve throughout the life-cycle.

It is a theoretical framework of analysis that provides a microeconomic theory of individual or household savings, which is useful for macroeconomic rationale through a process of an explicit aggregation of households (Deaton 1998). Under this scope an economy consisting of mainly young people in adult ages should show high aggregate saving rates, since most young workers will be have higher economic output than is required by their consumption patterns along with their children and their dependent elderly, thus creating a positive effect on economic growth.

3.3 Demographic Dividends and Savings

How the DemDiv are tinkered is perceived as a complexity of concepts in terms of social and economic variables interwoven in a macroeconomic system. There is, above all, the need to consider the dynamics and relationships in time between demographic characteristics, economic yield, consumption patterns, income not spent, investment destinations, employment, schooling, job training and health status. In this sense, Bloom et al. (2003) point out that the main mechanisms of operation are labor supply, human capital and saving.

This chapter focuses on demographic dynamics and saving. Mason (2005) refers to two effects that are related to change in age structure and the formation of future consumption that might have a positive effect on economic growth. First, there is an effect due to demographic composition, which becomes relevant because economic performance varies systematically throughout the life-cycle. Usually, as it was previously explained, it is in adulthood when there is more income than consumption hence a surplus for saving. Consequently, when population in middle age grows it also increases aggregate saving, a fact that has been corroborated by empirical studies. Kelley and Schmidt (1996) analyzed the rate of aggregate saving of 65 developing and 23 developed countries and found that the change in age structure had a significant effect on deferred consumption, especially around age 30. Williamson and Higgins (2001) found evidence that in East Asia private savings generated by the high proportion of population in working age was one of the main sources of financing of the growth of the region. Estimates are that demographic change increased 43 % of the gross national saving rate. However, there are differences over time and between countries.

There is also an effect from behavior guided by the expectations in the last years of working life (Mason and Kinugasa 2008). The increase in life expectancy increases the withdrawal period, which creates greater uncertainty and increases the propensity to save as a way to prevent possible future risks. In addition, the rise of

age at retirement means keep working and increasing savings. Through a simulation for the case of Taiwan, Lee et al. (2000) found that the combined effect of an increase in life expectancy and family support systems are enough to produce a threefold increase of the output ratio.

In addition to the above, declines in mortality and fertility during the demographic transition also hold relationship with economic behavior and saving. Higher life expectancy and better health care makes deferred consumption easier and appealing since a healthy population is prompt to plan ahead to maintain living standards throughout retirement (Lee et al. 2000). Lower fertility reduces offspring size, allowing a greater proportion of income for future consumption (Bloom and Canning 2001). Besides, less children encourages women to participate in the labor market as well as get an education, which eventually is translated into an income that helps to increase savings. Martínez et al. (2013) refer this potential economic benefit from working women as a *gender bonus*.

In the analysis of saving as an economic factor it is important to consider other elements such as the characteristics of the labor force, the capacity of the system to create jobs suitable for young people who every year seek a paid occupation, the capability for saving and the forms of investment. The value of unpaid work, mostly care and household work from women, is also an input.

3.4 Data, Variables and Methodology

The database used is from ENIGH. It is a cross-sectional survey carried out every other year, nation-wide representative as well as rural-urban, holding representativeness for those States that can afford an agreement with INEGI for over sampling. It collects data on the amount and structure of income of individual in a household and their expenditures. Information includes socio-demographic characteristics, occupation, dwelling unit infrastructure and housewares.

In this study, the sample was restricted to those households where the head of household is at least 20 years old and up to age 80. The ENIGH analyzed were from years: 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010 and 2012. The purpose was to have a greater number of cross-cutting units and data points in time, seeking to increases the number of degrees of freedom to reduce collinearity between variables. The ten surveys in the set are comparable in terms of sample design, methodology, period of the year and questionnaire capture. Each sample covers between 9,002 and 29,468 households.

3.4.1 Variables in a Demographic Dividends Study

The main variables in a DemDiv study are income, consumption expenditures and saving, regarded as income not spent, whose values are in current terms. Current income comes from wages, self-employment and returns from financial assets or

real estate.[2] Current consumption expenditures are the sum of regular expenses in goods and services for the benefit of household members. It includes food, clothing, education, health, transportation, housing, and recreational items. Both current income and current consumption expenditures include monetary and non-monetary components.

ENIGH questions and variables consider reference periods and their impact on the availability of resources. Examples are payment days, dates when profits or investment returns can be cashed, the nature of economic activity in terms of seasonal variations, irregular variations caused by instability in employment. Thus, the survey includes monthly and annual information. Regarding expenditures heterogeneity is taken into account at the time of buying goods and services. Since it is difficult for people to remember, buying reference periods are short, sometimes it is a daily basis. However, to record goods and services that are seldom purchased, longer periods are considered, such as semesters. In any case, figures are expressed in monthly terms.

Current saving of households (S) are estimated by subtracting consumption expenditures from current income.

$$S = Y - C \tag{3.1}$$

Variables of current income, current consumption expenditures and current saving are deflated in reference to the National Index of Prices to the Consumer (INPC) published by INEGI. Prices are in referred to December 2010 and in US dollars (USD).[3]

3.4.2 Pseudo-panel Method

To save has a dynamics. It is important to keep track over timing of income, consumption expenditures and saving. Describing life-cycle profiles using *instant pictures* from *cross-section* data may be biased by cohort effects. Shorrocks (1975) discusses about individuals belonging to different cohorts that accumulate wealth as they age. If younger cohorts are wealthier in comparison to the older cohort (for example by an increase in productivity), the use of a cross-section analysis might reflect an illusionary hump-shaped age profile for saving.

Available surveys that provide information on income and expenditures are cross-sectional and do not follow economic behavior throughout the life-cycle. To overcome this condition this study uses pseudo-panels proposed by Browning et al.

[2] Transfers were not included as part of the current income, for example, pensions. While it is true that pensions are an income for individuals, the effect of these saving is contradictory with the macroeconomic studies, which are usually disregarded (Butelmann and Gallego 2000).

[3] Data on aggregated savings is not compatible with the national accounting data. It is better to use original data by introducing a coefficient of adjustment. Estimates may not robust enough, from of arbitrary elements introduced at the time of the correction (Székely 1998).

(1985) that has been widely used to study saving as a cohort process (Deaton and Paxson 1998). The method builds up n Synthetic Cohorts (SC) which are individuals grouped by a fixed criterion and a constant interval. In this case the standards are the year of birth of the head of the household in 5-year intervals. This allows to keep the mean value of variables of interest of each cohort in successive surveys. The main assumption is that the composition of cohorts groups is consistent over time. The sample was restricted to those heads of household between the ages 20 and 79. The reason is that the number of cases out of that range is significantly small to yield wrong estimates.

Table 3.1 depicts the construction of the 11 SC used in this study. The first cohort is composed by heads of household who were born between 1930 and 1934. The second cohort is those who were born between 1935 and 1939, and so on until the 11th and youngest cohort corresponding to the generation that was born between 1980 and 1984. This arrangement helps to track the behavior of groups of households over time. The first cohort (1930–1934) was in the 60–64 age group in 1994, which is the year of the first survey. Then they were 62–66 in 1996, for the second survey year; up to the last survey in 2012, when the age was 78–82, although only people under age 80 were included. The same pattern can describe the 11 cohorts during ten surveys yielding 110 observations.

Table 3.2 is a numerical overview of SC by showing periods of birth, periods of study, age in 1994 and 2012 and number of households that are calculated for each SC. SC 1–9 were followed 18 years, SC 10 was followed 16 years and the youngest SC 11 for 14 years. Each SC is observed at a time different from their life-cycle interval. However, as surveys cover a period up to 18 years and SC are defined in 5-year intervals, the profile of each SC overlaps with immediate SC. Therefore, the same age is studied for different cohorts but at different times.

Added variables of current income, current consumption expenditures and current saving of households are yearly averages within cohorts. Averages were calculated without any sort of weighting since ENIGH expansion factors lead to population representativeness. When we consider the averages for specific groups, like cohorts or groups established by the age of the head of household, estimates are slightly less representative since sampling procedures are close to self-weighting.

3.5 Decomposition of Savings Profiles by Deaton and Paxson

In order to obtain an estimate the profile by age of saving behavior, Deaton and Paxson (2000) proposed a statistical decomposition. Saving can be estimated as:

$$s_{ct} \approx \overline{lny}_{ct} - \overline{lnc}_{ct} = a + Ab + Cg + Yd + u_{ct} \tag{3.2}$$

where s_{ct} is the c cohort saving in the period t. A, C and Y are matrices of dummy variables on age, cohort and period. Coefficients β, γ and δ are parameters of the effects from age, cohort and period. u_{ct} is the error term in the saving function. As

Table 3.1 Construction of the synthetic cohort (age of household head)

Cohort	1		2		3		4		5		6		7		8		9		10		11	
Year	1930	1934	1935	1939	1940	1944	1945	1949	1950	1954	1955	1959	1960	1964	1965	1969	1970	1974	1975	1979	1980	1984
1994	60	64	55	59	50	54	45	49	40	44	35	39	30	34	25	29	20	24	15	19	10	14
1996	62	66	57	61	52	56	47	51	42	46	37	41	32	36	27	31	22	26	17	21	12	16
1998	64	68	59	63	54	58	49	53	44	48	39	43	34	38	29	33	24	28	19	23	14	18
2000	66	70	61	65	56	60	51	55	46	50	41	45	36	40	31	35	26	30	21	25	16	20
2002	68	72	63	67	58	62	53	57	48	52	43	47	38	42	33	37	28	32	23	27	18	22
2004	70	74	65	69	60	64	55	59	50	54	45	49	40	44	35	39	30	34	25	29	20	24
2006	72	76	67	71	62	66	57	61	52	56	47	51	42	46	37	41	32	36	27	31	22	26
2008	74	78	69	73	64	68	59	63	54	58	49	53	44	48	39	43	34	38	29	33	24	28
2010	76	80	71	75	66	70	61	65	56	60	51	55	46	50	41	45	36	40	31	35	26	30
2012	78	82	73	77	68	72	63	67	58	62	53	57	48	52	43	47	38	42	33	37	28	32

Table 3.2 Overview of the cohort

Cohort	Year of birth		Period		Age in 1994	Age in 2012	Sample size
1	1930	1934	1994	2012	60–64	78–79	2,995
2	1935	1939	1994	2012	55–59	73–77	4,159
3	1940	1944	1994	2012	50–54	68–72	6,565
4	1945	1949	1994	2012	45–49	63–67	7,691
5	1950	1954	1994	2012	40–44	58–62	9,747
6	1955	1959	1994	2012	35–39	53–57	11,443
7	1960	1964	1994	2012	30–34	48–52	14,059
8	1965	1969	1994	2012	25–29	43–47	15,711
9	1970	1974	1994	2012	20–24	38–42	17,685
10	1975	1979	1996	2012	–	33–37	17,004
11	1980	1984	2000	2012	–	28–32	14,518

we are dealing with dummy variables, in the model estimation it is necessary to delete a column from each of the three matrices $(n-1)$, otherwise it will fall into perfect multicollinearity.[4]

Deaton (1998) proposes regression estimation of saving from the dummy cohort variables $(n-1)$, the age dummy variables $(n-1)$ and a set of $T-2$ dummy period variables, which comply with the condition of orthogonality in a zero sum linear trend, defined as follows:

$$d_t^* = d_t - \left[(t-1)d_2 - (t-2)d_1\right] \quad t = 3,\ldots,T \tag{3.3}$$

In the above expression d_t^* is the new dummy variable for each year and d_t is the original dummy variable which takes value 1 at time t and 0 elsewhere.

Going back to Eq. 3.2 the regression model to estimate saving rates is:

$$\begin{aligned} s_{ct} &= \alpha + A\beta + C\gamma + Y^*\delta + X\varphi + u_{ct} \\ &\quad para\ c = 1,\ldots,11 \quad y \quad t = 1,\ldots,10 \end{aligned} \tag{3.4}$$

3.5.1 Life-Cycle Profiles

Pseudo-panels allow to follow income behavior, consumption expenditures and saving throughout the life-cycle. Figure 3.1 shows current income of the 11 SC. Each line represents a SC, each SC has ten data points, except for the two youngest SC

[4] Corresponding to the variables age, cohort and period columns would result in an accurate linear combination with a constant leading to the determinant of the matrix X′X equal to zero, therefore singular (not switchable) would not allow to estimate the coefficients of the regression model.

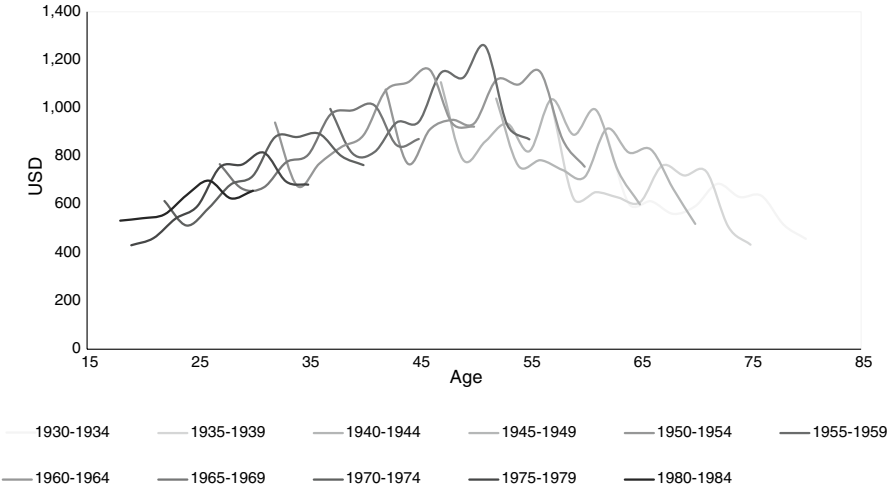


Fig. 3.1 Household current income by cohort. Mexico (USD, 2010 constant prices) (Source: Author's calculations based on National Household Income and Expenditure Survey, 1994–2012. INEGI)

that were tracked for less time. Each point represents the years of the surveys used in the study, in this case each segment of union represents the average income of all households in each SC.

In general, the average household profiles have an upside down U shape, as assumed by the LCH. The average income increases after the start of the life-cycle, reach a maximum of around 1,258 USD per month by the 49–53 age groups and then decreases.

It should be noted that in 1994 and 2010 there were significant decreases in mean income in all cohorts. It can be due to a period effect from economic shocks and not from economic agents. It should be recalled that in 1995 the country underwent serious economic crisis. GDP shrank more than 6 % and inflation reached 52.0 %, affecting the actual income of most people. In addition, a financial and economic crisis in 2008 seriously affected income. By 2009 GDP experienced a sharp contraction of 6.1 %, while in 2010 the growth rate was 5.4 %, a quantity that hardly offset the large contraction. The Fig. 3.1 also shows some vertical differences in income profiles between different cohorts observed at the same age. These differences can be regarded as a cohort effect in which the youngest generations have higher mean income than elderly cohorts. For example, the average income of the 1955–1959 cohort is always higher than the 1945–1949 cohort. Both ideas deserve caution since income profiles show simultaneous effects from age, cohort and period. The next section is a specific analysis trying to identify each of these effects.

Figure 3.2 shows that trajectories of cohorts current consumption expenditure also follows an upside down U pattern, although also shows some flattening. Average consumption slightly decreases in early and advanced ages, while it increases in the intermediate ages. It is highest at 50–54 age group, averaging

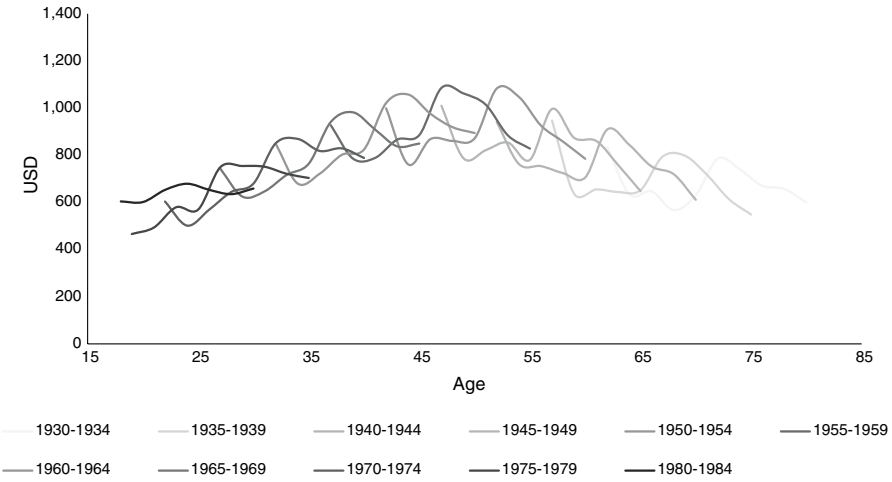


Fig. 3.2 Household current consumer expenditures by cohort. Mexico (USD, 2010 constant prices) (Source: Author's calculations based on National Household Income and Expenditure Survey, 1994–2012. INEGI)

$1,083 per month. Thus, consumption behavior pattern resembles current income and it is not constant as assumed in the simplest version of the LCH. These patterns are similar to other countries circumstances (Deaton 1998). Even it is not possible to separate age, cohort and period effects; there are some evidences, as the decrease of consumption expenditures in 1996, which would be reflecting a period effect.

Figure 3.3 shows the profile of current saving in a shape slightly resembling an inverted U. It is remarkable that saving rates are negative in most of the life-cycle. It is only at ages 50–60 that savings are positive, although at some points they turn to be negative. This less smoothing profile might be explained by the fact that the corresponding consumption profiles seem to follow the lifetime income pattern.

One element that is important to consider in the analysis is the impact of foreign remittances on saving. In 2013 Mexico was the country with most emigrants in the world and the fourth in terms or remittances received (World Bank 2013). However, Nava (2013) found that remittances are merely enough to help families in countries of origin to meet basic needs. In few cases it allows for durable goods purchasing and rarely is allocated as an investment.

3.6 Decomposing Age, Cohort and Period Effects

Each of the above Figs. 3.1, 3.2 and 3.3 shows one out of three effects on saving, from age, cohort and period. In fact, those components are simultaneously interrelated and it is difficult to distinguish the effect of one from the other, as they are actually a linear combined system. After carrying out the regression analysis

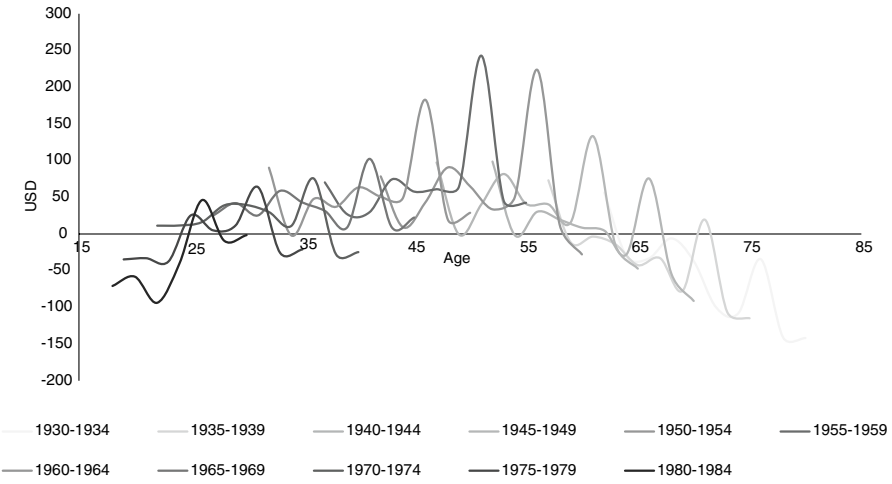


Fig. 3.3 Household current savings by cohort. Mexico (USD, 2010 constant prices) (Source: Author's calculations based on National Household Income and Expenditure Survey, 1994–2012. INEGI)

proposed by Deaton and Paxson (2000), it is possible to estimate the age profile shown in Fig. 3.4. It states that saving rates are positive during job prompt adulthood. In principle we can think that the current age structure, characterized by lower dependency ratios in the young and the elderly, should mean a positive effect on the aggregate household saving. Deaton (1998) claims its relevancy since aggregate deferred consumption are related to income and population growth rates. It is expected that saving will growth faster since population in middle ages and per capita income improves deferred consumption among young people in relation to dissaving during aging.

However, Fig. 3.4 does not describe a U inverted profile expected in a LCH model. It is rather sort of an M, increasing rapidly in the first part of the life-cycle, then goes down to increase again just to finish in a sharp dive. This savings profile is related to the life-cycle of the family unit, nuanced by the presence of children and the labor force participation of women. Children impact savings by changes in household consumption or income. A 4-year-old kid is fully dependent and will have a different effect than a 20-year-old son, who might contribute to the household income. The needs of children change over time according to their age affecting household consumption and income (Villagomez and Montes 2002). Besides, children affect working mothers that have to take care of them, often implying an eventual removal from work and a reduction of income. Connelly (1992) mention that the effect on savings because of younger children is large and negative, while for older children is positive. A similar result is obtained by Villagomez and Montes (2002), who found that savings of Mexican families even with children between 7 and 12 years is higher than those with children between 0 and 6 years. They credit it to mothers returning to the labor market.

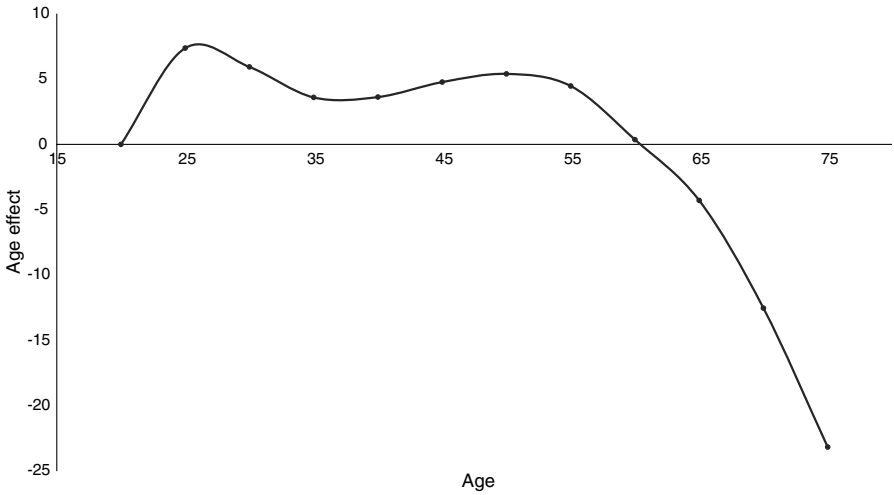


Fig. 3.4 Age effect in saving. Mexico (Source: Author's calculations based on National Household Income and Expenditure Survey, 1994–2012. INEGI)

It is also remarked that in the last years of adulthood working ages, saving rates increase. As previously, these figures suggest that in time there is a change in family structure and life-cycle when children are no longer economic dependent and in some cases they are no longer in the household. Mason (2005) also states that it is possible that uncertainty facing the aging process might encourages savings.

Households with heads 60 and over require dissaving, highlighting the negative quantity, in comparison with the effects of cohort or period, as it shown in Fig. 3.5. Those are households where transfers become relevant, mostly income from retirement, pensions and Government aid. It is important to mention that unlike the inverted U-shape age profile savings in Fig. 3.3, Fig. 3.4 shows that a part of households saving comes from cohort effect depicted by Fig. 3.5, but not of the age effects.

In regard to the effects of cohort and period, Fig. 3.5 shows that cohorts five (1950–1954) six (1955–1959) and seven (1960–1964), have positive savings rates. The cohort with highest values is the sixth. It is a generation that grew up under the welfare State and who enjoyed easy access to a permanent job. Corresponding to the period effect, it corroborates the results presented in the previous section, in the sense that between 1994 and 2010 there is a decline in savings due to bad economic conditions.

3.7 Conclusions

DemDiv approach offers a warning and planning tool to anticipate the enormous effects of demographic change. This chapter was an analysis of the mechanisms involved in DemDiv configuration focusing on savings. As it was already

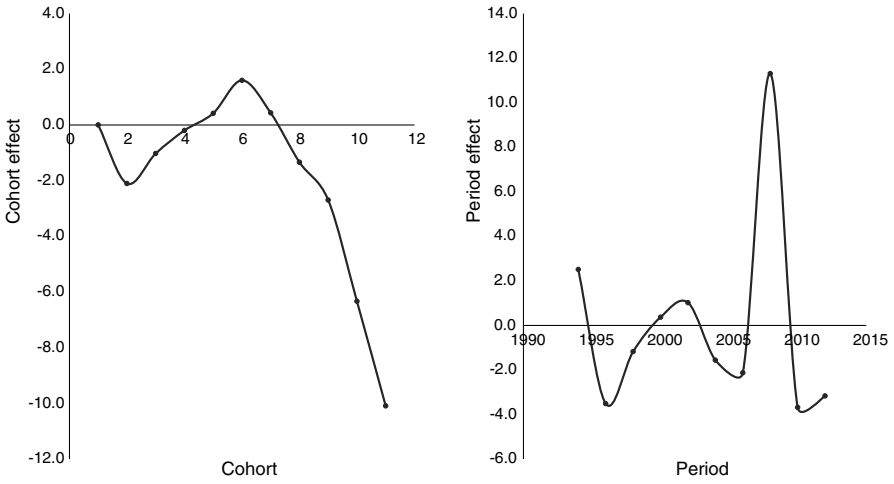


Fig. 3.5 Cohort effect and period effect in saving. Mexico (Source: Author's calculations based on National Household Income and Expenditure Survey, 1994–2012. INEGI)

mentioned, the temporary increase in the proportion of population in the working ages increase the ratio between producers and consumers. Thus, the population change has the potential to enhance aggregate savings and economic growth.

This chapter analyzes the LCH savings in Mexico. The research findings show that the age profile of current savings rates yield positive values from mid-age population, thus estimating how much the population age structure is related to the generation of aggregated savings. From the DemDiv approach, savings is a variable that would accelerate the growth of the economy. However, two important elements stand out. First, savings does not follow a U inverted pattern as it suggested by the LCH. It rather resembles an M. This is important because mid-age savings are reduced, contrary to what is expected in the LCH model. The second argument relates to the above and shows that aggregated household savings is very low. It is important to consider that DemDiv are not automatic. DemDiv depend on institutions and policies to profit from age structures potentials to create major savings. It is unfortunate that economic and social characteristics of Mexico have not been optimal for the DemDiv opportunity. Recent decades have lack of formal employment and access to social security is limited. Job income is rather low and decreasing in real terms, thus canceling any chance of savings required by the DemDiv setup.

This research and chapter is a first look at the analysis of aggregate households saving, using a technique of SC. It shows differences from other studies. Here microeconomic data coming from cross-sectional surveys in households are used. It is a method suitable for countries lacking longitudinal data. It also isolates age effect, which is the main goal in this paper. Findings show that existing cohort and period effects are blurred in cross-sectional analysis.

In terms of future research, it is important to add other components affecting savings. Mainly public savings should be considered to get a full hold of the concept.

Besides, it is necessary further analysis to identify and evaluate how savings are being incorporate to the economy. A key question is if savings is just keeping cash or going just to financial investment. Since the fundamental of DemDiv is that savings should result in growth capable of sustain current and future generations. This implies appropriate use of monetary resources in growth and development. The goal of the research emphasis was on households saving, however it is important to consider the characteristics of households and the head of the household considering schooling, income distribution, socio-economic status, and existence of children. Mexico still has a decade before the shutting of the DW. At least we should identify those elements that cancel the DemDiv, maybe to realize that investments should go to education, health and future productivity.

Acknowledgments This document was supported by a grant from the CONACYT/INEGI 186319 (Project: Prospectivas sociales, económicas y de salud por cohortes de la población) and the IIEc, UNAM (Project: Cambio en la estructura por edades, ahorro y seguridad social).

References

Bloom, D. E., & Canning, D. (2001). Cumulative causality, economic growth and the demographic transition. In N. Birdsall, A. C. Kelley, & S. Sinding (Eds.), *Population matters, demographic change, economic growth, and poverty in the developing world* (pp. 165–200). New York: Oxford University Press.

Bloom, D. E., Canning, D., & Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change*. California: RAND.

Browning, M., Deaton, A., & Irish, M. (1985). A profitable approach to labor supply and commodity demands over the life-cycle. *Econometrica, 53*, 503–543.

Butelmann, A., & Gallego, F. (2000). Ahorro de los hogares en Chile: evidencia microeconómica. *Economía Chilena, 3*, 5–24.

Connelly, R. (1992). The effect of children care costs on married women's labor force participation. *The Review of Economics and Statistics, 74*, 83–90.

Deaton, A. S. (1998). *The analysis of household surveys: A microeconometric approach to development policy*. Washington, DC: The World Bank/The Johns Hopkins University Press.

Deaton, A. S., & Paxson, C. H. (1998). *Saving and growth: Another look at the cohort evidence*. New Jersey: Princeton University.

Deaton, A. S., & Paxson, C. H. (2000). Growth, demographic structure, and national saving in Taiwan. In C. Y. Cyrus Chu & R. Lee (Eds.), *Population and economic change in East Asia, a supplement to population and development review* (pp. 141–173). New York: Population Council.

Giorguli, S., Banegas, I., Francisco, A., & de Oliveira, O. (2006). El bono demográfico en los programas de las políticas públicas de México (2000–2006): un análisis introductorio. In Consejo Nacional de Población (Ed.), *La situación demográfica de México 2006* (pp. 107–129). Mexico City: CONAPO.

Ham, R., & Nava, I. (2008). La discrepancia entre los dividendos demográficos y las pensiones de retiro. In R. Ham, B. P. Ramírez, & A. Valencia (Eds.), *Evaluación y tendencias de los sistemas de pensiones en México* (pp. 55–72). Mexico City: El Colegio de la Frontera Norte/Universidad Nacional Autónoma de México/Instituto de Investigaciones Económicas.

Hernández Laos, E. (2004). *Desarrollo demográfico y económico de México, 1970–2000–2030*. Mexico City: CONAPO.

Kelley, A. C., & Schmidt, R. M. (1996). Saving, dependency and development. *Journal of Population Economics, 9*, 365–386.

Lee, R., & Donehower, G. S. (2010). El envejecimiento de la población, las transferencias intergeneracionales y el crecimiento económico: América Latina en el contexto mundial. *Notas de Población, 90*, 13–37.

Lee, R., & Mason, A. (2006). What is the demographic dividend? *Finance and Development, 43*, 16–17.

Lee, R., Mason, A., & Miller, T. (2000). Life-cycle saving and the demographic transition in East Asia. *East Asia, a Supplement to Population and Development Review, 26*, 194–222.

Martínez, C., Miller, T., & Saad, P. (2013). *Participación laboral femenina y bono de género en América Latina*. Santiago de Chile: CEPAL.

Mason, A. (2005). Demographic transition and demographic dividends in developed and developing countries. In: *United Nations Experts Group meeting on social and economic implications of changing population age structures*. Mexico City: United Nations.

Mason, A., & Kinugasa, T. (2008). East Asian economic development: Two demographic dividends. *Journal of Asian Economics, 19*(5–6), 389–399.

Mejía, I. (2008). Ciclo de Vida Económico en México. In Consejo Nacional de Población (Ed.), *La situación demográfica de México 2006* (pp. 31–43). Mexico City: CONAPO.

Mejía, I. Fernández, F.V., & García, J.E. (2010). El primer dividendo demográfico y los sistemas de protección social en México. *Notas de Población, 90*, 133–162.

Mejía, I. (2011). The economic life-cycle and intergenerational redistribution in Mexico. In R. Lee & A. Mason (Eds.), *Population aging and the generational economy: A global perspective* (pp. 283–296). Cheltenham: Edward Elgar Press.

Modigliani, F. (1986). Life-cycle, individual thrift, and the wealth of nations. *American Economic Review, 76*, 297–313.

National Household Income and Expenditure Survey (1992–2012). Instituto Nacional de Estadística y Geografía. http://www.inegi.org.mx/est/contenidos/Proyectos/encuestas/hogares/regulares/enigh/. Accessed 31 Oct 2014.

Nava, I. (2013). *Ahorro y remesas en los hogares de México. Una mirada desde la dinámica demográfica*. Mexico City: El Colegio de México.

Shorrocks, A. F. (1975). The age-wealth relationship: A cross-section and cohort analysis. *The Review of Economics and Statistics, 57*, 155–163.

Székely, M. (1998). Monto y distribución del ahorro de los hogares en México. *El Trimestre Económico, 65*, 263–313.

Villagómez, A., & Montes, P. A. (2002). El efecto de los hijos sobre el ahorro de los hogares mexicanos. *Economía Mexicana. Nueva Época, 2*, 261–297.

Williamson, J. G., & Higgins, M. (2001). The accumulation and demography connection in Eastern and South-Eastern Asia. In A. Mason (Ed.), *Population change and economic development in eastern and south-eastern Asia: Challenges met, opportunities seized* (pp. 123–154). California: Stanford University Press.

World Bank (2013). Remittances Data. http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:22759429~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html. Accessed 04 May 2015.

Chapter 4
Demographic Transition in Sub-Saharan Africa: Implications for Demographic Dividend

Yoonjoung Choi

4.1 Introduction

Demographic dividend is accelerated economic growth associated with changes in population age structure, specifically having more working age population relative to young and old dependent population. Using examples primarily from East Asia such as South Korea, Bloom and Canning pioneered the research area, showing that economic growth is associated with the relative proportion of working population but not necessarily with the mortality or fertility level themselves (Bloom et al. 2000, 2003). Studies suggested the age structure change accounted for over 20 % of economic growth between the late 1960s and the 1980s in East Asia (Bloom and Williamson 1998; Bloom et al. 2000).

The change in population age structure, a result of the demographic transition, is a necessary but not sufficient condition to realize demographic dividend. Subsequent research as well as empirical examples suggested that investment in health, including family planning, education, governance, and economic sector – particularly promoting flexible labor market, international trade, and saving – must be made before and during the transition to economically favorable[1] age structure, in order to take advantage of it in the future (Bloom et al. 2003; Reher 2011; Gribble and Bremner 2012).

In most developed countries in Europe, demographic transition had occurred over a century. Over the period, responding to reduced mortality and fertility, the

Views and opinions expressed in this paper are the author's. They do not necessarily represent the views and opinions of the US Agency for International Development.

[1] In this study, the term of a favorable or advantageous age structure is used strictly from the macro economic growth point of view only.

Y. Choi (✉)
Office of Population and Reproductive Health, Bureau for Global Health,
United States Agency for International Development, Washington, DC, USA
e-mail: ychoi@usaid.gov

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9_4

population was able to make gradual social and economic adjustment and invest in human capital, which is essential to realize economic benefit from the changing population structure (Reher 2011). For example, with decreasing child mortality, family's investment in health and education for both male and female children increased. With less time needed to bear and raise children, women's labor force participation increased. Also, responding to population growth – though it was mostly less than 1 % per year, substantially lower than current growth rates in developing countries – and surplus of labor supply, substantial migration occurred within and across countries. In Asia and Latin America, however, the rate of demographic transition has been much faster thanks to use of more advanced technologies such as vaccine, antibiotics, and modern contraceptive methods from the outset. It is suggested that a window of adjustment, or a window for investment prior to having economically favorable age structure – hereinafter refer to as advance-investment, would be relatively short in these countries, which can make it difficult to "reap the full benefits from these momentous demographic changes" in a stable and lasting way (Reher 2011). Thus, recently reemerging interest to demographic dividend among both international development agencies as well as governments in less-developed countries raised the urgency of advance-investment.

However, in sub-Saharan Africa (SSA), many countries are in their early stage in demographic transition. The transition, in particular fertility decline, has been much slower than that in other less-developed regions. Though many countries in the region have demonstrated rapid economic growth in recent years, continuing population growth is a potential threat to sustainable development. Further, while many less-developed countries in other regions are entering or already have entered the advance-investment window and the window to reap demographic dividend appear to be approaching, it is unclear how much of the lessons learned and policy implications from such regions are relevant for sub-Saharan Africa. There are many unanswered questions for countries in the region, including: What is the expected pace of the population age structure change given current estimates and projections? When and how long will be the advance-investment window? What policies need to be reinforced or changed now in order to realize potential demographic dividend in the future?

This study focuses on prospects of demographic transition in countries in SSA, using population estimates and projections data published by United Nations. The study purpose is to understand fertility decline and changes in population age structure in the region, the critical necessary condition for realizing demographic dividend. Specific aims are: to estimate timing and length of windows for advance investment and windows with economically favorable age structure; to compare the length and timing of the windows to those in other less-developed regions; and to examine sensitivity of results across different fertility decline assumptions in the projection data.

4.2 Methods

4.2.1 Data and Study Countries

Data came from the World Population Prospects (WPP): the 2012 Revision by United Nations (2013). Updated every other year, the WPP provides population estimates since 1950 and projections by sex and 5-year age group for over 200 countries. Since the 2010 Revision, the population projections have been made available through 2100, a substantial extension from the previous projections to 2050. Also, a probabilistic method has been used to project country-specific trends of total fertility rate (TFR), significant departure from the previous approach that assumed all countries would eventually reach TFR of 1.85 regardless of their current position in the fertility transition (United Nations 2011). The new method allows country-specific fertility projections with varying pace of decline as well as fertility bottom.

Among a number of detailed indicators included in the WPP, selected indicators were used in the study. They are: Average annual number of births during a 5-year period; Crude birth rate (CBR) during a 5-year period; TFR during a 5-year period; Population growth rate per year (%) during a 5-year period; Total population for every year; and Total, child, and old-age dependency ratios[2] for every 5-year.

As in previous revisions, four variants were used to project TFR in the WPP 2012 Revision: medium, low, high, and constant. Data based on the medium fertility variant were used for the main analysis. For additional sensitivity analyses, population projections based on low and high fertility variants were used additionally. Projected TFR in the low and high fertility variants are typically lower and higher, respectively, by 0.5 compared to the medium variant.

A total of 62 countries were included in the study (Table 4.1), including 50 countries in SSA.[3] For the purpose of comparison, 12 countries in other less-developed regions were included additionally. The 12 countries were selected purposely to use as reference countries that have experienced rapid demographic transition, including the nine countries analyzed in the Reher's study (Reher 2011) and three countries which are frequently cited as examples of demographic dividend – Indonesia, South Korea, and Thailand. The 12 countries henceforward refer to as reference countries.[4]

[2] Total dependency ratio refers to: population below 15 years of age or 65 and above over population between 15 and 64 years of age. Child dependency ratio is: population below 15 years of age over population between 15 and 64 years of age. Old-age dependency ratio is: population 65 and above over population between 15 and 64 years of age.

[3] The WPP 2012 Revision includes 51 SSA countries, including South Sudan. However, the detailed estimates and projections indicators are not available in one country, Saint Helena.

[4] A few clear examples from Latin America which have had rapid demographic transition and economic development (such as Brazil and Mexico) were also considered. They have similar patterns compared to the selected 12 reference countries, and inclusion of such countries would have not changed overall results of the analysis.

Table 4.1 List of study countries by region (n = 62)

Reference countries	Eastern Africa	Western Africa	Central Africa	Southern Africa
(n = 12)	(n = 20)	(n = 16)	(n = 9)	(n = 5)
China	Burundi	Benin	Angola	Botswana
Costa Rica	Comoros	Burkina Faso	Cameroon	Lesotho
India	Djibouti	Cape Verde	Central African Republic	Namibia
Indonesia[a]	Eritrea	Cote d'Ivoire	Chad	South Africa
Iran	Ethiopia	Gambia	Congo	Swaziland
Morocco	Kenya	Ghana	Democratic Republic of the Congo	
South Korea[a]	Madagascar	Guinea	Equatorial Guinea	
Sri Lanka	Malawi	Guinea-Bissau	Gabon	
Thailand[a]	Mauritius	Liberia	Sao Tome and Principe	
Tunisia	Mayotte	Mali		
Turkey	Mozambique	Mauritania		
Venezuela	Reunion	Niger		
	Rwanda	Nigeria		
	Seychelles	Senegal		
	Somalia	Sierra Leone		
	South Sudan	Togo		
	Tanzania			
	Uganda			
	Zambia			
	Zimbabwe			

[a]Three countries that were not included in the Reher's study

4.2.2 Measurement

4.2.2.1 Advance-Investment Window

In order to estimate the window of advance-investment (i.e., period during which investment in health, education, and economic sector is needed in advance to capitalize economically favorable age structure in the future), a method developed by Reher was used (Reher 2011). Using data from selected countries with relatively rapid demographic transition (Table 4.1), the method defines the advance-investment window based on a relative change in CBR and an absolute change in the birth cohort size. Two consecutive phases consist of the advance-investment window. The first phase starts when the rate of CBR reduction exceeds 5 % between two consecutive 5-year periods, and it ends when the annual number of births starts to decrease. Since both CBR and the birth cohort size are 5-year period estimates in WPP, mid-year of the period was used in the analysis. The beginning of the first phase indicates a point when fertility decline accelerates. The end of the phase represents a critical shift in population age structure, as the bottom of a population pyramid

starts to shrink. The length of the first phase is determined by the pace of fertility decline – the more rapid fertility decline, the shorter the first phase. Then, the second phase of the window is the immediately following 30 years. This addition of 30 years represents time for a birth cohort to enter and constitute a critical component of the working-age population.

In applying the method, however, individual country data were examined carefully to check any significant reversal in the trend of two indicators, the rate of CBR reduction and the annual number of births. Following the initially identified first phase, relatively minor fluctuation in the two indicators was observed in many countries. However, a clear reversal trend emerged in some countries. Thus, when a significant rebound was observed, the method was applied again from the rebound point to re-identify the advance-investment window. A set of criteria was used to define a rebound: if any of the two indicators increased by 10 percentage points than the cutoff (i.e., the rate of CBR change over a 5-year period ≥5 %; or the number of births change over a 5-year period >10 %). Further, additional criteria were used for the rate of CBR change, since the magnitude of the relative change is sensitive to a baseline level. If the baseline CBR is less than 20 per 1,000, the rate of CBR change ≥5 % over a 5-year period was not considered a rebound. Finally, two consecutive CBR increases of 4 % or higher also was considered a rebound.[5]

Figure 4.1a shows an illustrative example of South Korea with trends of CBR and the annual number of births. Following the post Korean-war baby boom in the mid-late 1950s, CBR decreased rapidly between 1955–1959 and 1960–1964 (from 45 per 1,000 to 40 per 1,000, a 11 % reduction), and the birth cohort size decreased between 1960–1964 and 1965–1969, creating only 5 years of phase one, and, consequently, 35 years of the advance-investment window (1958–1993) (Fig. 4.1a). During this window, the total dependency ratio increased slightly in the beginning but then declined rapidly (Fig. 4.1b).

4.2.2.2 Low Dependency Ratio Window

To estimate the window of potentially benefitting from economically favorable age structure with a low dependency ratio (henceforward refer to as the low dependency ratio window), an empirical approach was used by reviewing data from China, South Korea and Thailand, often-cited examples of the demographic dividend. Figure 4.2 presents 5-year rolling average of the annual growth rate of GNI per capita and total dependency ratio in the three countries. All three countries experienced rapidly decreasing total dependency ratio coinciding with cyclic but generally high economic growth rates. However, not surprisingly, since changing population age structures is only a factor contributing to economic growth, there was no common threshold of total dependency ratio that might have been associated with

[5] For the rate of CBR change and the number of births change, a rebound above the cutoff was observed in 5 (Equatorial Guinea, Guinea-Bissau, Rwanda, China, and Iran) and 13 (Equatorial Guinea, Guinea-Bissau, Liberia, Burundi, Rwanda, Réunion, Seychelles, South Sudan, China, Iran, Costa Rica, Morocco, and Tunisia) countries, respectively.

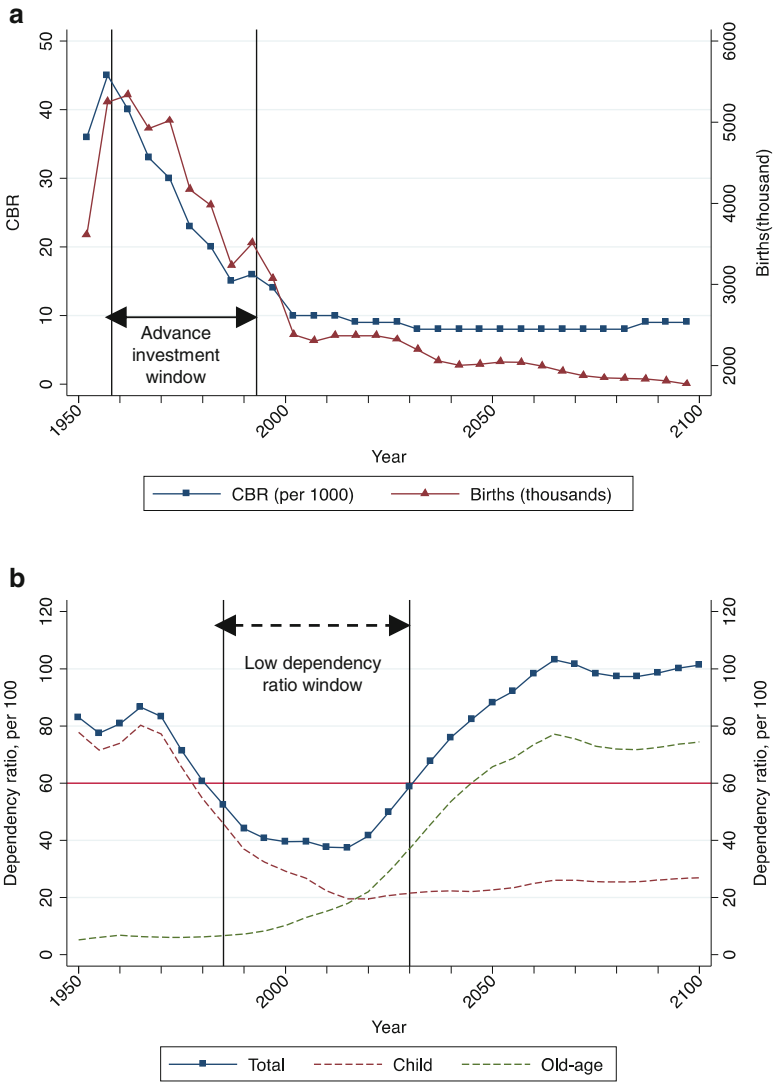


Fig. 4.1 Estimated advance-investment window and low dependency ratio window with trends of crude birth rate, annual birth cohort size, total dependency ratio: South Korea (**a**) Advance investment window (**b**) Low dependency ratio window

accelerated economic growth. For example, in South Korea during the 1970s, as the total dependency ratio fell below 80 per 100, the annual growth rate of GNI per capita were at around or exceeded 20 %. On the other hand, in Thailand, the growth rate declined for about 10 years while it had a similar level and trend of the total dependency ratio.

Thus, for the purpose of this study, an arbitrary cutoff of 60 per 100 was chosen to define a low dependency ratio window. This window represents a period with

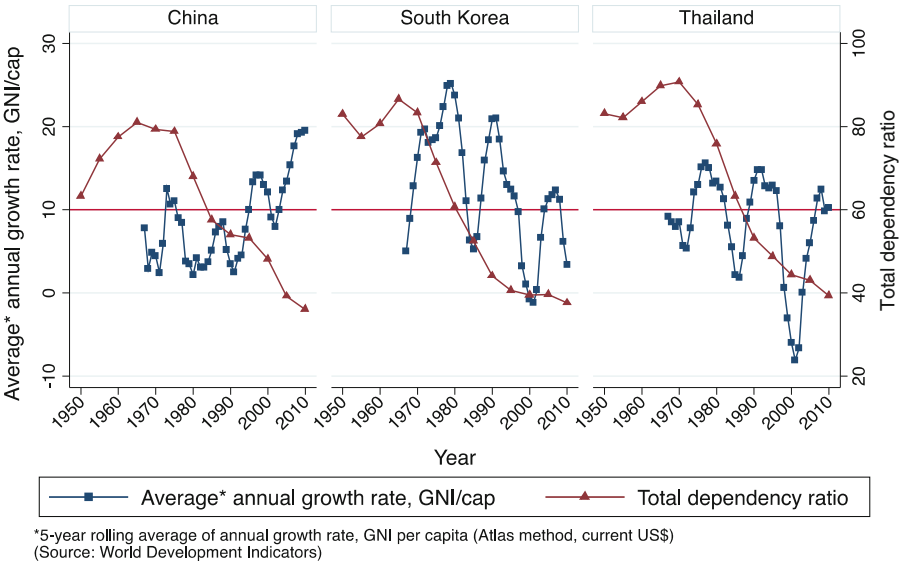


Fig. 4.2 Growth rate of GNI per capita and total dependency ratio: South Korea

economically favorable age structure, not necessarily a period when countries may experience demographic dividend. In addition, it should be noted that rapid aging occurs especially towards the end of this period. Nevertheless, this low dependency ratio window is useful as an indicator to assess the speed and the level of age structure changes in a population. In the example of South Korean, the low dependency ratio window was estimated to be about 45 years (1985–2030) (Fig. 4.1b) and overlapped with the advance-investment window (1958–1993). Total dependency ratio fell even below 40 between 2000 and 2015. Also, it was projected that old-age dependency ratio would continue to increase and exceed child dependency ratio during the window.

4.2.2.3 Analysis

Summary statistics for selected indicators were calculated among the study countries, un-weighted for population sizes. The indicators were summarized for each the advance-investment and the low dependency ratio window. They are: beginning year of the window, length of the window in years, and the annual population growth rate (%) during the window.

Summary measures were first compared by each of the four sub regions in SSA: Eastern, Western, Central, and Southern Africa. Preliminary analysis suggested substantial variation even within sub-regions, suggesting great country-level variation, although countries in Southern Africa tend follow the pattern observed in the reference countries. Rather, therefore, the 50 countries in SSA were classified into

three demographic transition patterns, compared to the pattern among the 12 reference countries. Specifically, the length of the advance-investment window – an indicator reflecting the pace of fertility transition – was used for classification. Among the reference countries, the average length of the window was 52 year (standard deviation: 17, median: 53 years, range: 30–80). The three patterns were: countries that have experienced or are projected to experience similar length of the advance-investment window (≤65 years) (Pattern A), countries that are projected to have a substantially longer window (>65 years) (Pattern B), and countries that are not projected to have the window closed by 2100 (Pattern C).

Finally, in order to assess differences in results by fertility variant in population projections, differences in estimated time and length of the window were calculated between the medium variant data and each of the low and high fertility variant data. Then, average differences were compared across the three transition patterns.

4.3 Results

Table 4.2 shows list of study countries in SSA by transition pattern, and summary statistics by the pattern are presented in Table 4.3. Figure 4.3 shows illustrative examples for each of three patterns. A total of ten countries were categorized into Pattern A. Compared to the reference countries, these countries had a similar pace of fertility decline and thus resulting age structure changes. On average, the advance-investment window started around 1980 and would last for about 50 years on average (Table 4.3). It is, however, notable that the birth cohort size started declining before 2010 in only eight of the ten countries, and classification of two countries (Ethiopia and Sierra Leone) was based on the projection data, which are subject to assumptions in population projections.[6] The low dependency ratio window would start in 2020, on average. However, the length of the window was estimated in only seven countries, since the total dependency ratio was still below the cutoff (60 per 100) in 2100 in the rest countries.

Most countries in the region were classified into Pattern B (n = 36), with much slower demographic transition. On average, the advance-investment window started in the early 1990s but would last almost a century (102 years). During the advance-investment window, the average population growth rate was estimated to be about 1.7 % per year. The low dependency ratio window would start around 2050 on average, almost 30 years later compared to estimates in Pattern A countries. In a majority of these countries (n = 31), the end of the low dependency ratio could not be determined before 2100, as shown in the Kenya example (Fig. 4.3). Nevertheless even with censored data, it is clearly suggested that the Pattern B countries would have a shorter low dependency window and a higher minimum dependency ratio compared to Pattern A or reference countries.

[6] For example, using the high fertility variant projection data, there was reduction in the birth cohort size by 2100 in neither country, and, thus, the advance-invest could not be identified.

Table 4.2 Classification of sub-Saharan African countries according to the length of the advance-investment window

	Pattern A	Pattern B		Pattern C
	(n = 10)	(n = 36)		(n = 4)
Eastern	Djibouti	Comoros	Reunion	Burundi
(n = 20)	Ethiopia	Eritrea	Rwanda	Tanzania
	Mauritius	Kenya	Seychelles	Zambia
		Madagascar	Somalia	
		Malawi	South Sudan	
		Mayotte	Uganda	
		Mozambique	Zimbabwe	
Western	Cape Verde	Benin	Liberia	Niger
(n = 16)	Sierra Leone	Burkina Faso	Mali	
		Cote d'Ivoire	Mauritania	
		Gambia	Nigeria	
		Ghana	Senegal	
		Guinea	Togo	
		Guinea-Bissau		
Central		Angola	Democratic Republic of the Congo	
(n = 9)		Cameroon	Equatorial Guinea	
		Central African Republic	Gabon	
		Chad	Sao Tome and Principe	
		Congo		
Southern	Botswana			
(n = 5)	Lesotho			
	Namibia			
	South Africa			
	Swaziland			

Finally, in four countries with Pattern C (Burundi, Niger, Tanzania, and Zambia), the projection data suggested no reduction in the birth cohort size until 2100. Thus, the end of the advance-investment window could not be determined in these countries, as shown in the Zambia example in Fig. 4.3. The low dependency ratio window would start only towards the end of the century.

Additional analysis was conducted using data with the low and high fertility variant assumptions, for which TFR is about a half-child lower and higher throughout the projection period, respectively, than TFR in the median variant assumption. Figure 4.4 shows illustrative examples of the differences starting from 2010 by fertility variant, using data from Kenya. In Kenya, the advance-investment window already started in 1983, but the end of the window varied substantially because of drastically different projections of the annual number of births by fertility assumption (Fig. 4.4b). Consequently, projected total dependency ratio also varied greatly by fertility assumption (Fig. 4.4c). For example, compared to the medium variant,

Table 4.3 Advance-investment window and low dependency ratio window: by pattern

Indicator	Pattern	Number of countries	Mean	SD	P-value[a]
Advance-investment window					
Start (year)					
Reference countries		12	1966	10.1	(Reference)
Pattern A		10	1979	15.0	0.045
Pattern B		36	1994	17.4	0.000
Pattern C		4	2004	28.7	0.075
Length (year)					
Reference countries		12	51.7	17.0	(Reference)
Pattern A		10	50.5	11.2	0.849
Pattern B		36	101.9	19.2	0.000
Pattern C		0	–	–	–
Population growth rate during the window (%/year)					
Reference countries		12	1.6	0.4	(Reference)
Pattern A		10	1.7	0.5	0.628
Pattern B		36	1.7	0.3	0.390
Pattern C		0	–	–	–
Low dependency ratio window					
Start (year)					
Reference countries		12	1998	7.5	(Reference)
Pattern A		10	2020	17.1	0.003
Pattern B		36	2047	17.0	0.000
Pattern C		3	2073	10.4	0.003
Length (year)					
Reference countries		12	53.3	12.3	(Reference)
Pattern A		7	65.0	15.8	0.123
Pattern B		5	48.0	6.7	0.271
Pattern C		0	–	–	–
Population growth rate during the period (%/year)					
Reference countries		12	0.6	0.2	(Reference)
Pattern A		7	0.5	0.2	0.297
Pattern B		5	0.9	0.3	0.096
Pattern C		0	–	–	–

SD standard deviation
[a]P-value of *t*-test for differential distribution compared to the reference groups

the low dependency ratio window would start earlier and the minimum level would be lower under the low variant.

Results suggest a relatively small difference in the fertility assumption would make substantial differences in population age structures among Pattern B and C countries (Tables 4.4 and 4.5).[7] Among the 36 Pattern B countries, compared to the

[7] In Pattern A countries, there was relatively less difference in the advance-investment window indicators by fertility variant, since the window has already started in most of them (i.e., results are less subject to fertility-varying projection data). Further, in Pattern A countries, the length of the

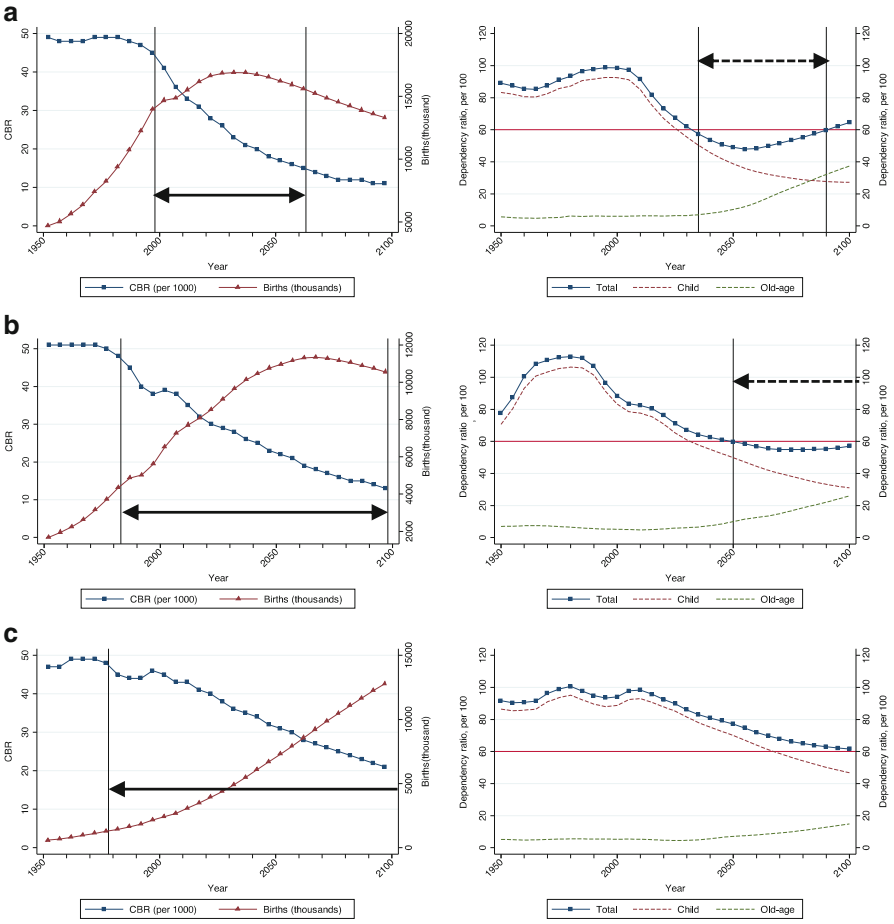


Fig. 4.3 Estimated advance-investment window and low dependency ratio window with trends of crude birth rate, annual birth cohort size, total dependency ratio: Ethiopia, Kenya, and Zambia (**a**) Pattern A: Ethiopia (**b**) Pattern B: Kenya (**c**) Pattern C: Zambia ◄——►Advance-investment window, ◄·····►Low dependency ratio window

results based on the medium variant (Table 4.3), the advance-investment window would start slightly earlier (on average by 1 year) but the length would be substantially shorter (on average by 34 years), using the low variant data – where TFR is approximately lower by 0.5 in projections (Table 4.5). However, resulting age structure would be more favorable: the low dependency ratio window would start about

low dependency ratio window was slightly ***shorter*** when the low fertility variant data were used due to a more rapid population aging process, compared to the results using the medium variant data (Table 4.4).

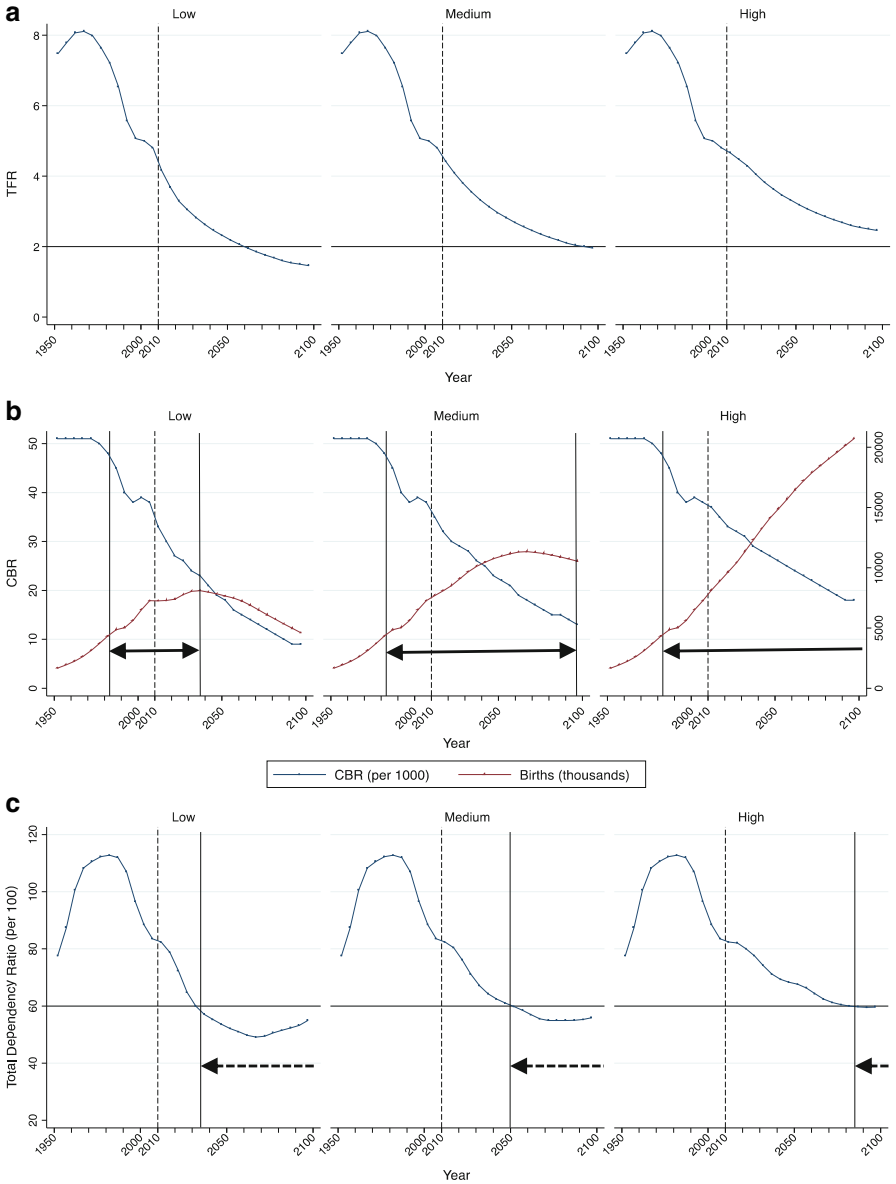


Fig. 4.4 Illustrative example of differences by fertility variant in projections: Kenya (**a**) Total fertility rate (**b**) Crude birth rate and annual number of births *Advance-investment window: 1983–2038 (Low), 1983–2098 (Medium), and 1983- (High) (**c**) Total dependency ratio Low dependency ratio window: 2035- (Low), 2050- (Medium), and 2085- (High)

Table 4.4 Estimated advance-investment window and low dependency ratio window by low and high fertility variant in population projection: among 50 sub-Saharan African countries

	Pattern A (n = 10)			Pattern B (n = 36)			Pattern C (n = 4)		
Fertility variant	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD
Advance-investment window									
Start (year)									
Low	10	1979	15.0	36	1992	15.7	4	2002	24.3
High	10	1979	15.0	36	1997	21.6	4	2009	32.2
Length (year)									
Low	10	45.5	10.1	36	68.5	15.4	3	83.3	7.6
High	8	47.5	10.4	3	81.7	7.6	0	–	–
Population growth rate during the window (%/year)									
Low	10	1.7	0.5	36	1.9	0.4	3	1.9	0.2
High	8	1.9	0.6	3	1.6	0.4	0	–	–
Low dependency ratio window									
Start (year)									
Low	10	2016	13.8	36	2037	14.0	4	2065	11.5
High	10	2028	21.4	33	2064	21.4	2	2100	0.0
Length (year)									
Low	8	63.1	12.2	8	57.5	8.5	0	–	–
High	7	54.3	18.1	9	31.7	13.2	0	–	
Population growth rate during the period (%/year)									
Low	8	0.1	0.2	8	0.5	0.3	0	–	–
High	7	0.9	0.2	9	1.2	0.2	0	–	–
Minimum total dependency ratio during the period (per 100)									
Low	8	39.0	2.9	8	44.0	2.5	0	–	–
High	7	50.9	5.1	9	54.5	5.0	0	–	–

SD standard deviation

11 years earlier, the length would be longer by 6 years, and the minimum total dependency ratio would be lower by 5 per 100 (Table 4.5).[8]

On the other hand, using the high variant data – where TFR is approximately higher by 0.5 in projections, only three of the Pattern B countries (Zimbabwe, Reunion, and Seychelles) would have a defined advance-investment window, since the rest countries would not have a reduction in the birth cohort size by 2100. The low dependency ratio window would start 19 years later on average, compared to the results using the medium variant data.

Among the four Pattern C countries (which did not have a defined advance-investment window using the medium variant data), using the low variant data, the advance-investment window was defined in three countries and, on average, was 83-year long. In Zambia, however, still no reduction in the birth cohort size was

[8] The mean values for differences in the length and minimum dependency were calculated only among the five countries which had a defined low dependency ratio window (Table 4.3).

Table 4.5 Summary statistics of differences in estimates by low and high fertility variant in population projections, compared to corresponding estimates using the medium fertility variant: among 50 sub-Saharan African countries by pattern

	Pattern A (n = 10)			Pattern B (n = 36)			Pattern C (n = 4)		
Fertility variant	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD
Advance-investment window									
Start (year)									
Low	10	0.0	0.0	36	−1.3	3.5	4	−2.5	5.0
High	10	0.0	0.0	36	3.3	6.2	4	5.0	7.1
Length (year)									
Low	10	−5.0	10.5	36	−33.5	16.2	0	–	–
High	8	0.0	0.0	3	1.7	2.9	0	–	–
Population growth rate during the window (%/year)									
Low	10	0.0	0.1	36	0.1	0.2	0	–	–
High	8	0.1	0.1	3	0.1	0.1	0	–	–
Low dependency ratio window									
Start (year)									
Low	10	−4.0	4.6	36	−10.7	5.4	3	−11.7	2.9
High	10	8.0	6.7	33	18.5	7.4	2	25.0	14.1
Length (year)									
Low	7	−3.6	5.6	5	6.0	6.5	0	–	–
High	7	−10.7	7.3	5	−15.0	12.7	0	–	–
Population growth rate during the period (%/year)									
Low	7	−0.4	0.1	5	−0.4	0.0	0	–	–
High	7	0.4	0.1	5	0.3	0.1	0	–	–

Difference compared to the estimate using medium fertility variant data in each country
SD standard deviation

projected by 2100. The low dependency ratio window would start on average 12 years earlier when the low variant data were used, compared to the medium variant results.

4.4 Discussion and Concluding Remarks

Fertility transition in SSA has long been studied for its relatively slow pace of decline as a region, still wide variation across countries within the region, and a potentially unique role of postponement in fertility intention – distinct from the role of spacing or limiting in other regions (Caldwell et al. 1992; Agadjanian 2005; Timæus and Moultrie 2008). This paper assessed prospects of demographic transition in sub-Saharan African countries and its implications for demographic dividend, compared to selected countries in other less developed regions that have experienced rapid transition. Results showed vastly diverse trajectories in population age structure changes in this large region. In addition, sensitivity

analysis suggested a relatively small difference in the fertility decline assumption would make substantial differences in resulting population age structures in majority of countries.

While most countries in the region have substantially slow transition, a set of countries – mostly in the Southern Africa but throughout the region as well – have experienced or are projected to have as rapid demographic transition as the reference countries. These countries have already entered the advance-investment window and are on their way to have economically advantageous age structure fairly soon. This indicates, in order to capitalize potential demographic dividend, immediate needs to continue to improve health and education as well as to develop and implement economic policies to respond to increasing share and size of working age population. On the other hand, like the reference countries in other regions, these countries will also face rapid population aging as the old-age dependency ratio increases towards the second half of the century. This suggests that, in addition to policies to maximize prospects of realizing demographic dividend in the near future, it is essential to promote life-cycle savings for realizing "second demographic dividend" (Mason and Lee 2006) and have other economic and social policies that can negate any negative impact of population aging to the extent possible (Reher 2011).

An example of South Korea may be useful to create and implement development plans during the advance-investment window in these countries, although it should be reminded that any lessons learned from this example should be applied to other countries with careful consideration of different context across regions and time. South Korea had integrated comprehensive development plans for decades since 1960s. Family planning, which was promoted mainly at health facilities in the 1960s, expanded to include home visits by health workers from village health posts and contributed to rapid and sustained fertility decline in the 1970s (Gribble and Bremner 2012). In addition, behavior change campaigns to generate demand for contraception were among the most visible campaigns by the government for a few decades. Meanwhile, health insurance programs and free/subsidized health care programs were established in 1977, and nearly universal coverage for essential health programs was achieved by the early 1990s.

In terms of education, secondary school enrollment rate[9] increased from 70 % in 1980 to 95 % by 2000 (World Bank 2012), and "production-oriented" education was promoted, focusing on knowledge and skills that are needed for employment and economic development (Mason 1997). Meanwhile, with lack of natural resources, economic policies heavily promoted labor-intensive, export-oriented manufacturing business, starting from the 1970s, and household saving was promoted intensively. In terms of gender equality, South Korea has developed more slowly, partially due to strong male-dominant Confucian tradition. For example, the male-to-female sex ratio at birth was 116 during the 1980s, although it has come down to a more

[9] Secondary school enrollment rate refers to a ratio of children of the official secondary school age who are enrolled in secondary school to the population of the official secondary school age.

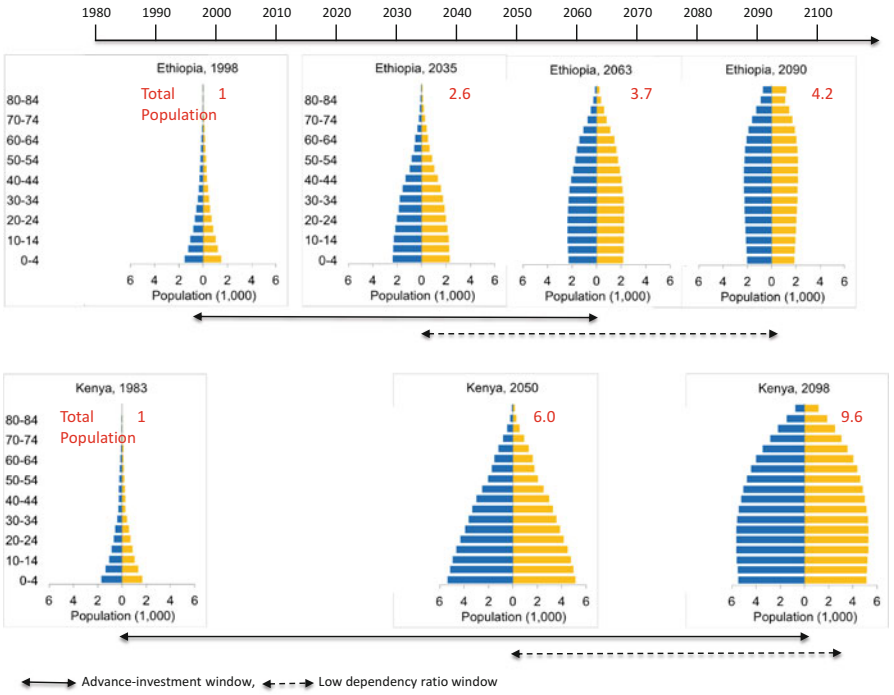


Fig. 4.5 Age structure and relative population growth over the advance-invest window and the low dependency ratio window: Ethiopia and Kenya

balanced level recently. Progression to secondary school[10] was 94 % for females and 100 % for males in 1980, and the gap was closed by 1995. Ratio of female-to-male tertiary enrollment was only 31 % in 1980 and has increased gradually to 58 % in 1995 and to 72 % in 2010 (World Bank 2012).

However, majority of countries in sub-Saharan Africa have had relatively slow fertility transition, compared to the reference countries or Pattern A countries in the region. It is suggested that the pace and the magnitude of age structure changes would be less economically advantageous throughout the century. Further, continuing high population growth rate during the long transition period implies a rapid increase in the absolute size of working age population, even though the relative share of the population increases gradually. This suggests even greater needs to develop and implement economic policies in order to increase labor force demand and promote employment in these countries. Figure 4.5 illustrates age structures and relative increases in the total population size during the advance-investment window and the low dependency ratio window in two countries: Ethiopia (Pattern A) and Kenya (Pattern B). The total population size was standardized to be equal at

[10] Progression to secondary school ratio refers to the number of new entrants to the first grade of secondary education in a given year, expressed as a percentage of the number of pupils enrolled in the final grade of primary education in the previous year.

the beginning of the advance investment window (1998 in Ethiopia and 1983 in Kenya), and population pyramids represent both age structure changes and relative increases in the total population size. The two countries show roughly comparable age structure initially. Over the century, however, Ethiopia is projected to experience lower dependency ratios and population growth of about four times. Projections in Kenya suggest that the initial population will grow by almost ten times, in addition to having a relatively less share of working age population throughout the century. Specially, by the beginning of the low dependency ratio window (2035 in Ethiopia and 2050 in Kenya), total population would have grown by six times in Kenya, compared to an increase by 2.6 times in Ethiopia.

Reduction of the birth cohort size is beginning of a major shift in population age structures – from a bottom wide pyramid to a working-age heavy bell shape. The birth cohort size is determined by current fertility rates as well as the number of reproductive-age population, reflection of past fertility. With currently projected pace of fertility decline, most countries in the region (Patterns B and C) are not expected to have age structure changes that would have economically meaningful impact in the near future. Many of these countries have had rapid economic growth in recent years and may well continue to do so. However, without substantial and rapid changes in age structures, it is unlikely they will have demographic dividend, which by definition is tied to age structure changes. Nevertheless, additional analyses using low and high fertility variant data showed that, if fertility decline is accelerated by about a half child difference in TFR, majority of the countries will have substantial changes in age structures that are economically favorable.

Fertility decline results from a complex process that is operationalized at a family-level. Women's voluntary, informed use of modern contraceptive methods to meet their demand for family planning need is a key in that process. Individual family-level desire to space or limit child bearing depends on various factors, including but not limited to health and survival of existing children, knowledge of health benefits from birth spacing, perceived utility of investing in their children's education, women's opportunity cost of having additional children, etc. Policies and programs in health and family planning, education, and economic sectors contribute to a smaller desired family size,[11] and couples seek to use contraceptive methods to regulate their fertility accordingly. Fertility decline is also heavily influenced by ages at marriage, which is associated with secondary schooling as well as women's employment.

The causal relationships among these factors and fertility decline is difficult to determine, because of their endogenous relationships especially in contemporary populations. For example, a recent study examined human capital dynamics, fertility decline and resulting age structure changes, and their impact on economic development (Crespo et al. 2014). By treating education as an explicit demographic variable that both brings down fertility and improves productivity of the labor force,

[11] Discussion on what policies and programs may reduce the desired family size in SSA is limited in this paper currently. However, among many, women's education, women's formal labor force participation, and child health are negatively associated with desired fertility level.

the study argued conventionally considered demographic dividend is rather due to educational expansion as well as fertility decline, not changes in age structure.

Meanwhile, currently, 25 % of women in developing countries have unmet need for family planning - i.e., they want to avoid pregnancy, but are not using contraceptive methods (Darroch et al. 2011; World Health Organization and UNICEF 2012). Limited access to quality family planning services, including appropriate counseling to provide full information on a range of methods and their side effects, are suggested to be among the critical factors of unmet need. Thus, there's great need to improve access to and service quality of family planning in order to reduce the currently existing unmet need for family planning and increase voluntary use of modern contraceptive methods, which will result in more rapid fertility decline at the national level. Further, with improving women's education and increasing population size, the demand for family planning is expected to increase in both relative and absolute terms. Policies and programs need to address this increasing demand.

An important note about this study is its reliance on population projections data. First, the classification of countries into the three prospective patterns is based on the latest population projections, which are inevitably sensitive to assumptions in the method. For example, many of the 62 study countries had a large enough difference in projected fertility indicators between the two latest revisions of WPP: 2010 vs. 2012 Revision (United Nations 2011, 2013). On average among the 60 countries,[12] TFR estimate for year 2010 was higher by 6 % in the 2012 Revision than in the 2010 Revision (Appendix 4.1). The slower fertility transition resulted in a longer advance-investment window by about 8 years in using the 2012 Revision, compared to the previous 2010 Revision (Appendix 4.1). Thus, while the overall results regarding the three patterns are likely robust, individual countries' classification is subject to estimates and projections as well as the advance-investment window cutoff used in this paper. Second, since uncertainty increases as projection time horizon extends, use of projection data through 2100 should be interpreted carefully. In spite of that limitation, however, analyses using projections in the relatively near future, for example through 2050 instead, would have not revealed much useful information, given slow fertility transition expected in many countries in SSA. Finally, especially in SSA, a large degree of fertility reduction is assumed in many countries. Thus, projections data are more subject to fertility assumptions and, thus, there is a relatively high degree of uncertainty in many countries in the region. For example, in 36 out of the 50 study countries in the region, the 80 % upper uncertainty bound of TFR estimate for 2095–2100 was higher than the high fertility variant estimate. In five countries (Burundi, Mali, Niger, Nigeria, and Somalia), the upper bound was higher than the high variant estimate even by 0.5 or more (United Nations 2013).

In addition, the study employed conventional definitions of dependency ratios which define working-age population as those between 15 and 60. Empirical data, however, suggest that the conventional age cutoff does not represent age distribution of consumption and income in both developed and developing countries (Mason

[12] Detailed indicators for Seychelles and South Sudan were not included in the WPP 2010 Revision.

and Lee 2011, 2012). Alternative age ranges such as between 25 and 60 may be more relevant to study demographic dividend. Nevertheless, overall prospects on demographic transition and age structures would remain similar in SSA, regardless of the age range to define working-age population.

In summary, this study examined prospects of demographic transition in SSA countries, in comparison to recent transition in selected countries from other less-developed regions. It is suggested that, in a majority of countries in the region, fertility decline is too slow to have a substantially rapid change in population age structures that is economically meaningful in the near future. However, accelerated fertility decline – by about half child less in total fertility rate – can change the prospect substantially in many of these countries. In a smaller number of countries, the transition pace is close to recent experience in other regions, and most already have entered the advance-investment window. In both cases, health, education, and economic sector policies to reduce the desired family size as well as family planning policies to reduce existing unmet need is needed to accelerated and sustain fertility decline.

Appendix

Comparison of results between TFR estimates for year 2010 and analysis results based on the WPP 2010 and 2012 Revision data: 60 study countries

	2010 revision		2012 revision			
Country	TFR estimate for year 2010	Advance-investment window length (years)	TFR estimate for year 2010	% change compared to the 2010 revision	Advance-investment window length (years)	% change compared to advance-investment window length based on the 2010 revision
Reference (n = 12)						
China	1.6	30	1.7	6.4	30	0.0
Costa Rica	1.8	55	1.8	0.0	55	0.0
India	2.5	45	2.5	−1.6	55	22.2
Indonesia	2.1	45	2.4	14.1	45	0.0
Iran	1.6	35	1.9	21.4	60	71.4
Morocco	2.2	35	2.8	27.5	80	128.6
South Korea	1.4	35	1.3	−5.0	35	0.0
Sri Lanka	2.2	40	2.4	4.9	40	0.0
Thailand	1.5	30	1.4	−7.8	30	0.0
Tunisia	1.9	55	2.0	5.8	50	−9.1
Turkey	2.0	55	2.1	1.5	60	9.1
Venezuela	2.4	80	2.4	0.8	80	0.0

(continued)

Country	2010 revision		2012 revision			
	TFR estimate for year 2010	Advance-investment window length (years)	TFR estimate for year 2010	% change compared to the 2010 revision	Advance-investment window length (years)	% change compared to advance-investment window length based on the 2010 revision
SSA (n=48)						
Angola	5.1	55	5.9	14.8	90	63.6
Benin	5.1	90	4.9	−3.7	90	0.0
Botswana	2.6	50	2.6	0.8	50	0.0
Burkina Faso	5.8	–	5.7	−1.7	100	–
Burundi	4.1	30	6.1	50.1	–	–
Cameroon	4.3	80	4.8	12.4	95	18.8
Cape Verde	2.3	60	2.3	2.2	60	0.0
Central African Republic	4.4	55	4.4	−0.2	75	36.4
Chad	5.7	75	6.3	9.9	95	26.7
Comoros	4.7	115	4.7	0.0	140	21.7
Congo	4.4	115	5.0	12.6	110	−4.3
Côte d'Ivoire	4.2	100	4.9	16.6	135	35.0
Democratic Republic of Congo	5.5	65	6.0	8.9	80	23.1
Djibouti	3.6	50	3.4	−4.7	50	0.0
Equatorial Guinea	5.0	90	4.9	−1.8	95	5.6
Eritrea	4.2	95	4.7	11.8	85	−10.5
Ethiopia	3.9	40	4.6	19.2	65	62.5
Gabon	3.2	100	4.1	28.8	110	10.0
Gambia	4.7	90	5.8	23.2	75	−16.7
Ghana	4.0	95	3.9	−2.5	85	−10.5
Guinea	5.0	80	5.0	−1.6	80	0.0
Guinea-Bissau	4.9	130	5.0	1.6	120	−7.7
Kenya	4.6	115	4.4	−4.5	115	0.0
Lesotho	3.1	45	3.1	0.7	45	0.0
Liberia	5.0	95	4.8	−4.2	115	21.1
Madagascar	4.5	110	4.5	0.2	140	27.3
Malawi	6.0	–	5.4	−9.2	135	–
Mali	6.1	100	6.9	12.1	90	−10.0
Mauritania	4.4	85	4.7	7.8	105	23.5
Mauritius	1.6	30	1.5	−4.4	30	0.0
Mayotte	4.2	90	3.8	−8.4	95	5.6
Mozambique	4.7	85	5.2	10.8	105	23.5
Namibia	3.1	75	3.1	0.7	55	−26.7

(continued)

Country	2010 revision		2012 revision			
	TFR estimate for year 2010	Advance-investment window length (years)	TFR estimate for year 2010	% change compared to the 2010 revision	Advance-investment window length (years)	% change compared to advance-investment window length based on the 2010 revision
Niger	6.9	–	7.6	9.4	–	–
Nigeria	5.4	100	6.0	10.7	100	0.0
Réunion	2.3	85	2.2	−0.4	80	−5.9
Rwanda	5.3	95	4.6	−13.6	90	−5.3
Sao Tome and Principe	3.5	95	4.1	17.5	135	42.1
Senegal	4.6	85	5.0	8.0	120	41.2
Sierra Leone	4.7	55	4.8	0.4	60	9.1
Somalia	6.3	–	6.6	5.3	115	–
South Africa	2.4	55	2.4	0.8	55	0.0
Swaziland	3.2	35	3.4	6.0	35	0.0
Tanzania	5.5	–	5.2	−4.7	–	–
Togo	3.9	75	4.7	21.2	115	53.3
Uganda	5.9	90	5.9	0.2	100	11.1
Zambia	6.3	–	5.7	−9.4	–	–
Zimbabwe	3.1	45	3.5	12.9	75	66.7
Average, reference	1.9	45.0	2.0	5.7	51.7	18.5
Average, SSA	4.4	78.7	4.7	5.5	90.8	12.9
Average, total	3.9	71.2	4.1	5.5	82.4	14.2

Detailed data were unavailable for Seychelles and South Sudan in the 2010 Revision
SSA sub-Saharan Africa

References

Agadjanian, V. (2005). Fraught with ambivalence: Reproductive intentions and contraceptive choices in Sub-Saharan fertility transition. *Population Research and Policy Review, 24*, 617–645.

Bloom, D., & Williamson, J. (1998). Demographic transitions and economic miracles in emerging Asia. *World Bank Economic Review, 12*(3), 419–456.

Bloom, D., Canning, D., & Malaney, P. (2000). Demographic change and economic growth in Asia. *Population and Development Review, 26*(Supplement), 257–290.

Bloom, D., Canning, D., & Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change* (Population Matters Monograph MR-1274). Santa Monica: RAND.

Caldwell, J., Orubuloye, I., & Caldwell, P. (1992). Fertility decline in Africa: A new type of transition? *Population and Development Review, 18*(2), 211–242.

Crespo Cuaresma, J., Lutz, W., & Sanderson, W. (2014). Is the demographic dividend an educational dividend? *Demography, 51*, 299–315.
Darroch, J., Sedgh, G., & Ball, H. (2011). *Contraceptive technologies: Responding to women's needs*. New York: Guttmacher Institute.
Gribble, J., & Bremner, J. (2012). Achieving a demographic dividend. *Population Bulletin, 67*(2), 1–13.
Mason, A. (1997). *Population and the Asian economic miracle*. Honolulu: East West Center.
Mason, A., & Lee, R. (2006). Reform and support systems for the elderly in developing countries: Capturing the second demographic dividend. *Genus, 62*(2), 11–35.
Mason, A., & Lee, R. (2011). *Population aging and the generational economy: A global perspective*. Northampton: Edward Elgar Publishing.
Mason, A., & Lee, R. (2012). Lower-income countries and the demographic dividend. *NTA Bulletin*, No. 5, December 2012. http://www.ntaccounts.org/doc/repository/NTAbulletin5final.
Reher, D. (2011). Economic and social implications of the demographic transition. *Population and Development Review, 37*(Supplement), 11–33.
Timæus, I., & Moultrie, T. (2008). On postponement and birth intervals. *Population and Development Review, 34*(3), 483–510.
United Nations, Department of Economic and Social Affairs, Population Division. (2011). *World population prospects: The 2010 revision*. New York: United Nations.
United Nations, Department of Economic and Social Affairs, Population Division. (2013). *World population prospects: The 2012 revision*. New York: United Nations.
World Bank. (2012). World Development indicators 2012. Accessed at http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2012, on 9 Mar 2013.
World Health Organization, UNICEF. (2012). *Building a future for women and children: The 2012 report*. Geneva: World Health Organization.

Chapter 5
Age-Structural Transition and Demographic Windows Around the Mediterranean

Maria Carella and Alain Parant

5.1 Introduction

Until the late 1990s, research into the relationship between demographic and economic growth focused mainly on the effects of population growth on the welfare and income of individuals. It completely neglected the age structure variable. More recently this has changed and various studies have begun to examine the influence and repercussions of changes in populations' age structure on economic growth. As early as 2003, the first authors, Bloom, Canning and Sevilla noted, "In recent years, the debate has given insufficient attention to a critical issue: the age structure of the population (that is, the way in which the population is distributed across different age groups), which can change dramatically as fertility and mortality rates change. Because people's economic behaviour and needs vary at different stages of life, changes in a country's age structure can have significant effects on its economic performance".

This article contributes to the ongoing debate about the relationships between population age structure and the "demographic window",[1] the point in the transition when mortality is postponed and birth rates fall as a result of a rapid decline in fertility, leading to a sharp fall in the ratio of dependent persons per person of working age. [..]During this transition period, the working population temporarily increases faster than the number of people it supports, releasing resources for investment in economic development and family welfare[..] (Lee and Mason 2006).

[1]The full expression "demographic window of opportunity" was popularised by the US economists David Bloom, David Canning, Ronald Lee and Andrew Mason.

M. Carella (✉)
Università degli Studi di Bari "Aldo Moro", Bari, Italy
e-mail: maria.carella1@uniba.it

A. Parant
Institut National d'Études Démographiques (INED), Futuribles, Paris, France

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9_5

The study examines the Mediterranean Basin, defined here as all the 21 countries bordering the Mediterranean plus Portugal, Serbia (with Kosovo), Macedonia (Former Yugoslav Republic of Macedonia, FYROM) and Jordan, four countries in its immediate neighbourhood and closely related to the others in one way or another.[2]

Section 5.2 contains an analysis of the process of transition and transformation of the age structure of the population in these countries. Section 5.3 identifies the dates at which the demographic window opens and closes, using the main approaches preferred in the existing literature. The proposed typology of countries by the duration, intensity and completion date of their demographic windows based on this identification is linked to the United Nations 1950–2010 estimates and 2010–2100 projections,[3] arbitrarily choosing the high and low variants of the projections to give the widest possible measure of their uncertainty.

Section 5.4 places the possibilities of future demographic windows and the advantages they are supposed to bring in terms of development within the context of the general ageing of Mediterranean populations and governments' widely differing perceptions of the underlying demographic trends and the adaptive or corrective policies required.

5.2 Transformations of Age Structure

The Mediterranean Basin, as we have defined it, had a total population in 2010 of some 500 million. The countries it comprises vary widely, in both levels of development and settlement patterns. Some are small and densely populated, like Malta, Palestine and Lebanon, alongside others that are huge and sparsely populated, such as Algeria and Libya; some sub-sets—the Asian and African littorals—have seen their populations boom since 1950, while in others—the EU countries and Western Balkans—the population has only slightly increased.

Across this vast region, however, there can be seen a certain convergence on the demographic model of the European countries. Over the long term, fertility has clearly turned down in the Mediterranean Basin as a whole and in each of its subregions. The Asian and African littorals began after the European littoral, but the fall in fertility has accelerated since the 1980s. Meanwhile, age at death has tended to rise, only slowly in the West Balkans, hit hard by the crises of the 1990s, and at varying rates in the Asian littoral countries (Fig. 5.1). In the latter the rapid decline of mortality across the board has led to a substantial increase in life expectancy; this

[2] The 25 countries are subdivided as follows:

- European littoral
- EU countries: Portugal, Spain, France, Italy, Slovenia, Croatia, Greece, Malta;
- Western Balkans: Bosnia-Herzegovina, Montenegro, Serbia, Albania, Macedonia (FYROM);
- Asian littoral: Turkey, Syria (Syrian Arab Republic), Lebanon, Israel, Palestine (State of Palestine), Jordan, Cyprus;
- African littoral: Egypt, Libya, Tunisia, Algeria, Morocco.

[3] United Nations, *World Population Prospects. The 2012 Revision*, 2013.

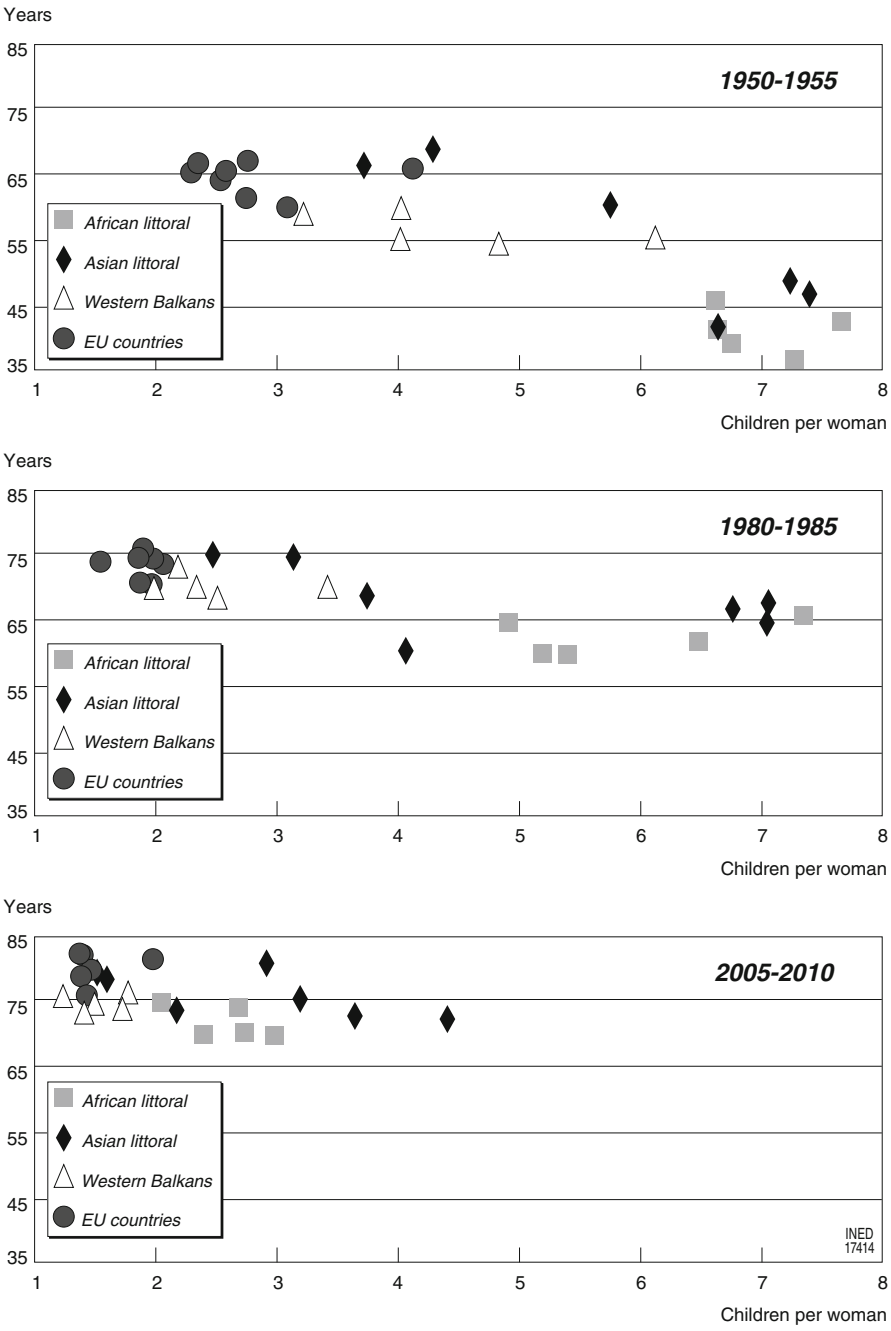


Fig. 5.1 Mediterranean Basin, 1950–1980–2010. Life expectancy at birth (years) and total fertility rate (children per woman) (Source: United Nations, World Population Prospects. The 2012 Revision, 2013)

Table 5.1 Mediterranean Basin, 1950–1980–2010. Proportion of population under 15 and 65 or over (%)

	Proportions (%)					
	0–14			≥65		
Littoral/country	1950	1980	2010	1950	1980	2010
EU countries						
Croatia	26.8	21.6	15.3	7.9	10.6	17.5
France	22.7	22.3	18.4	11.4	14.0	16.8
Greece	28.7	22.8	14.5	6.8	13.1	19.0
Italy	26.7	22.2	14.0	8.1	13.4	20.3
Malta	34.9	23.3	15.6	5.8	9.2	14.5
Portugal	29.6	25.8	15.1	7.0	11.5	18.0
Slovenia	27.5	23.2	14.0	7.0	11.4	16.7
Spain	26.5	26.0	14.9	7.2	11.2	17.1
Western Balkans						
Albania	38.8	38.2	22.8	5.9	5.0	10.1
Bosnia-Herzegovina	37.8	27.7	17.4	4.0	6.0	15.1
Macedonia	36.0	29.3	17.4	7.1	6.5	11.7
Montenegro	36.2	27.8	19.5	7.4	8.1	12.5
Serbia	28.1	24.5	16.9	7.6	9.1	13.7
Asian littoral						
Cyprus	34.5	25.0	17.8	6.0	9.4	11.6
Jordan	45.7	49.0	35.1	4.8	3.2	3.4
Israel	31.7	33.0	27.2	3.9	8.7	10.4
Lebanon	34.2	39.0	23.7	7.3	5.4	8.4
Palestine	45.5	49.9	42.1	4.8	2.3	2.8
Syria	38.8	48.7	35.7	4.5	2.9	3.7
Turkey	39.4	40.1	26.7	3.0	4.7	7.1
African littoral						
Algeria	40.6	46.2	27.1	3.5	3.4	4.7
Egypt	39.3	40.3	31.5	3.0	4.5	5.5
Libya	38.7	46.1	29.4	5.2	2.9	4.6
Morocco	39.6	44.0	28.1	2.9	3.0	5.0
Tunisia	40.0	41.9	23.5	1.5	3.4	6.9

Source: United Nations, World Population Prospects. The 2012 Revision, 2013

ranged between 42 and 48 in the early 1950s (except for Israel, Lebanon and Cyprus, forerunners in this respect) and now exceeds 72 in all cases.

Given this fall in fertility, or continued low level (EU countries), and rise in life expectancy, all the countries in the Mediterranean Basin have ageing populations (lower proportions of young people, higher proportions of older people; Table 5.1) and this trend is set to continue at a rate determined by future variations in fertility. The inversion of the age pyramid that has been occurring for decades in the countries of the European littoral will spread to the countries of the other littorals (Fig. 5.2).

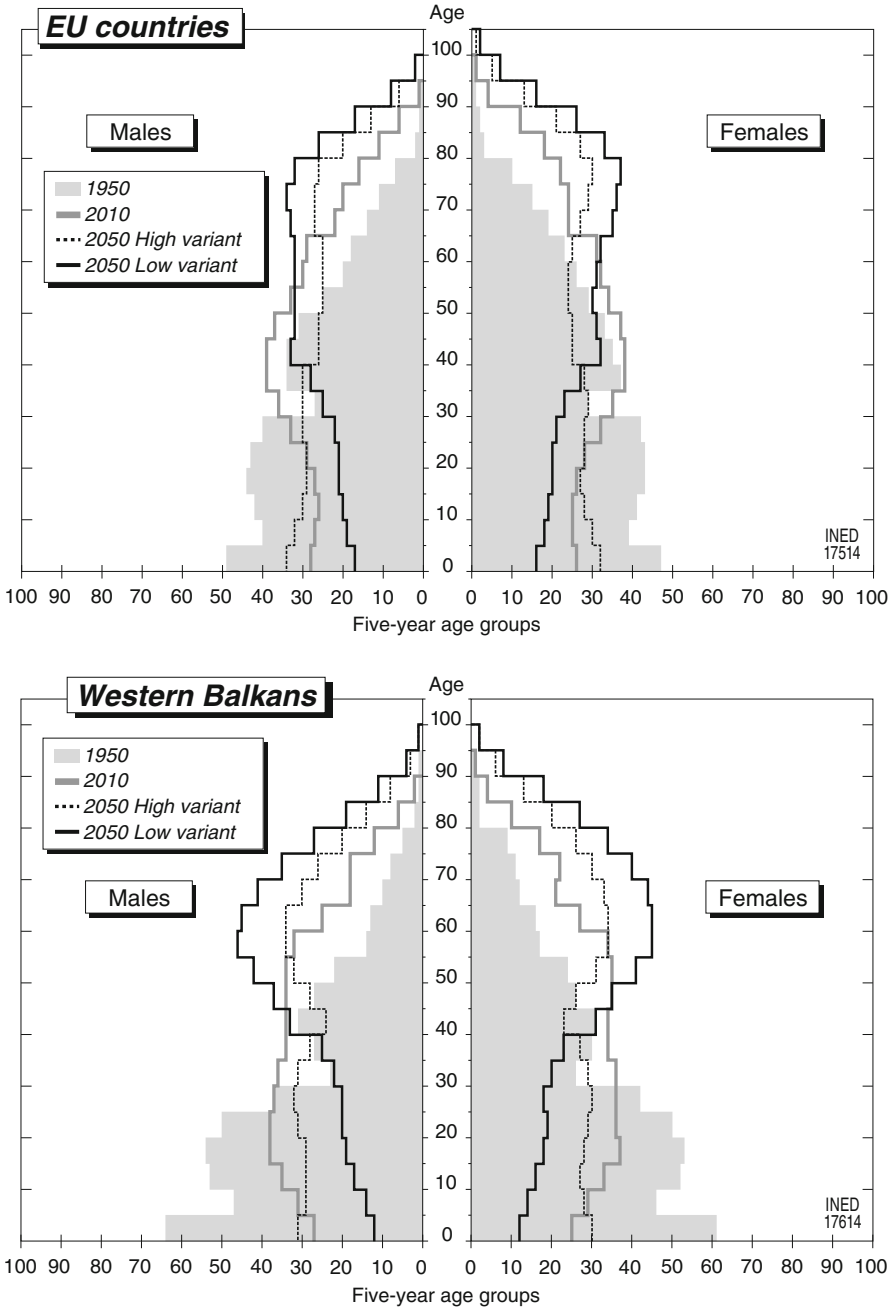
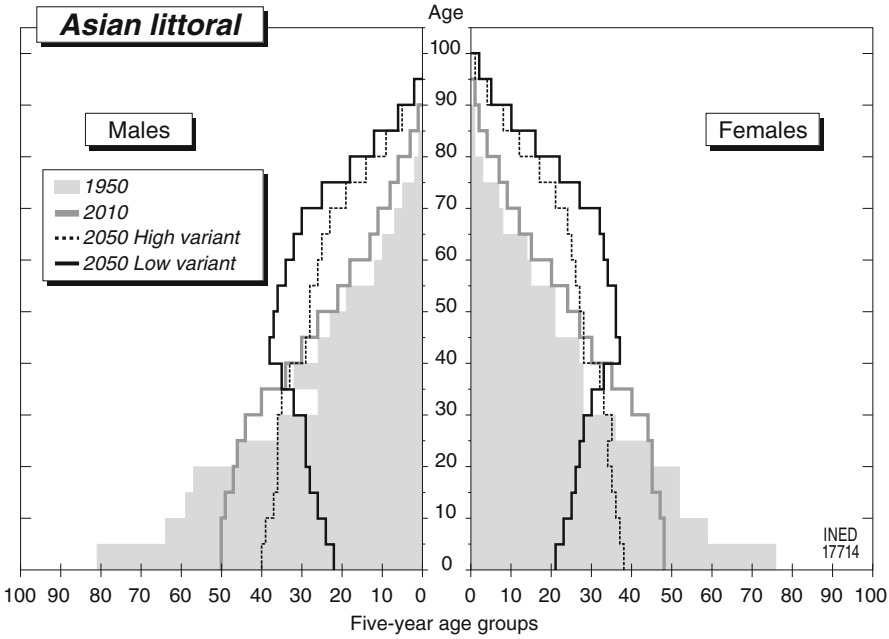


Fig. 5.2 Mediterranean Basin, 1950–2050. Age pyramids by sub-region, estimated and projected, high and low variants (Source: United Nations, World Population Prospects. The 2012 Revision, 2013)



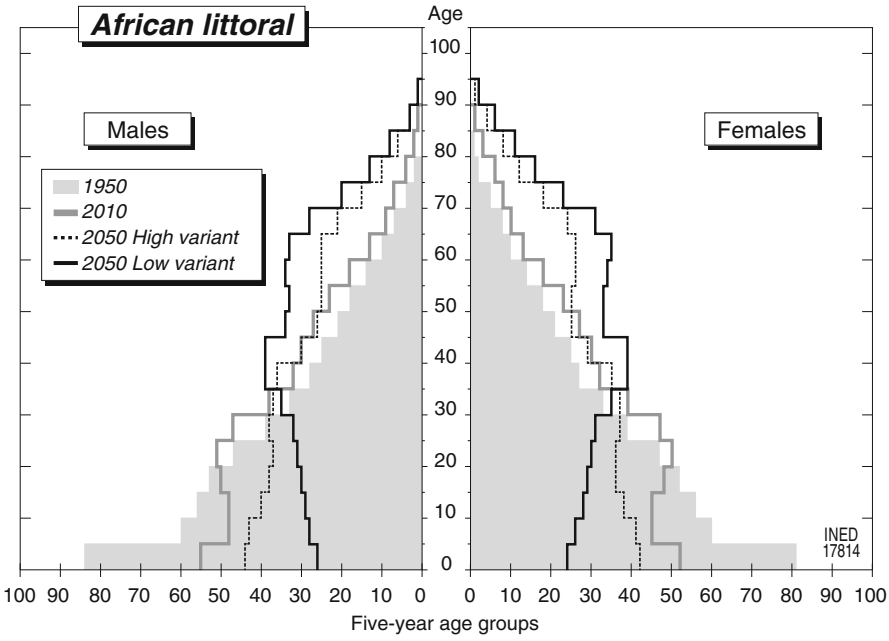


Fig. 5.2 (continued)

Table 5.2 Phases of age-structural transition around the Mediterranean

Littoral		1950–1955	2005–2010	2050–2055 et 2095–2100
European	UE countries	Higher share of young adults	Higher share of elderly	Pronounced demographic ageing
	Balkans	Higher share of children	Higher share of mature adults	
	Croatia, Serbia	Higher share of young adults		
	Albania	Higher share of children	Higher share of mature adults	
Asian	Asian	Higher share of children	Higher share of mature adults	Higher share of elderly
	Syria, Jordan		Higher share of children	
	Palestine			Higher share of mature adults
African		Higher share of children	Higher share of mature adults	Higher share of elderly

Source: Malmberg and Lindh 2006; authors' calculation

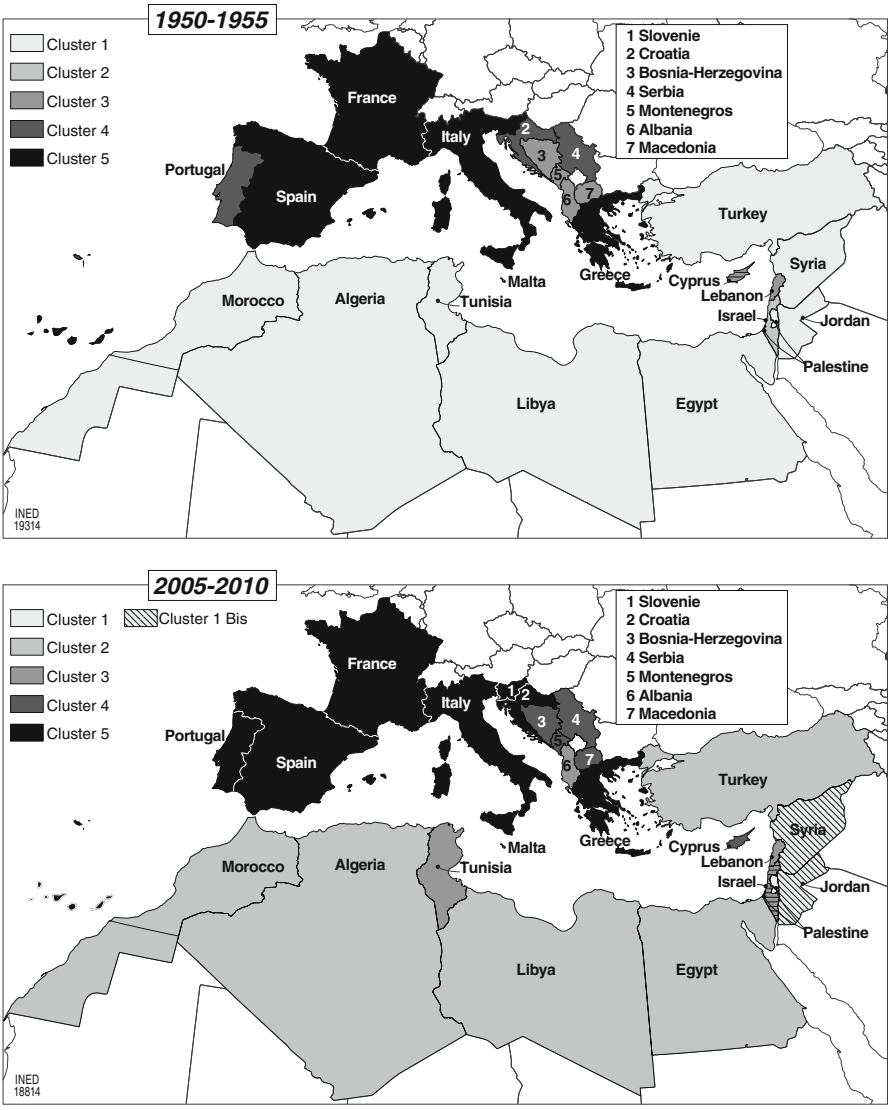
Cluster analysis[4] is used to classify the countries according to the speed and similarity of their age-structural transition process (Table 5.2 and Map 5.1).

The analysis reveals a process of convergence of age structures: all of the Mediterranean Basin is moving towards demographic ageing; in the Asian and African littorals, subject to an intermediate phase of growth in the population of working age, as a result of a rapid fall in fertility from historically high levels and a still relatively low age at death, despite its current rise, that has not yet caused an increase in the elderly population.

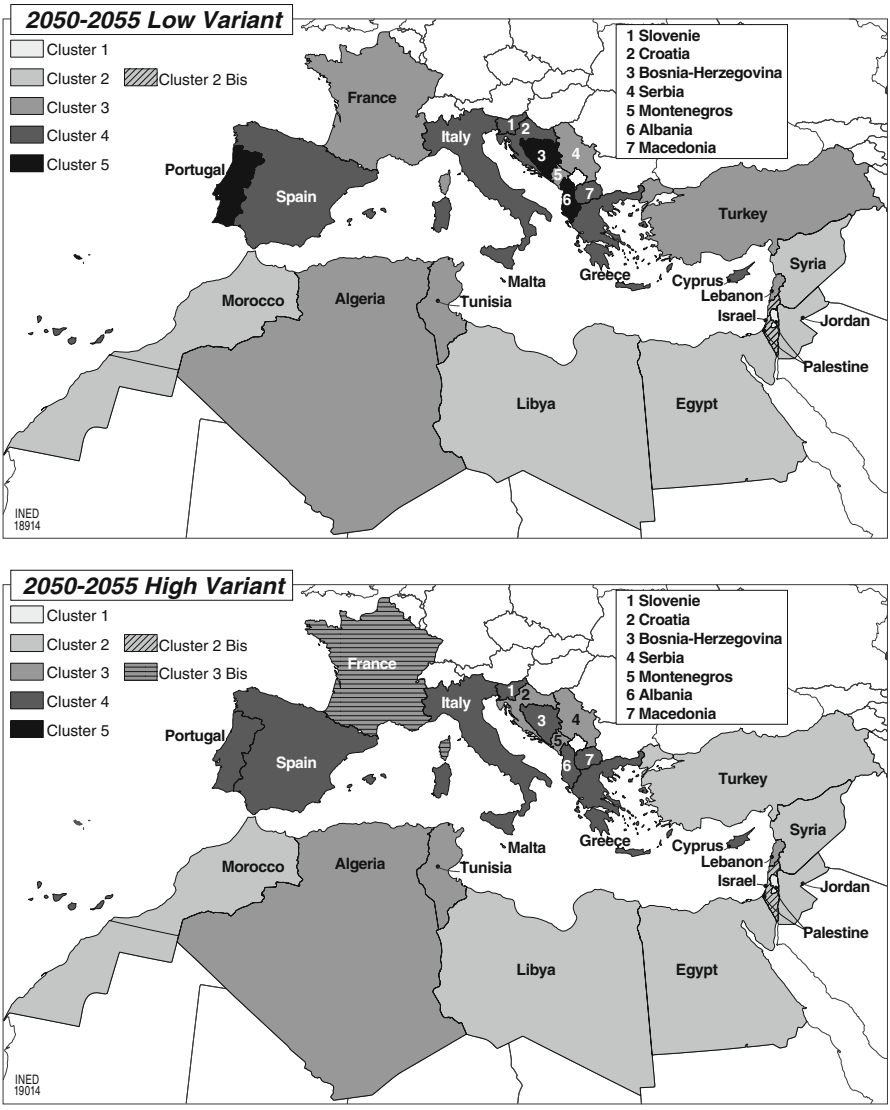
5.3 The Demographic Window

A population's age structure illustrates that population's history over a period that may be nearly a century, depending on the statistics available. While a sharp, sustained increase in fertility or its continuation at a high level causes a rise in the number and proportion of young people, and then of adults, a fall in fertility has the reverse effect and the ageing of the age pyramid occurs from the bottom up. Falling

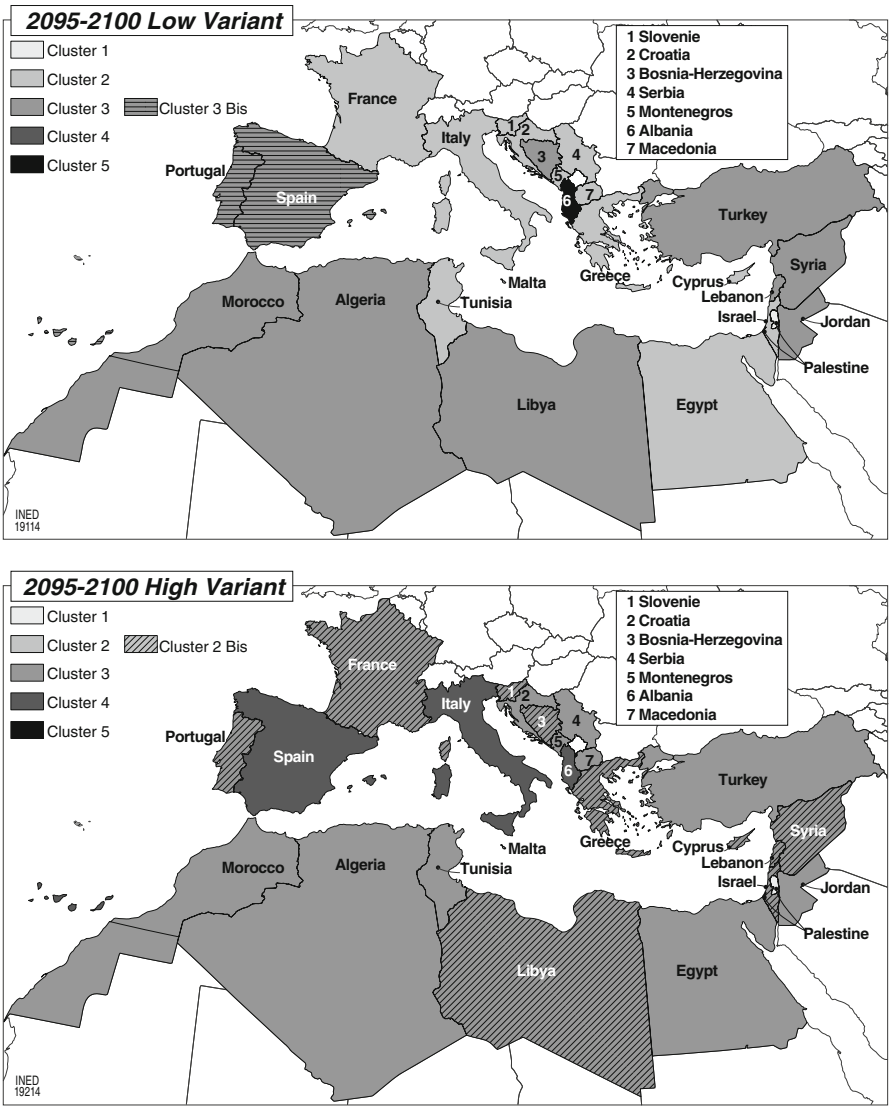
[4]The cluster analysis was applied to four periods (1950–1955, 2005–2010, 2050–2055, 2095–2100) using the following variables: total fertility rate, male and female life expectancy at birth, total population growth rate, proportion of under-15 s, 15–64-year-olds, 65 s and older, total dependency ratio. The final groups emerging from hierarchical clustering by various methods (Ward's method, centroid clustering, medoid clustering, average linkage) are listed by age-structural change.



Map 5.1 Grouping of Mediterranean countries from demographic indicators of age structural transition (years 1950–1955; 2005–2010). Grouping of Mediterranean countries from demographic indicators of age structural transition (years 2050–2055). Grouping of Mediterranean countries from demographic indicators of age structural transition (years 2095–2100)



Map 5.1 (continued)



Map 5.1 (continued)

death rates among children tend to increase the proportion of young people and adults, but when they affect older people, they increase the proportion of elderly and an ageing of the pyramid from the top down. Since the overwhelming majority of children and the elderly are supported by adults, changes in their proportions over time due to the changes in the rate and timing of fertility and mortality, and secondarily, to migration are not neutral in their effects particularly the socio-economic ones.

5.3.1 Theoretical Background

The demographic window of opportunity refers to the period during which a country can maximise the socio-economic advantages of the positive changes in its population age structure (de Carvalho and Wong 1998; Bloom and Canning 2001; Bloom et al. 2003; Mason and Lee 2006; Pool 2007). It defines a phase in the demographic transition when the dependency ratio first falls then rises again as a result of ageing (Rallu 2010). In the transition to the modern demographic regime, the speed at which fertility and mortality fall affects both the duration and impact of the demographic window (Golini and Marini 2006; Angeli and Salvini 2007). The faster they fall, the greater the inherent benefits of the consequential modification of the population age structure.

Economic effects:

- During the demographic transition, when fertility rates are falling rapidly, "the labour force temporarily grows more rapidly than the population dependent on it, freeing up resources for investment in economic development and family welfare" (Lee and Mason 2006): *the first demographic dividend*;
- As the larger cohorts of the working population age, given that they are likely to live longer in retirement, they may have high incentives to save and acquire assets. If the income of these assets is invested, national income rises: *the second demographic dividend* (Bloom and Canning 2006)

5.3.2 Approaches Adopted

The literature contains no single definition of the demographic window of opportunity that can be used to measure its duration. In its *World Population to 2300* report (2004), the United Nations identified it as the period when under-15s are below 30 % of the population but the 65s and over have not exceeded 15 %.

The studies that have attempted to measure the beneficial economic effects of the demographic window, in particular the size of its "dividend", estimate the dividend period either

- With econometric models, which assess economic growth from the relationship between the increase in the working-age population and GDP per capita (Bloom and Canning 2001, 2003, 2008); or
- With analytical methods linked to the changes in the increase in the ratio of producers to consumers (support ratio) deduced from the age structure of the two populations (Mason and Lee 2006).

The research that has focused more on the demographic aspects has mainly adopted one of four approaches:

- Establishing the demographic window from threshold figures for the proportions of young and elderly population (United Nations 2004);
- Considering the demographic window to be open while the total dependency ratio is between 40 and 60 %;
- Considering the demographic window to be open when the rate of growth in the working-age population exceeds the total population growth rate (Navaneetham 2004; Saxena 2011);
- Relating the phenomenon to supposedly decisive periods in the fertility transition process that favour "reproductive efficiency" (Reher 2011). Reher's method defines the demographic window as the period between the onset of declining fertility and the onset of declining birth rate.

5.3.3 Results

1. **Young and elderly proportion threshold approach**

The window is the period when under-15s are below 30 % of the population but the 65s and over have not exceeded 15 %. Analyses using this approach show that for the European littoral countries, the demographic window lies either in the past (EU countries), or in the present (Western Balkans) if fertility soon rises sharply (high-variant forecasts)[5] (Fig. 5.3).

For the Asian and African littoral countries the demographic window is currently open and will remain so for as long as fertility is high or rising.

2. **Total dependency ratio approach**

The demographic window is open while this ratio is equal to or less than 60 %, the reciprocal of 1.5, the minimum support ratio deemed sufficient for enabling the conditions for an increase in a country's economic potential (Lee and Mason 2007; Golini and Marini 2006).

The total dependency ratio[6] as a percentage is defined by convention as either

- The ratio of the non-working-age population to the working-age population: (P0–14 + P65+)/(P15–64) * 100; or
- On the basis of a non-dependent population aged 20–64: (P0–19 + P65+)/(P20–64) * 100, since employment rates in the 15–19 age group are very low in transition countries, as they are in economically advanced countries, because of longer education (Mason 2005; Mason and Lee 2006).

[5] Proportions are calculated for 5-year periods and the dates on the graphs mark the start of each period.

[6] Proportions are calculated for 5-year periods and the dates on the graphs mark the start of each period.

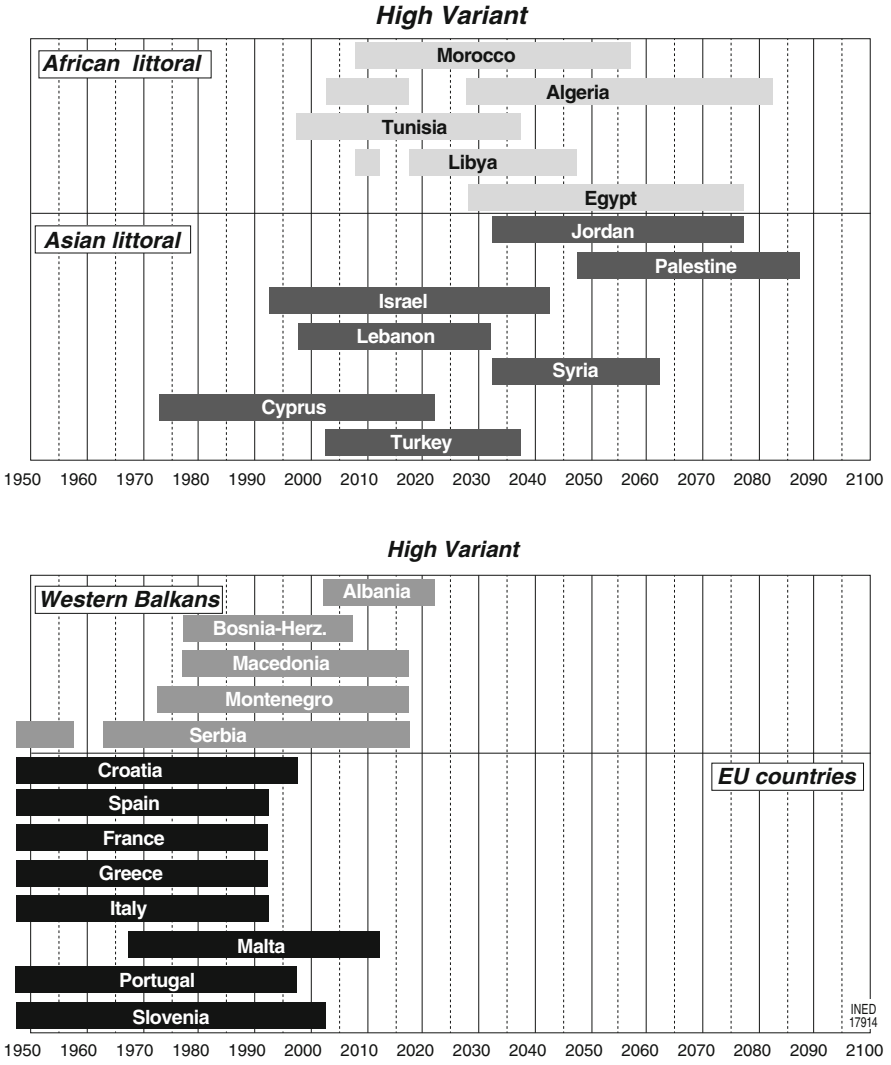


Fig. 5.3 Demographic window: proportion threshold approach 0–14s <30 % and 65 + s ≤15 % (Source: United Nations, World Population Prospects. The 2012 Revision, 2013)

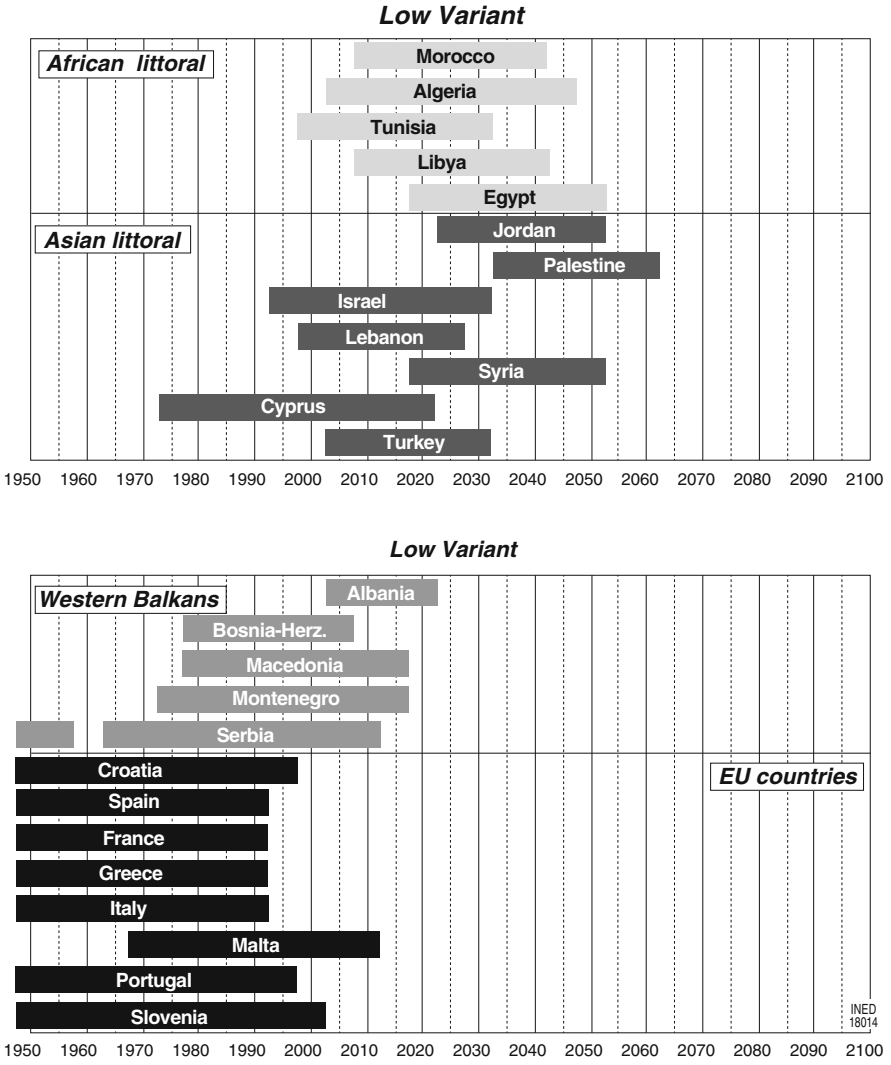


Fig. 5.3 (continued)

Using the [(P0–14 + P65+)/(P15–64) * 100] total dependency ratio, all the countries currently have an open demographic window and any assumption of a future rise in fertility would tend to shorten it (Fig. 5.4).

For the EU countries, the windows are either continuous (Croatia, Greece, Italy, Slovenia) or discontinuous (France, Portugal, Spain).

For the Asian and African littoral countries, the windows open relatively late between 2000 and 2015, except for the extreme case of Palestine with its still high fertility.

Extending the young population to age 19 and thus altering the total dependency ratio [(P0–19 + P65+)/(P20–64) * 100] causes a large decline in the number of

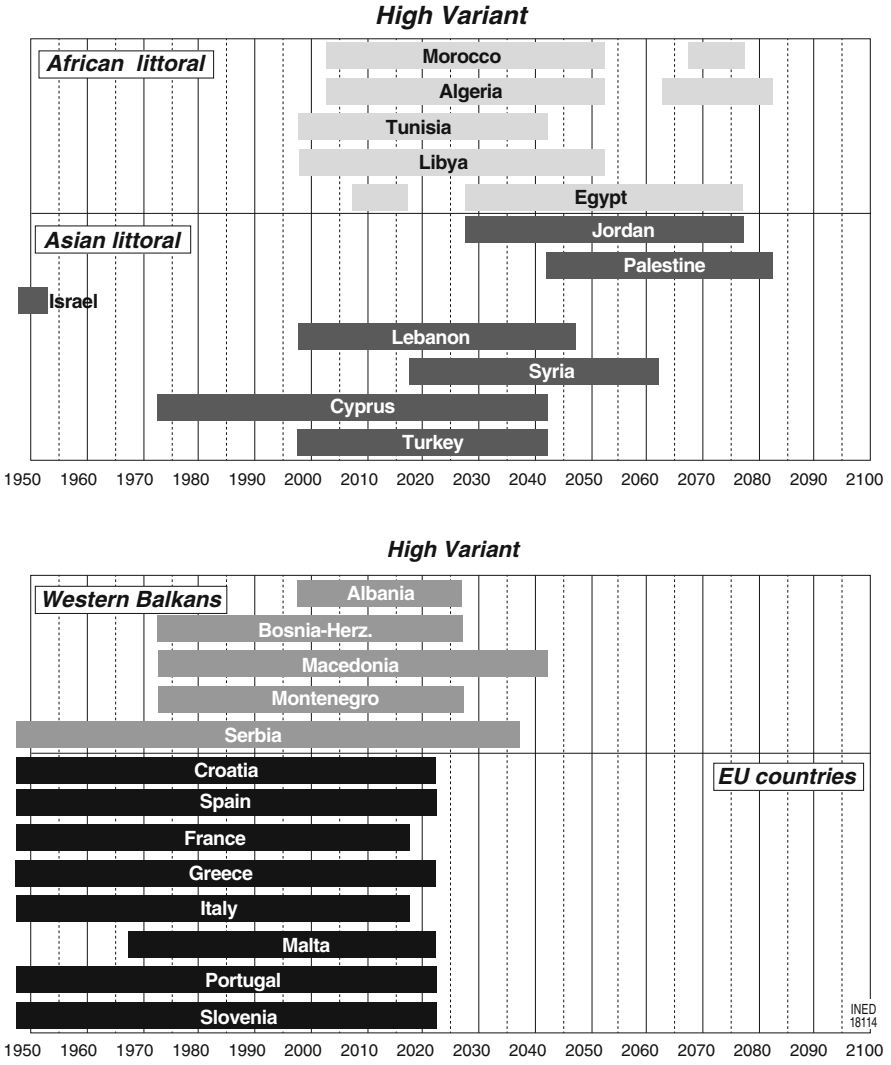


Fig. 5.4 Demographic window: total dependency ratio approach $(P_{0-14} + P_{65+})/(P_{15-64}) * 100 \leq 60\,\%$ (Source: United Nations, World Population Prospects. The 2012 Revision, 2013)

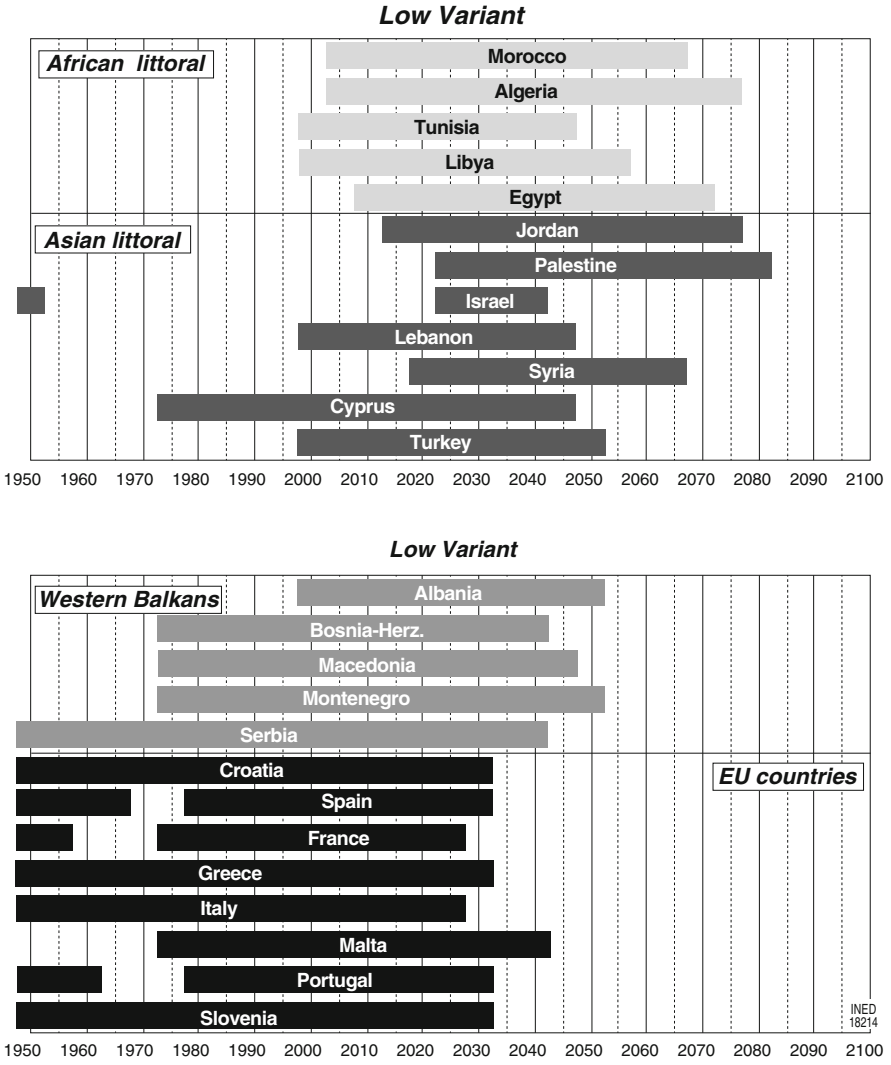


Fig. 5.4 (continued)

countries that have an open demographic window, and the length of that window is substantially shortened, particularly on the assumption of a future rise in fertility, because as the elderly dependency ratio continues to rise (sustained lower mortality) and the young dependency ratio also rises with higher fertility, the two together soon exceed 60 % (Fig. 5.5).

3. **Working-age population growth rate approach**

"It has been shown mathematically that output per capita would grow if the growth rate of working population exceeds the growth rate of total population even

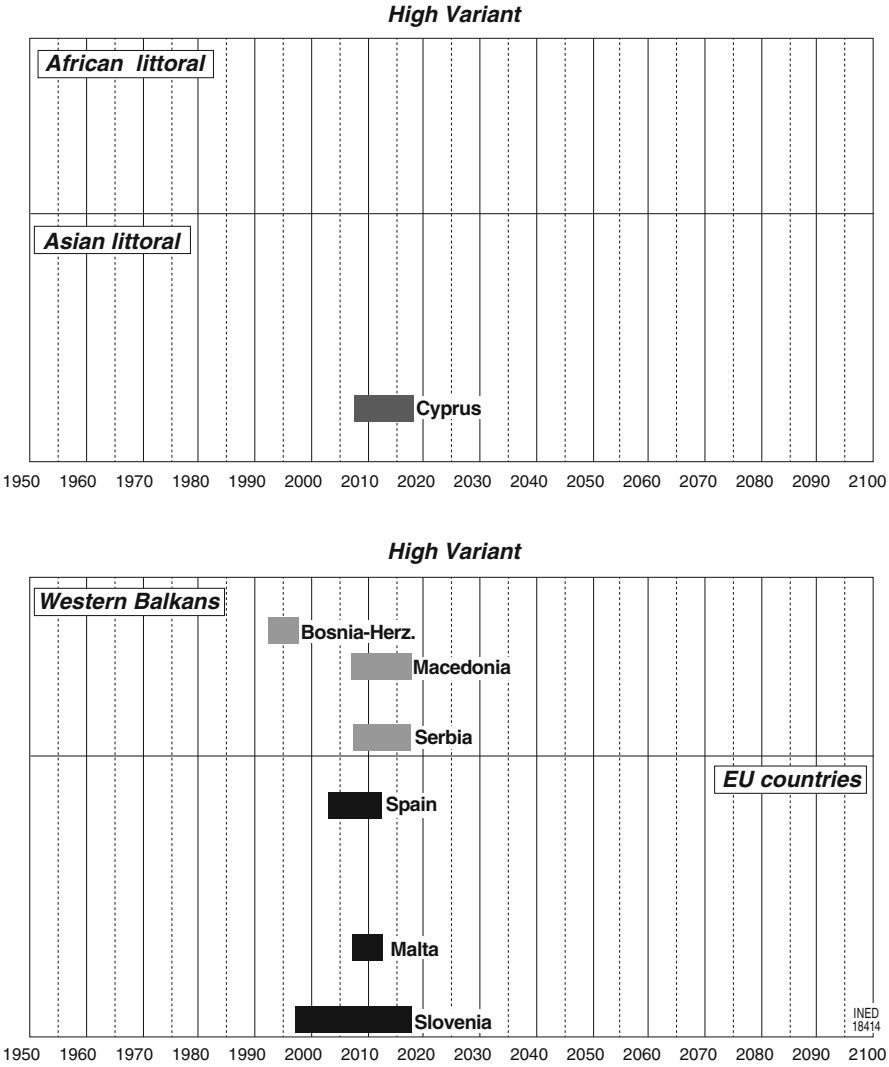


Fig. 5.5 Demographic window: total dependency ratio approach II $(P_{0–19} + P_{65+})/(P_{20–64}) * 100 \leq 60\,\%$ (Source: United Nations, World Population Prospects. The 2012 Revision, 2013)

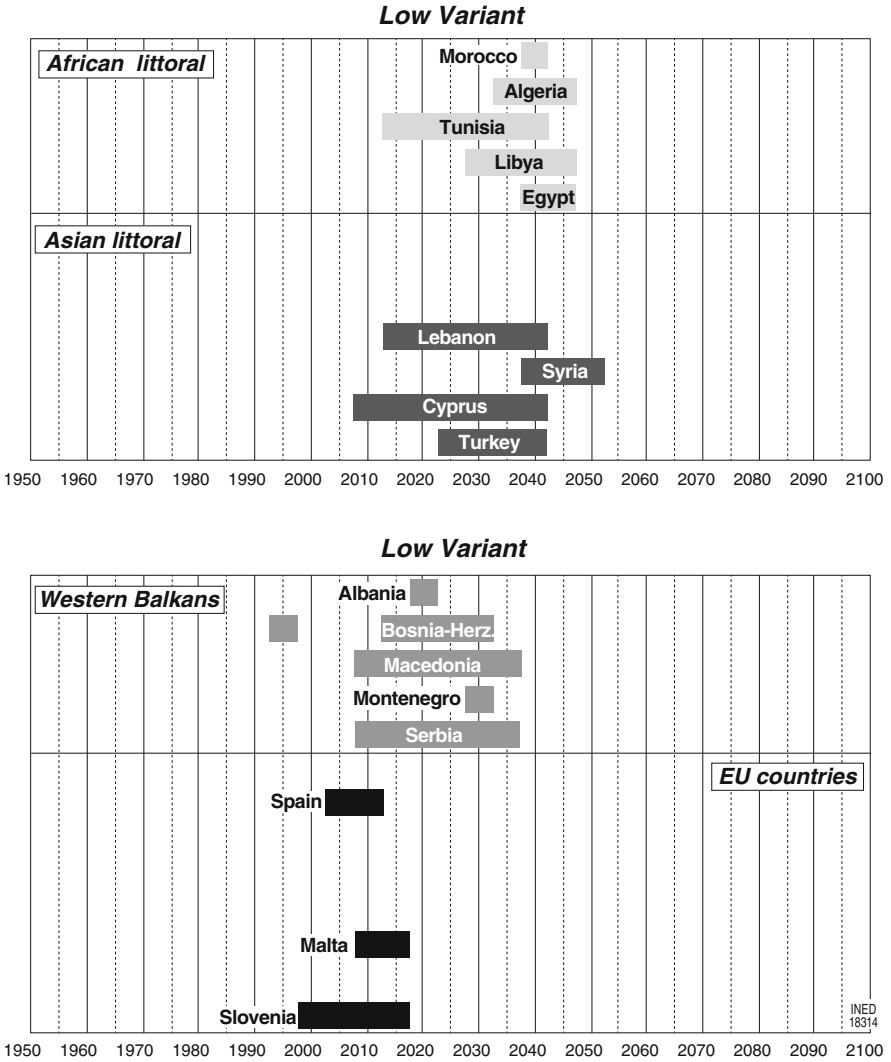


Fig. 5.5 (continued)

if the output per worker does not change" (Bloom and Williamson 1998). The demographic window opens once the difference between the growth rate of the working-age population and that of the total population is positive (Navaneetham 2004; Saxena 2011). In this research, the working-age population is defined as the non-dependent population aged 20–64 and the mean growth rates for total and working-age population are calculated for 10-year periods.[7]

[7] The dates on the graphs mark the start of each period.

Table 5.3 Demographic window: EU and Western Balkan countries Working-age (20–64) population growth rate approach

Countries		Opens	Closes	Lasts
EU Countries	Portugal	1970	2000	30
	Spain	1980	2000	20
	France	1970	2000	30
	Italy	1980	2000	20
	Slovenia	1950	2000	50
	Croatia	1950	1980	30
	Greece	1970	2000	30
	Malta	1960	2000	40
Western Balkans	Serbia	1950	1990	40
	Montenegro	1950	2000	50
	Bosnia-Herzegovina	1950	1980	30
	Macedonia	1950	2000	50
	Albania	1970	2010	40

Source: United Nations, World Population Prospects: The 2012 Revision, 2013

Using this approach, for the European littoral countries, the demographic window belongs to the past but some countries may have further windows (Table 5.3). Although Slovenia and Croatia are now EU member states, they still present similarities with the Western Balkan countries they so recently belonged with. Worthy of note is Bosnia-Herzegovina, where the window closed in the 1980s and 1990s, marked by severe political crises and a sudden emigration of its young adult working population (Fig. 5.6). All the African and Asian littoral countries currently have open demographic windows (Table 5.4), with greater homogeneity in Africa, compared to Asia, where Lebanon is ahead of Syria (Fig. 5.7) and Palestine stands out for having a demographic window that will last longer than elsewhere, as the previous approaches have already shown.

4. **Reher's method**

Reher (2011) estimates the demographic window of opportunity from three key dates and presupposes one condition:

- Date fertility begins to fall;
- Date birth rate begins to fall: this is the start of the phase when the ageing process rapidly accelerates;
- 30 years after the start of the birth rate decline: when shrinking numbers of births lead to cohorts of decreasing size in the population of working and reproductive age;
- Window exists if there is moderate natural population growth rate, below or equal to 1.5 % or 2 %.

The demographic window is defined as the period from the onset of fertility decline to the onset of lower numbers of births. Because data for earlier periods are

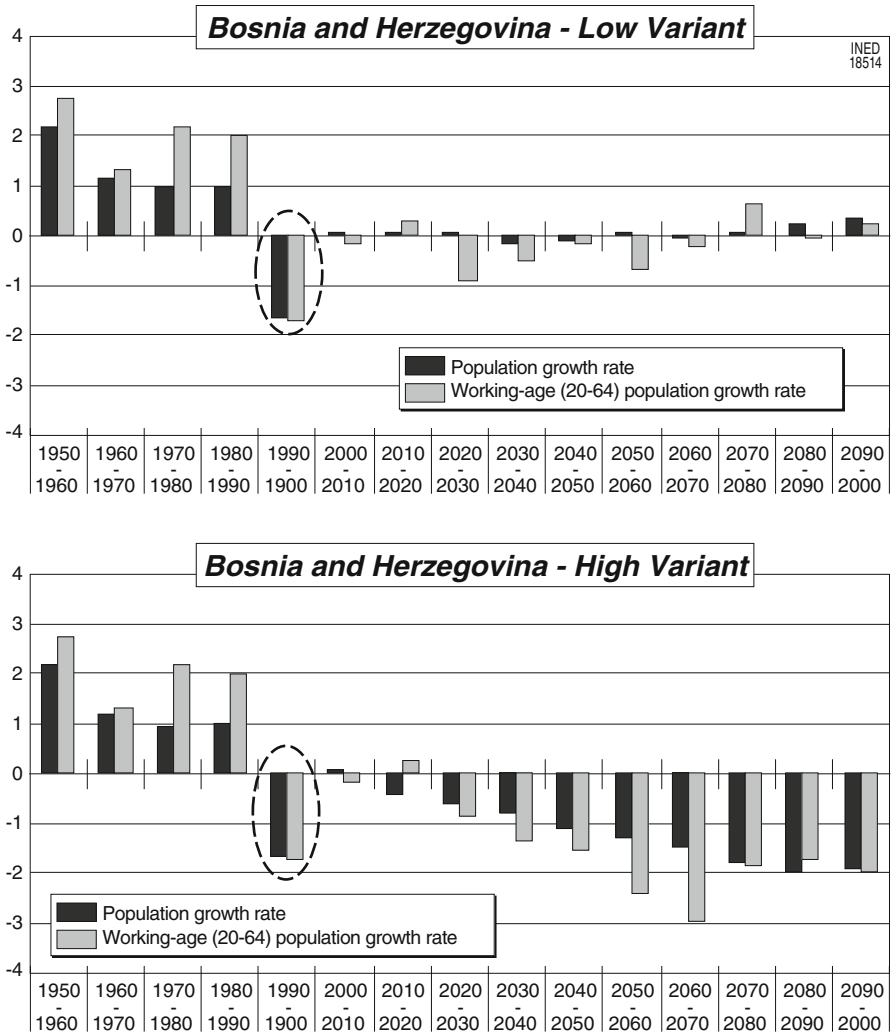


Fig. 5.6 Demographic window. Bosnia-Herzegovina Working-age (20–64) population growth rate approach (Source: United Nations, World Population Prospects: The 2012 Revision, 2013)

unavailable, Reher assumes that the window opens when the crude birth rate (ratio of births to mean population in a period) begins to decline.

Since Reher's analysis focuses on fertility figures and these have begun to decline everywhere, sometimes from quite some time ago (EU countries), the demographic window, following this approach, is a phenomenon belonging largely to the past, with the notable exception of the Palestinian Territories, where fertility is still high and only began to decline recently. For these purposes, the high-variant projections are irrelevant since they are based on an anticipated rebound in fertility (Table 5.5).

Table 5.4 Demographic window. Asian and African littorals Working-age (20–64) population growth rate approach

Littoral	Country	Low variant			High variant		
		Opens	Closes	Lasts	Opens	Closes	Lasts
Asian	Turkey	1970	2020	50	1970	2010	40
	Cyprus	1970	2010	40	1970	2000	30
	Syria	1990	2030	40	1990	2040	50
	Lebanon	1970	2020	50	1970	2010	40
	Israel	1980	2000	20	1980	2000	20
	Palestine	1980	2050	70	1980	2070	90
	Jordan	1990	2030	40	1990	2030	40
African	Egypt	1970	2030	60	1970	2030	60
	Libya	1980	2030	50	1980	2030	50
	Tunisia	1970	2020	50	1970	2030	60
	Algeria	1970	2030	60	1970	2030	60
	Morocco	1970	2030	60	1970	2030	60

Source: United Nations, World Population Prospects: The 2012 Revision, 2013

5.4 Final Thoughts and Conclusions

Any discussion of demographic windows around the Mediterranean depends on the data available, and policy responses differ according to the approach taken. Our analysis does, however, make it possible to assert that for the countries of the European littoral, the demographic window is a thing of the past, unlike for those of the Asian and African littorals, where demographic windows of varying duration are still open. The opening is due, however, to a widespread general ageing of the population, caused by lower fertility and a substantial postponement of the age of death. This is a well-established trend, although the precise extent of it varies to some extent between countries, independently of the duration of the demographic window and the manner in which it was achieved.

How far will the potential advantages of the window for economic and social development be reduced, if at all, by the unavoidable reshaping of the age pyramid?

The opening of a demographic window is not automatically a source of development. Many countries in the recent or distant past have had a similar opportunity and have not always seized it. Since socio-economic development can occur without a demographic window opening first, the window is not a sufficient condition. Socio-economic development requires forward-looking investment in political governance, infrastructure, and private and public productive capacities.

Given that the countries to the East and South of the Mediterranean will shortly be faced, if they are not already, with a major shift in family structures and mutual aid systems, as the young flock to cities that often have nothing to offer them but unemployment, casual jobs and inadequate housing, and these countries' economies are only able to absorb a minority of their burgeoning youth, they will soon

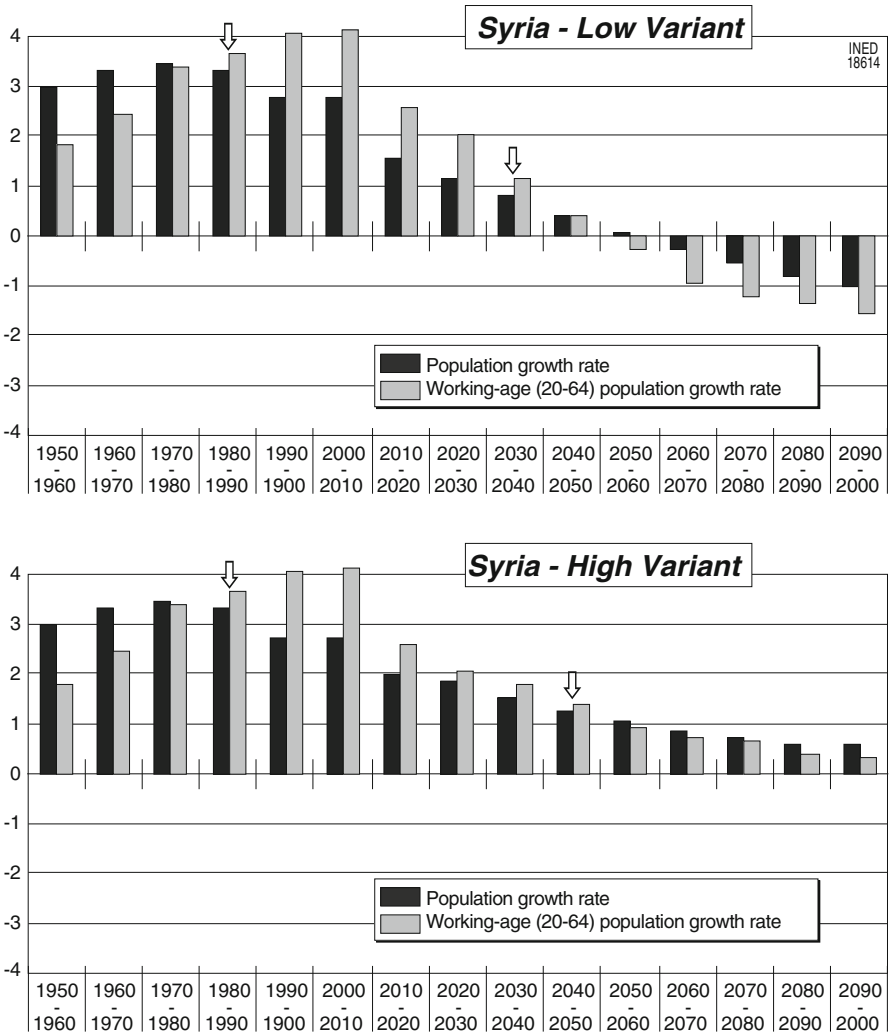


Fig. 5.7 Demographic window. Selected Asian littoral countries Working-age (20–64) population growth rate approach (Source: United Nations, World Population Prospects: The 2012 Revision, 2013)

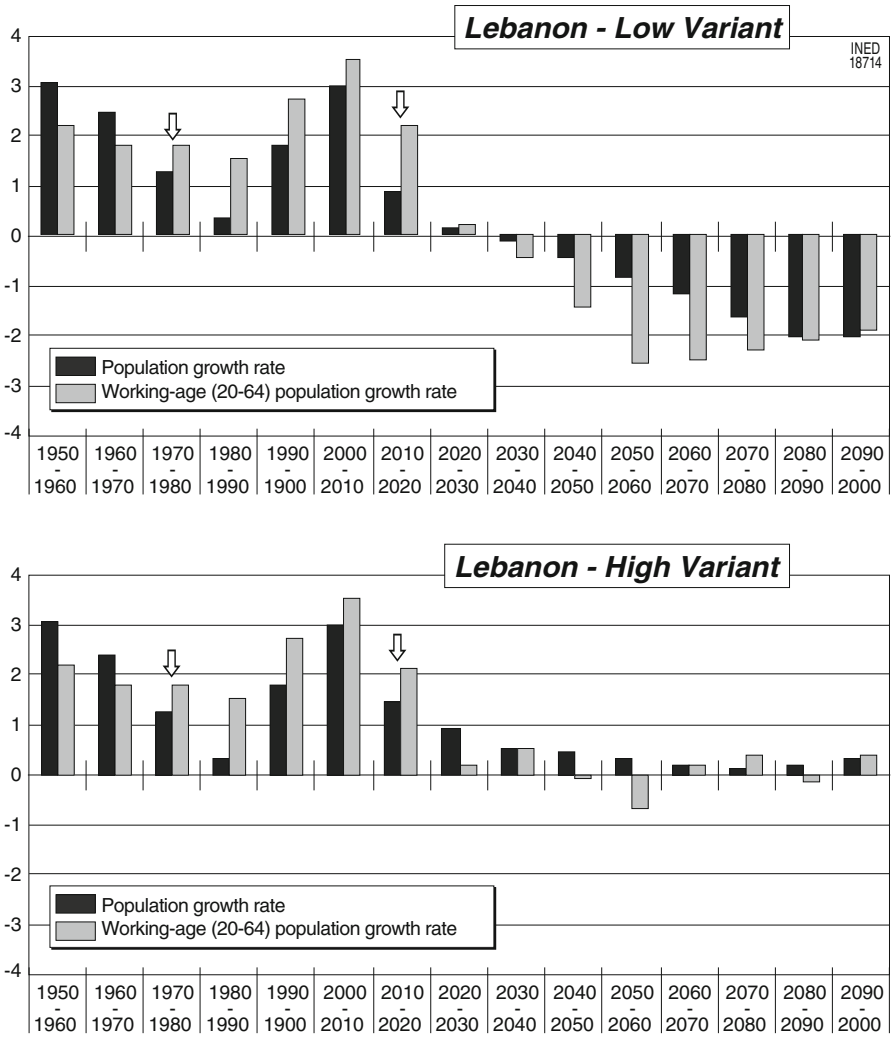


Fig. 5.7 (continued)

have to meet the challenge of a major, and possibly rapid, ageing of their populations. Their authorities will inevitably be torn between opposing pressures and they will not be able to delay the trade-offs they need to make.

For the time being, as shown in the *2013 World Policies Report*, the various governments along the eastern and southern littorals of the Mediterranean differ widely in the clarity with which they perceive these demographic changes and in the policies they are adopting to enable them to fully benefit from their likely demographic windows (Tables 5.6, 5.7, 5.8, 5.9, and 5.10).

Table 5.5 EU and Western Balkan countries. Demographic window: Reher's method

Country		Onset of birth rate decline	Onset of birth number decline in period beginning 1950	Natural growth rate <2 %	Window lasts
EU countries	Portugal	1925	1965	1925	40
	Spain	1902	1975	1902	73
	France	1880	1965	1880	85
	Italy	1925	1970	1925	55
	Slovenia	1931–1934	1955	1930–1934	24
	Croatia	1931–1934	1955	1930–1934	24
	Greece	1935	1980	1935	45
	Malta	1950	1955	1950	–
Western Balkans	Serbia	1931–1934	1955	1930–1934	24
	Montenegro	1931–1934	1965	1960	34
	Bosnia-Herzegovina	1931–1934	1960	1970	29
	Macedonia	1931–1934	1955	1960	24
	Albania	1960	1990	1985	30

		Low variant				High variant	
Littoral	Country	Onset of birth rate decline	Onset of birth number decline	Lasts	Natural growth rate ≤2 % (starting date)	Onset of birth number decline	Onset of birth number rebound
Asian	Turkey	1955	1995	40	1985	Interrupted decline	2065
	Cyprus	1950	1995	45	1950	Interrupted decline	2015
	Syria	1965	2010	45	Out window	Never	Always
	Lebanon	1960	2000	40	1985	Interrupted decline	2075
	Israel	1975	2010	35	1975	Never	Always
	Palestine	1970	2045	75	Out window	Never	Always
	Jordan	1965	2010	45	Out window	Never	Always

(continued)

Table 5.5 (continued)

Littoral	Country	Low variant				High variant	
		Onset of birth rate decline	Onset of birth number decline	Lasts	Natural growth rate ≤2 % (starting date)	Onset of birth number decline	Onset of birth number rebound
African	Egypt	1960	2010	50	2000	Never	Always
	Libya	1975	2010	35	Out window	2015	2070
	Tunisia	1965	1990	25	1990	Interrupted decline	2070
	Algeria	1975	1985	10	1995	Interrupted decline	2070
	Morocco	1970	1985	15	1995	Interrupted decline	2070

Source: for period before 1950, B.R. Mitchell (1998), International Historical Statistics 1750–1993, Macmillan, London and D. Breznik (1991), Stanovništvo Jugoslavije. Chronos, Titograd Asian and African littorals. Demographic window: Reher's method. Source: United Nations, World Population Prospects: The 2012 Revision, 2013

Table 5.6 Government views and policies 2013. Population growth

View on growth	Satisfactory	Albania, France, Lebanon, Libya, Morocco, Montenegro, Turkey, Tunisia
	Too high	Algeria, Egypt, Malta, Jordan, Syria
	Too low	Bosnia-Herzegovina, Cyprus, Croatia, Israel, Italy, Greece, Portugal, Slovenia, Serbia, Montenegro, Spain, Macedonia
Policy on growth	Maintain	Albania, France, Malta, Morocco, Montenegro, Turkey
	Raise	Cyprus, Croatia, Israel, Italy, Greece, Portugal, Slovenia, Serbia, Spain, Macedonia
	Lower	Algeria, Egypt, Jordan, Palestine, Tunisia, Syria
	No intervention	Bosnia-Herzegovina, Lebanon, Libya

Source: World Policies Report 2013, United Nations, New York, 2013

Algeria, for all the wide-ranging measures it has taken and resources it has devoted, despite some distortions in international migration, is a highly instructive case.

The Algerian authorities are greatly concerned by the rapid growth of the population and claim to be acting to reduce fertility (a policy that is good for the demographic window but accelerates population ageing), but they appear to lack any proactive management of the working population. However large this now is, it will still age in time, especially if the stated goal of reducing mortality is actually achieved. In the short to medium term, the Algerian government will not only have to legislate with respect to the retirement age but also join with all the country's dynamic forces to maintain the employability of the largest possible number of

Table 5.7 Government views and policies 2013. Population age structure

Level of concern about the size of the working age population	Major concern	Algeria, Bosnia-Herzegovina, Cyprus, Croatia, Egypt, France, Israel, Italy, Greece, Malta, Morocco, Slovenia, Serbia, Jordan, Macedonia, Turkey, Tunisia, Syria
	Minor concern	Albania, Lebanon, Libya, Portugal, Montenegro, Spain
Level of concern about ageing of the population	Major concern	Albania, Bosnia-Herzegovina, Cyprus, Croatia, France, Israel, Italy, Greece, Lebanon, Malta, Morocco, Portugal, Slovenia, Serbia, Montenegro, Spain, Macedonia, Turkey, Tunisia
	Minor concern	Algeria, Egypt, Jordan, Palestine, Syria
Measures to adress population ageing[a]	Neither	Algeria, Malta, Morocco, Palestine, Tunisia, Syria
	Reforms (YES)	Albania, Bosnia-Herzegovina, Cyprus, Croatia, Egypt, France, Israel, Italy, Greece, Lebanon, Portugal, Slovenia, Serbia, Jordan, Montenegro, Spain, Macedonia, Turkey

Level of concern about ageing of the population. Indicates Government's level of concern about the growing size or the proportion of older persons in the population and its consequences for health and social welfare provisions

Source: World Policies Report 2013, United Nations, New York, 2013

Level of concern about the size of the working-age population. Indicates Government's level of concern regarding the current size of the working-age population in relation to the domestic labour market or in relation to the size of the dependent populations

[a]Indicates whether the Government has adopted specific measures in the last 5 years to address population ageing in the country. Measures to address population ageing: (1) change in statutory retirement age in the last 5 years; (2) pension system reform in the last 5 years

Table 5.8 Government views and policies 2013. Fertility Palestine: data not collected

View on fertility level	Satisfactory	Albania, France, Lebanon, Libya, Morocco, Turkey, Tunisia
	Too high	Algeria, Egypt, Jordan, Syria
	Too low	Bosnia-Herzegovina, Cyprus, Croatia, Italy, Greece, Malta, Portugal, Slovenia, Serbia, Montenegro, Spain, Macedonia, Israel
Policy on fertility level	Maintain	Albania, Turkey
	No intervention	Lebanon, Libya, Bosnia-Herzegovina
	Lower	Algeria, Egypt, Morocco, Jordan, Palestine, Tunisia, Syria
	Raise	Cyprus, Croatia, France, Italy, Greece, Malta, Portugal, Slovenia, Serbia, Montenegro, Spain, Macedonia, Israel

Source: World Policies Report 2013, United Nations, New York, 2013

Table 5.9 Government views and policies 2013. Health and mortality

View on life expentancy at birth	Acceptable	Albania, Cyprus, Croatia, Egypt, France, Israel, Italy, Greece, Lebanon, Libya, Malta, Morocco, Portugal, Serbia, Spain, Jordan, Turkey, Tunisia, Syria
	Unacceptable	Algeria, Bosnia-Herzegovina, Slovenia, Montenegro, Macedonia
View on under five mortality	Acceptable	Cyprus, Croatia, Egypt, France, Israel, Italy, Greece, Libya, Malta, Portugal, Slovenia, Serbia, Spain, Macedonia, Syria
	Unacceptable	Algeria, Albania, Bosnia-Herzegovina, Lebanon, Morocco, Jordan, Montenegro, Palestine, Turkey, Tunisia
View on maternal mortality	Acceptable	Cyprus, Croatia, Egypt, France, Israel, Italy, Greece, Malta, Portugal, Slovenia, Serbia, Montenegro, Spain, Macedonia, Tunisia, Syria
	Unacceptable	Algeria, Albania, Bosnia-Herzegovina, Lebanon, Libya, Morocco, Jordan, Turkey, Palestine

Palestine: data not collected
Source: World Policies Report 2013, United Nations, New York, 2013

Table 5.10 Government views and policies 2013. International migration

View on immigration	Satisfactory	Albania, Cyprus, Egypt, Italy, Greece, Lebanon, Malta, Morocco, Portugal, Serbia, Montenegro, Spain, Macedonia, Turkey, Tunisia, Syria, Bosnia-Herzegovina
	Too high	Algeria, Croatia, France, Libya, Jordan
	Too low	Israel, Slovenia
Policy on immigration	Maintain	Algeria, Albania, Bosnia-Herzegovina, Italy, Greece, Lebanon, Libya, Malta, Morocco, Portugal, Serbia, Montenegro, Spain, Macedonia, Turkey, Tunisia, Syria
	Lower	Cyprus, Croatia, Egypt, France, Jordan
	Raise	Israel, Slovenia
	No intervention	Palestine
Irregular migration	Major concern	Algeria, Albania, Bosnia-Herzegovina, Cyprus, Egypt, France, Israel, Italy, Greece, Lebanon, Libya, Malta, Morocco, Portugal, Slovenia, Jordan, Montenegro, Spain, Macedonia, Turkey, Tunisia
	Minor concern	Croatia, Serbia, Syria
View on emigration	Satisfactory	Albania, Cyprus, France, Italy, Greece, Libya, Malta, Portugal, Slovenia, Montenegro, Spain, Turkey, Tunisia
	Too high	Algeria, Bosnia-Herrzegovina, Croatia, Israel, Lebanon, Serbia, Macedonia, Syria
	Too low	Egypt, Morocco, Jordan
Policy on emigration	Maintain	Albania, Cyprus, Egypt, Libya, Portugal, Turkey
	No intervention	Algeria, France, Italy, Greece, Lebanon, Malta, Slovenia, Montenegro, Spain, Syria
	Lower	Bosnia-Herzegovina, Croatia, Israel, Serbia, Macedonia,
	Raise	Morocco, Jordan, Tunisia

Source: World Policies Report 2013, United Nations, New York, 2013
View on immigration: Palestine data not collected
Irregular migration: Palestine data not collected
View on emigration: Palestine data not collected
Policy on emigration: Palestine data not collected

wealth producers, and this will require wide-ranging, expensive investment in human capital and adaptable production capacities.

The demographic dividend is not a low-hanging fruit; you have to stretch to pluck it.

Appendix 5.1. Countries in the Mediterranean Basin. General characteristics

Region/Country	Area ('000 km^2)	Population 2010 ('000)	Density 2010 (pop/ km^2)	Urban population proportion 2010 (%)	PIB/ habitant 2009 (en PPA en dollers)	Indice de dévelopment humain 2010	
						Valeur	Rang mondial
European littoral	**1,866**	**218,908**	**117**	**73,3**			
EU countries	**1,669**	**199,542**	**120**	***75,0***			
Portugal	92	10,590	115	61.3	24,080	0.808	41
Spain	506	46,182	91	77.6	31,490	0.876	23
France	552	63,231	115	85.9	33,950	0.883	20
Italy	301	60,509	201	68.6	31,870	0.873	24
Slovenia	20	2,054	103	49.5	26,470	0.882	21
Croatia	57	4,338	76	58.0	19,200	0.794	46
Greece	132	11,110	84	61.7	28,800	0.862	29
Malta	0	425	1,416	94.8	23,170	0.830	36
Cyrus	9	1,104	123	70.5	30,290	0.839	31
West Balkans	**197**	**19,365**	**98**	**54,9**			
Bosnia-Herzegovina	51	3,846	75	49.2	8,770	0.731	74
Montenegro	14	620	44	61.5	1, 110	0.769	54
Albania	29	3,150	109	52.9	8,640	0.737	70
Serbia	77	9,647	125	56.4	11,700	0.764	59
FYROM	26	2,102	81	59.4	10,880	0.726	78
Asian littoral	**1,105**	**115,899**	**105**	**70,2**			
Turkey	784	72,138	92	70.1	13,500	0.696	92
Syria	185	21,533	116	56.2	4,620	0.631	119
Lebanon	10	4,341	434	87.4	13,400	0.737	71
Israel	22	7,420	337	91.9	27,010	0.886	17
Palestine	6	4,013	669	74.4	–	0.640	114
Jordan	89	6,455	73	78.6	5,730	0.697	95
African littoral	**5,754**	**163,453**	**28**	**54,7**			

(continued)

Region/Country	Area ('000 km²)	Population 2010 ('000)	Density 2010 (pop/km²)	Urban population proportion 2010 (%)	PIB/habitant 2009 (en PPA en dollers)	Indice de dévelopment humain 2010	
						Valeur	Rang mondial
Egypt	1,001	78,076	78	43.5	5,680	0.644	113
Libya	1,760	6,041	3	78.1	16,400	0.770	64
Tunisia	164	10,632	65	67.7	7,810	0.698	94
Algeria	2,382	37,063	16	67.1	8,110	0.696	96
Morocco	447	31,642	71	58.8	4,400	0.579	130
Mediterranean Basin	**8,725**	**498,260**	**57**	**66,4**			

Sources: World population Prospects: The 2012 Revision, 2013; World Population Data Sheet, Population Reference Bureau; Human Development Report, United Nations Development Program

Appendix 5.2. Countries in the Mediterranean Basin. Demographic indicators, 2005–2010

Country	Mean annual population growth rate (‰)	Rate of natural increase (‰)	Net migration rate (‰)	Total fertility rate (children/women)	Mean age at child birth (years)	Net reroduction rate (surviving daughters/women)	Life expectary at birth (years)		Infant mortality rate (per 1,000 live births)
							Male	Female	
European littoral									
EU countries									
Portugal	1,5	–0,3	1,9	1,4	29,5	0,7	75,5	81,9	3
Spain	12,5	1,9	10,0	1,4	30,8	0,7	78,0	84,4	4
France	5,7	4,2	1,7	2,0	29,9	1,0	77,4	84,3	4
Italy	6,2	–0,4	6,4	1,4	31,1	0,7	78,7	84,1	3
Slovenia	5,3	0,6	4,4	1,4	29,9	0,7	75,1	82,0	3
Croatia	–2,3	–2,2	0,0	1,4	28,8	0,7	72,6	79,5	6
Greece	1,2	0,4	1,0	1,5	30,0	0,7	77,3	82,3	10
Malta	4,8	1,1	3,2	1,4	29,0	0,7	76,3	81,2	6
Cyprus	13,3	5,0	8,3	1,5	29,5	0,7	76,9	81,1	4
West Balkans									
Bosnial-Herzegovina	–1,8	–0,6	–1,0	1,2	27,3	0,6	72,9	78,1	9
Montenegro	1,4	2,3	–1,1	1,7	28,2	0,8	71,9	76,5	11
Albania	–2,9	7,0	–9,5	1,6	27,1	0,8	73,4	79,7	16
Serbia	–6,3	0,0	–4,9	1,4	27,5	0,7	70,6	76,1	12
FYROM	1,2	2,0	–0,8	1,5	27,5	0,7	72,1	76,7	12
Asian littroal									
Turkey	12,6	13,2	–0,1	2,2	27,4	1,0	69,9	76,9	16

Country	Mean annual population growth rate (‰)	Rate of natural increase (‰)	Net migration rate (‰)	Total fertility rate (children/women)	Mean age at child birth (years)	Net reroduction rate (surviving daughters/women)	Life expectary at birth (years)		Infant mortality rate (per 1,000 live births)
							Male	Female	
Syria	34	20,4	11,5	3,2	29,4	1,5	73,1	77,3	15
Lebanon	17	9,1	8,8	1,6	29,6	0,8	76,2	80,6	10
Israel	23,3	15,4	7,8	2,9	30,1	1,4	78,7	82,7	4
Palestine	24	30,2	–4,8	4,4	29,2	2,1	70,6	73,8	22
Jordan	41,7	22,3	15,4	3,6	29,7	1,7	71,5	74,6	20
African littoral									
Egypt	16,8	18,7	–0,9	3,0	27,8	1,4	67,6	72,3	23
Libya	15,4	20,0	–3,0	2,7	32,5	1,3	72,4	76,2	17
Tunisia	11,2	11,5	–0,6	2,1	31,2	1,0	72,3	77,0	19
Algeria	15,5	15,9	–0,3	2,7	31,7	1,3	68,8	71,8	30
Morocco	9,6	14,3	–4,0	2,4	30,5	1,1	67,9	71,3	32

Source: World population Prospects: The 2012 Revision, 2013

References

Angeli, A., & Salvini, S. (2007). *Popolazione e sviluppo nelle regioni del mondo*. Bologna: Il Mulino.

Bloom, D., & Canning, D. (2001). Cumulative causality, economic growth, and the demographic transition. In N. Birdsall, A. C. Kelley, & S. W. Sinding (Eds.), *Population matters: Demographic change, economic growth and poverty in the developing world* (pp. 165–197). New York: Oxford University Press.

Bloom, D., & Canning, D. (2006). *Booms, busts, and echoes: How the biggest demographic upheaval in history is affecting global development*. Cambridge: Harvard University.

Bloom, D. E., & Williamson, J. G. (1998). Demographic transitions and economic miracles in Emerging Asia. *World Bank Economic Review, 12*(3), 419–456.

Bloom, D., Canning, D., Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change.* Santa Monica, CA: RAND.

Breznik, D. (1991). *Stanovništvo Jugoslavije*. Titograd: Chronos.

de Carvalho, J., & Wong, L. (1998). Demographic and socioeconomic implications of rapid fertility decline in Brazil: A window of opportunity. In G. Martine, M. Das Gupta, & L. Chen (Eds.), *Reproductive change in India and Brazil* (pp. 208–240). Oxford: Oxford University Press.

Golini, A., & Marini, C. (2006). *Aspetti nazionali ed internazionali delle popolazioni considerate da una "finestra demografica"*. Quaderno di ricerca n.2, Dipartimento di Economia, Università Politecnica delle Marche.

Lee, R., & Mason, A. (2006). What is the demographic dividend? *Finance and Development (IMF Quarterly), 43*(3), 16–17.

Lee, R., & Mason, A. (2007). Who gains from the demographic dividend? Forecasting income by age. *International Journal of Forecasting, 23*(4), 603–619.

Malmberg, B., & Lindh, T. (2006). Forecasting global income growth using-age structural projections. In L. Pool, R. Wong, & E. Vilquin (Eds.), *Age-structural transitions: Challenges for the development*. Paris: Committee for International Cooperation in National Research in Demography.

Mason, A. (2005). *Demographic transition and demographic dividends in developed and developing countries*, United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures, Mexico City.

Mason, A., & Lee, R. (2006). Reform and support systems for the elderly in developing countries: Capturing the second demographic dividend. *Genus, 57*(2), 11–35.

Mitchell, B. R. (1998). *International historical statistics 1750–1993*. London: Macmillan.

Navaneetham, K. (2004). *Age-structural transition and economic growth: Evidence from South and Southeast Asia*. Asian Meta Centre, Research Paper Series No. 7. Asian Meta Centre for Population and Sustainable Development Analysis, National University of Singapore, Singapore.

Pool, I. (2007). Demographic dividends: Determinants of development or merely windows of opportunity? *Ageing Horizon, 7*, 28–35.

Rallu, J. L. (2010). La Démographie de l'Océanie des années 1950 aux années 2000. *Population, 1*, 7–115.

Reher, D. S. (2011). Economic and Social Implications of the Demographic Transition. In R. D. Lee and D. S. Reher (Ed.), *Demographic transition and its consequences. Population and development review*, (vol. 37). Blackwell Publishing.

United Nations. (2013). *World population prospects. The 2012 revision*. Department of Economic and Social Affairs, Population Division, New York.

United Nations. (2013). *World population policies 2013*. Department of Economic and Social Affairs, Population Division, New York.

Chapter 6
The Potential Collateral Demographic Dividend

Natalie Jackson

6.1 Introduction

As other contributors to this volume have shown, the development of the Demographic Dividend concept has forever changed the way the relationship between population change and economic growth and development can be viewed. In place of early correlations between size/rate of population growth and economic development are now two classic tenets which illuminate the underlying dynamics of the relationship. These tenets are conceptualised as two consecutive windows of opportunity which occur during demographic transition (the journey from high to low mortality and fertility rates). First there is the 'moment' when the age structure becomes maximal for the gaining of an economic windfall, due to the majority of the population being in the main working age groups (15–64 years) and the proportion notionally dependent at older and younger ages at its minimum (Chesnais 1990; Higgins and Williamson 1997; Bloom and Freeman 1998; Bloom and Williamson 1998; Birdsall et al. 2001; Mason 2003; Bloom et al. 2003; Bloom and Canning 2003; Fink and Findlay 2007). As we now know, gaining from this moment is not automatic, but requires a priori recognition of its potential, and timely investment in the education of the forthcoming workforce – hence the dividend period has become broadly understood as a 'potential' demographic dividend, and moreover, as transient. If not appropriately invested in, the window of opportunity soon closes (Pool 2007a). More recently has come an accompanying recognition that it is the level and composition of education within the working age population that generates the economic windfall; that economic growth is implausible without it (Lutz et al. 2008). Similarly the health of the population has also been shown to be strongly associated

N. Jackson Prof. PhD (ANU) Demography; MSocSci (Waik.); BSocSc (Waik.) (✉)
School of People, Environment and Planning, Massey University,
Palmerston North, New Zealand
e-mail: N.O.Jackson@massey.ac.nz

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9_6

with a country's ability to capitalise on the dividend period (Bloom and Canning 2003).

The second tenet is the moment some years later when the theoretically well-educated, fully-employed, healthier and longer-living workforce passes through its maximum income-earning years, reaches the end of its main childrearing years, and is able to save in earnest for its retirement, generating a second economic windfall in terms of national savings – albeit the stage heavily dependent on the first having been realised, and more pertinent for some types of welfare state (old age income support) arrangements than others (Ogawa et al. 2010: 103, 114; see also Lee and Mason 2011). This 'second demographic dividend' occurs approximately from the point that the maximum proportion of the population in the working ages is reached, but significant proportions have not yet arrived at the oldest ages where they are notionally dependent – and/or begin to use their accumulated savings. Importantly for national economies, the second window of opportunity is potentially permanent, and may hold the answer to the more negative economic implications of structural ageing.

A third interpretation has recently proposed the possible existence of a 'collateral demographic dividend', argued to arise when a relatively youthful subpopulation co-exists alongside – or within – a structurally older population (Jackson 2012). Drawing on work which suggested that adjacent older and younger national-level populations may be seen as collectively comprising an overall economic dividend system (Ogawa et al. 2010: 115), Jackson proposed that the concept could equally be applied to relatively large subpopulations such as New Zealand's Māori and European-origin populations, which are at different stages of their demographic transition and have markedly different age structures (Pool 1991, 2003, 2007a; Jackson 1999, 2002). In 2013 the median age of New Zealand's Indigenous Māori population was approximately 24 years; that of the numerically dominant European/New Zealander/Other (hereafter European) population, 41 years (Statistics New Zealand 2014a). (See Appendix A regarding classification issues).

These demographic disparities, arising from differences in the timing and speed of demographic transition (Pool 1991), have previously been argued to have many negative implications for the Māori population, for example disproportionately exposing young Māori to the risk of unemployment (Jackson 2002; Pool 2003). However the same demographic disparities have many potentially positive implications. Uppermost of these is that a far greater proportion of the Māori population is currently located at the ages at which most educational qualifications are gained, while a disproportion of the European-origin population is at older ages where relatively few post-school qualifications are held, due to the era in which those people undertook their schooling (1920s and 1930s). With structural ageing more advanced for the European population, the proportion at the prime education-gaining ages is diminishing much faster for European than for Māori. Not only does this situation proffer well for the Māori population in absolute terms, but long-standing gaps in educational attainment between Māori and European have the potential to reduce simply because of the underlying differences in age structure (Jackson 2002, 2008). As the total New Zealand labour supply dwindles due to projected population

ageing, there is significant potential for Māori to enjoy increased employment and prosperity in both relative and aggregate terms (Jackson 2011).

As with all interpretations of the demographic dividend, converting this opportunity to reality will require foresight, strategic planning, and investment: it will not happen of its own accord. It will also not happen unless there is a convincing body of evidence on which to base policy development; and it will not happen in the timely manner prescribed unless that body of evidence is produced with some urgency: everywhere, structural ageing is accelerating and these one-off windows of opportunity are closing. Accordingly, this chapter extends the argument to two other 'Anglo-Celtic Settler' countries in which there are recognised ethnic/Indigenous subpopulations with notably different age structures to the non-Indigenous population: Australia and Canada – albeit there are differing levels of appropriate and valid data on which to illustrate the argument (Walter and Andersen 2013). Because of the relatively large size of New Zealand's Māori population – in 2013 numbering almost 700,000 and accounting for 14 % of the total population – and the ready availability of relatively robust data by age, this chapter primarily draws on those data to illustrate the story, supplementing it with a briefer analysis of data from Australia and Canada.

Two caveats to these propositions exist. First it is acknowledged that ethnic/Indigenous groups are not the only subpopulations with which the chapter might be concerned; for example, subpopulations which differ by country of birth also tend to have different age structures and to age at different rates. However Indigenous populations such as those of New Zealand, Australia and Canada tend not only to be differentiated by age structure, but those age structures are in part an enduring legacy of Anglo-Celtic colonisation, alienation from tribal lands and the destruction of viable modes of production, observable today in differing demographic transitions (Pool 1991; Jackson 1999). Recognition and proactive attention now the possibilities offered by the collateral demographic dividend could assist in accelerating the economic advancement of these populations.

The second caveat concerns the classification of groups by ethnicity or Indigenous status itself. The method of enumerating populations by ethnicity is far from consistent either by country or over time (Walter and Andersen 2013), while several countries do not collect data by ethnicity at all (Kukutai et al. 2014). In New Zealand for example, the classification 'Māori' has been subject to many changes over time, ranging from 'blood fraction' (until 1981) to various measures of descent and cultural affiliation. The present classification is based on a multiple ethnic origin enumeration method, which, in the Census of Population and Dwellings, counts people into each of the ethnic groups they state as belonging to on their Census form. The method means that just over half of New Zealand's current Māori population is enumerated in both the Māori and 'non-Māori' populations (Statistics New Zealand 2014a: 7); and there are many and varied combinations of ethnicity between the approximately 96 other ethnic groups which comprise New Zealand's population. The multiple count method also results in difficulties in accurately expressing the proportion of the total population which is in each ethnic group, because the denominator, when responses for all ethnic groups are summed, is somewhat greater than

the total head count (+11.0 % in 2013). At the same time, the headcount denominator makes the interpretation and explanation of trends particularly complicated. Accordingly in this chapter, the summed ethnic group 'response count' denominator is used, so that percentages sum to 100.

While this and related methodological conundrums do to some extent compromise the rigour of the argument presented here (see Pool 1991: 11–25), it does not greatly affect the relative age structures of each population. Similar comments apply to the data for Australia and Canada.

The structure of the chapter is as follows. First, the concept of the collateral demographic dividend is further briefly elaborated. Demographic diversity within New Zealand, Australia and Canada is then analysed in that context. A distinction is introduced between a relative collateral dividend, which has the potential to occur for the younger (sub)population as the older (sub)population disproportionately moves towards retirement, and an aggregate collateral dividend, which has the potential to occur for the overall population – this being largely dependent on the size of the younger (sub)population. The chapter concludes by echoing comments made by most scholars investigating the opportunities on offer from the dividend period: that just having the demographic dividend present does not ensure it will result in an economic dividend; that a-priori investment in the stage is critical. Also centrally restated is the often overlooked preamble of Adam Smith, who argued that in order for the 'invisible hand' of the market to operate for the good of all, populations need first to be educated and healthy – at the hand of the state – a proposition fundamentally distorted by today's neo-liberal economic ideology, and affecting the development potential of many minority groups.

6.2 The Collateral Demographic Dividend

The collateral demographic dividend builds on the foundation principles outlined above, namely that the dividend period unfolds in two consecutive stages, the first during which the proportion of the population in the younger working ages increases vis-à-vis the proportion that is notionally dependent (0–14 and 65+ years); the second as increasing proportions of older workers pass through the (potentially) higher income earning and saving age groups. However the operational focus of the collateral dividend moves from the national level to its subnational opportunities.

According to Ogawa et al. (2010: 115), it is plausible to see the bifurcated demography of today's youthful developing and ageing developed countries as a demographic dividend system, from which both sides can mutually benefit: [..]people from countries where the first demographic dividend has already disappeared can invest their assets accumulated in the form of the second demographic dividend in dynamically growing economies that are enjoying the first demographic dividend and, by doing so, bring a sizeable amount of financial gain back to their home countries[..].

Drawing on this it is Jackson's (2012) argument that precisely the same 'dividend system' argument can be made for countries within which younger and older

subpopulations co-exist. Specifically, proactive investment in relatively youthful subpopulations by their co-existing older subpopulation/s could be mutually beneficial. In New Zealand for example, where data for Māori and European were used to first illustrate the argument, the retirement of each successively larger cohort from the structurally older European subpopulation is now being – and will for some years be – replaced by a successively smaller cohort at labour market entry age. This situation is ushering in a demographically-tight labour market, in which youthful cohorts will be in short supply and – theoretically – great demand, prominent among them those of the structurally younger Māori population, and also of New Zealand's even more youthful Pacific population. This situation gives rise to the potential for the collateral demographic dividend.

Since it is timely investment in the youthful population that has the potential to bring about the economic dividend, it is also important to recognise that what has previously been observed as the first dividend period is actually the period in which the dividend is realised. Drawing on Notestein's three-stage model of Demographic Transition, we can alternatively conceptualise a 'potential first dividend' stage, during which timely investment occurs, followed by the second stage in which the dividend is realized – and towards the end of which the potential second dividend emerges. Finally we can posit a third stage during which the second dividend is, or has the potential to be, realised.

The model can be readily illustrated using the classic Potential Support Ratio, which juxtaposes the proportion of the population in the prime working ages 15–64 years to those notionally dependent aged 0–14 and 65+ years. However given increasing scholastic discomfort with this index – not least because many developed countries now have more people in the prime working age groups who are dependent on income support than in the 65+ year old population which is increasingly experiencing a longer work life – a more appropriate index might simply be the proportion at youthful ages – for example less than 15 or 25 years. This youth-based perspective would also accommodate changes in cohort size bought about by the age structural transitions that accompany the incipient decline stage of demographic transition (Pool 2003, 2005, 2007a, b; Tuljapurkar et al. 2005). As these 'disordered cohort waves' flow through the age structure they will cause the future working age population to temporarily wax and wane in size, as, for example, a large wave enters and a small one leaves (and vice-versa), making it difficult to convince governments of the need to invest in the demographic dividend via conventional indices. Indeed if the potential collateral dividend is to be invested in in a timely manner, it needs to be targeted from birth.

6.2.1 The Collateral Demographic Dividend in New Zealand

Figure 6.1 provides an overview of New Zealand's demographic diversity by major ethnic group (data for the Middle Eastern/Latin American/African [MELAA] population closely resemble the Asian age-sex structure, but are not shown on Fig. 6.1

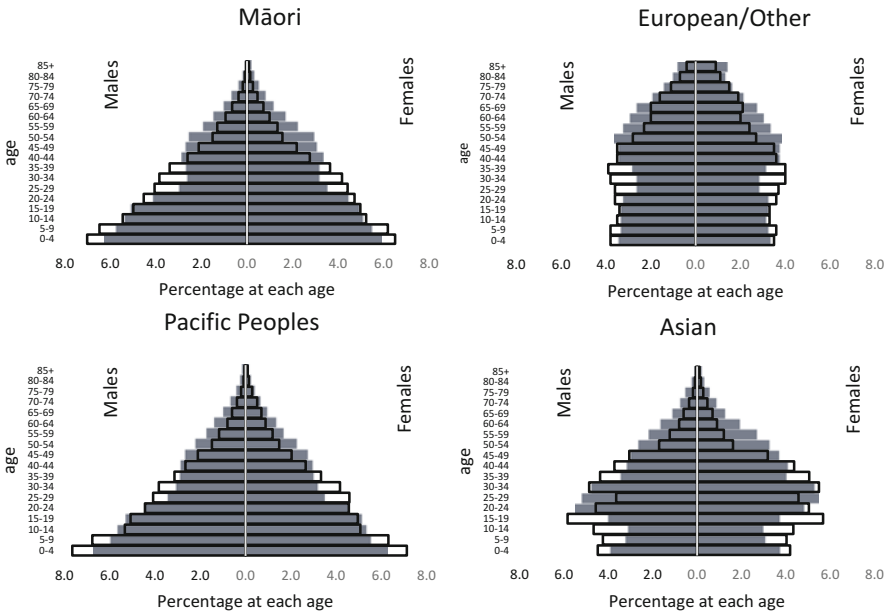


Fig. 6.1 New Zealand population by major ethnic group[1] age and sex, 1996 (*unshaded bars*) and 2013 (*shaded bars*) (Source: Author/Statistics New Zealand (2014b). Notes: [1] Multiple ethnic group method of enumeration means that some people are counted in more than one population)

due to small cell sizes). The shaded bars represent data for 2013, the unshaded bars for 1996. The structural ageing of each ethnic group can be clearly seen in the difference between the unshaded and shaded bars.

Table 6.1 provides an accompanying overview of changing population share, based on the summed total of ethnic group responses as indicated above. The proportion held by the population of European origin has declined steadily since 1996, at which time it accounted for just on three-quarters of the population. The proportion held by Māori has remained static between 13 and 14 %, due primarily to increasing proportions of those of Asian origin (up from 4.8 % in 1996 to 11.0% in 2013), and Pacific Peoples (increasing from 5.6 to 7.0 %). The MELAA population has also more than doubled in size, but in 2013 remained at just over 1 % of the population.

Table 6.2 returns to the issue of age distribution. With 33.7 % and 35.3 % respectively aged 0–14 years in 2013, the Māori and Pacific populations clearly differ markedly from their European and Asian counterparts which have 19.6 and 19.9 % at those ages. Thereafter there is less similarity between the European and Asian age structures, primarily observable in the smaller proportions of European aged 15–24 years, and greater proportions aged 55–64 and 65+ years, vis-à-vis all other ethnic groups.

Table 6.1 New Zealand population share (%) by major ethnic group, 1996, 2001, 2006, 2013

	1996	2001	2006	2013
European and other ethnicity (incl. 'New Zealander')	75.2	72.8	70.1	67.0
Māori	14.0	13.9	13.6	14.0
Pacific peoples	5.6	6.2	6.6	7.0
Asian	4.8	6.5	8.8	11.0
Middle Eastern/Lat. American/ African (MELAA)	0.5	0.7	0.8	1.1
Total (head count)	91.2	91.9	91.3	89.9
Total (responses summed %)	100.0	100.0	100.0	100.0
Total (responses summed – number)	4,090,350	4,221,800	4,582,200	4,943,200

Source: Author/Statistics New Zealand 2014. Estimated resident subnational population by major ethnic group, age and sex at 230 June 1996, 2001, 2006 and 2013
Multiple ethnic group method of enumeration means that some people are counted in more than one population. In 2013 the total responses exceeded the headcount by just over 11 per cent.

With regard to the collateral demographic dividend, however, it is the proportion *yet* to reach the main working age groups which is of the greatest import, as it is these age groups which, if invested in a timely manner, have the potential to return the first two economic dividends. As Table 6.2 shows, over half of New Zealand's Māori and Pacific populations are currently aged less than 25 years, by comparison with just on one-third of European and Asian.

Drawing together estimated resident population data for the observed period 1996–2013 and population projections to 2026, Fig. 6.2 shows that the proportion of each of the Māori and Pacific populations aged 0–24 years is likely to remain at around 50 % for at least another decade (in 2026, Māori 49 %; Pacific Island 53 %). Proportions for the older European and Asian populations are both lower and drop by a somewhat greater margin.

However even more important than their individual age distributions is the percentage of all 0–24 year olds accounted for by these two ethnic groups. Figure 6.3 indicates that together, Māori and Pacific Peoples aged 0–24 years in 2026 will account for one-third of New Zealand's children and labour market entrants, up from 30 % in 2013. The addition of young Asians would take this to almost 50 %; however by and large young Asians at 15–24 years of age are in New Zealand temporarily for educational purposes, and it cannot be assumed all will remain to enter the local workforce.

Herein thus lies a sizeable portion of New Zealand's mid-century workforce, with sufficient time to ensure its advanced educational training (and improved health status, which is beyond the scope of this chapter) for the benefit of both ethnic groups, and all New Zealanders. That such investment is urgently needed is now turned to. Despite the availability of free education in New Zealand, educational disparities between the Māori and Pacific populations on the one hand, and the European and Asian populations on the other, remain profound. This is not to say

Table 6.2 New Zealand population by major ethnic group, age distribution, population share (%) and median age, 2013

	Age group								
	0–14 years	15–24 years	Total 0–24 years	25–54 years	55–64 years	65+years	Number	% Share	Median age years[a]
European and other ethnicity (incl. 'New Zealander')	19.6	12.9	32.5	38.3	12.5	16.7	3,312,100	67.0	40.5
Māori	33.7	18.5	52.1	35.4	7.3	5.3	692,270	14.0	23.8
Pacific peoples	35.3	19.3	54.6	34.6	6.1	4.7	344,370	7.0	22.4
Asian	19.9	18.0	37.9	47.8	8.4	5.9	541,300	11.0	30.7
Middle Eastern/Lat. American/ African (MELAA)	25.3	17.4	42.7	48.3	5.7	3.4	53,130	1.1	28.5
Total (head count %)	20.5	14.1	34.6	39.8	11.5	14.1	4,442,100	89.9	37.8
Total (responses summed %)	22.8	14.7	37.5	38.8	10.8	12.9	4,943,180	100.0	

Source: Author/Statistics New Zealand 2014. Estimated resident subnational population by major ethnic group, age and sex at 230 June 1996, 2001, 2006 and 2013

Multiple ethnic group method of enumeration means that some people are counted in more than one population

[a]The median age (x) means that exactly one half of the population is older than 'x' and the other half is younger than 'x'

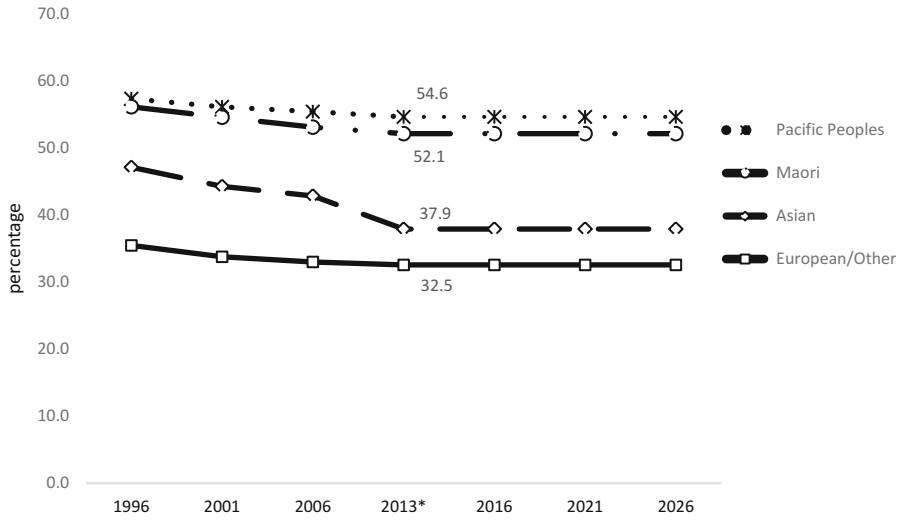


Fig. 6.2 New Zealand population, percentage of each major ethnic group[1] aged 0–24 years, 1996–2013 (observed) and 2016–2026 (projected) (Source: Author/Statistics New Zealand (2010, 2014b). Notes: [1] Multiple ethnic group method of enumeration means that some people are counted in more than one population; *the 2011 Census was delayed)

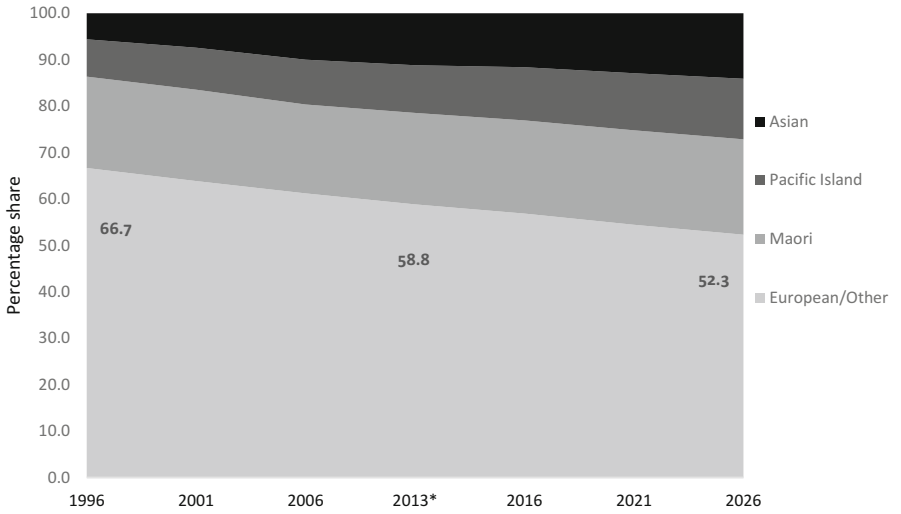


Fig. 6.3 New Zealand population, percentage share of total population aged 0–24 years by major ethnic group[1], 1996–2013 (observed) and 2016–2026 (projected) (Source: Author/Statistics New Zealand (2010, 2014b). Notes: [1] Multiple ethnic group method of enumeration means that some people are counted in more than one population; *the 2011 Census was delayed)

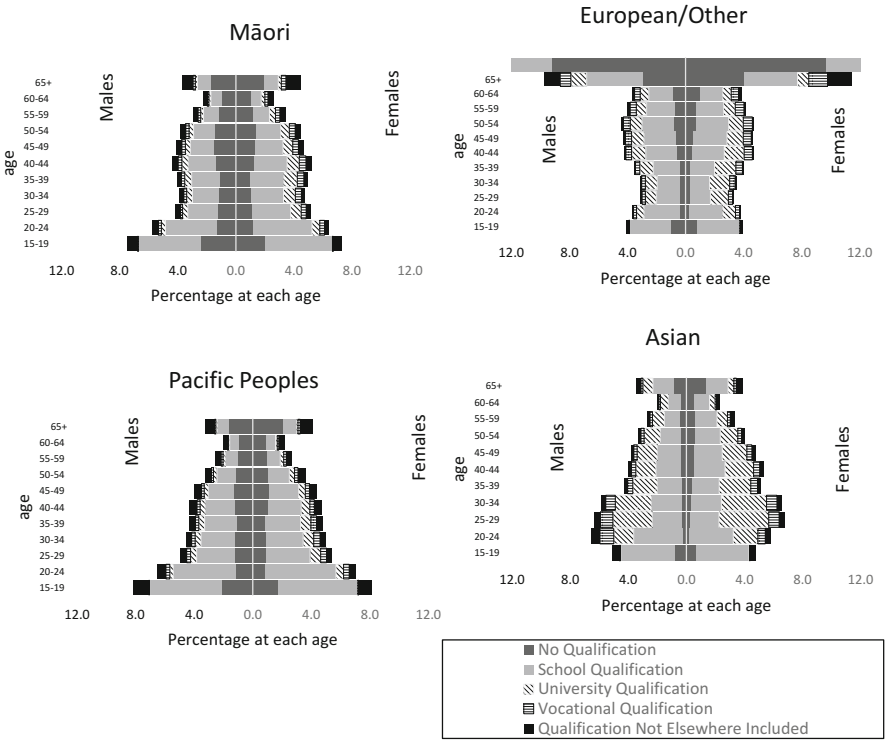


Fig. 6.4. New Zealand population, highest qualification by major ethnic group[1], age and sex (percentage distribution across the age-sex structure), 2013 (Source: Author/Statistics New Zealand (2014c). Notes: [1] Multiple ethnic group method of enumeration means that some people are counted in more than one population)

that young Māori and Pacific Peoples have not been gaining educational qualifications in both absolute and relative terms, but rather, that the European and Asian populations have also continued to gain them at a steady rate and the crude gap in absolute levels (e.g., percentage holding a secondary school qualification) has reduced primarily because of the differences in age structure outlined above. That is, because a disproportion of the Māori and Pacific populations are at the age at which school and post-school qualifications are gained, a sizeable portion of the reduction in the crude gap is due to age structure differentials (Jackson 2002). Accordingly, age-specific attainment rates are a far more valid index for comparison than are crude (summary) levels.

However, rather than turn now to an analysis of age-specific rates of educational attainment, the data are instead embedded in their respective age structures (Fig. 6.4) to show the overall distribution of qualifications across the population. According to Lutz et al. (2008), in relation to the demographic dividend this approach provides the most enlightening perspective on the future qualification levels of a population, because once gained, qualifications can only be improved on—they cannot be 'lost'.

That is, lower level qualifications can only be replaced by higher ones (unless sizeable proportions of credentialed people leave the country).

As can be seen from Fig. 6.4, the disparity between the qualifications distributions of the Māori and Pacific populations, and the European and Asian populations, is striking. Most notable are the relatively low proportions of Māori and Pacific People holding a university qualification, although it must be noted that the very high proportions of Asian New Zealanders with a university qualification largely reflects the immigration of this population; also of note is that – as elsewhere – females of all ethnic groups hold a disproportion of these qualifications. It can also be seen that those with no post-school qualifications at the older ages are disproportionately females because of the era in which those people left school, relatively few people of either sex going on to higher qualifications until the 1980s. However also notable are the high proportions of young adult Māori and Pacific People holding a secondary school qualification, the basis on which to build additional qualifications. In order to capitalise on the potential demographic dividend before the age structures of the left-hand panels transform into those of the right-hand, these opportunities must be engaged with. For the collateral dividend specifically to be realised, that is, to capitalise on the labour market opportunities that await Māori and Pacific school leavers as disproportions of the older European and Asian populations move towards retirement, the sizeable concentration of no qualifications at 15–19 years must be urgently addressed. The same comments of course apply to those still at primary and secondary school age, where the future labour force is presently amassing.

6.2.2 The Collateral Demographic Dividend in Australia

As is the case for New Zealand, Australia's Indigenous Aboriginal/Torres Strait Islander (hereafter Aboriginal) population has a markedly younger age structure than its non-Indigenous (non-Aboriginal) counterpart. In 2011 the median age of the Aboriginal population was 21.8 years; that of its non-Aboriginal counterpart, 37.6 years (author/Australian Bureau of Statistics 2014, Tables 11 and 12). However by contrast with New Zealand, Australia's Aboriginal population is relatively small. Numbering 670,000 in 2011 as enumerated by descent (from an Indigenous Aboriginal), it is slightly smaller than the New Zealand Māori population, and accounts for barely 3 % of the total population. That said, measurement issues with respect to enumerating people living in remote and very remote parts of Australia are enormous and all Aboriginal data collections carry strong caveats regarding the approximate nature of the underlying enumeration (Walter and Andersen 2013: 33–39). It is also of some importance that there are somewhat higher and lower percentages who identify as Aboriginal across Australia's eight states and territories, ranging from 1 % in Victoria to 30 % in the Northern Territory (Author/Australian Bureau of Statistics 2014, Tables 11 and 12). Given that each state and territory has its own government and controls most of its local policy development,

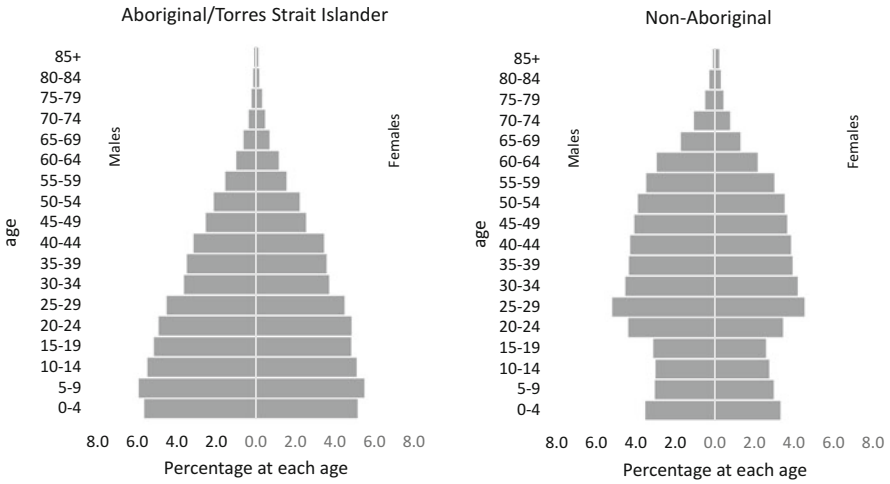


Fig. 6.5 Aboriginal/Torres Strait Islander and Non-Aboriginal populations by age and sex, Northern Territory, Australia, 2011 (Source: Author/Australian Bureau of Statistics (2014) Tables 11 and 12)

a state/territory-based analysis would appear the most germane; and given the relatively minor impact of the collateral demographic dividend in each of the remaining states and territories (the next closest population share is 5%, for Tasmania), an analysis based on data for the Northern Territory would appear to have most pertinence. Usefully also, because of the Northern Territory's relatively large Aboriginal population there is also a substantial literature on its socio-demographic experience. These points notwithstanding, however, at 69,000 Aboriginal people enumerated in the Northern Territory in 2011, the total number of Aboriginals in that region is somewhat smaller than in the states of New South Wales (208,000), Queensland (189,000), and Western Australia (88,000), and they account for just over 10% of Australia's Aboriginal population. This means that while the proposition of a potential collateral demographic dividend for the Northern Territory can be extrapolated to the Aboriginal populations of the larger states per se, the dividend will have little state-level impact in those states.

Figure 6.5 shows the significant difference between the Northern Territory's Aboriginal and non-Aboriginal populations, whose median ages in 2011 were respectively 23.8 and 43.8 years. The somewhat distorted age structure of the Northern Territory's non-Aboriginal population is due to net migration gain of people typically at 20+ years, especially 20–29 years (Australian Bureau of Statistics 2014c, d), drawn to the territory's extractive (mining) industries.

Although these data say nothing about the propensity for local Aboriginal people to remain in the Northern Territory – or their desire to work in any particular industry – these demographic differences multiplied by the relative size of the territory's Aboriginal population (30%), auger well for the possibility of realising a collateral demographic dividend.

For comparison, Fig. 6.6 gives the same data for the populous state of New South Wales, which in 2011 enumerated over seven million residents. Although Aboriginal

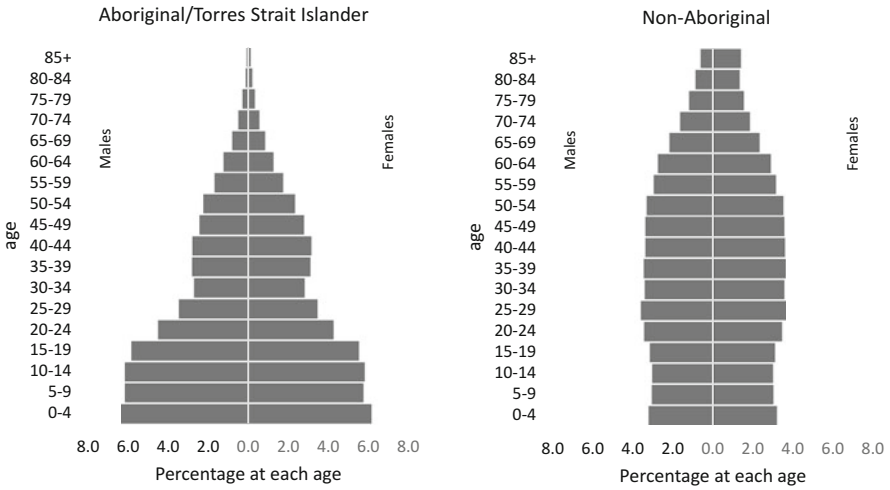


Fig. 6.6 Aboriginal and non-aboriginal populations by age and sex, New South Wales, Australia, 2011 (Source: Author/Australian Bureau of Statistics (2014) Tables 11 and 12)

people account for a little less than 3 % of that state's population, the equally marked differences in age structure – median ages of 21.4 and 38.0 years for the Aboriginal and non-Aboriginal populations respectively – suggest clear collateral dividend opportunities for the Aboriginal population per se, as its non-Aboriginal counterpart ages and disproportionately enters retirement. Such a dividend may not have the same state-level economic impact as in the Northern Territory (i.e. an aggregate impact), but it has the potential to change the economic wellbeing of the Aboriginal population itself (a relative impact).

Such a proposition of course again raises the matter of education. It is clear that far greater proportions of Aboriginal than non-Aboriginal Australians are presently at school and approaching tertiary education age. This advantage has the potential to be transformed into many positive outcomes over the next few decades. However intra-cohort analysis has identified an increase in disparity between Australia's Aboriginal and non-Aboriginal populations in the gaining of both Year 12 and post-school qualifications (Jackson 2008). For the possibilities to translate into actual improvements it is therefore critical that ostensibly 'ethnically-neutral' or 'one-size-fits-all' policies pertaining to education in Australia are carefully monitored, as the gaps may not yet have reached their maximum.

6.2.3 The Collateral Demographic Dividend in Canada

Finally, and with particularly strong caveats regarding the political nature of Indigenous enumeration in Canada (Walter and Andersen 2013: 28–33), Figs. 6.7 and 6.8 provide an approximation of the age-sex structures for Canada's Aboriginal and non-Aboriginal subpopulations. The data are drawn from the National Health

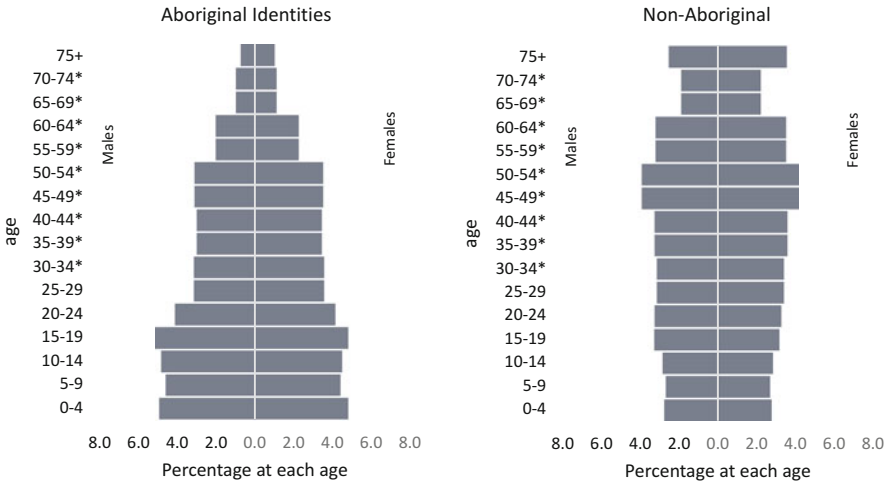


Fig. 6.7 Aboriginal and Non-Aboriginal populations by age and sex, Inuit Nunangat, Canada, 2011 (Source: Author/Statistics Canada (2013). *Note data for ages 30–74 years have been crudely split from 10-year to 5-year age groups. See Table 6.3 this paper for footnotes)

Survey and are for the Inuit Nunangat region, which is the homeland of the Inuit of Canada. It includes the communities located in the four Inuit regions: Nunatsiavut (Northern Coastal Labrador), Nunavik (Northern Quebec), the territory of Nunavut, and the Inuvialuit region of the Northwest Territories (Statistics Canada 2013). According to Statistics Canada these regions collectively encompass the area traditionally occupied by Inuit. The data for age groups 30–74 years were available in 10-year age groups only; these data have been crudely split 50:50 to give an approximation of proportions by 5 year age group, commensurate with the foregoing analyses. As for those analyses, a range of footnotes and caveats also accompany these data and are given below Table 6.3.

Figure 6.7 again illustrates the marked difference in age structure for Canada's Aboriginal and non-Aboriginal populations, whose median ages in 2011 were 27.0 and 40.6 years. These medians corresponded to 46 % and 29 % respectively aged less than 25 years (see Table 6.3).

In Fig. 6.8 the Aboriginal population is further disaggregated by Aboriginal Identity, resulting in the median age ranging from 22.8 years for the Inuk (single identity) to 31.4 years for the Métis (single identity) and 39.4 years for Aboriginal Identity Not Elsewhere Included (NEI). Again these medians correlate with higher and lower proportions aged less than 25 years, from 54 % for the Inuk to just 33 % for Aboriginal Identity NEI (Table 6.3).

As Table 6.3 shows, at 4 %, Canada's Aboriginal populations account for a relatively small proportion of the total, precluding the development of a major aggregate collateral dividend (although the caveats regarding enumeration should be especially recalled here). However the potential for each group to experience a relative collateral dividend is large. With the exception of those for whom Aboriginal

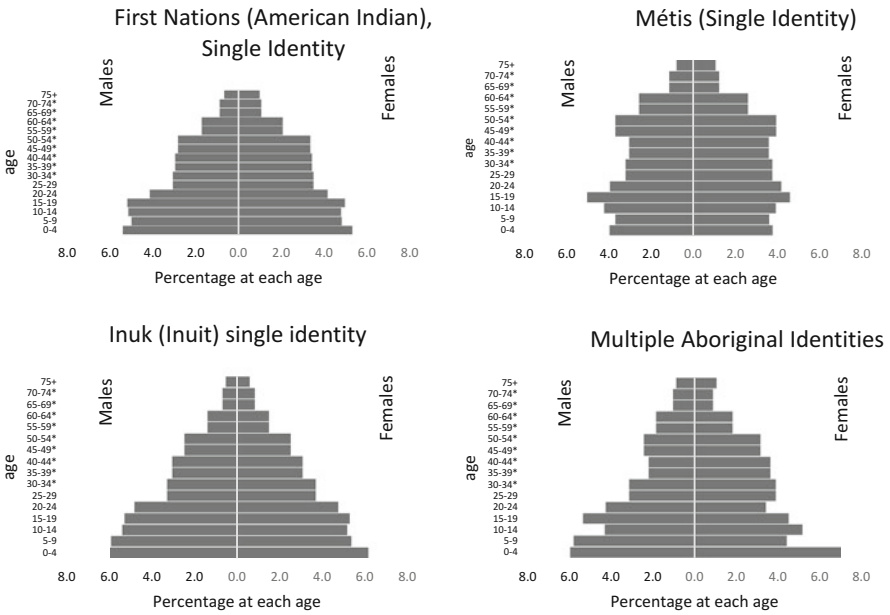


Fig. 6.8 Aboriginal population by aboriginal identity, age and sex, Inuit Nunangat, Canada, 2011 (Source: Author/Statistics Canada (2013). *Note data for ages 30–74 years have been crudely split from 10-year to 5-year age groups. See Table 6.3 this paper for footnotes)

identity is not elsewhere included, and to a lesser extent for those identifying as Métis, the proportion aged less than 25 years is still close to or above half. This contrasts substantially with the non-Aboriginal population of whom just 30 % is at these ages, just below the proportion for European New Zealanders and non-Aboriginal Australians, and again implies mutually beneficial economic impacts to both populations from additional attention to investment in the younger population.

6.3 Summary and Discussion

This paper has outlined significant demographic differences between New Zealand's, Australia's and Canada's Indigenous/Aboriginal and non-Indigenous populations, and linked them to the concept of the demographic dividend. Moving on from classic expressions of the dividend and the potential promises of its 'first' and 'second' windows of opportunity, the paper proposes a third such opportunity; a potential 'collateral' demographic dividend arising as the significantly more youthful Indigenous/Aboriginal populations co-exist alongside their structurally older non-Indigenous/non-Aboriginal counterparts. This opportunity will now escalate as structural population ageing results in much greater proportions of the older

Table 6.3 Aboriginal and non-aboriginal populations by aboriginal identity, age distribution, population share (%) and median age, Inuit Nunangat, Canada, 2011

	Age group								
	0–14 years	15–24 years	Total 0–24 years	25–54 years	55–64 years	65+years	Number	% Share	Median age years[e]
First Nations (North American Indian) single identity[a]	30.4	18.4	**48.8**	38.2	7.5	5.5	851,560	2.59	25.9
Métis single identity	23.1	17.7	**40.8**	42.3	10.3	6.6	451,795	1.38	31.4
Inuk (Inuit) single identity	33.9	20.1	**54.0**	36.1	5.8	4.1	59,440	0.18	22.8
Multiple Aboriginal identities[b]	32.7	17.5	**50.2**	36.9	7.3	5.7	11,415	0.03	24.9
Aboriginal identities not included elsewhere[c]	18.9	13.9	**32.8**	39.4	15.4	12.5	26,475	0.08	39.4
Total aboriginal identity[d]	**28.0**	**18.2**	**46.2**	**39.4**	**8.5**	**5.9**	**1.4 m**	**4.26**	**27.7**
Non-aboriginal identity	16.5	12.9	**29.5**	42.9	13.4	14.2	31.451 m	95.74	40.6
Total – population by aboriginal identity	**17.0**	**13.2**	**30.2**	**42.8**	**13.2**	**13.9**	**32.852 m**	**100.00**	**40.1**

Source: Author/Statistics Canada (2013)

Excludes National Household Survey data for one or more incompletely enumerated Indian reserves or Indian settlements

For the 2011 National Household Survey (NHS) estimates, the global non-response rate (GNR) is used as an indicator of data quality. This indicator combines complete non-response (household) and partial non-response (question) into a single rate. The threshold used for estimates' suppression is a GNR of 50% or more. For more information, please refer to the National Household Survey User Guide, 2011

[a]Users should be aware that the estimates associated with this variable are more affected than most by the incomplete enumeration of certain Indian reserves and Indian settlements in the National Household Survey (NHS). In 2011, there were a total of 36 Indian reserves and Indian settlements that were 'incompletely enumerated' in the NHS. For these reserves or settlements, NHS enumeration was either not permitted or was interrupted before it could be completed, or was not possible because of natural events (specifically forest fires in Northern Ontario). For additional information, please refer to the Aboriginal Peoples Reference Guide, National Household Survey, 2011

[b]'Multiple Aboriginal identities' includes persons who reported being any two or all three of the following: First Nations (North American Indian), Métis or Inuk (Inuit)

[c]'Aboriginal identities not included elsewhere' includes persons who did not report being First Nations (North American Indian), Métis or Inuk (Inuit) but who did report Registered or Treaty Indian status and/or membership in a First Nation or Indian band

[d]'Aboriginal identity' includes persons who reported being an Aboriginal person, that is, First Nations (North American Indian), Métis or Inuk (Inuit) and/or those who reported Registered or Treaty Indian status, that is registered under the Indian Act of Canada, and/or those who reported membership in a First Nation or Indian band. Aboriginal peoples of Canada are defined in the Constitution Act, 1982, section 35 (2) as including the Indian, Inuit and Métis peoples of Canada

[e]The median age (x) means that exactly one half of the population is older than 'x' and the other half is younger than 'x'

populations reaching the age at which people traditionally retire, and much greater proportions of the younger populations reaching labour market entry age. Together the bifurcated demography of these countries can be likened to an economic dividend system along the lines proposed for adjacent ageing and youthful countries by Ogawa et al. (2009).

In a similar manner to classic arguments which hold that the first dividend period is fleeting and requires proactive investment in education and health to realise the potential of both first *and* second windows, the arguments presented in this paper reaffirm that imperative. The collateral dividend has similar characteristics to the first window of opportunity, and if successfully managed, could yet see not only a second but also a third economic dividend realised. Difficulties in robustly enumerating populations by ethnicity mean that this proposition will not be devoid of challenge; however conceptually, and for the good of both parts of each system, it would be useful to explore further.

Appendix A: New Zealand's Current Concept of Ethnicity

The ethnic concept used in projections of New Zealand ethnic groups 'is the ethnic group or groups that people identify with or feel they belong to. Ethnicity is self-perceived and people can belong to more than one ethnic group. For example, people can identify with Māori ethnicity even though they may not be descended from a Māori ancestor. Conversely, people may choose to not identify with Māori ethnicity even though they are descended from a Māori ancestor' (Statistics New Zealand 2010).

The New Zealand ethnic group projections are based on the Series 6 (medium variant) assumptions; for details see http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/NationalEthnicPopulationProjections_HOTP2006-26/Technical%20Notes.aspx.

References

Australian Bureau of Statistics. (2014). *Australian demographic statistics, March 2014*. Cat. No. 31010DO001_201403.

Birdsall, N., Kelley, A., & Sinding, S. (2001). *Population matters: Demographic change, economic growth, and poverty in the developing world*. Oxford: Oxford University Press.

Bloom, D., & Canning, D. (2003). From demographic lift to economic lift-off: The case of Egypt. *Applied Population and Policy, 1*, 15–24. Santa Monica, CA: RAND.

Bloom, D. E., & Freeman, R. B. (1998). Economic development and the timing of and components of population growth. *Journal of Policy Modeling*. April 1988, *10*, 57–82.

Bloom, D. E., & Williamson, J. G. (1998). Demographic transitions and economic miracles in emerging Asia. *World Bank Economic Review, 12*, 419–456.

Bloom, D., Canning, D., & Sevilla, J. (2003). *The demographic dividend: A new perspective on the economic consequences of population change*. Santa Monica, CA: RAND.

Chesnais, J.-C. (1990). Demographic transition patterns and their impact on the age structure. *Population and Development Review, 16*, 327–336.
Fink, G., & Findlay, J. (2007). *Does the demographic dividend forecast economic growth?* Paper presented at the Annual Meeting of the Population Association of America. New York.
Higgins, M., & Williamson, J. G. (1997). Asian demography and foreign capital dependence. Population and Development Review, 23(2), 261–93.
Jackson, N. O. (1999). Ethnic Stratification in New Zealand. A Total Social Production Perspective, PhD Thesis (Unpublished). Canberra: Australian National University.
Jackson, N. O. (2002). The doubly-structural nature of Indigenous disadvantage: Indigenous age structures and the notion of disparate impact. *New Zealand Population Review, 281*, 55–68.
Jackson, N. O. (2008). Educational attainment and the growing importance of age structure: Indigenous and non-Indigenous Australians. *Journal of Population Research, 25*(2), 223–244.
Jackson, N. O. (2011). Māori: Ko te Whakatipu Tāngata hei Huanga Ohanga: Māori: Demographic Dividend for Economic Return. Commissioned Research Report to Te Puni Kōkiri. *New Zealand Institute for Economic Research*, 1–34.
Jackson, N. O. (2012). Māori and the [potential] demographic dividend. *New Zealand Population Review, 37*, 65–88.
Kukutai, T., Thompson, V., & McMillan, R. (2014). Whither the census? Continuity and change in census methodologies worldwide, 1985–2014. *Journal of Population Research, 32*, 3–22.
Lee, R. D., & Mason, A. (2011). Generational economics in a changing world. In R. D. Lee and A. Mason (Eds.), *Demographic transition and its consequences* (pp. 115–142). *Population and Development Review*. Supplement to Volume 37. New York: Population Council.
Lutz, W., Cuaresma, J. C., & Sanderson, W. (2008). The demography of educational attainment and economic growth. *Science, 22*, 1047–1048. doi:10.1126/science.1151753.
Mason, A. (2003). Population change and economic development: What have we learned from the East Asia experience? *Applied Population and Policy, 1*, 3–14.
Ogawa, N., Chawla, A., & Matsukura, R. (2009, 2010, Reprint). Some new insights into the demographic transition and changing age structures in the ESCAP region. *Asia-Pacific Population Journal, 4*(1), 87–116. NUPRI Reprint Series No. 96.
Pool, I. (1991). *Te Iwi Māori. A New Zealand population past, present and projected*. Auckland: Auckland University Press.
Pool, I. (2003). Ageing, population waves, disordered cohort flows and policy. In I. Pool, A. Dharmalingam, R. Bedford, N. Pole and J. Sceats (Eds.), *Population and social policy* (pp. 19–40). *Special Issue: New Zealand Population Review, 291*.
Pool, I. (2005). Age structural transitions and policy: Frameworks. In S. Tuljapurkar, I. Pool, & V. Prachuabmoh (Eds.), *Population, resources and development: Riding the age waves* (Vol. 1, pp. 13–39). Dordrecht: Springer.
Pool, I. (2007a). Demographic dividends. Determinants of development or merely windows of opportunity? Oxford Institute of Ageing. *Ageing Horizons, 7*, 28–35.
Pool, I. (2007b). Is New Zealand demographically vulnerable? Paper presented to the Annual General Meeting of the Population Association of New Zealand. Wellington, July 4th.
Statistics Canada. (2013). *2011 National Household Survey*. Catalogue Number 99-011-X2011027.
Statistics New Zealand. (2010). National ethnic population projections: 2006 Base -2026 Update.
Statistics New Zealand. (2014a). *Quick Stats about culture and identity*. Wellington: Statistics New Zealand.
Statistics New Zealand. (2014b). Estimated resident population by ethnic group, age and sex, at 30 June 1996, 2001, 2006, and 2013.
Statistics New Zealand. (2014c). Customised census database. Area of usual residence (2013), ethnic group (total responses), age groups and sex by highest qualification for the census usually resident population count aged 15 years and over.
Tuljapurkar, S., Pool, I., & Prachuabmoh, V. (2005). *Population, resources and development: Riding the age waves* (Vol. 1). Dordrecht: Springer.
Walter, M., & Andersen, C. (2013). *Indigenous statistics. A quantitative research methodology*. Walnut Creek: Left Coast Press.

Chapter 7
The Impact of Sub-national Demographic Transitions on Demographic Dividends in Italy

Roberta Pace and Nadia Mignolli

7.1 Introduction

This chapter aims at illustrating the territorial differences in the Italian demographic and economic development that are highlighted by applying the demographic transition model.

For this purpose, starting from the end of the nineteenth century a long-term historical analysis of the four geographical areas in which Italy is divided[1] was carried out that stressed significantly different demographic transition patterns.

Estimates processed with all the available sources and territorial reconstructions were used in order to bring out some underlying trends summarising several Italian specificities.

In Italy the demographic transition can be considered as a key element inside a huger process involving both economic and social variations, where the latter represent the driving force behind all the demographic changes within the country. Actually the demographic transition years also coincided with a period of successful economic performance and a gradual decrease in the number of people employed in the agricultural sector.

At the same time, the steady decline in fertility, that is shown in this chapter through the General Fertility Rate and the Total Fertility Rate, also determined important changes in the population age structures.

[1] North-west, North-east, Centre and the so-called *Mezzogiorno* corresponding to the Italian Southern regions together with and the two main Islands (Sicilia and Sardegna).

R. Pace (✉)
Università degli Studi di Bari "Aldo Moro", Bari, Italy
e-mail: roberta.pace@uniba.it

N. Mignolli
Italian National Institute of Statistics, Istat, Italy

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9_7

In Italy – as in most European countries – the period characterised by the highest proportions of population in working age lasted about four decades (1951–1991). In general, this represents a real window of opportunity with profound economic implications, as long as the economic system involved is able to generate enough development and employment to support this situation (Reher 2011). This occurred also in Italy and it is quite evident when looking at indicators of employees by economic sector, with respect to which there was a turnaround between the number of employees in agriculture and those employed in the service sector: the crossover was registered around 1951 in all the four geographical areas of Italy.

In this context it is worth considering that in the first two decades outlined above part of the Italian demographic *bonus* was offered to other countries experiencing their own demographic transition and representing the main destinations of Italian outward migration flows that took place in those years. More specifically, the third phase of this massive emigration from Italy (1946–1976) involved more than seven million people only partially rebalanced by the repatriation of over four million Italians living abroad.

In a general overview, this chapter is introduced by a brief summary of the economic theoretical background, followed by a description of the demographic transition model both at national and geographical area level. A focus on Italian migration flows is then carried out together with an in-depth analysis of the demographic window and of some aspects of the demographic dividend.

7.2 A Summary of the Theoretical Reference Framework

Understanding Italy's main demographic changes in the period between the end of the nineteenth century and the beginning of the twenty-first century requires a short description of their underlying economic theoretical background.

For this reason, some relevant economic theories considering both inequality and economic growth rate are taken into account, bearing in mind that the evolution of population derives from individual paths strictly affected by the economic sphere. On the other hand, economic or political economic choices depend on the demographic dimension and vice versa.

Within this framework, until the late 1980s a certain degree of inequality was believed to have positive repercussions on the economic growth rate. This concept is well illustrated by Kaldor (1956): assuming that the most economically advantaged individuals have a higher marginal propensity to save, a certain degree of inequality would lead to a high flow of savings and investments, with positive effects in terms of economic growth.

This thesis has afterwards been criticised taking into account two possible scenarios on how inequality can affect this growth.

A first scenario accepts Kaldor's theory since in the early stages of development of an economic system, when human capital is relatively ineffective, the stock of

physical capital is scarce; as a consequence relevant flows of savings are required for its accumulation (Galor 2000).

The second scenario considers the core role of redistributive policies. Social unrest and political instability are determined by excessive inequality in income distribution, with consequences for investments and growth (Alesina and Perotti 1994, 1996). In this context also fiscal policies play an important role: the gap size between median and average income determines the tax rate equilibrium, with possible negative consequences on the propensity to save and invest (Persson and Tabellini 1994).

Barro (1999) believes that this gap can occur even without any redistributive policies; moreover it is important to consider that redistributive policies themselves may be influenced by specific stakeholder interests through forms of political pressure, affecting economic performance and growth adversely.

On the contrary, in Saint Paul's and Verdier's opinion (1996) redistributive policies are not necessarily harmful for growth.

It is important to analyse also the dynamic relationships between growth and demographic transition introducing "*the intricate evolution of population*, *technology and output in the long transition from Malthusian stagnation to sustained economic growth*" (Galor and Moav 2001).

Historical evidence gives a central role to both the acceleration of technical progress and the demographic transition partly overcoming the traditional growth theories.

The positive link between population growth and innovation has gradually raised the rate of technical progress, encouraging investments in human capital, demographic transition and sustained growth (Galor and Weil 1999, 2000). The acceleration of technical progress, then, can be associated with demographic transition and inequality reduction.

In order to investigate the connection between demographic dynamics and economic growth in the twentieth century, it is necessary to go back to the nineteenth century where several authors integrated the Malthusian Theory[2] with new approaches. Within these approaches and taking into consideration the development observed in Western European Countries, Galor and Weil (2000) identify three different stages:

- the first one called Malthusian Regime, when population growth rate and Gross Domestic Product – GDP per capita are both low (and positively correlated);
- the second one called post-Malthusian Regime, characterised by higher growth rates of population and GDP;
- a final stage called Modern Growth Regime, where per capita income and population evolution reveal a negative correlation and a particular acceleration of GDP per capita is registered at the end of the 19th.

[2] According to Thomas R. Malthus (1798), an uncontrolled population growth leads to economic stagnation. More specifically, the Malthusian assumption is that every improvement in living standard – that is to say increasing in per capita income – has a positive effect on the population growth.

A wide part of the economic literature also introduces the human capital element in the view of intergenerational relationships, because it represents the key that can explain the more recent demographic and economic dynamics. Improvement in life expectancy at birth and at certain ages induces people to limit the number of births preferring quality over quantity and therefore it pulls the economy towards a sustained growth path (Ehrlich and Lui 1991).

The *Unified Growth Theory* analyses the intricate evolution of population, technology and output in the transition from stagnation to growth (Galor and Moav 2000). The Malthusian interaction between technology and population size and composition has a positive effect on technological progress and brings out the importance of human capital in the production process (Galor 2005). On the basis of this theory, the enhancement of the role of human capital and demographic transition (with the decline of both mortality and fertility rates) contributed significantly to the shift from stagnation to a sustained economic growth, with the consequence that the impact of population growth on productivity seems no longer to have a negative influence.

Furthermore, it can also be observed that population growth goes along with relevant changes in the agricultural and industrial sectors and usually brings about a rise in living standards and GDP per capita (Kuznets 1986; Di Bartolomeo et al. 2009).

Concerning the demographic trend and economic development of the Italian population before the unification process of its territory that took place between 1861 and 1870 originating the sovereign State of Italy, specific studies underline that it is possible to identify the key events which have marked the long-run of the country throughout the industrial revolution and the demographic transition.

They can be summarised as follows (Malanima 2002):

– introduction of corn, rice and potatoes, which allowed higher land productivity;
– increasing food availability as a result of increased agricultural productivity;
– switching from heat to mechanical energy;
– discovery of electricity;
– introduction of fertilisers in agriculture.

In addition to these important elements that produced crucial changes in the Italian economic context, the Napoleonic period (1796–1815) represented an important phase of reforms both from a socio-sanitary and administrative point of view that brought about the end of most infectious epidemic diseases. At the same time, other diseases also became less frequent and less aggressive. In this period mortality started to assume the feature of a selective event, whereby socio-economic and contextual factors play a fundamental role in survival chances (Bengtsson et al. 2004).

All the improvements outlined above facilitated the Italian demographic transition, which started to take place at the end of the nineteenth century (between 1871 and 1875), when mortality rates began to decrease, and continued until 1971–1975, when both mortality and birth rates recorded very low levels, as illustrated in the following paragraphs.

Moreover, the impact of Italian migration flows – internal and external – needs to be evaluated when studying demographic changes and to be considered together with the natural increase rate that represents the only component taken into account by the demographic transition model. Furthermore, the scientific literature on the demographic dividend does not consider migration flows openly, even if the weight of the age group studied for the assessment of the demographic *bonus* is determined also by net migration rates. Considering migration properly implies a complicated cohort analysis that starts as a birth cohort and is modified both by mortality and net migration rates. Changes across subsequent life-cycle stages and differences in size at each stage can be obtained by the comparison between previous and following cohorts and have a very relevant demographic impact. These flows produce momentum effects that can be added to net migration and natural increase rates as either positive or negative drivers for the overall population growth (Pool 2007).

For these reasons, in an historical analysis covering several hundred years it results very difficult to identify exactly the impact of migration flows on the population age structure and only assumptions can be made.

7.3 The Demographic Transition Model at National Level

As in all more advanced countries, also in Italy the evolution from stagnation to a period of sustained population growth can be explained through the demographic transition model. It is worth reminding that the scientific literature in the field of Demography makes use of crude birth and mortality rates as main reference indicators for the application of this model. This is of course related to the fact that the historical data used for these analyses are not always detailed enough to allow the calculation of more accurate measures. However, these indicators can be considered sensible because it is possible to rely on a certain homogeneity of the population age structure especially in the past. This applies also to Italy that is characterised by a quite uniform population age structure in all its territorial areas at least until 1930.[3] Since then the Italian territorial areas began to show more remarkable differences also concerning the population age structure.

[3] As resulting from Population and Housing Census data, during the years 1871–1921 the age structure of the Italian regions was very similar. Since the huge outward migration flows that started in 1876 involved the entire population of the country, it caused no relevant change in the age structure. Migration-related processes began to differentiate the Italian geographical areas in the years between the two World Wars. For this reason, by the 1931 Population and Housing Census the first differences in the population age structure had emerged and the demographic bonus of Mezzogiorno seemed to shift massively towards the Northern regions. At this stage the demographic choices of the fascist regime, the great economic depression and the reversal of trend affecting international migration policies accelerated the internal mobility, thus partially reducing outward migration flows (Audenino and Tribassi (2008) (For an in-depth analysis of Italian migration flows see paragraph 7.5).

In the present paragraph this model is used to capture some development features observed both at the national level and considering the two groups of urban areas (main towns and municipalities with more than 50,000 inhabitants) and rural areas (municipalities with less than 20,000 inhabitants).

As a matter of fact, the relevant epochal changes that took place during the nineteenth and twentieth centuries, such as the progressive transition of rural societies into industrialised communities and the related urbanisation process, played a strategic role on the population structure and characteristics.

In this period, the demographic transition model can effectively be applied to analyse the shift from a population characterised by high birth and mortality rates (pre-transitional situation) to an opposite situation in which the population moves towards a different stage showing decreasing birth and fertility rates together with lower mortality rates (post-transitional situation) (Tapinos 1996; Natale 2002).

Decreasing mortality rates by unchanged reproductive behaviour and without considering migration flows lead to an increase in the population growth rate affected only by the natural population change (that is highly positive) and consequently determine the population total amount. This could become even more pronounced if mortality rates decreased at a faster pace than birth rates and if these differences persisted over time. In this theoretical scenario of exponential growth, the post-transitional population would result greater than the pre-transitional one. Historical evidence, however, shows that this step fails because such an exponential population growth cannot be maintained indefinitely and there comes a time when population growth itself begins to be a constraint for further growth (logistics theory). When the total population size starts to hamper further population growth, a gradual decline in birth rates and a simultaneous reduction of the gap between birth and mortality rates can be noticed. In this specific situation, the post-transitional population can be compared to the pre-transitional one, even within a completely changed framework: very low birth rates and lower mortality rates.

In addition, passing from this theoretical scenario to the real situation also implies considering migration flows that affect negatively the total amount of population in the presence of unfavourable economic conditions, as described hereinafter.

As mentioned above, the process of demographic transition in Italy can be temporally placed at the end of the nineteenth century, between 1871 and 1875, when a decline in mortality was recorded and the rate of natural increase amounted to 6.3‰ (difference between the crude birth rate of 36.3‰ and the crude mortality rate of 30‰; see Fig. 7.1a).

This reduction that continued until 1965 was related mainly to exogenous factors (lower incidence of epidemic cycles, disappearance of plague, and lesser frequency of famine), to a more efficient economic organisation and to a decrease in the spread of infectious diseases, especially in early childhood. In 1912 the population growth reached its highest value, with a rate of natural increase equal to 14‰ (the crude birth rate arrived at 32.3‰ and crude mortality rate at 18.2‰).

Observing mortality and birth rates during years, the impact of some critical events such as World War I and the Spanish influenza (1915–1918) are clearly

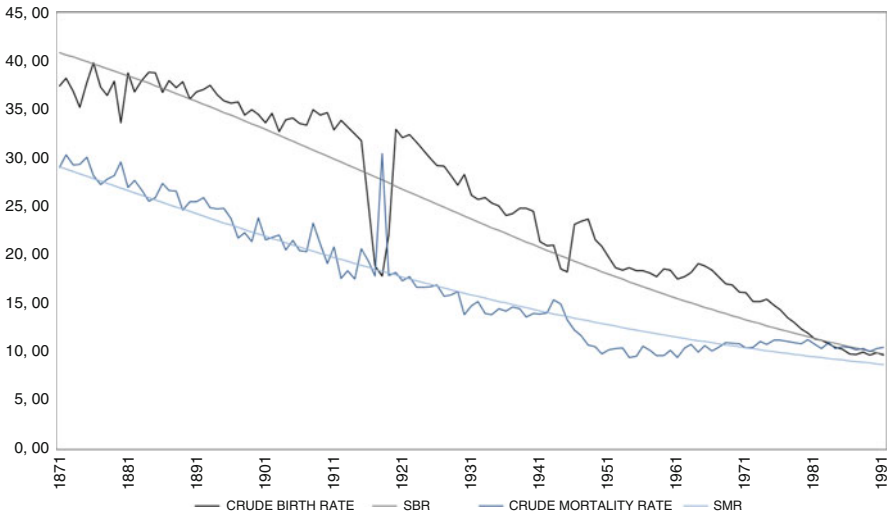


Fig. 7.1a Crude birth and mortality rates, smoothed birth and mortality rates in Italy (values per 1,000 inhabitants), 1871–1991 (Source: Authors' calculations on several Istat databases)

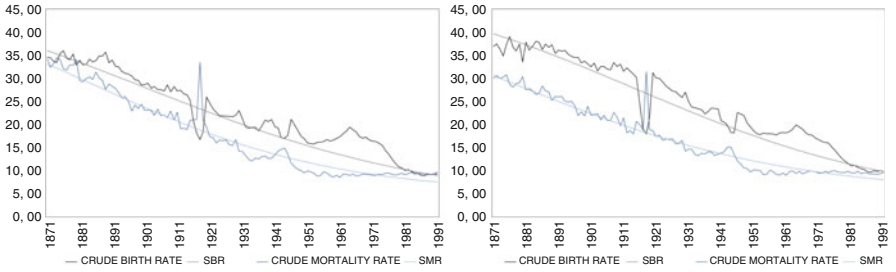


Fig. 7.1b Crude birth and mortality rates, smoothed birth and mortality rates in Italian Municipalities with more than 50,000 (urban areas, on the *left*) and with less than 20,000 inhabitants (rural areas, on the *right*) (values per 1,000 inhabitants), 1871–1991 (Source: Authors' calculations on several Istat databases)

highlighted and determined a remarkable but temporary reversal of these trends (Fig. 7.1a). More precisely, mortality rates reached a peak in 1918 (31.4‰, +51.6% in the period 1915–1918), while birth rates were interested by a consequent relevant drop (18‰, −40.4% in the period 1915–1918). Similarly, in correspondence of World War II (1939–1945), mortality rates increased (+13.4% during 1939–1944) and birth rates decreased (−22.4%) though with a lower impact than previously.

In general, due to the transitional process during the period 1871–1971 the population in Italy more than doubled in absolute terms (from 26,801,063 residents to 54,788,108), corresponding to an annual average percentage change equal to 0.72%, despite the existence of a systematic migration deficit recorded during the period considered (see Paragraph 8.4).

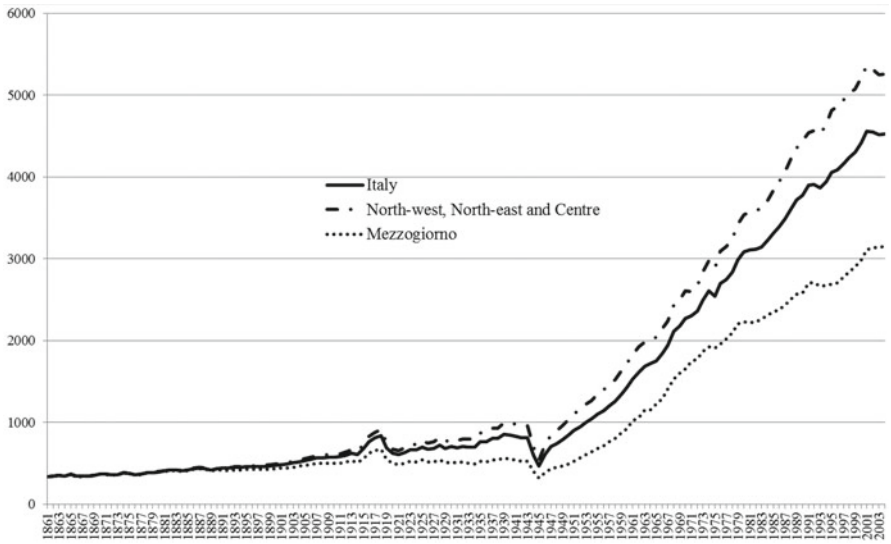


Fig. 7.2 Gross Domestic Product – GDP per capita (at constant prices 1911) in Italy by territorial areas, (expressed in Italian Lira) 1861–2004 (Source: Authors' calculations on Daniele and Malanima 2007)

In the same period, Italy experienced a shift passing from a rural to an urban and more industrialised country, that profoundly changed all spheres of social life. This also contributed to shape the timing of the decline in mortality and birth rates as well as of the duration and extent of the demographic transition itself. Data on the evolution of the population in Italy confirm what was previously described and in Fig. 7.1b the demographic transition model is applied keeping urban areas (identified by Municipalities with more than 50,000 inhabitants) distinguished from rural areas (identified by Municipalities with with up to 20,000 inhabitants).

The two figures shown highlight deep differences in the transitional paths between urban and rural areas: together with higher birth rates in rural communities, rural areas also show a much more widespread and significant population growth compared to urban areas where these changes occur more slowly and gradually.

The beginning of the demographic transition in Italy coincided also with a period of successful economic performance: the Gross Domestic Product – GDP per capita started to gradually increase in the first years of 1900, with a certain homogeneity between the North and the *Mezzogiorno* (Fig. 7.2). In the years immediately after the World War I this increase was partially arrested especially in the *Mezzogiorno* that began to differentiate from the rest of the country.

The end of the World War II marked both a decline in the GDP per capita and an approach of the geographical areas. Since 1947 this indicator has started to increase more resolutely even if with huge differences between the Italian territorial areas. At the end of the demographic transition period (1971) the *Mezzogiorno* values were about 33 % lower compared with those of the North, reaching –40 % in 2004.

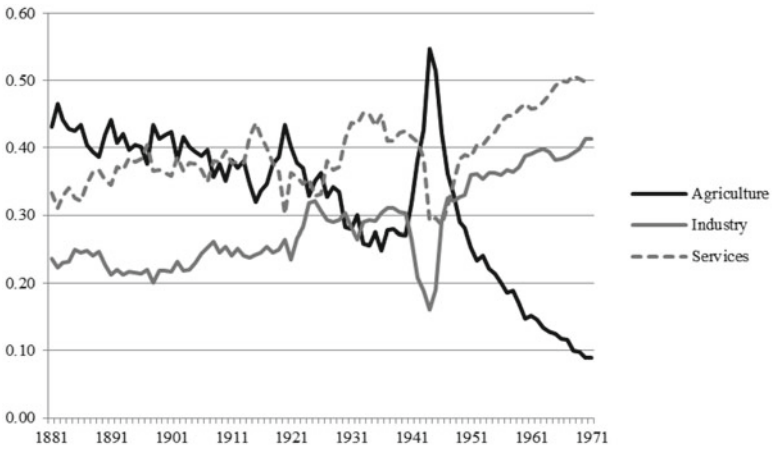


Fig. 7.3 Total value added in Italy by economic sector (proportion out of the total), 1881–1970 (Source: Authors' calculations on several Istat databases)

Since the transitional period concerned (1871–1971) is also characterised by a far higher increase in production than in population, it is possible to detect in these years the onset of a modern economic growth. Indeed, the most significant Italian demographic growth recorded in the late nineteenth century and the first decade of the twentieth century can be explained by the endowment of natural resources, capital, and a general increase of the production system efficiency (Malanima 2006). The related gradual industrialisation process that swept the country during these years certainly contributed to the turning over of behaviours typical of traditional societies – in which agriculture represents the main economic sector – to make room for values and ideologies typical of modern societies.

In Italy during the demographic transition period there was a gradual decrease of Total Value Added in the agricultural sector and a simultaneous increase of Total Value Added in the industrial sector (Fig. 7.3). Both trends were interrupted only during wartime (in particular during World War II) because of the temporary disruption that affected production.

In addition, as a consequence a gradual decrease in the number of people employed in the agricultural sector started around 1881 in Italy, when they still represented approximately 60 % of the total workforce. In 1961 their weight in percentage was almost halved (30 %), reaching 6 % in 2001. During the same period the workforce employed in industry rose from 24 % in 1881 to 40 % in 1961 and then settled again at values around 28 % in 2001 (Fig. 7.4).

The sector that experienced the fastest growth in terms of number of employees was that of services. After remaining stable up to the 1950s (around 20 % of the total workforce), when Italy experienced its famous economic boom accompanied by an unprecedented progress, it was then affected by an extraordinary development lasted only 40 years (from 1961 to 2001): during these years, the number of employees in this sector rose from 30 to 66 %.

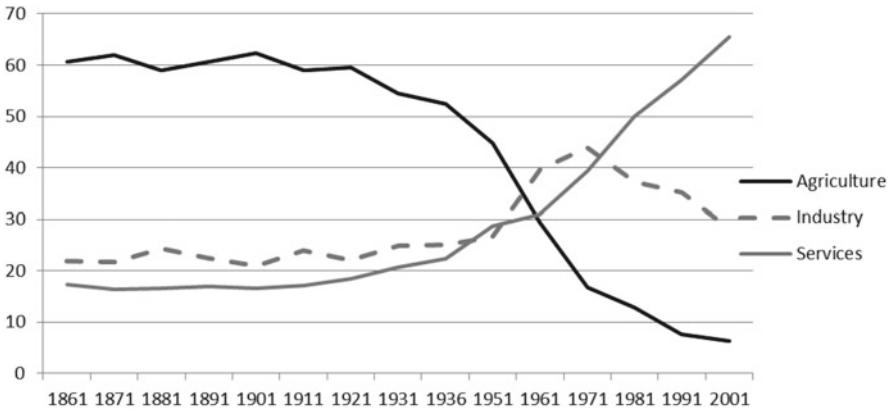


Fig. 7.4 Employees by economic sector in Italy (% of total workforce), 1861–2001 (Source: Authors' calculations on Istat Population and Housing Census data)

Table 7.1 Main economic and demographic indicators in Italy, 1871–1991

Years	Life expectancy at birth in years	Adult Literacy Rate ALR %	Gross enrolment ratio %	GDP (US$ PPP)	HDI index
1871	33.1	32.1	19.4	1,473	0.288
1891	39.3	43.9	23.7	1,615	0.358
1911	44.1	61.4	30.0	2,407	0.453
1928	52.8	75.6	34.1	2,949	0.549
1938	58.1	80.2	34.3	3,243	0.594
1951	65.0	85.8	34.0	3,658	0.651
1961	69.7	90.5	43.4	6,236	0.728
1971	72.3	93.9	59.0	9,598	0.791
1981	74.0	96.5	63.4	13,145	0.828
1991	77.0	97.6	65.0	16,112	0.861

Source: Conte et al. (2007)

For further details on the construction of each indicator see the article cited in the references

The positive improving phase in the economic and social development of the Italian population – in the late nineteenth and twentieth century – is also confirmed by Human Development Index (HDI) data.

Table 7.1 shows the relationship between the GDP and the trend of life expectancy at birth: at the beginning of the demographic transition a rise in per capita product corresponded to important gains in average life expectancy at birth; this rhythm then slowed down because the availability of goods became irrelevant to the survival rate in the presence of a certain level of welfare. This does not imply that further welfare improvement may not be translated into other gains in life expectancy. Nonetheless, these are also associated with intangible progress which is closely linked to relevant changes in lifestyle.

Table 7.2 Human Development Index (HDI) by Italian geographical areas, 1871–1999

Years	North-west	North-east	Centre	*Mezzogiorno*	Italy
1871	0.367	0.290	0.290	0.230	0.288
1891	0.439	0.390	0.366	0.286	0.358
1911	0.527	0.493	0.475	0.365	0.453
1928	0.605	0.581	0.561	0.475	0.549
1938	0.644	0.624	0.608	0.527	0.594
1951	0.696	0.676	0.665	0.598	0.651
1961	0.756	0.745	0.741	0.687	0.728
1971	0.802	0.805	0.807	0.759	0.791
1981	0.838	0.841	0.846	0.800	0.828
1991	0.869	0.871	0.878	0.835	0.861

Source: Conte et al. (2007)

An inverse relationship characterises reproductive behaviours: important decreases of GDP gradually determine lower regressions in fertility levels; on the contrary, increasing prosperity goes along with the spread of voluntary birth control, and this is especially true at a specific stage of economic maturity (Livi Bacci 1998).

Data concerning the Adult Literacy Rate and the Gross Enrolment Ratio confirm the growing importance that the investment in human capital assumes within the economic and social history of the country. With improvements in health and longer life expectancy, the accumulation of human capital and its exploitation become progressively more important.

Theoretical considerations suggest that longer life expectancy encourages educational investment because a longer time horizon increases the value of investments that pay out over time. An investment that pays out a certain amount each year is more valuable if the stream of pay-outs lasts longer.

An important implication of this concept is that improvements in life expectancy should increase investment in human capital, which in turn may spur economic growth.

Therefore, investment in human capital is also the basis of expected returns that occur in the form of higher income for future generations (Birdsall 1999). *Ceteris paribus*, when the expected return on investment in human capital increases, its flow does the same.

In Italy, Mortality decreased and life expectancy at birth increased significantly within just a few generations. At the same time the traditional social environment changed profoundly as a great part of the population became educated (see ALR) and literacy – which at the end of the 1800 was the prerogative of a small elite (around 44 % of the population) – became widespread, reaching 80 % of the population in the first half of the twentieth century (1938) and at the same pace of gains in average life expectancy at birth. Therefore, formal education represents the main channel of human capital formation.

A comparison between the four Italian geographical areas (Table 7.2) indicates a certain heterogeneity, especially with regard to the initial period: at the beginning

(1871) the HDI for the North and the Centre was higher than the average value represented by the whole country. The North-east and the Centre reached the HDI levels of the North-west as early as 1971, when the Centre registered the highest HDI levels. This in spite of the fact that this geographical area still remained behind in terms of GDP, compared to the North (Conte et al. 2007).

The more peculiar case concerns the *Mezzogiorno* whose HDI was still far from the levels of Italy at the end of the period from 1950 to 1970, though the distance had been considerably reduced.

Nonetheless the growth of income and the improvement in the standard of living expressed by the HDI do not move in the same direction, it is to say that they do not coincide with an equal increase in the capacity to produce goods and services, which have a recognisable form by national account standards (Conte et al. 2007).

Notwithstanding the intrinsic limits of this indicator outlined by many experts, there are many variables that need to be considered and cannot be dealt with in the present context as, for example, the incidence of a shadow economy that is much greater in the *Mezzogiorno* than in other regions of the country, besides having a more structural than a short-term nature (Meldolesi 1998).

7.4 The Demographic Transition Model Within the Italian Geographical Areas

In this section a differential analysis of the demographic transition model is carried out with regard to the four geographical areas in which Italy is divided (North-west, North-east, Centre and the so-called *Mezzogiorno* corresponding to the South and the two main Italian Islands).

The heterogeneity of the transitional paths that affected various areas of the country is analysed taking into account both territorial trends and those recorded in rural and urban areas within each territorial level.

Before highlighting the differences within each single geographical area, it is useful to analyse the pace and modes related to the drop of mortality rates in the four areas (Fig. 7.5).

In the pre-transitional period mortality rates were steady around 30–40‰; when these values began to decrease the transitional phase started. As shown in the graph, however, before the uninterrupted decrease of mortality rates reached 9–10‰, thus signing the end of the transitional process, slightly fluctuating trends were registered for about 10 years in all the Italian geographical areas until values settled down. This process affected differently the various areas of the country: it started in the North-west in 1875 to follow in the other areas with the *Mezzogiorno* as last (there the decrease of mortality rates was registered starting from the last years of 1800). This situation was especially due to the effect of very high infant mortality rates (both at birth and in age class 0–5, see paragraph 7.6).

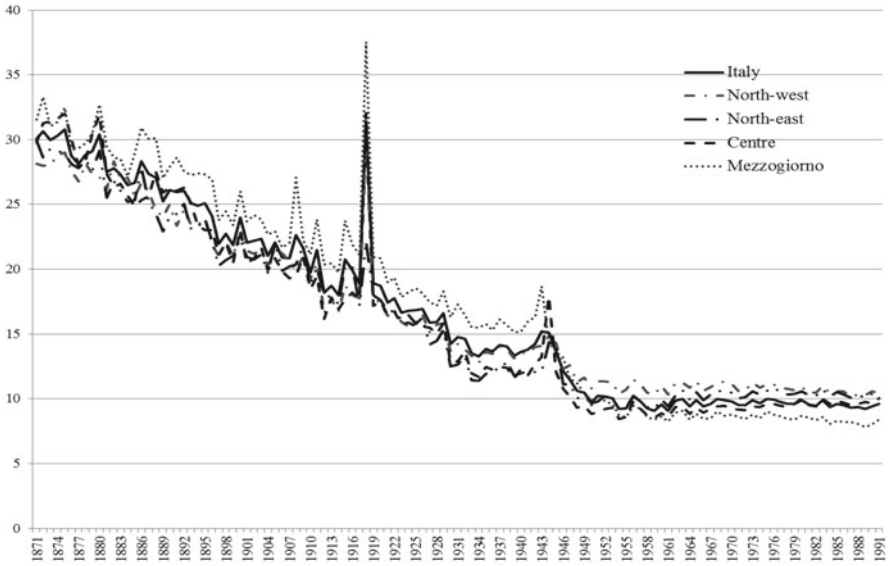


Fig. 7.5 Crude death rate in the Italian geographical areas (values per 1,000 inhabitants), 1871–1991 (Source: Authors' calculations on several Istat databases)

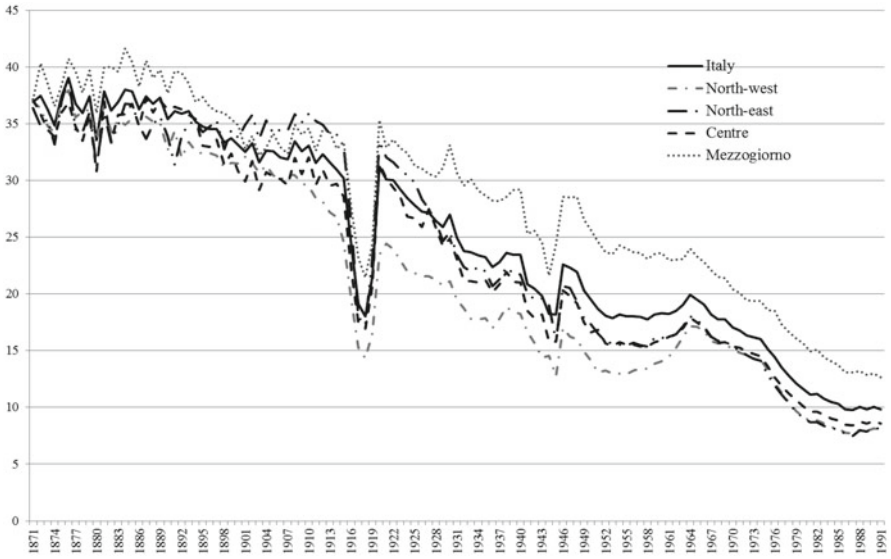


Fig. 7.6 Crude birth rate in the Italian geographical areas (values per 1,000 inhabitants), 1871–1991 (Source: Authors' calculations on several Istat databases)

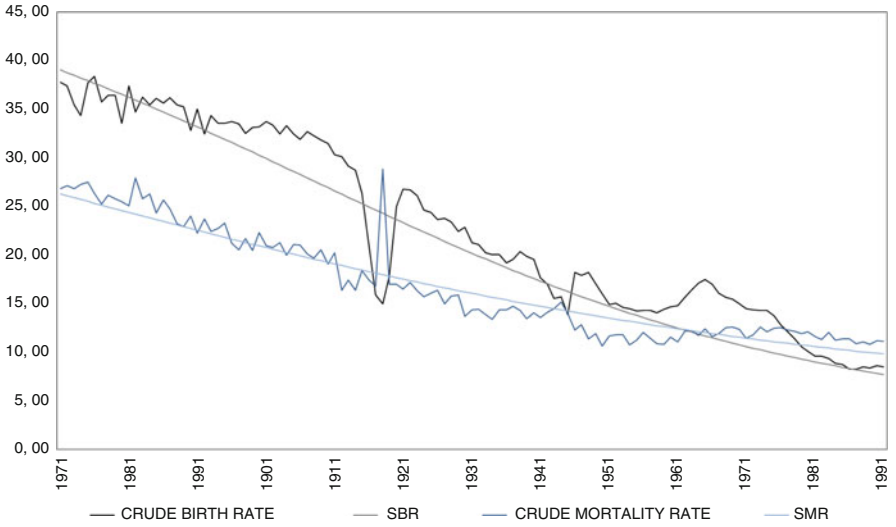


Fig. 7.7a Crude birth and mortality rates, smoothed birth and mortality rates in the North-west of Italy (values per 1,000 inhabitants), 1871–1991

Nonetheless, the initial misalignment was nearly completely balanced off in the conclusive phase of the transitional process, when mortality rates in the four areas reached 10‰.

As far as birth rates are concerned (Fig. 7.6), the level of 30‰ remained stable over a wider period of time of about 16 years, characterised at first by a leading position of the Centre which accounted for 29,8‰ already in 1901. Around 1920–1921 the differences between the areas mitigated except for the *Mezzogiorno* where the decreasing trend started to settle down only about 10 years later, in 1933. This delay characterised this geographical along the entire demographic transition process.

Observing the North-west graph (Fig. 7.7a), the first evidence that emerges is the clear difference in the levels of birth rates and mortality rates recorded in rural and urban environments, thus leading the rural exodus into nearby farming and industrial areas that followed later.

On the one hand, North-western municipalities with more than 50,000 inhabitants (urban areas) showed levels of birth and mortality rates with no significant differences during the entire period of observation (1871–1991). As a consequence, the population growth was very close to zero (high birth rates offset by high levels of mortality), as confirmed by the fact that the maximum gap between the two ratios (about 6‰ both in 1889 and in 1964) was much lower than that observed in other Italian territorial areas. On the other hand, the evolutionary pattern of North-western rural areas follows the traditional scheme of the demographic transition model (Fig. 7.7b).

Within the national scenario the North-east of Italy (Fig. 7.8a) is characterised by a transition in the birth rate that started lagging behind that of mortality (approximately in 1910 in all municipalities and in rural areas, see Fig. 7.8b), leading to

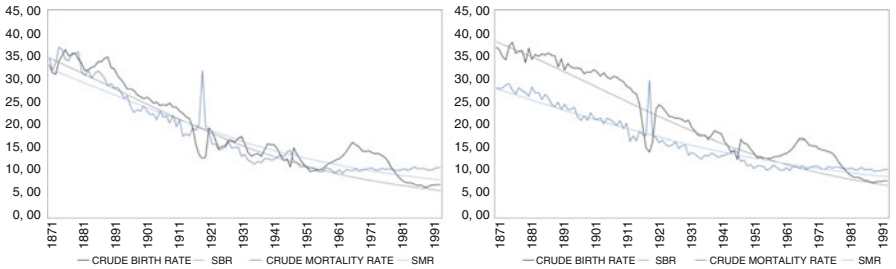


Fig. 7.7b Crude birth and mortality rates, smoothed birth and mortality rates in the North-western Italian Municipalities with more than 50,000 (urban areas, on the *left*) and with less than 20,000 inhabitants (rural areas, on the *right*) (values per 1,000 inhabitants), 1871–1991 (Source: Authors' calculations on several Istat databases)

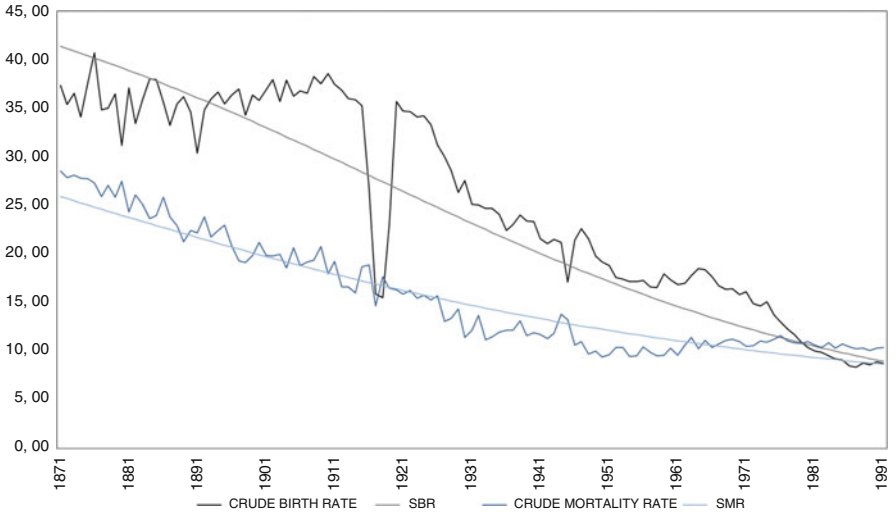


Fig. 7.8a Crude birth and mortality rates, smoothed birth and mortality rates in the North-east of Italy (values per 1,000 inhabitants), 1971–1991

sustained growth at least until the outbreak of World War I. This was especially true for rural municipalities where reproductive behaviours were typical of a traditional society in which agriculture played a central role.

As illustrated in the following figures (Figs. 7.9a and 7.9b), the Centre of Italy is very similar to the North-east, showing similar patterns with regard to the demographic transition model. The peculiarity is the birth rate that recorded two very high peaks at the two world wars.

The dualism between the northern and southern areas of Italy can also be observed analysing the demographic transition patterns in the *Mezzogiorno*.

The three graphs illustrated in Figs. 7.10a and 7.10b show that although there are no significant differences between the patterns which emerged before for rural and urban environments, the transitional process in the *Mezzogiorno* ended up lagging behind the rest of the country. Here the demographic transition was concluded in the

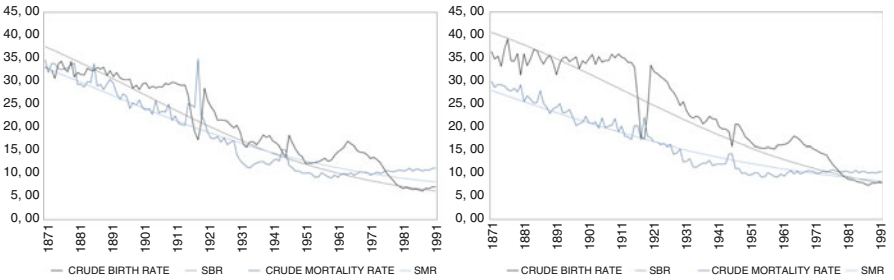


Fig. 7.8b Crude birth and mortality rates, smoothed birth and mortality rates in the North-eastern Italian Municipalities with more than 50,000 inhabitants (urban areas, on the *left*) and with less than 20,000 inhabitants (rural areas, on the *right*) (values per 1,000 inhabitants), 1871–1991 (Source: Authors' calculations on several Istat databases)

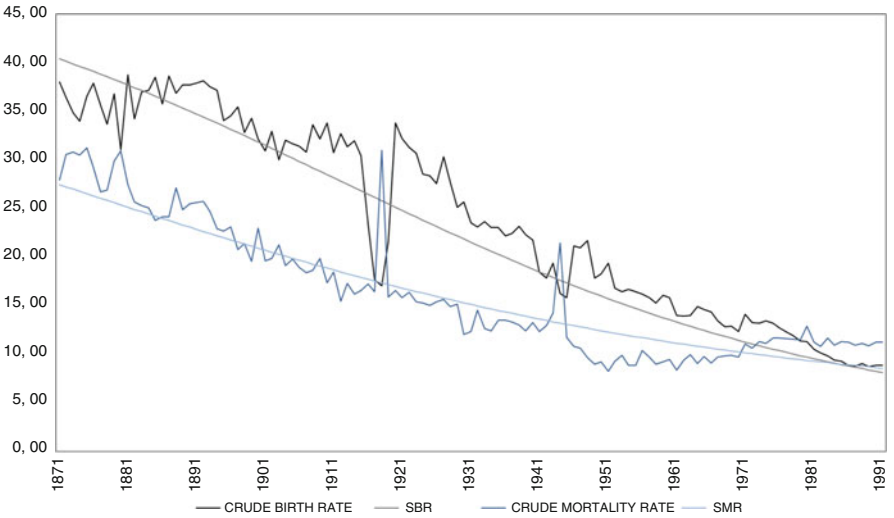


Fig. 7.9a Crude birth and mortality rates, smoothed birth and mortality rates in the Centre of Italy (values per 1,000 inhabitants), 1971–1991

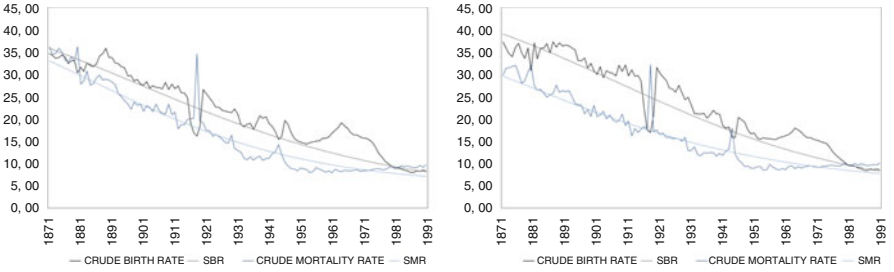


Fig. 7.9b Crude birth and mortality rates, smoothed birth and mortality rates in the Central Italian Municipalities with more than 50,000 inhabitants (urban areas, on the *left*) and with less than 20,000 inhabitants (rural areas, on the *right*) (values per 1,000 inhabitants), 1871–1991

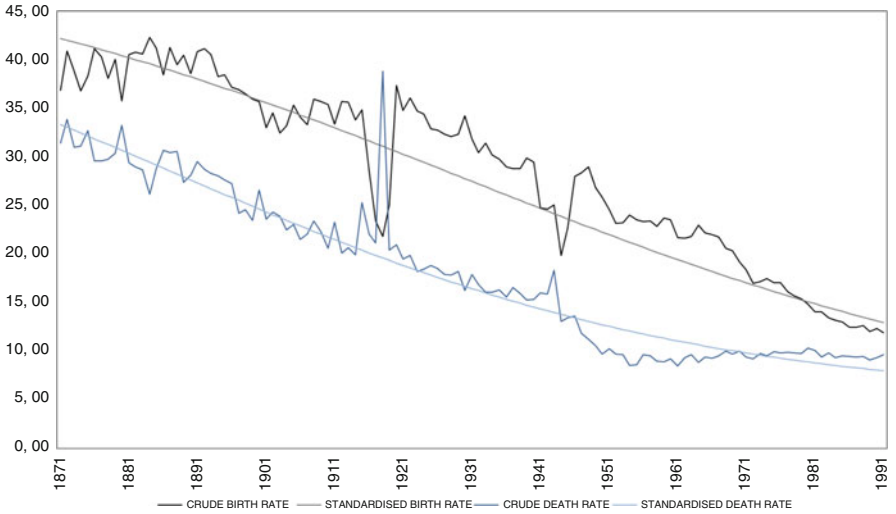


Fig. 7.10a Crude birth and mortality rates, smoothed birth and mortality rates in the *Mezzogiorno* of Italy (values per 1,000 inhabitants), 1871–1971

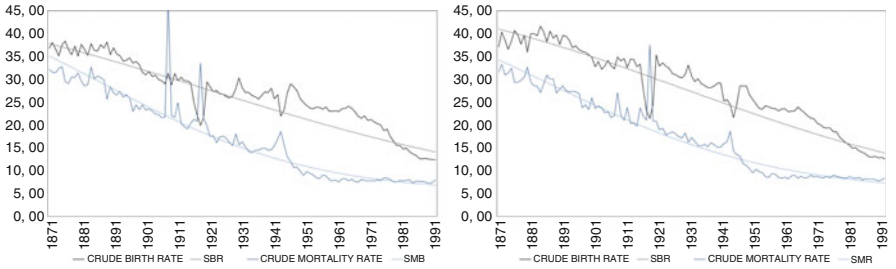


Fig. 7.10b Crude birth and mortality rates, smoothed birth and mortality rates in the *Mezzogiorno* of Italy. Municipalities with more than 50,000 inhabitants (urban areas, on the *left*) and with less than 20,000 inhabitants (rural areas, on the *right*) (values per 1,000 inhabitants), 1871–1991

late 1980s, with a delay of about 10 years, and in 1991 the reversal trends in birth and mortality rates had not yet occurred.

In a vertical reading (geographically) of all the previous graphs concerning birth and mortality trends (Figures from 7.7, 7.8, 7.9, and 7.10), a gradual delay in the transitional process and in the reversal trends of the two rates can be outlined. In particular, with regard to the Italian municipalities with more than 50,000 inhabitants (urban areas), there is apparently a gap between the levels of transitional indicators which become progressively greater when shifting from the North to the *Mezzogiorno* of the country.

In more detail, in the light of the above analyses of birth and mortality rates in Italy at territorial level (affected especially by very high infant mortality rates, see paragraph 7.6), the time series of the General Fertility Rate (GFR – total number of live births in the reference year per 1,000 women aged 15–49 years) during the

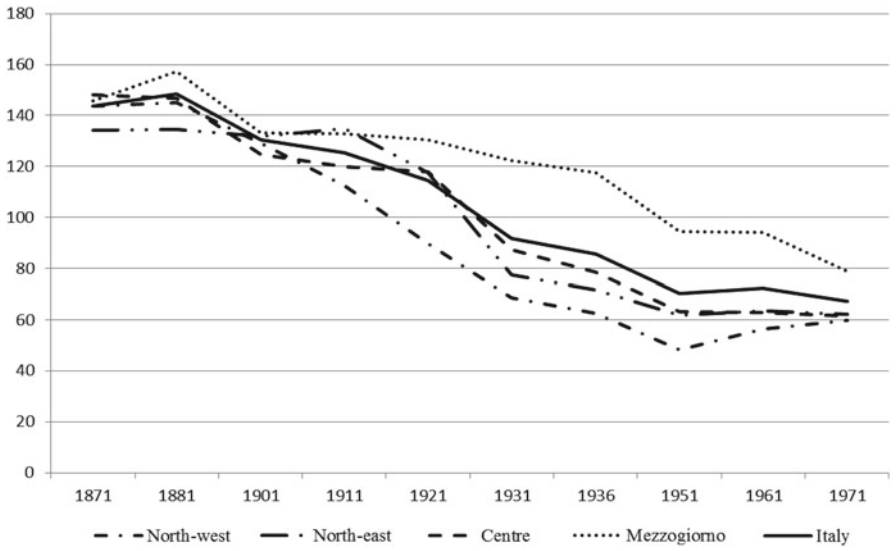


Fig. 7.11 General Fertility Rate – GFR (total number of live births in the reference year per 1,000 women aged 15–49 years) in Italian territorial areas, 1871–1971 (Source: Authors' calculations on Istat Population and Housing Census data)

demographic transition period (1871–1971) showed in Fig. 7.11 represents a comparative synthesis of the results illustrated previously.[4] During these years, all the Italian territorial areas registered a significant decrease of the GFR that passed from about 144‰ to 67.3‰ at national level. The *Mezzogiorno* remained always above the Italian average values reducing its GFR from about 146‰ to about 79‰ in the same period, as highlighted by the huge difference between the *Mezzogiorno* and the rest of Italy especially from the late 1920s onwards. The North-west recorded high values up to 1881 (145.2‰), then started to decrease until 1951 when it reached its minimum of 48.3‰ to register a reversal of trend later (56.4‰ in 1961 and 59.7‰ in 1971). The North-east was affected by fluctuations that led it to overcome the *Mezzogiorno* in 1911 (135‰). The Centre registered the highest value of all at the beginning of the demographic transition (148.2‰ in 1871) and the lowest one at the end of the period in 1971 (61.4‰).

Since the beginning of 1950s, the progressive improvement in official statistical sources has made a huge amount of detailed data available, thus allowing to calculate more refined indicators such as age-specific fertility rates and the related average number of live births per woman, as shown in Table 7.3 and Fig. 7.12. This indicator showed both a sharp decline during the years 1952–2013, passing from a

[4] The General Fertility Rate (GFR) showed in Fig.11 was calculated in order to cover the whole Italian demographic transition period (from 1871 to 1971). The Total Fertility Rate (TFR) illustrated both in Table 7.3 and in Fig.12 covers the years from 1952 to 2013 when official statistical sources were made available to produce more refined indicators.

Table 7.3 Total Fertility Rate – TFR (Average number of live births per woman) in Italian territorial areas, 1952–2013

Years	North-west	North-east	Centre	South	Islands	Total Italy
1952	1.71	2.02	1.94	3.18	3.13	**2.34**
1955	1.68	1.99	1.95	3.18	3.17	**2.33**
1957	1.75	2.01	1.94	3.12	3.13	**2.33**
1959	1.80	2.12	2.01	3.14	3.12	**2.38**
1961	1.88	2.15	2.09	3.11	3.10	**2.41**
1963	2.15	2.31	2.23	3.24	3.06	**2.56**
1965	2.30	2.42	2.35	3.33	3.10	**2.67**
1967	2.17	2.26	2.22	3.20	3.04	**2.53**
1969	2.17	2.25	2.20	3.14	3.01	**2.51**
1971	2.09	2.18	2.16	2.99	2.87	**2.41**
1973	2.05	2.09	2.13	2.87	2.79	**2.34**
1975	1.95	1.91	2.00	2.71	2.65	**2.21**
1977	1.67	1.66	1.76	2.53	2.41	**1.97**
1979	1.43	1.42	1.57	2.32	2.21	**1.76**
1981	1.29	1.27	1.41	2.12	2.00	**1.60**
1983	1.24	1.22	1.36	2.02	1.92	**1.54**
1985	1.17	1.16	1.27	1.88	1.84	**1.45**
1987	1.09	1.05	1.18	1.77	1.73	**1.35**
1989	1.10	1.08	1.18	1.72	1.72	**1.35**
1991	1.11	1.09	1.16	1.66	1.64	**1.32**
1993	1.06	1.06	1.13	1.55	1.54	**1.26**
1995	1.05	1.05	1.07	1.42	1.38	**1.19**
1997	1.11	1.11	1.11	1.42	1.37	**1.23**
1999	1.13	1.15	1.16	1.36	1.34	**1.23**
2001	1.19	1.21	1.16	1.36	1.31	**1.25**
2003	1.24	1.26	1.22	1.36	1.34	**1.29**
2005	1.33	1.36	1.29	1.35	1.34	**1.34**
2007	1.43	1.45	1.36	1.37	1.35	**1.40**
2009	1.51	1.50	1.42	1.38	1.39	**1.45**
2011	1.49	1.49	1.45	1.36	1.37	**1.44**
2013	1.45	1.45	1.39	1.31	1.31	**1.39**

Source: Authors' calculations on Istat data

total Italian value of 2.34–1.39, and significant differences between the territorial areas.

In this period, the North-west, the North-east and the Centre of Italy registered levels that were severely lower than those of the *Mezzogiorno* at least up to the beginning of 1990s. The *Mezzogiorno* remained over the replacement level (2.1)[5] from 1952 to 1980 in the Islands and to 1982 in the South.

[5]The average number of live births per woman required to keep the population size constant if there are no migration flows (inward or outward).

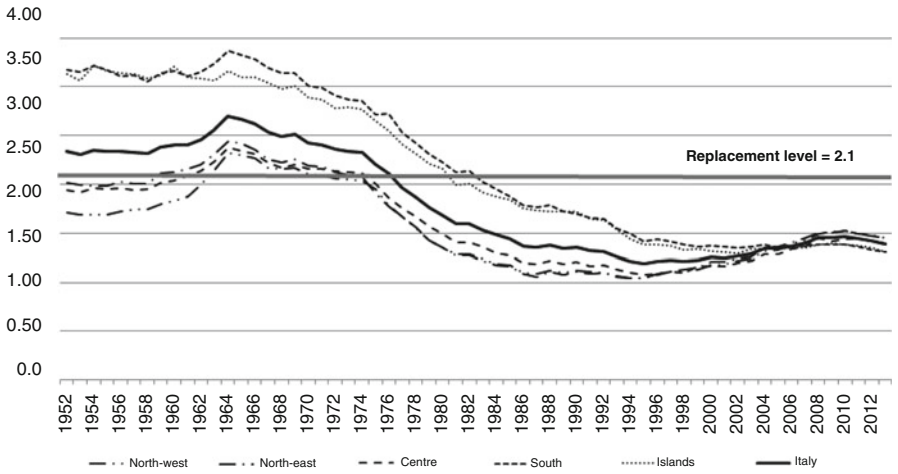


Fig. 7.12 Total Fertility Rate – TFR (Average number of live births per woman) in Italy, 1952–2013 (Source: Authors' calculations on Istat data)

At the beginning of the same period (1952), the North-east recorded higher values than the North-west assuming more similar patterns in the mid-1970s, while the Centre was placed in an average position if compared with these other two areas.

A peak in the average number of live births per woman was detected in 1964 in all the Italian geographical areas: from 1963 to 1970 all of them registered values that were higher than the replacement level, emphasising the so-called *baby boom* phase.

Starting from the 1980s, values in all the Italian geographical areas became gradually closer, though with a continuous decrease for the *Mezzogiorno* and a slight recovery for the North-west, the North-east and the Centre. The reasons for this situation are of course different: the *Mezzogiorno* was interested especially by migration outflows, while the northern and central territorial areas showed lower fertility together with higher migration inflows that contributed to the increasing of the population in working (and consequently reproductive) age. All this explains the expected future recovery that is partly reduced by the ageing of immigrants. This affects also the dependency ratios illustrated below.

7.5 A Glance at the Italian Migration Flows

7.5.1 The Outward Migration Flows

Although the demographic transition theoretical model does not take migration flows into account, they actually took place assuming an extraordinary importance during the years 1871–1971, when Italy was interested exclusively by a relevant emigration. This applied especially to the *Mezzogiorno* that was therefore characterised by an important population loss, strictly related to international emigration (mainly to North and South America).

Table 7.4 First and second phase of the Italian outward migration flows by internal geographical areas and areas and countries of arrival (absolute values and %)

Italian geographical areas of outward migration flows	I Phase 1876–1915		II Phase 1916–1942	
	Emigrants	%	Emigrants	%
North	7,026,651	50.1	2,225,751	42.3
Centre	1,522,788	10.9	495,181	9.4
Mezzogiorno	5,477,831	39.1	1,528,532	29.1
Unknown	–	–	1,008,366	19.2
Italy	**14,027,270**	**100.0**	**5,257,830**	**100.0**
Areas and countries of destination				
Europe	**6,132,958**	**43.7**	**2,245,660**	**42.7**
United Kingdom	*69,483*	*0.5*	*27,713*	*0.5*
The Netherlands	*37,489*	*0.3*	*115,850*	*2.2*
France	*1,715,510*	*12.2*	*1,568,980*	*29.8*
Germany	*1,225,820*	*8.7*	*88,907*	*1.7*
Switzerland	*1,340,260*	*9.6*	*319,184*	*6.1*
Extra-Europe	**7,894,312**	**56.3**	**2,109,584**	**40.1**
North America	*4,305,445*	*30.7*	*1,093,612*	*20.8*
Canada	*148,565*	*1.1*	*47,762*	*0.9*
USA	*4,156,880*	*29.6*	*1,045,850*	*19.9*
South America	*3,317,170*	*23.6*	*826,716*	*15.7*
Brazil	*1,225,120*	*8.7*	*107,516*	*2.0*
Argentina	*1,795,860*	*12.8*	*672,052*	*12.8*
Venezuela	*19,720*	*0.1*	*5,291*	*0.1*
Oceania (*Australia*)	*18,437*	*0.1*	*49,144*	*0.9*
Africa	*237,966*	*1.7*	*133,324*	*2.5*
Asia	*15,294*	*0.1*	*6,788*	*0.1*
Unknown	**–**	**–**	**902,586**	**17.2**
Total	**14,027,270**	**100.0**	**5,257,830**	**100.0**

Source: Authors' calculations on Favero and Tassello (1978)

Italian outward migration flows can be divided into three distinct phases. The first phase (1876–1915) covered the period before World War I; the second phase (1916–1942) coincided with the interval between the two World Wars and was affected by the specific migration policy of the Italian fascist regime. During both the first and second phases, repatriates are to be considered negligible and insignificant.

In the third phase (1946–1976), which took place in the period immediately after World War II, emigration was particularly high until the end of the 1960s, when the first repatriations indicated a reversal of the trend (Di Comite and Pace 2002).

During the first phase, the North accounted for slightly over 50% of total estimated emigrants (more than 14 million residents in Italy that moved abroad), the *Mezzogiorno* for little more than 39% (see Table 7.4). As a consequence, the estimated emigration rate increased from 3‰ in 1876 to 24‰ in 1914, with a very rapid acceleration during the first years of 1900.

Concerning areas and countries of destination, Italian outward migration flows resulted especially directed to extra-European countries during this first phase: more than 56 % of emigrants from Italy immigrated there, more precisely in the United States (about 30 %) and in South America (about 24 % of which 12.8 % in Argentina and 8.7 % in Brazil).

In the same period, the main European destinations were France (12.2 % of total emigrants), Switzerland (9.6 %) and Germany (8.7 %).

In the years between the two World Wars (1916–1942), Italian outward migration flows recorded a general increasing reduction due to the fascist policy that strongly contrasted emigration (5,257,830 emigrants vs 14,027,270 of the previous phase). During this phase a new axis started to be delineated with European countries representing the destination that involved the highest percentage of emigrants from Italy (about 43 %), while flows towards overseas countries strongly decreased (from previous 56.3 % to 40.1 %). Proportionally speaking, these latter countries reflected the general lowering trend of the Italian outward migration flows.

During this period, the North of Italy with the regions of the so-called industrial triangle still represented the area recording the highest outward migration flows (42.3 %), while the *Mezzogiorno* involved about 29.1 % of the total amount of emigrants.

Finally, in the third phase of the Italian outward migration flows that took place in the post-World War II period (1946–1976) the number of emigrants increased (from 5,257,830 of the previous phase to 7,447,330, see Table 7.5). For the first time the percentage of emigrants registered in the Northern areas of the country was lower than in the *Mezzogiorno* (31.3 % as against 59 %). It is worth reminding that during these years this area also showed the highest percentage of residents who moved internally towards the Italian Northern regions.

This phase was characterised by a clear orientation of flows towards Europe (about 70 % of total Italian emigrants). Italian emigrants headed especially to Switzerland (31.3 %), Germany (15.3 %), and France (13.9 %): beside being closer compared to overseas countries, these destinations were in high demand for workforce.

Starting from the 1970s, the migratory balance between Italian emigrants and repatriates was finally changing after almost a century due to the reduction of Italian labour demand by the traditional destination countries and as a consequence of the welfare policies adopted internally during the 1970s, especially to the advantage of the *Mezzogiorno*.

Only in the last 15 years of this third phase (1961–1976), repatriation flows started and affected over two and a half million Italians returning mostly from Europe (84 %), distributed between Switzerland (about 45 %) and the other countries belonging to former European Economic Community (especially Germany with 20.1 %, France with about 13 % and the Netherlands with 4.2 %). On the contrary, repatriations from overseas destinations were negligible, thus confirming the specific stable character of this type of immigrants coming from Italy.

Table 7.5 Third phase of the Italian outward migration flows: emigrants and repatriates by internal geographical areas and areas and countries of arrival/departure (absolute values and %)

	III Phase 1946–1976		From 1961 to 1976	
Italian geographical areas	Emigrants	%	Repatriates	%
North	2,329,086	31.3	1,577,415	36.5
Centre	*699,406*	9.4	*432,979*	10.0
Mezzogiorno	4,395,227	59.0	2,286,310	52.9
Unknown	23,611	0.3	22,882	0.5
Italy	**7,447,330**	**100.0**	**4,319,586**	**100.0**
Areas and countries of destination/departure				
Europe	**5,109,860**	**68.6**	**3,628,430**	**84.0**
United Kingdom	*166,402*	*2.2*	*53,200*	*1.2*
The Netherlands	*381,692*	*5.1*	*179,298*	*4.2*
France	*1,032,730*	*13.9*	*548,483*	*12.7*
Germany	*1,137,810*	*15.3*	*868,255*	*20.1*
Switzerland	*2,330,230*	*31.3*	*1,935,240*	*44.8*
Extra-Europe	**2,337,315**	**31.4**	**691,156**	**16.0**
North America	*929,279*	*12.5*	*140,113*	*3.2*
Canada	*440,796*	*5.9*	*44,454*	*1.0*
USA	*488,483*	*6.6*	*95,659*	*2.2*
South America	*944,518*	*12.7*	*311,882*	*7.2*
Brazil	*124,227*	*1.7*	*45,007*	*1.0*
Argentina	*500,116*	*6.7*	*122,012*	*2.8*
Venezuela	*260,048*	*3.5*	*123,776*	*2.9*
Oceania (*Australia*)	*360,708*	*4.8*	*54,333*	*1.3*
Africa	*88,852*	*1.2*	*172,795*	*4.0*
Asia	*13,958*	*0.2*	*12,033*	*0.3*
Unknown	**155**	**0.0**	**–**	**–**
Total	**7,447,330**	**100.0**	**4,319,586**	**100.0**

Source: Authors' calculations on Favero and Tassello (1978)

In general, Italy is undoubtedly the western country that experimented the highest outward migration flows in modern history. During the demographic transition period, about 26 million residents left Italy; of these, about 14 million towards Europe and over 12 million towards extra-European destinations, especially North and South America and Australia. Many of them returned to Italy, while many other still reside stably abroad. According to consular registers and AIRE (the register of Italian citizens residing abroad), as to 31st December 1993 there were 3,5 million Italians residing abroad; out of them 2,150,000 resided in Europe, 780,000 in South America and 365,000 in North America (Di Comite and Pace 2002).

Finally, in the second half of the 1970s Italy changed completely its migration pattern becoming a country of destination of immigrant flows first from the Southern areas of the World and after the fall of the Berlin Wall (November 1989) from European Eastern countries (Maccheroni et al. 2007).

7.5.2 The Internal Migration flows

Since the years immediately following Italy's unification process, internal mobility (i.e. movements from one geographical area to another within the Italian territory) affected the demographic dynamics of the country producing changes in the size and structure of Italian population.

Until 1930 nearly all European countries experienced overseas migration and – as seen in the previous paragraph – Italy played a leading role in this framework. Only in the first years of the 1950s, however, internal mobility assumed a relevant size in the Italian peninsula. Internal migration in Italy progressively increased since the second post-war period, that is when the different socio-economic development of Italian geographical areas either attracted or rejected migrants that changed their residence on medium-long distances (Carella and Mastrorocco 2002).

The beginning of this mobility process coincided with the appearance of the so called Demographic Window (1951) which will be dealt with in the following paragraph. In the 40-year-period between 1955 and 1995 interregional movements in Italy registered important variations especially linked to the size of this event that grew increasingly from 1955 until the first years of the 1970s, to decrease then from 1972 to date though with some slight recovery.

Given the nature of the Italian internal mobility, particularly oriented by the labour market rules and guided mostly by the industrial areas of the country, it is possible to assume that it interested especially the working age population. In this context, the outflow of an important share of persons aged 15–64 years affected primarily the *Mezzogiorno* that registered a highly negative balance in the years from 1955 to 1973, reaching its peak in the 5-year-period 1960–1964. During these years, this area lost about 927,000 units (Carella and Mastrorocco 2002). Since 1974 and during the entire subsequent decade the internal mobility from the *Mezzogiorno* showed a progressively decreasing trend as confirmed by the minimum migration deficit of 139,000 units in the 5-year-period 1980–1984; in 1986, however, a further worsening of the *Mezzogiorno* migration balance was registered (Bonifazi et al. 1999).

Passing on to the territorial detail, it is interesting to note how in the years between 1955 and 1978 the internal migration from the *Mezzogiorno* decidedly favoured the North-west of Italy (Fig. 7.13).

As a matter of fact, during this 20-year-period this area was forced to become a strongly attractive territory for incoming internal migration flows given its growing industry. In general, it is possible to detect a first stage of the internal mobility model, with strong migration flows from the *Mezzogiorno* to the North-western regions of Italy (with a peak of about 170,000 persons in 1962) and a second stage, when the behaviour of internal migrants from the South strongly changed as to the choice of the destination; since the first years of the 1980s migrants from the *Mezzogiorno* seemed to equally head both to the two geographical areas in the North and to the regions in the Centre, which over time caused a certain spread of the immigration areas (see Fig. 7.13).

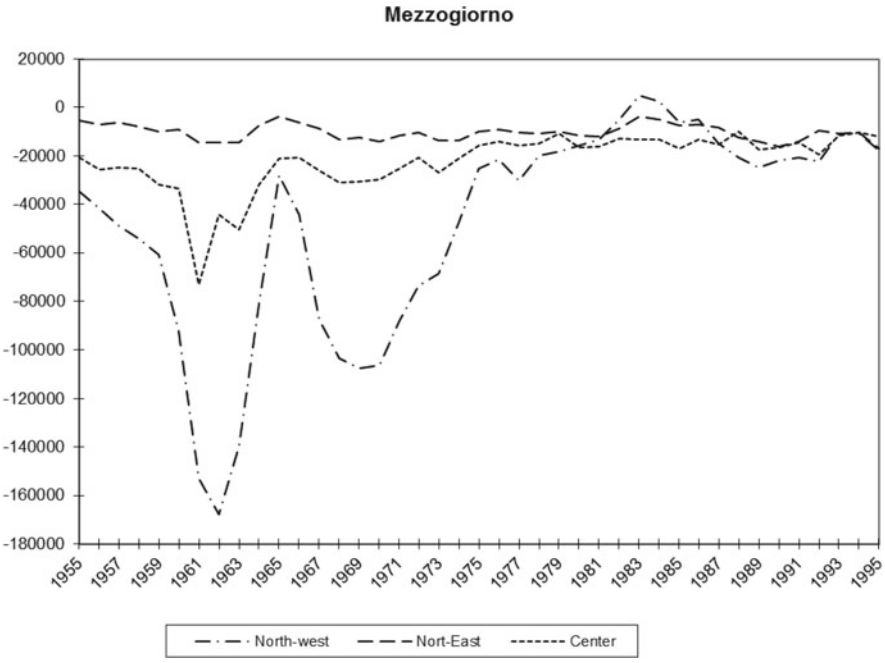


Fig. 7.13 Migration balance of the *Mezzogiorno* with the other Italian geographical areas, 1955–1995 (values in thousands) (Source: Bonifazi et al. 1999)

As to internal migration affecting the other geographical areas of the country, basically in the 40-year-period under study all the three remaining areas (the North-east, the North-west and the Centre) overall registered a steadily positive migration balance with the only exception of the outward flows experienced by the North-east from 1955 to the first years of the 1960s.

An analysis of the rates reported in Fig. 7.14 shows how the *Mezzogiorno* maintained a constantly leading position in the system of internal mobility from 1955 to 1995, registering outward migration rates nearly always higher than in the other Italian geographical areas.

This significant outflow of working age population explains the different trend of the Total Dependency Ratio in the *Mezzogiorno* (see Fig. 7.15) compared to the other geographical areas starting from 1951 until the first years of the 1980s, when the outward migration flow registered a sharp decrease especially, as already said, in the 5-year-period comprised between 1980 and 1984.

In order to better understand the reasons underlying this huge internal mobility, that is unique within the European context of the mid past century, it is necessary to briefly outline some economic history. Within the framework of reforming policies characterising the work of Italian Prime Minister Alcide De Gasperi, on August 10th 1950 the so called *Cassa per il Mezzogiorno* (Development Fund for Southern Italy) was set up by law. This public body aimed at favouring the implementation of

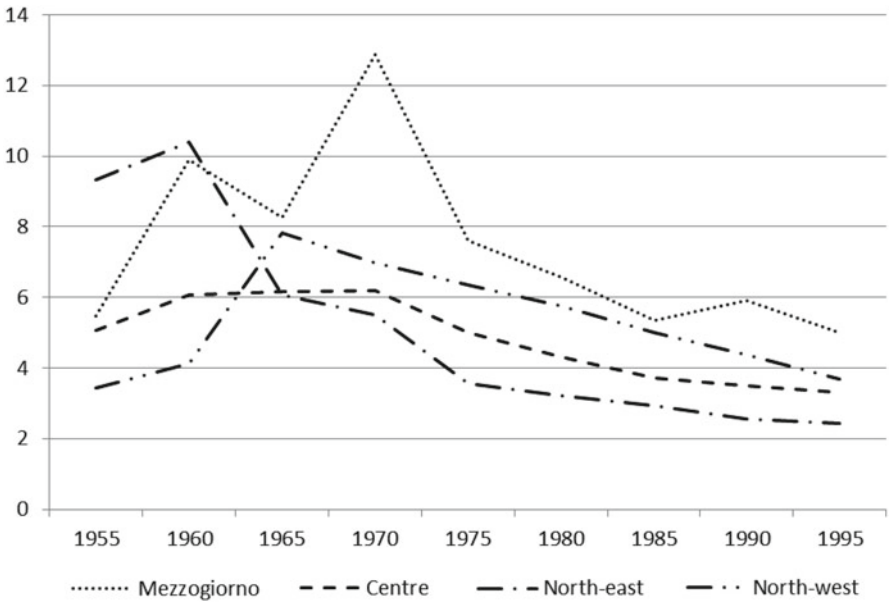


Fig. 7.14 Internal emigration rates by Italian geographical areas from 1955 to 1995 (per 1,000 inhabitants) (Source: Authors' calculations on Bonifazi et al. 1999)

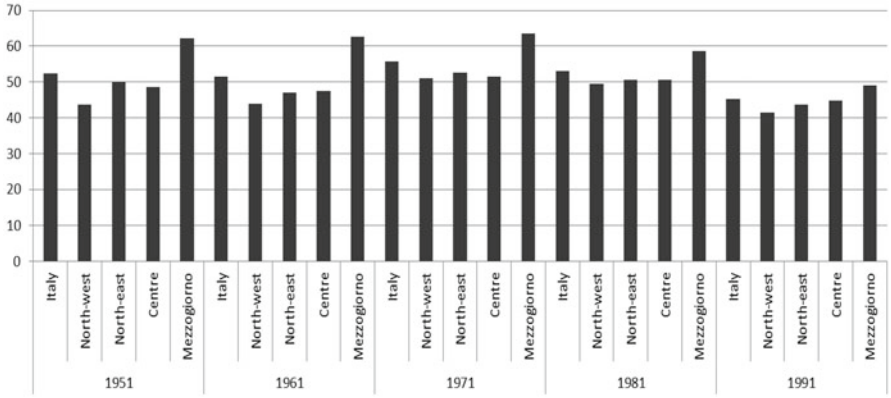


Fig. 7.15 Total Dependency Ratio by geographical areas from 1951 to 1991 (Source: Authors' calculations on Istat Population and Housing Census data)

infrastructures (arrangement of mountain basins and streams, reclamation and irrigation, road network, aqueducts, drainage systems, etc.), planning and supporting measures for the development of Italian Southern regions and of some disadvantaged parts of the Centre and Northern areas.

Within one decade, from 1950 to 1960, the *Cassa per il Mezzogiorno* approved 169,202 projects, for a total amount of 1,403 billion Liras, of which 1,029 for public

works and 374 for the private sector. These measures certainly considerably contributed to the development of the *Mezzogiorno*. However, the undoubtable changes that the *Mezzogiorno* underwent in the years after 1950 could not fill neither the socio-economic gap of regions in the South of Italy, nor the disadvantage compared to the Northern regions. On the contrary, the exceptional development of the industrial areas in the North, by offering employments and hopes to workers from the South, rather contributed to increase the outward migration flow from the *Mezzogiorno* that lost about four million workers in just 20 years.

7.6 The Demographic Window and Some Aspects of the Related Demographic Dividend in Italy

Indicators of a population age structure can be considered key measures to identify milestones in a country's history and evolution, both in terms of social and economic development.

This is only a theoretical assumption of course, due to the fact that age classes are often chosen on the basis of standard definitions and are not able to completely cover real situations.

The demographic window represents a significant example of the above, being characterised by a particularly relevant amount of working-age population (15–64 years) compared with population aged both 0–14 years and 65 and over. In this context, the dependency ratio plays a core role by combining these population shares together: children and youths with elderly people in the numerator, population aged 15–64 years in the denominator.

Figure 7.16, that follows, illustrates the dependency ratio in Italy as surveyed during the Population and Housing Censuses between 1861 and 2011.

Observing these values, the demographic window in Italy can be placed along the period 1951–1991, when the total dependency ratio started to decrease more significantly, though not always uniformly: in 1951 and 1961 it fell slightly from 52.3 to 51.6 (per 100 persons aged 15–64 years), in 1971 it registered an increase reaching 55.5, then it showed a decline up to 2001.

Considering the two different core component of this total ratio, during the same period the young-age dependency ratio fell below 40 (per 100 persons in working-age) and the old-age dependency ratio was still below 25. In more detail, children and youths per 100 persons aged 15–64 years passed from 39.8 in 1951 to 23.1 in 1991, registering a steady decreasing trend, while elderly persons (65 years and over) compared to the same reference population varied from 12.5 to 22.3 with a constant increase during the years.

In general, young age played a very central role from 1861 at least to 1981; on the contrary in 1991 a reversal took place with the elderly becoming the heaviest component.

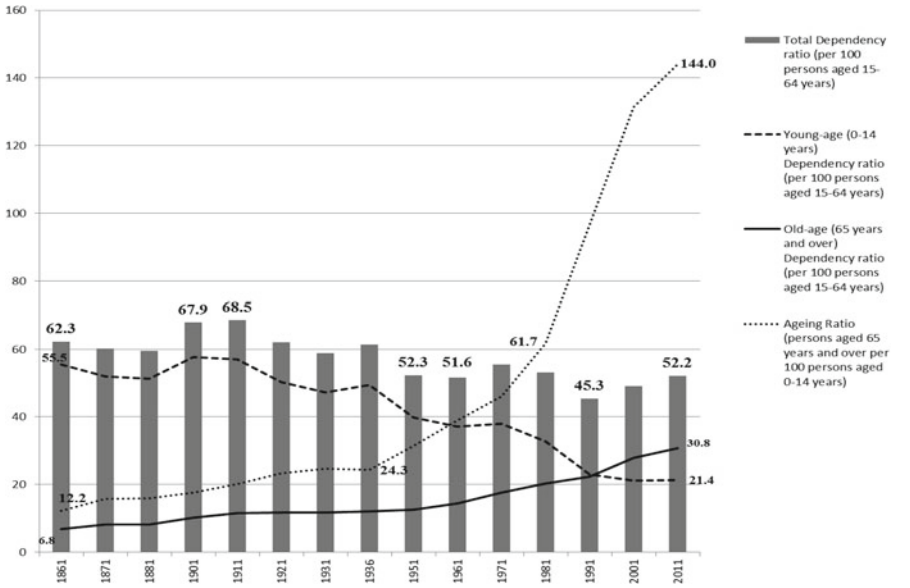


Fig. 7.16 Total dependency ratio in Italy (disaggregated by young-age and old-age dependency ratios) and ageing ratio (values per 100 persons aged 15–64 years and 0–14 years), 1861–2011 (Source: Authors' calculations on Istat Population and Housing Census data)

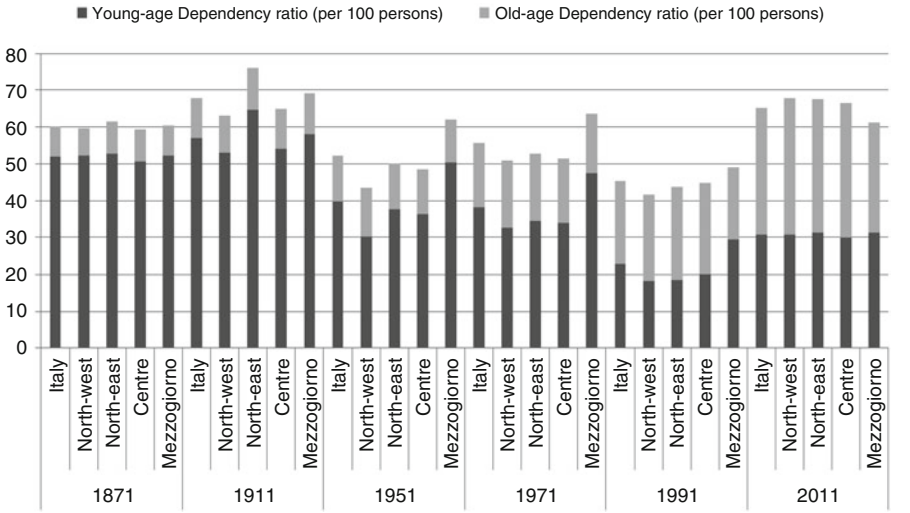


Fig. 7.17 Total dependency ratio at geographical level in Italy (disaggregated by young-age and old-age dependency ratios) (values per 100 persons aged 15–64) 1861–2011 (Source: Authors' calculations on Istat Population and Housing Census data)

Focusing on the Italian geographical areas, in Fig. 7.17 the total dependency ratio is calculated at territorial level highlighting differences in the population age structure that have played an increasingly remarkable role since 1931.

The above mentioned demographic window represented also for Italy a favourable environment for the occurrence of the so-called demographic dividend (Bloom and Williamson 1998): a sort of a temporary *bonus* able to trigger the economic development that is likely to enhance savings and investments in human capital with the availability of extra resources in the presence of the dependency ratio levels illustrated previously, with the share of working-age population larger than the non-working-age proportion.

As a direct result of this, an accounting effect together with an additional consequence more related to individual behaviour are produced, with youths and elderly people consuming more than they produce, while working-age population tends to have a higher level of income production than consumption, thus causing a relevant predisposition towards savings (Andria et al. 2009). The improved life quality and longevity make it desirable to increase savings in order to maintain or to enhance the achieved standard of living also during the retirement years. Moreover, both smaller household size and increased mobility resulting from the urbanisation process determine an additional saving capacity that can be made available to fund this rapid economic development.

In order to exploit this situation making it really operational and facilitating the realisation of this demographic dividend, however, it is necessary to provide and enforce targeted policies, aiming at supporting adequate access to quality education and jobs, as well as investing in nutrition and health measures (concerning also reproductive health care) especially addressed to youths, and to foster research and technology innovation. This leads to an improvement of employment rates with increasing participation of women in the labour market.

As emerged above, the demographic dividend is strictly linked to the demographic transition that determines a shift from very high to very low fertility and mortality rates: concerning Italy this topic has been well illustrated in the previous paragraphs.

Focusing on mortality, it is worth highlighting that this generally falls as infant and child survival rates increase, mainly because of improved health and hygiene conditions especially exogenous and related to the external environment but also endogenous with a prompt protection effect on infant and maternal health status.

An evidence of this is represented by the Italian trend of infant mortality rate illustrated in Fig. 7.18.

During the years 1863–2012 the sharp decline of this rate has been very clear and evident: from a total value of 232.1 per 1,000 live births at the beginning of the observed period to 3.0 in 2012.

Some exceptions occurred in specific years and were related to particular conditions such as infectious disease peaks and epidemics both at the end of nineteenth century and in correspondence of the two World Wars.

Fig. 7.18 Infant mortality rate in Italy by gender (per 1,000 live births), 1863–2012 (Source: Authors' calculations on Istat data)

With regard to gender differences, the female positive selection effect is always confirmed even if a gender gap decrease is registered in the most recent years (Fig. 7.18).

Focusing on under-five mortality rates during the demographic transition period (Fig. 7.19), at the beginning values were nearly double if compared with infant mortality rates.

The Italian territory presented a strongly varied situation with the *Mezzogiorno* highlighting a more disadvantaged position with respect to other geographical areas, and the Centre showing more favourable conditions.

The long duration of this combination of low mortality and low fertility, however, caused the population ageing, while the growing proportion of elderly people inflated again the dependency ratio as observed previously in Figs. 7.16 and 7.17.

This is highlighted also by the national trend of the number of persons aged 65 and over per 100 children and youths aged 0–14 (the ageing ratio) rising severely from 12.1 to 144 in the period 1861–2011.

The population ageing process still characterises Italy nowadays, due to the combination of very low fertility rates and higher life expectancy at birth and at certain ages, leading both to a sharp reduction of working-age population and to an expansion of retired people.

Indeed, since 1931 population ageing has become a specific feature of Italy. Increasing values of the ageing ratio were also evident at geographical level (Fig. 7.20). During the years 1861–2001 the *Mezzogiorno* presented the lowest values of the country passing from 15.7 elderly persons per 100 children and youths aged 0–14 years to 126.4 in 2011. Since 2001, however, the ageing ratios of the North-

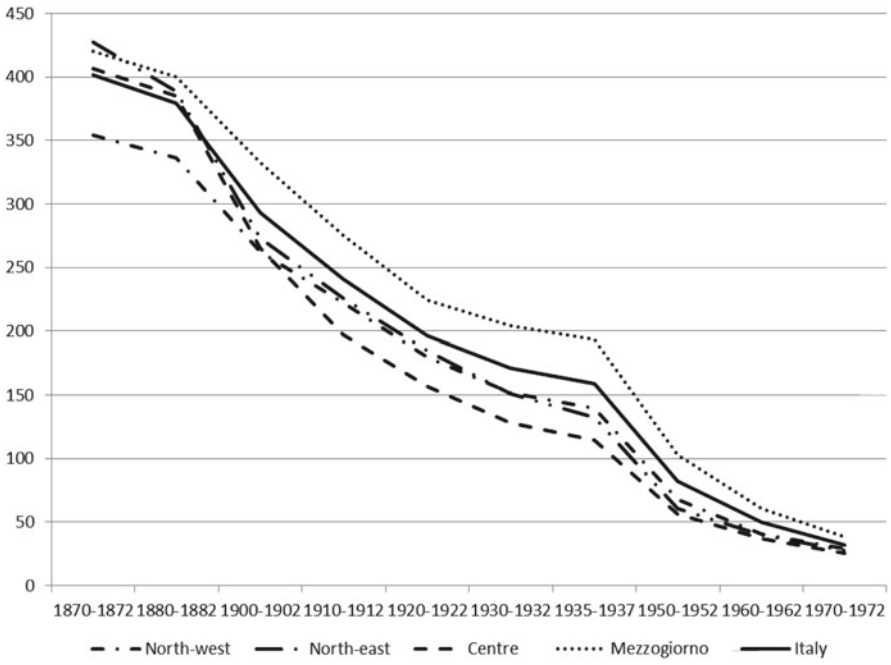


Fig. 7.19 Under-five mortality rate in Italy by geographical areas (per 1,000 live births), 1871–1971 (Source: Authors' calculations on Istat Population and Housing Census data)

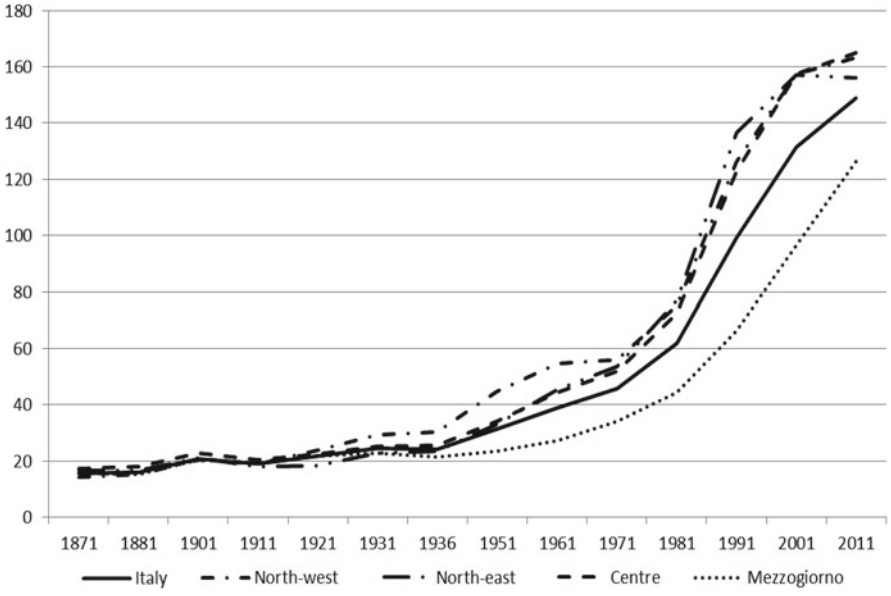


Fig. 7.20 Ageing ratio at geographical level in Italy (values per 100 persons 0–14 years), 1861–2011 (Source: Authors' calculations on Istat Population and Housing Census data)

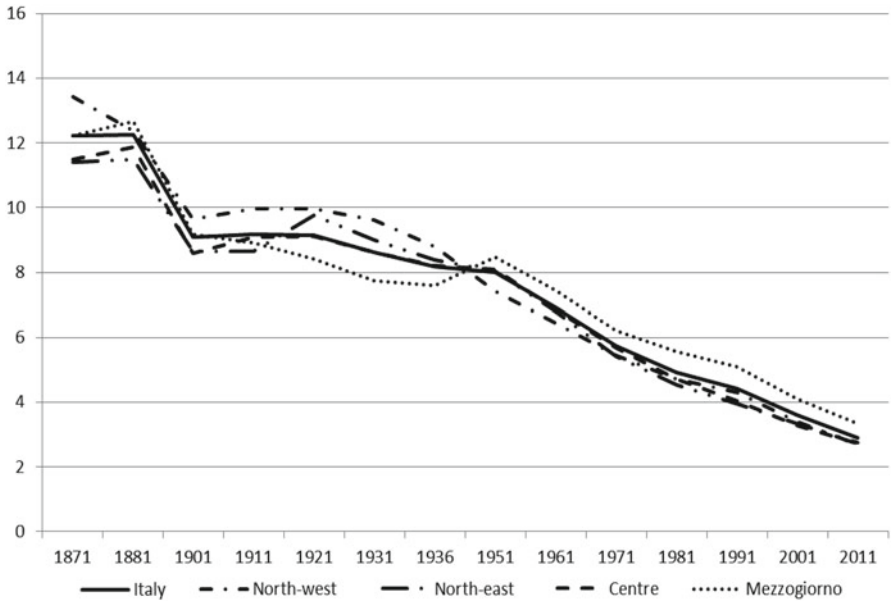


Fig. 7.21 Potential support ratio at geographical level in Italy (values per 100 persons aged 65 and over), 1871–2011 (Source: Authors' calculations on Istat Population and Housing Census data)

west, the North-east and the Centre have all established around 160, with a general process of convergence that has interested the whole country. In this context, the *Mezzogiorno* has continued to register a steady increase due to a progressive reduction of fertility rates.

As a consequence, this started to negatively affect those who had to provide for the social expenditure required for a range of related services.

Analysing the potential support ratio that is derived from the old-age dependency ratio for the years 1871–2011 (Fig. 7.21) and measures the number of people aged 15–64 per 100 persons aged 65 and over, it is possible to determine the burden placed on working age population by the elderly. As in the rest of the country, the North-west of Italy registered a decreasing trend of this ratio with the highest values up to 1951 (13.4 working-age persons per 100 elderly persons in 1871 and 7.4 in 1951); it then diminished and reached the lowest levels (4.3 in 1991 and 2.7 in 2011). The North-east reached two significant peaks both in 1881 (11.5) and in 1921 (9.7), starting to reduce more regularly later.

In 1901 at the beginning of the period, the Centre of Italy registered the lowest value of potential support ratio (8.6), then started to increase and decreased again from 1936 (8.2; 2.7 in 2011).

The *Mezzogiorno* fluctuated more than the other territorial areas, registering a first peak of the potential support ratio in 1881 (12.7) and a second one in 1951 (8.5), then starting its reduction though maintaining higher values than the other Italian territorial areas.

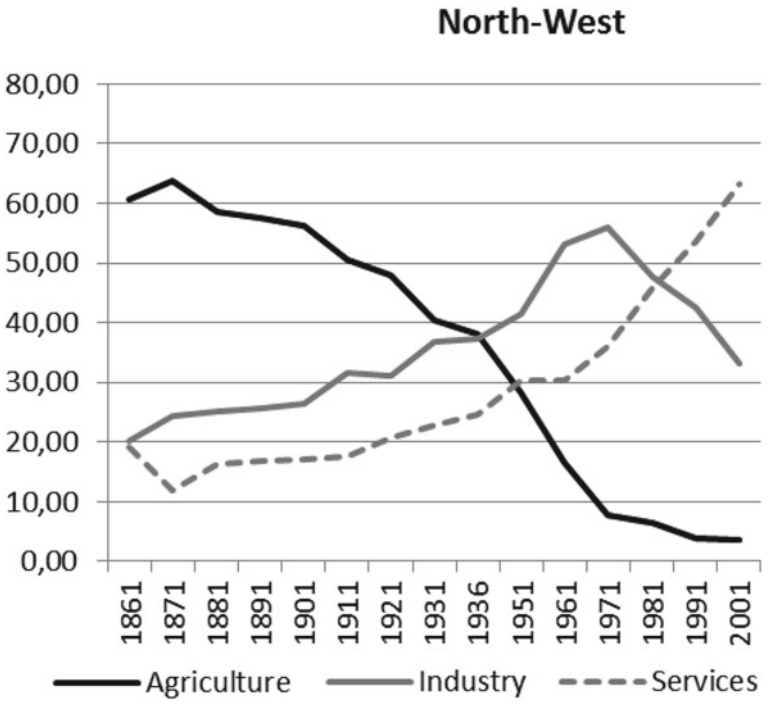


Fig. 7.22 Employees by economic sector in the North-west of Italy (% of total workforce), 1861–2001 (Source: Authors' calculations on Istat Population and Housing Census data)

The number of employees by economic sectors can be used to better highlight the differences in economic development and the strong territorial inequalities derived from the Italian growth process.

According to several experts' considerations (Daniele and Malanima 2007), the differences in development within the Italian territory (albeit modest) had already appeared in the aftermath of the unification process of the country. These differences increased progressively for about a century, thus creating the preconditions for a differential growth that is one of the most distinctive features of the Italian development model.

Since demographic data have been compared, the population pressure on resources has always been higher in the North: the land productivity was higher in the North while the labour productivity was more relevant in the South (and consequently farmer per capita income). Indeed, in 1891, the agricultural product per capita was 10 % higher in the South than in the North.

During the demographic transition period, the workforce in the North-west of Italy changed significantly (Fig. 7.22) with the percentage of employees in the agricultural sector passing from over 60 % of total workforce in 1871 to about 8 % in 1971, to eventually reach about 4 % in 2001. The industrial sector employees rose from 24.3 % of total workforce in 1871 to 56.1 % in 1971, then registered a decrease

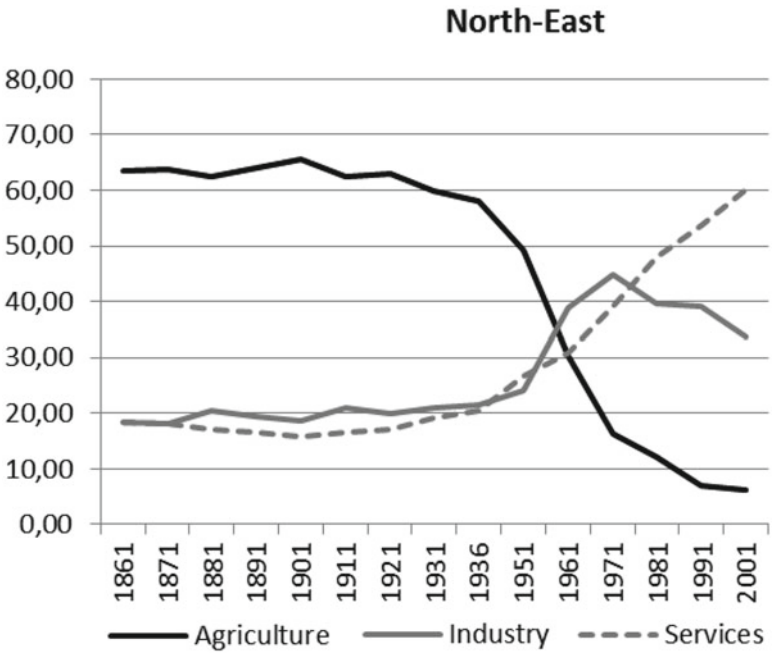


Fig. 7.23 Employees by economic sector in the North-east of Italy (% of total workforce), 1861–2001 (Source: Authors' calculations on Istat Population and Housing Census data)

(from 47.6 % in 1981 to 33.1 % in 2001). During the same transitional years, service sector employees increased gradually from about 12 % of total workforce in 1871 to 36.2 % in 1971 and kept growing up to 63.2 % in 2001.

As a matter of fact, during the demographic transition period the proportion of the workforce employed in agriculture in the North-east was over 50 % of total workforce in all economic sectors at least until the 1960s (Fig. 7.23). Compared with the North-west – where the change in the economy was more gradual – a more rapid transformation was observed in the North-east starting in the 1950s (the rural population shifted from 50 % to 16 % during two decades). This happened in connection with the Italian economic boom and the specialisation of production recorded in the so-called Italian industrial triangle (Provinces of Milano, Torino and Genova in the Italian Regions of Lombardia, Piemonte and Liguria respectively).

The Centre of Italy is almost identical to the North-east, showing similar patterns with regard to employees by economic sector (Fig. 7.24).

With regard to workers in the various economic sectors, in the *Mezzogiorno* the percentage of employees in industry out of total workforce is worth noting (Fig. 7.25). This sector recorded starting values higher than in the rest of the country (30 % in 1881). Similar levels were recorded only around the first decade of the twentieth century in the North-west that is the most industrialised area of Italy.

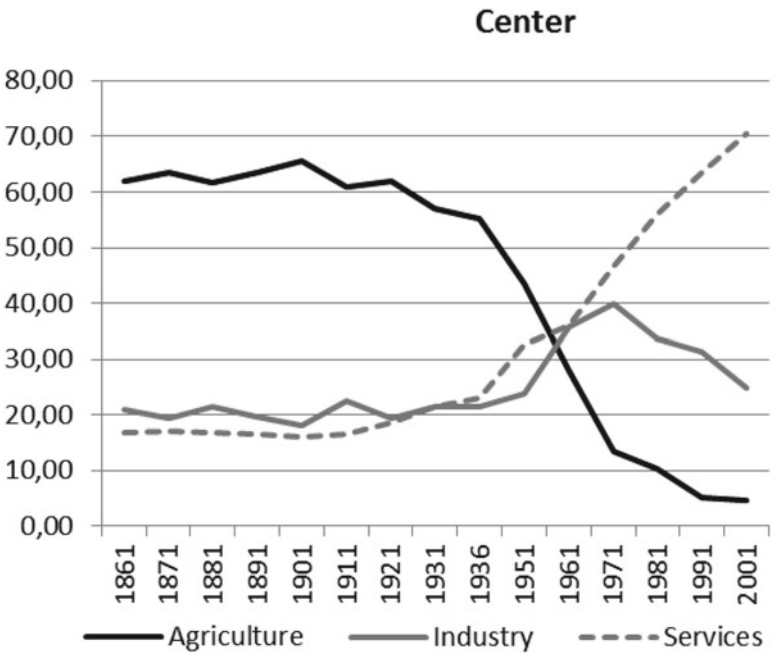


Fig. 7.24 Employees by economic sector in the Centre of Italy (% of total workforce), 1861–2001 (Source: Authors' calculations on Istat Population and Housing Census data)

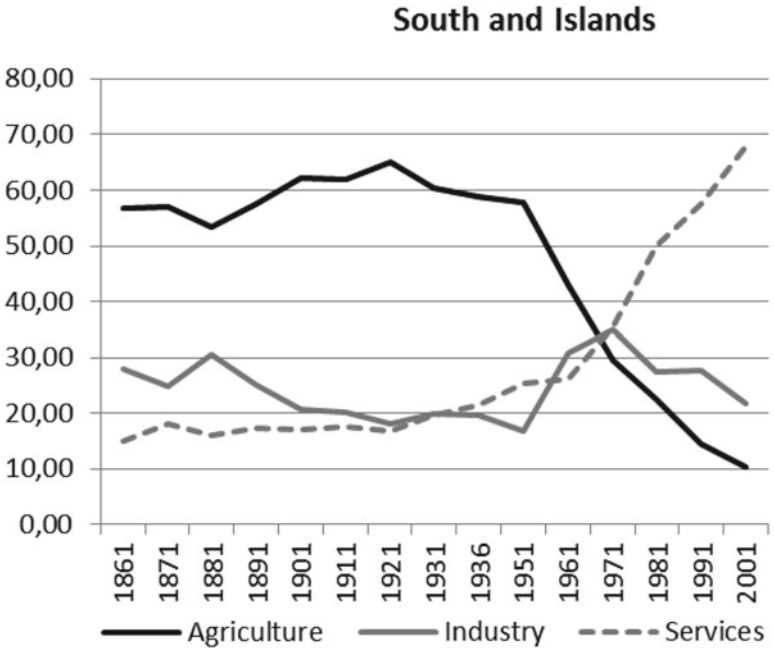


Fig. 7.25 Employees by economic sector in the *Mezzogiorno* of Italy (% of total workforce), 1861–2001 (Source: Authors' calculations on Istat Population and Housing Census data)

During the period 1963–1975, the industrial promotion policy supported by the *Cassa per il Mezzogiorno* (Development Fund for Southern Italy) reached its maximum intensity: in the years 1970–1975 gross fixed investments represented 34 % of GDP in the *Mezzogiorno*, while the share of industrial investments represented 13 %. Massive public sector interventions, intensive emigration and the productive capacity growth of the *Mezzogiorno* led to a significant reduction of Italian territorial differences that lasted until the early 1970s. This convergence phase – when per capita income in the South represented an increasing share of that in the North and in the Centre passing from 47 to 61 % – was very important especially considering that it took place in a period of relevant growth for the Italian economy, with an annual growth rate of 4.6 % registered in the period 1960–1971 (Daniele 2002).

Nevertheless the "welfare curvature" brought about by the government public action had a quite distortive effect on the *Mezzogiorno* development: on the one hand current transfers improved for this territorial area, on the other hand its ability in producing income was strongly reduced. As a consequence, during the 1980s a dependent development model was consolidated in a *Mezzogiorno* characterised by evident disproportion between internal production capabilities and significantly higher consumption (Wolleb and Wolleb 1990).

In Italy the evolution of regional disparities over time follows a trend that – up to some scholars – is very similar to a reversed *u*, this highlighting both an increase of this gap during the first phase of the national economic development and an immediately following reduction. As illustrated in recent studies, this *u*-shaped pattern is related to the degree of the geographical concentration of economic activities: at the beginning, when the industry is still very concentrated, the ascending part of this reversed *u* is interested, to leave later the place to the descending one, when industrialisation starts to be present also in the regions that are lagging behind (see Fig. 7.23) (Daniele and Malanima 2014).

At last, Figures from 7.21, 7.22, 7.23, and 7.24 well-illustrate all Italian territorial characterisation as showed very clearly by Kuznets that outlined the rapidity of the workforce reallocation process between agriculture, industry and the service sector: "*the distinctive feature of modern economic growth is not the shifts in the long-term proportions of industries in product and resources* […], *but rather the rapidity of these shifts and their striking magnitude when cumulated over the decades*." (Kuznets 1986).

According to Kuznets, the shift from agriculture to other sectors implied the passage from small, individually managed enterprises, to large-scale productive units, thus bringing about far-reaching changes for the economic status of the population and the division of society into economic and social classes, as well as determining the establishment of a more complex economic structure (Kuznets 1986).

7.7 Concluding Remarks

All the analyses carried out in this Chapter aimed at identifying some of the key features characterising the process of economic development and demographic growth in Italy.

As in most advanced economies, the process of demographic transition started in the last quarter of the nineteenth century and lasted until 1971–1975, but the conditions defining the demographic *bonus* were not fully translated into a demographic dividend, thus making the phase of economic development that occurred between the 1950s and the 1970s a *unicum*, an event that cannot be repeated anymore.

Italy could not really achieve the conditions required to fully exploit the demographic dividend, since during the phase of maximum potential of demographic transition the country had not yet adopted the reforms of the education and training systems needed to increase investments in human capital.

Even if significant progress were made with respect to life expectancy at birth, if knowledge indicators (adult literacy rate and gross enrolment ratio) are taken into account the situation – though significantly improved in absolute terms – "*remains completely unchanged*" in terms of international rankings (Conte et al. 2007), with Italy always in the last positions compared with the other advanced countries.

For much of its recent history, at least until the mid-1960s, Italy did not encourage participation in higher levels of education, keeping down compulsory school attendance, failing to provide a comprehensive system of scholarships to facilitate school attendance of children from low income households, and failing to promote tertiary level education. Hereupon, the gross enrolment ratio in Italy remains far from that of most advanced countries, confirming the fact that the Italian school system is still a major cause of backwardness. As noted, education has many positive consequences: better training raises labour productivity and the adoption of innovative technologies and tools; though from a social perspective, a particularly skilled formed human capital reduces illegal behaviour and discourages organised crime.

Although Italy – in particular its southern areas – has always been characterised by a high propensity to save as a legacy of a predominant rural society, saving has seldom translated into productive investments, with a negative effect on the average productivity per employee. This is due to a number of reasons: the lack of a modern entrepreneurial class; an industrial structure made up mainly of small and medium-sized enterprises and family businesses; the lack of a fully operational capital market until the 1980s; and the presence of a backward and inefficient private banking sector (Pasca di Magliano 2011).

Italy's rapid industrialisation (the economic boom) in the 1950s, initially concentrated in the North-west, then extended into the North-east and the Centre, attracted large numbers of national workers from the disadvantaged areas of the *Mezzogiorno*, fuelling an internal migratory wave from the South to the North of the country. Strictly conditioned by the features described above (low investment and low-skilled workforce), in the second half of 1900 the Italian industrial system was characterised by low value-added production, placing itself on a collision route with newly industrialised countries and unable to convert to high value-added production, for which substantial capital expenditure and highly skilled workforce are needed.

Simultaneously, what has been called the first major effort to implement a territorial policy through the institution of the *Cassa del Mezzogiorno* (1950) took place in the South. Its principal objective was to activate a broad programme of public

investments in the South and to overcome the historic Northern-Southern dichotomy that has always characterised Italy since its unification process. One of the main goals of the *Mezzogiorno* industrialisation process was to balance the costs of labour force migration that drained key resources for its development from the southern territory (Lepore 2013).

It seems, however, that something went wrong. In fact, in the first stage the *Cassa del Mezzogiorno* was able to improve the living conditions of local populations (especially in rural areas, enhancing land reforms, the modernisation of agriculture and the successful strengthening of basic infrastructures) and to offer the entire *Mezzogiorno* a strong support to launch the convergence process. Nonetheless, in the early 1970s the process showed a stagnation that continued over time and produced in the early 1990s the deepening of the North-South gap, emphasising the dependency level of Southern economy.

From a demographic point of view, between the 1950s and 1980s a remarkable increase of population in working age (see Fig. 7.15) was registered, matching perfectly with a period of rapid economic growth in all Italian regions that is considered the most rapid and sustained economic expansion Italy ever had since the unification (Sylos Labini 2003), thus providing the conditions for the economic opportunity. In addition, in the same period there were consistent internal migration flows by workforce that did not find employment in Southern regions.

Among the other factors that led to an uneven development between the different areas of the country – at sub-national level – some peculiarities of the Italian system can also be identified, that caused serious delays in the development processes of certain regions, such as: the lack of intergenerational equity, both in the use of environmental resources and in the distribution of the benefits of economic growth; the absence of an efficient system of social protection; widespread tax evasion; the lack of regulation of the labour market (since the existence of a jungle of laws and norms added up to the absence of regulations) which resulted in the consolidation of an important informal sector of the economy; and a poorly prepared and mostly corrupt political class, both at national and local levels.

In conclusion it is difficult to talk about an homogeneous demographic dividend in Italy but it is possible to refer to an internal demographic dividend that has been achieved through the transfer of labour from the South to the most industrialised areas of the country. If the South had been able to exploit the opportunities given by the programmes of economic support[6] and the favourable age structure of its population, the history of Italy would have followed a different course and would not have established the conditions for a long-lasting dualism between a richer North and a South that plod along.

[6]The International Bank for Reconstruction and Development (known as the World Bank) made a loan to the *Cassa del Mezzogiorno* of $10 million in 1951 and another of $7 million between 1953 and 1959 aimed at: addressing the gap in the southern territories and initiating a major work of productive modernisation; stimulating growth in demand through investments in the South; achieving financial stability conditions (Lepore 2013).

Acknowledgments English text revision by Laura Peci, technical expert of the Italian National Institute of Statistics – ISTAT.

References

Alesina, A., & Perotti, R. (1994). The political economy of growth: A critical survey of the recent literature. *The World Bank Economic Review, 8*(3), 351–371.

Alesina, A., & Perotti, R. (1996). Income distribution, political instability, and investment. *European Economic Review, 40*, 1203–1228.

Andria, L., Carella, M., & Pace, R. (2009). La finestra demografica: quale opportunità per i paesi a sud e ad est del Mediterraneo. *NIKE, 2*, 71–90.

Audenino, P., & Tribassi, M. (2008). *Migrazioni italiane. Storia e storie dall'ancien règime a oggi*. Milano: Bruno Mondadori.

Barro, R. J. (1999). *Inequality, growth and investment, National Bureau of Economic Research. NBER* (Working Paper Series 7793).

Bengtsson, T., Campbell, C., & Lee, J. Z. (2004). *Life under pressure: Mortality and living standards in Europe and Asia, 1700–1900*. Cambridge MA: MIT Press.

Birdsall, N. (1999). *Education: The people's asset* (Working Paper 5). Washington, DC: The Brookings Institution – Centre on Social and Economic Dynamics.

Bloom, D. E., & Williamson, J. G. (1998). Demographic transitions and economic miracles in emerging Asia. *World Bank Economic Review, 12*(3), 419–456.

Bonifazi, C., Chieppa A., & Heins, F. (1999). Le migrazioni interne meridionali: un'analisi a livello provinciale. In *Mezzogiorno e migrazioni interne*, Monografia 10 Roma: IRP-CNR.

Carella, M., & Mastrorocco, N. (2002). La récente évolution de la mobilité interne par niveau d'instruction du Mezzogiorno vers le Centre et le Nord de l'Italie. In *La Migration Sud-Nord: la problématique de l'exode des compétences*. Rabat: AMERM.

Conte, L., Della Torre, G., & Vasta, M. 2007. The human development index in historical perspective: Italy from political unification to the present day. *Quaderni del Dipartimento di Economia Politica* 491. Università degli Studi di Siena.

Daniele, V. (2002). Divari di sviluppo e convergenza regionale in Italia. Un esame per il periodo 1960–1998. WP 2002.

Daniele, V., & Malanima, P. (2007). Il prodotto delle regioni e il divario Nord-Sud in Italia (1861–2004). *Rivista di Politica Economica* XCVII.

Daniele, V., & Malanima, P. (2014). Perché il Sud è rimasto indietro? Il Mezzogiorno fra storia e pubblicistica. *Rivista di Storia Economica, 1*, 1–24.

Di Bartolomeo, A. et al. *(*2009). *Vital events and economic conditions: Testing the Malthusian theory on Northern Italy's historical data (1650–1860).* Conference IUSSP, Marrakech.

Di Comite, L., & Pace, R. (2002). L'Italia tra emigrazione ed immigrazione. In A. Dentremont et al. (Eds.), *Homenaje a Manuel Ferrer Regales* (pp. 83–108). Pamplona: Ediciones Universidad de Navarra.

Ehrlich, I., & Lui, F. T. (1991). Intergenerational trade, longevity and economic growth. *Journal of Political Economy, 99*, 1029–1059.

Favero, L., & Tassello, G. (1978). Cent'anni di emigrazione italiana (1876–1976). In G. Rosoli (Ed.), *Un secolo di emigrazione italiana: 1876–1976* (pp. 9–63). Roma: Centro Studi Emigrazione. file:///C:/Users/Utente/Desktop/491.pdf.

Galor, O. (2000). Income distribution and the process of development. *European Economic Review, 44*, 706–712.

Galor, O. (2005). From stagnation to growth: Unified growth theory. In P. Aghion & S. Durlauf (Eds.), *Handbook of economic growth* (pp. 171–293).

Galor, O., & Moav, O. (2000). *Natural selection and the origin of economic growth* (Working Paper 1800). Providence Rhode Island: Brown University.
Galor, O., & Moav, O. (2001). Evolution and growth. *European Economic Review, 45*, 718–729.
Galor, O., & Weil, D. N. (1999). From Malthusian stagnation to modern growth. *American Economic Review, 89*, 150–154.
Galor, O., & Weil, D. N. (2000). Population, technology, and growth: From Malthusian stagnation to the demographic transition and beyond. *American Economic Review, 90*, 150–154.
Kaldor, N. (1956). Alternative theories of distribution. *Review of Economic Studies, 23*(2), 83–100.
Kuznets, S. (1986). *Modern economic growth: Rate, structure, and spread*. New Haven: Yale University Press.
Lepore, A. (2013). *La Cassa per il Mezzogiorno e la Banca Mondiale: un modello per lo sviluppo economico italiano*. Soveria Mannelli: Rubbettino.
Livi Bacci, M. (1998). *La popolazione nella storia d'Europa*. Roma: Laterza.
Maccheroni, C., Bruzzone, S., & Mignolli, N. (2007). *La mortalità degli stranieri in Italia: metodi di misura a confronto. Quaderni del Dipartimento per lo studio delle società mediterranee*. Bari: Cacucci Editore.
Malanima, P. (2002). La ricchezza e la povertà dell'Italia. Le risorse naturali. In P. Ciocca & G. Toniolo (Eds.), *Storia economica d'Italia* (Vol. 3). Roma: Laterza.
Malanima, P. (2006). Alle origini della crescita in Italia 1820–1913. *Rivista di Storia Economica*, XXII.
Malthus, T. (1798). *An essay on the principle of population*. London: J. Johnson, in St. Paul's Church-yard.
Meldolesi, L. (1998). *Dalla parte del Sud*. Roma: Laterza.
Natale, M. (2002). *Economia e popolazione. Alcuni aspetti sulle interrelazioni tra sviluppo demografico ed economico*. Milano: Franco Angeli.
Pasca di Magliano, R., et al. (2011). Il Mezzogiorno d'Italia: discontinuità per uno sviluppo responsabile. *Le politiche per l'uscita dalla crisi Europa Mediterranea e America Latina a confronto*. XII Meeting of Economists of Neolatin language. Coimbra, 21–22 ottobre 2011.
Persson, T., & Tabellini, G. (1994). Is inequality harmful for growth? *American Economic Review, 84*(3), 600–621.
Pool, I. (2007). Demographic dividends. Determinants of development or merely windows of opportunity? Oxford Institute of Ageing. *Ageing Horizons, 7*, 28–35.
Reher, D. (2011). Economic and social implications of the demographic transition. In Ronald D. Lee & David S. Reher (Eds.), *Demographic transition and its consequences*, (pp. 11–33). Population and Development Review (a Supplement to Vol.37).
Saint Paul, G., & Verdier, P. (1996). Inequality, redistribution and growth. A challenge to the conventional political economy approach. *European Economic Review, 40*, 719–728.
Sylos Labini, P. (2003). *Scritti sul Mezzogiorno (1954–2001)*. Manduria: Lacaita.
Tapinos, G. (1996). *La démographie: population, économie et sociétés*. Paris: Éditions de Fallois.
Wolleb, E., & Wolleb, G. (1990). *Divari regionali e dualismo economico*. Bologna: Il Mulino.

Notes on Contributors

Maria Carella Senior Lecturer of Demography at the Department of Political Sciences, University of Bari 'Aldo Moro'. She has been member of the board for the PhD programme in Programme in Economics and Population Development at the Department of Political Sciences, University of Bari. Her research interests are demographic dynamics in the Mediterranean Basin, the demographic window of opportunity and age structure in non-industrialized countries and international migrations.

Yoonjoung Choi Senior Technical Advisor for Population and Metrics in the Office of Population and Reproductive Health, US Agency for International Development. She is a demographer with experience in impact evaluation research and monitoring multilateral health assistance programmes. She currently serves as a technical advisor to the demographic and health survey programmes. Her research interests include household and health facility survey methods, data quality assessment, as well as demographic impact on social and economic development.

Roberto Ham-Chande Full Professor at El Colegio de la Frontera Norte (Tijuana, Mexico). Former Actuary for the Mexican Institute for Social Security (IMSS) and for the Institute for Social Security for Public Employees (ISSSTE). Past appointment as Chairman of the Department of Population and Urban Studies of El Colegio de México. Over 100 publications including books, chapters and articles published in USA, Belgium, Malta, Japan, India, Brazil, Argentina, Chile and Mexico. National Award on Demography 2009 from the Presidency of Mexico. Research interests include demography of ageing, social security and healthy life expectancy.

Natalie Jackson Adjunct Professor of Demography at Massey University, New Zealand, and Director of Natalie Jackson Demographics Ltd. Between 2010 and 2014, she was Professor of Demography and Foundation Director of the National

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9

Institute of Demographic and Economic Analysis at the University of Waikato. She currently leads a New Zealand Royal Society Marsden funded project 'The subnational mechanisms of the ending of population growth – towards a theory of depopulation', and is member of another large grant team investigating the demographic diversity dividend in Aotearoa/New Zealand.

Anrudh K. Jain Distinguished Scholar at the Population Council in New York conducts social science research and policy analysis on international population and reproductive health, particularly family planning quality of care, unmet need for family planning and HIV risk reduction. His work bridges the gap between demographic and reproductive health perspectives in population policies and programmes. Previously, as vice president of international programmes, he was responsible for managing council's activities in developing countries. He has collaborated as a founding member in setting up the African Population and Health Research Center in Nairobi and served on its board of directors until 2005.

Ciro Martínez Consultant in Population and Development at CELADE, Population Affairs Office of CEPAL. He is member of the research group on Demographic Bonus and National Transfer Accounts. He has been National Advisor on Population and Development at National Office of UNFPA in Colombia. He has been Chief of Social Indicators Division at Colombian National Planification Office. He has been Director of National Census in Colombia. His main research interests are economic implications of demographic dynamics and migration internal and international.

Nadia Mignolli Senior Researcher of the Italian National Institute of Statistics (Istat) in the field of socio-demographic statistics, she deals with the stages of the production process of specific statistical sources, with standardisation and modernisation issues and with several research topics. Her main research areas are health care, health and social protection, particularly with regard to the conditions of the non-national population residing in Italy and in the countries of origin and citizenship; geographical differences; statistical methods for the integration and harmonisation of data, in order to maximise the potential of statistical sources available and the characteristics of the processes; social policy and employment.

Tim Miller Chief of the Population and Development Area of the Latin American and Caribbean Demographic Centre (CELADE) – Population Division of the United Nations Economic Commission for Latin America and the Caribbean (ECLAC). Before joining ECLAC in 2007, he served as Population Affairs Officer for 8 years at the Population Division of the Department of Economic and Social Affairs (DESA) of the United Nations in New York. Throughout his career of over 30 years, he has worked on various issues related to population and development, particularly the social and economic impacts of demographic changes and population ageing.

Isalia Nava-Bolaños Research Investigator at the Universidad Nacional Autónoma de México (UNAM). She is responsible for development and public policy research unit. She is coordinator of the Working Group 'Demography of Aging in Latin America' of the Latin American Population Association. She is responsible for two national projects of demography and economy. She received the Gustavo Cabrera Award (1st place best in population research, 2013). Her research interests are demography and economics, economic impacts of population dynamics, economy and ageing population, and gender and economics.

Roberta Pace Associate Professor of Demography at the Department of Political Science, University of Bari 'Aldo Moro'. Responsible of the University of Bari for demographic data. She has been Coordinator of the PhD programme in Economics of Population and Development. She is coordinator of several international exchanges with European universities. Her research interests are demographic implications of economic development, international migration, sustainable development, demographic processes and demographic trends in the Mediterranean.

Alain Parant Scientific Adviser at Futuribles International (Paris, France) and member of editorial board of Futuribles journal. He has been demographer of the French National Institute for population studies (INED, Paris, France) centring more particularly his researches on population ageing and demographic applied foresight.

Paulo Saad Chief of the Population and Development Area of the Latin American and Caribbean Demographic Centre (CELADE) – Population Division of the United Nations Economic Commission for Latin America and the Caribbean (ECLAC). Before joining ECLAC in 2007, he served as Population Affairs Officer for 8 years at the Population Division of the Department of Economic and Social Affairs (DESA) of the United Nations in New York. Throughout his career of over 30 years, he has worked on various issues related to population and development, particularly the social and economic impacts of demographic changes and population ageing.

Author Index

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9

Subject Index

R. Pace, R. Ham-Chande (eds.), *Demographic Dividends: Emerging Challenges and Policy Implications*, Demographic Transformation and Socio-Economic Development 6, DOI 10.1007/978-3-319-32709-9