

Demographic Dividend or Demographic Threat in Pakistan?

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Population growth and size have remained the focus of debate for centuries but the recent demographic transition in developing countries has made social scientists take note of the changing age structure of the population as well. As a result of declining population growth and consequent changes in age structure, the proportion of working-age population is increasing in most developing countries. An associated decline in the dependent age population offers a window of opportunity, referred to as the 'demographic dividend'. Pakistan is also going through the demographic transition, and is experiencing a once-in-a-lifetime demographic dividend as the working-age population bulges and the dependency ratio declines. This paper looks into the demographic dividend being offered to Pakistan and its implications for the country, mainly through three mechanisms: labour supply, savings, and human capital. For economic benefits to materialise, there is a need for policies dealing with education, public health, and those that promote labour market flexibility and provide incentives for investment and savings. On the contrary, if appropriate policies are not formulated, the demographic dividend might, in fact, be a cost, leading to unemployment and an unbearable strain on education, health, and old age security.

JEL classification: J10, J11, J21

Keywords: Demographic Dividend, Age-structure, Demographic Transition, Pakistan

INTRODUCTION

Ever since Malthus gave his apocalyptic views, in the late 18th century, on ever-increasing population and starvation, a debate has persisted over the relation between population growth and economic growth and development. Social scientists, mainly economists and demographers, continue to argue whether population growth encourages, discourages or is independent of economic growth.¹ The focus of this debate however has mainly remained confined to population size and growth, giving little consideration

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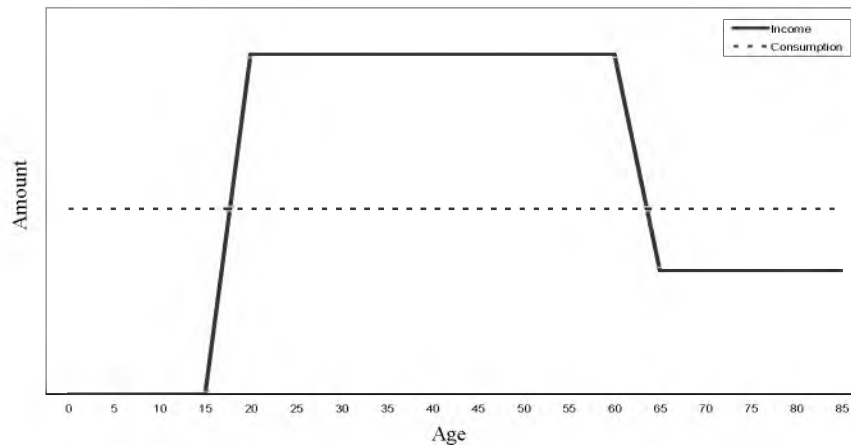
Author's Note: The author is indebted to Dr Nadeem Ul Haque for his comments and suggestions on this paper, and also for motivating me to think and work harder. All errors and omissions, of course, remain the responsibility of the author.

¹The views generated by this debate can be classified into three schools of thought. (1) *The pessimists:* who believe that population growth restricts economic growth. They argue that world with its fixed resources for growing food would not be able to feed the growing population leading to widespread starvation and death. Proponents of this view include Malthus (1798) and Ehrlich (1968). (2) *The optimists:* who think that population growth can promote economic growth. Kuznets (1967), Simon (1981, 1986), and Boserup (1981) are some who subscribe to this view, as does Srinivasan (1988) who attributes lack of economic growth more to inappropriate institutions and policies than to rapid population growth. (3) *The neutralists:* who propose that population growth has no relation with economic growth. They, including, Kelly and Schmidt (1995), Kelley (2001) and Bloom and Freeman (1986), propose that controlling for factors like educational attainment, openness to trade and civil institutions, there is little evidence available that population growth promotes or restricts economic growth.

to the age structure of the population. Bringing age structure dynamics in this debate can be attributed to Coale and Hoover (1958), who argued that sustained high fertility and falling mortality make governments and households burdened with high youth dependency rates, lowering tax revenues and household savings, respectively.

Economists have recently begun to focus on the impact of changing age structure of the population moving beyond the Malthusian emphasis on population growth [Mason (2005); Birdsall, *et al.* (2001); Sachs (2002); Bloom and Canning (1999); Bloom and Freeman (1986); Bloom and Sachs (1998); and Bloom and Williamson (1998)]. The interest in relation between population change and economic growth has reignited because of the demographic transition taking place in the developing countries, which are at varying stages in experiencing declining fertility and mortality rates. The life cycle consumption model suggests that different age groups in a population have different economic implications. The young need investment in health and education, adults supply labour, income and savings and at old ages there is a need for retirement income and, again, a requirement to invest in health. As the relative size of each of these age groups change in the population similar is the respective impact of the economic behaviour associated with different ages. This relation is summarised in the lifecycle income and consumption model, a schematic representation of which can be found in Figure 1. As a result of declining population growth and consequent changes in age structure, the proportion of working-age population is increasing in most developing countries, offering a window of opportunity to these countries, referred to as the 'demographic dividend'.

Fig. 1. Lifecycle Income and Consumption



Source: Adapted from Bloom, *et al.* (2001).

The demographic dividend can be defined as the potential economic benefit offered by changes in the age structure of the population, during the demographic transition, when there is an increase in working-age population and an associated decline in the dependent age population. What needs to be emphasised here is that economic gains from demographic dividend are not certain, as the term might misleadingly imply.

Economic returns are not solely function of demographic dividend. For economic benefits to materialise there is a need for policies dealing with education, public health and those that promote labour market flexibility, and provide incentives for investment and savings. On the contrary, if appropriate policies are not formulated demographic dividend might, in fact, be a cost, leading to unemployment and an unbearable strain on education, health and old age security.

Pakistan is also going through the demographic transition, with fertility rates finally showing a declining trend. It is now experiencing a once in a lifetime demographic dividend as the working-age population bulges and the dependency ratio declines. This paper looks into the demographic dividend being offered to Pakistan and what it holds for the country in future. The paper is divided into five sections. After giving an introduction to the topic, section two gives a brief account of the literature on issues related to demographic dividend. Section three looks into the demographic evolution leading to the demographic dividend in Pakistan, while section four examines the key mechanisms that can influence the ability to capitalise on the demographic dividend in Pakistan. The last section deals with conclusions of the study and policy implications that emerge from it.

I. WHAT IS THE “DEMOGRAPHIC DIVIDEND”?

The term ‘demographic dividend’ has its origin in a study of the East Asian growth carried out by David Bloom and Jeffrey Williamson [Bloom and Williamson (1998)]. Bloom and Williamson used aggregate quantitative data to carry out cross-country econometric regressions with the objective of calculating the contribution made by age structure dynamics to the boom in the East Asian economic growth late last century. They identified the role of changing age-structure in economic take-off in East Asia, and found demographic dividend to account for between one-fourth and two-fifths of East Asia’s “economic miracle” [Bloom and Sachs (1998); Bloom and Williamson (1998); and Bloom, Canning, and Malaney (2000)]. And later the work by Mason (2001) confirmed the results of the analyses carried out by Bloom and colleagues.

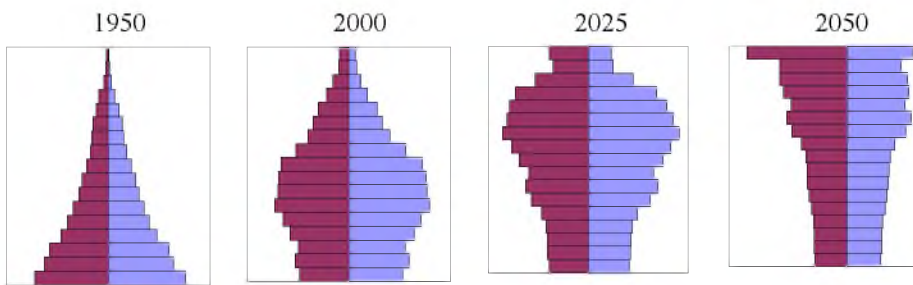
The demographic dividend occurs when decline in birth rate, which normally follows mortality decline with the onset of the demographic transition, leads to changes in age structure of a population. The impact of changes in crude death rate and crude birth rate over the demographic transition cycle is not fully encapsulated by population growth rate alone. Three important demographic scenarios result because of the lag between changes in fertility and mortality rates. One is a temporary rise and a subsequent fall in population growth rate. The other is a delayed change in the ratio of working-age population to total population. During the first phase, characterised by a decline in crude death rate from the pre-demographic transition level, the working-age ratio undergoes an initial decline as the decline in crude death rate tends to be concentrated in early childhood, creating a population bulge in the young age groups. During the second phase of the demographic transition, in which crude birth rate declines from the pre-demographic transition level, the population bulge enters and stays in the working-age group, and the rate of growth of the working-age population surpass that of total population, with a consequent increase in the working-age ratio. During the third phase the population bulge moves out of the working-age group and enters the old age category.

The gap between the rates of growth in the working-age population and total population is now reversed resulting in a decline in the working-age ratio.

The essence of demographic dividend thus is that the young and the old tend to consume more than they produce, unlike working-age population, who contribute more to output and savings than they consume [Mason (1988); Higgins (1998); Higgins and Williamson (1997); Kelley and Schmidt (1996); Lee, Mason, and Miller (2000); and Leff (1969)]. Consequently, the value of output per capita tends to increase when the population of working-age individuals is relatively large and tends to decrease when a relatively large part of the population consists of young and elderly dependents.

Korea's experience of demographic transition can be taken as a case to illustrate the process of changing age-structure, presented in Figure 2. Demographic transition in Korea followed a very steep path, turning one of the youngest populations out of the more developed economies in 1950s into one of the oldest by the middle of the 21st century [Phang (2005)]. Rapid fertility decline and consistent decrease in mortality shrunk the base of the population in Korea, leading first to a bulge in the working-age population (that is, the "demographic dividend" phase) and then to aging of the population.

Fig. 2. Korea 1950-2050 from 'Demographic Dividend' to an Old Population



The 'demographic dividend' leads to opportunities for growth in output per capita in two principal ways. One, there is an age-structure impact on total GDP due to increasing proportion of working-age group in total population, increasing the ratio of producers to consumers. This situation, naturally, is extremely favourable to the growth of output per capita [Bloom, *et al.* (2001)]. Fertility decline can also add to this 'composition effect' by relieving women from their childbearing responsibilities and enabling them to enter the labour market.

Two, there are behavioural effects of changing age structure. This behavioural impact reflects itself in many ways. An increasing proportion of working-age individuals in a population enhances overall productivity, with improved skill level of the workers contributing to it. As discussed earlier, there are changes in aggregate saving and consumption following the life cycle pattern. Increase in savings can make capital more available and thus relatively cheaper. Another behavioural effect can arise from the changing attitudes to the status of females, leading to increased female enrolment and consequently more educated females in the labour force. The sum total of all these behavioural effects has the potential to further increase per capita output.

It is worth repeating the fact that demographic dividend is a time specific window of opportunity, and is not going to last forever. With time, the age-structure changes again, as the large adult population grows old, and become less productive. At this stage the dependency ratio rises again, as does the level of intergenerational transfers, but in the reverse direction. It is now a question of the care and support needs of the aged, instead of providing sustenance to a large young population. As aptly put by Mason, “seizing the opportunities implicit in the dividend is not just about creating opportunities for the young. Increasingly successful policies for stimulating economic growth and reducing poverty will be about policies for the elderly” (2005, p. 6).

The demographic dividend is thought to be delivered through the interplay of three interconnected mechanisms [Bloom, *et al.* (2001)]. These are:

Labour Supply: As the demographic transition follows its path, children born during the high fertility years enter adult life and become workers. However, sound policies are needed to be in place before the demographic transition to train and educate them, so that they are not left unemployed. Women are more likely to enter the labour force as fertility rates decline and they are released from their childrearing responsibilities sooner to be able to be part of the labour force. Also, as the transition moves forward, younger women may tend to become better educated than those in the older cohorts, and are thus more productive in the labour force. This assumes that provision would be made to create more jobs and accommodate the growing numbers of workers entering the labour force, thus seizing the ‘dividends’ of the changing age-structure.

Savings: The demographic transition also promotes the growth of savings, improving the country’s ability for investment and growth. Prime working-age adults have the potential to earn more and thus can save more than new entrants to the labour market, which can encourage personal and national savings. Deaton and Paxson (1997) believe that people tend to save more between the ages of 40 and 65, when they are less likely to be investing in their young children and the need to prepare for their retirement is becoming more dominant. Likewise, improved health and longevity, which are by-products of the demographic transition, make savings easier and more attractive. Personal savings can continue to grow and be able to serve as a source of investment that can stimulate economic growth, as was the case in the East Asian countries [Krugman (1994); Higgins (1998); and Kelley and Schmidt (1995, 1996)]. Countries can thus move from being heavily dependent on external finance to a position of relative financial self-sufficiency.

Human Capital: Demographic transition affects investment in human capital. These effects are least evident but have far-reaching implications. Increase in life expectancy makes people think differently about education, family, retirement, status and role of women and labour force participation. Fewer children means better educated ones as more investment is allocated to each individual child, including girl child, making them more productive workers once they enter the labour force. Female participation in the labour force enhances the social status and personal and financial independence of women which in turn improves the productivity of a population as a whole.

All these mechanisms, however, depend on the policy environment of the country. Health and education can only improve if there is a provision for quality health and

education. Likewise, savings can only increase if people have access to acceptable savings mechanisms and have confidence in the domestic financial markets [Bloom, *et al.* (2001)]. It is these institutional differences that make a certain country take full benefit of the ‘dividend’ provided by the demographic change while some do not, examples being the East Asian and Latin American countries, respectively [Phang (2005); Mason (2003)].

The East Asian experience is an example for other countries. The East Asian countries were the first to complete the demographic transition outside the Western countries. The fertility decline in this region was unusually sharp and the development success of the region is unparalleled [Mason (2003)]. These countries progressed not just in per capita income but also health, education, poverty reduction and income equality. The key to their success was human resource base, success at employment growth and high rates of saving and investment [Feeney and Mason (2001); Bauer (2001)]. The East Asian “economic miracle” shows how reduced fertility can help create conditions for vigorous economic growth. Declining mortality, followed by declines in fertility, resulted in a rapid demographic transition in the region between 1965 and 1990 and the working-age population grew four times faster than the dependent population. Strong educational systems and trade liberalisation policies enabled national economies to absorb this bulge in the workforce numbers. The demographic dividend was fully seized, evident in the region’s spectacular economic boom, with the real per capita income growth averaging six percent per year between 1965 and 1990. As stated earlier, the demographic dividend accounted for approximately one-fourth to two-fifths of the economic growth in the East Asian region [Bloom, Canning, and Malaney (2000); Bloom, Canning and Sevilla (2001); and Mason (2005a)].

II. EVOLUTION OF DEMOGRAPHIC TRANSITION AND DEMOGRAPHIC DIVIDEND IN PAKISTAN

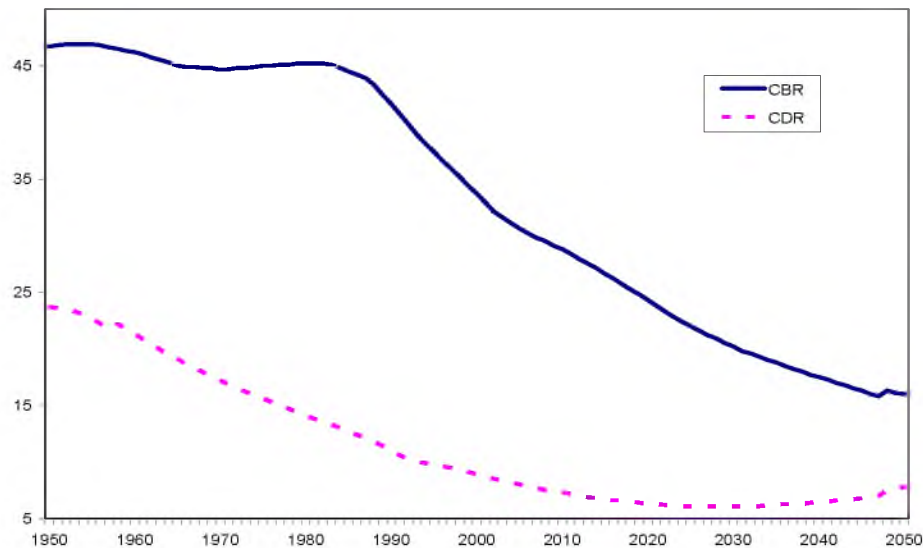
Pakistan is among those Asian countries that made late entry to the demographic transition. Using the UN projections (2005), this section looks into what the future may hold for Pakistan demographically. UN projections provide three variants—low, medium and high—and the present paper mainly uses the medium variant to analyse the dividend demography has offered Pakistan, however scenarios based on low and high variants are provided in Appendix². Since projections are as good as the assumptions they are based on, they can never claim to be an exact reflection of future happenings, yet they do give some indication of what things could look like.

Demographic transition is characterised by the decline in mortality followed by the decline in fertility, and it is the difference between the two that defines the natural increase in a population. Figure 3 shows the long-term trend in crude birth rate (CBR) and crude death rate (CDR) in Pakistan. The CBR peaked at about 45 in the late 1970s to early 1980s, when the demographic transition took off and decreased to 30 births per

²Population projections ascribed to by sources in Government of Pakistan correspond more to the low variant of the UN projections. Medium variants of UN population projections are, however, primarily used in this paper to have a more balanced view of the future instead of using the low or high variant that in a way present the ‘best’ and ‘worst’ case scenarios for Pakistan. Details regarding the low and high variants of population projection in Pakistan, however, could be found in the Appendix.

1000 population by the year 2006. By 2050 it is expected to almost half, at 16 births per 1000 population. The CDR has progressively declined from 24 deaths per 1000 population in 1950 to approximately eight in the year 2006. It will continue to decline before increasing again after year 2045. This increase would be due to the changing age structure of the population, which would then have a bigger proportion of elderly population.

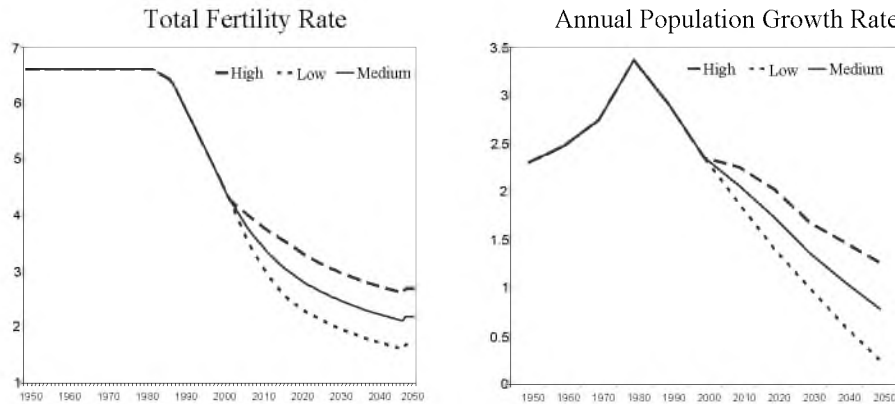
Fig. 3. Crude Death and Crude Birth Rates: Pakistan, 1950–2050



Source: Medium Variant: UN (2005).

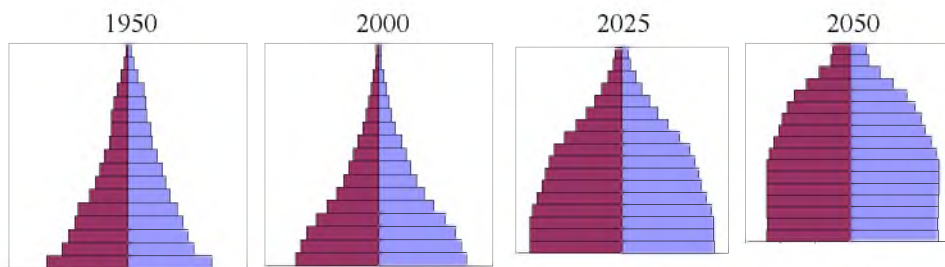
Figure 3 showed that natural increase in the population was largest in the 1980s, and Figure 4 presents this trend even more clearly, where the population growth rate could be found peaking in 1980s, hovering around 3.5 percent increase per annum. The growth rate gradually begins to decline after mid-1980s, reaching a growth rate of two percent per annum by the year 2006. The population is expected to keep growing till 2050 albeit at a slower rate of 0.78 percent per annum [Medium Variant, UN (2005)]. The low and high variants project a growth rate of 1.26 and 0.25, respectively, by the year 2050 (Figure 4).

Figure 4 also shows the historical trend of the total fertility rate (TFR) of Pakistan. It was during the '90s that Pakistan had a major shift in fertility decline, with the rate falling from over six children per woman to around 4.5 children per woman by the year 2000. The TFR is expected to continue to fall, reaching a near replacement level by 2050, according to the medium variant [UN (2005)]. The low and high variant foresees a TFR of 1.69 and 2.69 children per woman by 2050 in Pakistan (Figure 4). If the low variant of population projection is translated into reality, Pakistan should reach replacement level fertility by 2027, as against 2047 projected by the medium variant [UN (2005)].

Fig. 4. Total Fertility Rate and Population Growth Rate: Pakistan, 1950–2050

Source: High, medium and low variant: UN (2005).

The changing age structure of the population can be best represented in population pyramids. Figure 5 shows the changing age structure of population in Pakistan over a century (for years 1950, 2000, 2025 and 2050). We can see that not much fertility decline took place from 1950 to 2000 and the age structure still appears like a classic pyramid, however, the base does show a slight shrinking. In the 25 years after 2000, the population age structure shows an apparent change, with the base losing its pyramid appearance. In the subsequent twenty-five years the age structure is projected to change drastically, from what it looked like fifty years earlier, and approach an almost cylindrical shape. The decreasing fertility makes the base lighter and due to the past high fertility rates an echo generation, which now comprises working-age adults, moves its way through the demographic evolution of the country's population, making the centre heavy. The top of the pyramid, though still narrow, shows a widening trend with the share of the elderly gradually increasing in the population.

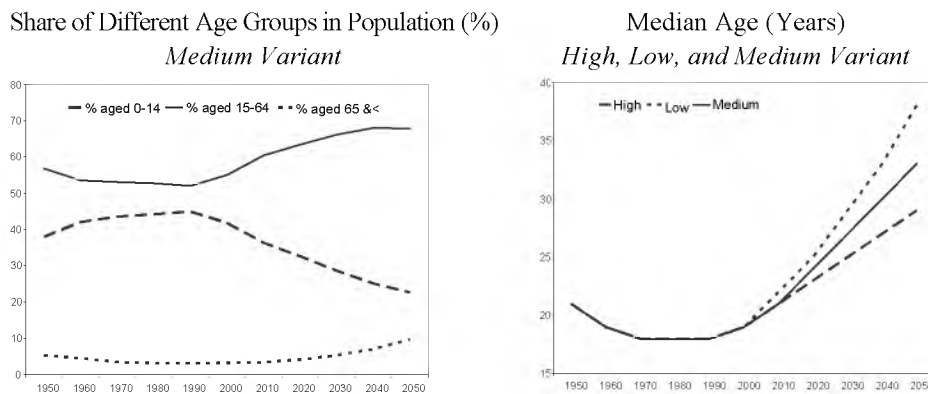
Fig. 5. Population Pyramids of Pakistan: Changes over Time, 1950–2050

Source: Based on medium variant, UN (2005).

Needless to say, fertility decline in Pakistan has lagged far behind many countries in Asia, even in South Asia. However, now that the demographic transition is finally taking place, corresponding changes are starting to appear in the age-structure of the population. With the shrinking young age population the proportion of working-

age population is gradually increasing, as can be seen from Figure 6. With the percentage share of 52 percent in the late 80s to early 90s, the proportion of working-age population (15–64 years) has reached almost 59 percent in 2006. The share of working-age population will peak in 2045 to 68 percent before starting to decline again, this time the reason being the growing old age population share instead of young. The approximately three percent old age population share would increase to almost 10 percent by 2050 in Pakistan [medium variant, UN (2005)]. The young age population share with decreasing fertility, naturally, shows a declining trend. From the current 38 percent in the total population the young population is expected to comprise only 23 percent of the country's population by 2050. Looking at the low and high variants we find 18 and 27 percent of the population, respectively, comprising young people by 2050 (see Figure A-1).

Fig. 6. Percentage Share of Young, Working-age and Old Population and Median Age of Population: Pakistan, 1950–2050



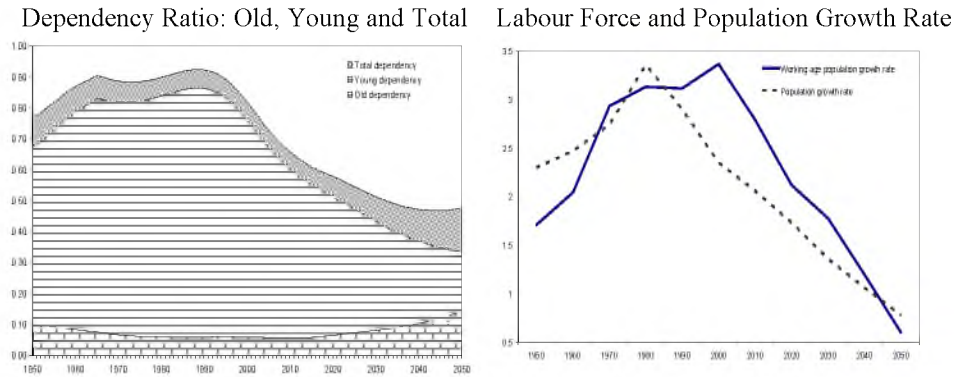
Source: Based on UN (2005).

These trends in fertility and mortality rates in the country indicate an increasing median age of the population. From a youngish median age of 20 years in 2006, it is projected to increase to an adult 33 years by 2050 (medium variant). As can be seen from Figure 6, the median age of the population in Pakistan started to increase in the 1990s and, with decreasing fertility level, the trend will continue in future. If the demographic transition follows a slower path in the country, the median age would be around 29 years by 2050, compared to 38 years if the fertility decline is more rapid (Figure 6).

All these demographic processes have resulted in decreasing the dependency ratio in the country. As we saw in Figure 6, the proportion of the population in working-ages (15–64 years) continues to increase while those in the younger ages (0–14) decrease. The proportion of the elderly in the total population is projected to show a substantial increase only after 2025. It would be then the increasing elderly population that would take the dependency ratios higher as against the 20th century when it was mainly young dependency that contributed to the total dependency ratio. Figure 7 shows the old, young and total dependency ratios in Pakistan projected till the year 2050. We can see the total dependency falling in the late 1990s till almost middle of the 21st century, along with the

young dependency, on the other hand the old dependency ratio shows an increasing trend after 2025, making the total dependency ratio increase again towards the middle of this century.³

Fig. 7. Dependency Ratio, and Working-age and Population Growth Rate: Pakistan, 1950–2050



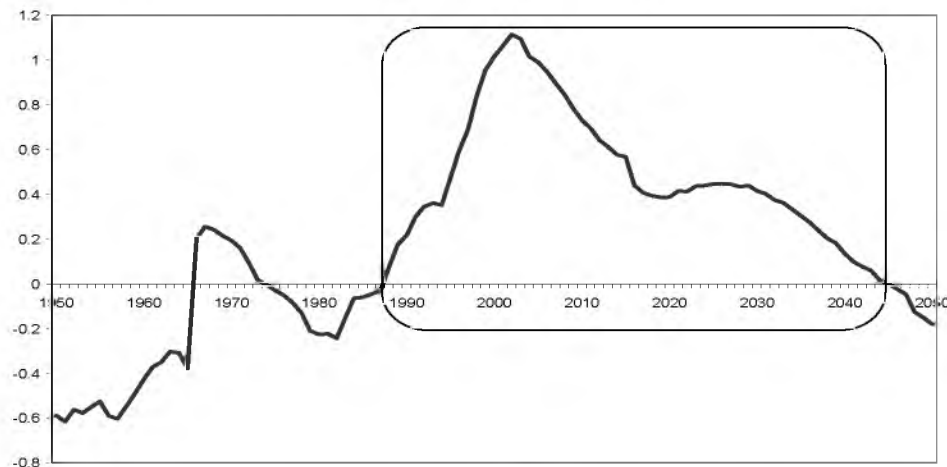
Source: Based on medium variant UN (2005).

A period of high population growth precedes the period in which there is a large share of working-age individuals in the population. As Bloom, *et al.* (2001) point out, this period is of extreme importance to a country's income growth prospects. Policies need to be formulated taking into account the relation between economic development and the effects of changing age structure of the population. This lag in growth that Bloom and colleagues talk about can be witnessed in Figure 7 where the surge in the growth of working-age population in Pakistan follows the high population growth rate with a lag of roughly 20 years (Figure 7). This surge in the working-age population is the "echo" of the high population growth in the past. The comparatively higher growth rate of working-age population during the late 1990s and roughly the first half of 2000s offer Pakistan a demographic dividend to take economic benefit from.

Just like there is gradation in dependency there is gradation in the demographic dividend offered to a country. A 70 year old is a dependent but to a smaller degree than a 90 year old [Mason (2005)]. Likewise, demographic dividend goes through a gradation of available opportunities. Theoretically, demographic dividend is the difference between the rate of growth of working-age population and total population. When the difference is in favour of working-age population, it is considered to be a window of opportunity offered by country's demography to make use of for economic growth [Mason (2005)]. Figure 8 shows that Pakistan's 'window of opportunity' opened in 1990 and is projected to shut by year 2045 (the period denoted by the box in Figure 8). The almost fifty-year long 'offer' is at its best currently (that is early 2000s) before starting to withdraw and ultimately end in 2045 (Figure 8).⁴

³For dependency ratios based on low and high variants of population projections, see Figure A-2.

⁴See Appendix Table A-1 for high, low and medium projection variants for the timing and duration of demographic dividend.

Fig. 8. Pakistan: Timing and Duration of Demographic Dividend

Source: Based on medium variant UN (2005).

Note: Inset box signifies the period of demographic dividend.

III. SOCIO-ECONOMIC IMPLICATIONS OF DEMOGRAPHIC DIVIDEND FOR PAKISTAN

Although population of Pakistan is still increasing, the changing age structure offers it an opportunity to avail for economic growth. According to Bloom, Canning and Sevilla (2001), while the population growth has a negative impact on per capita income growth, this effect is counteracted by the positive effect from growth in the share of the population that is economically active. Mason (2001), however, gives a counter-argument, positing a reverse causal mechanism in which rapid economic development and accompanied social change (modernisation, urbanisation, and changes in demographic behaviour) might have initiated or facilitated demographic transition. But, when the two processes (demographic change and economic development) take place almost at the same time, it could be a futile effort to draw a valid causal flow between the two. Therefore, instead of trying to treat the demographic change as the source of bringing about economic development in Pakistan, we will see what opportunities it offers and what are the implications of this offer for the country.

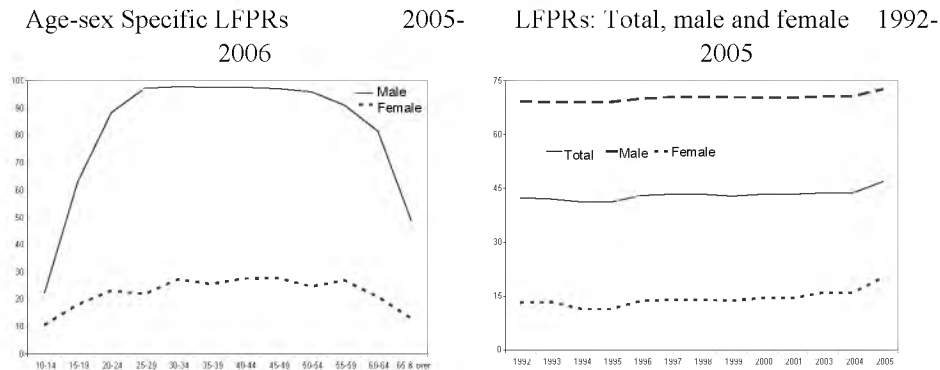
As has been previously emphasised, the demographic dividend is not inevitable but has to be earned and is also time-limited. If opportune policies are not adopted and efficiently applied, the opportunity would be missed. Failure to grab the opportunity would not only be a letdown on its own but adverse effects could also set in instead. If a right environment is provided, the population dividend can be delivered through increased and/or improved (i) labour supply, (ii) savings, and (iii) human capital [Bloom, *et al.* (2001); Mason (2002)].

Pakistan's projected period of 'demographic dividend' is from 1990–2045 [see Figure 8), which means that 15 years of this opportunity have already gone by. We now look into the implications of demographic dividend for Pakistan in the above-mentioned three key areas, namely, labour supply, human capital and savings.

Labour Supply

Demographic transition passes through a phase when it adds to the labour force in two ways. One, the number of people in the working-ages gets bigger, and two, women are more likely to enter the labour market as fertility level declines. However, it depends on the ability of the market and workers to make able use of this scenario.

Fig. 9. Pakistan: Age-sex Specific Labour Force Participation Rates, and Trend of Sex Specific Labour Force Participation Rates over a Decade

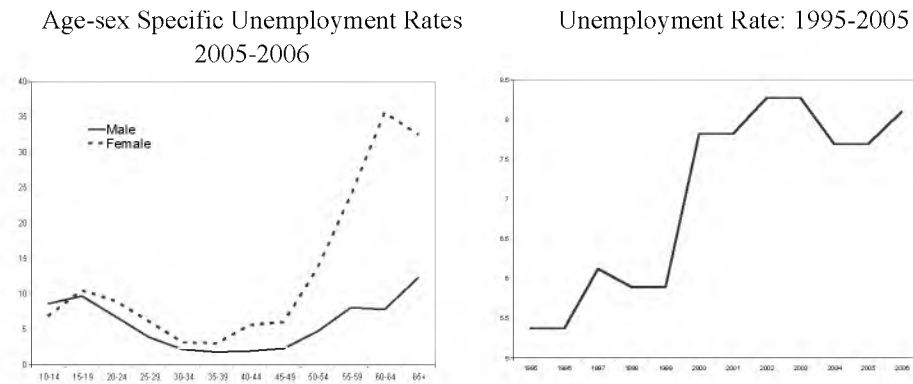


Source: Labour Force Survey 2005-2006; Economic Survey 2005-2006.

Figure 9 presents the age-sex specific labour force participation rates (LFPRs) for the year 2005-2006. The male curve shows a typical inverted-U shape, with the LFPR peaking between 25–50 years of age. The female participation remains low throughout their lifespan, showing no particular pattern. This trend of low female labour participation has persisted over time. As we can see in Figure 9, female LFPR does show a slight increasing trend but has continued to remain low over the last decade. Benefits of demographic dividend cannot be reaped with half the population not fully active in the labour market as is prevalent in the Pakistan. With only one-fifth of females in working-ages actually active in the labour market means a waste of resources that could be used to avail the opportunity the changing demography is offering Pakistan.

Being part of the labour market is only beneficial if there is ability in the market to absorb these workers. In Figure 10 we see that despite low participation rates among females, rate of unemployment is much higher for them than males. The unemployment rates are especially worth noting among older women (Figure 10). Unemployment rates climb for older ages but are especially pronounced among women aged 60 and above. This trend has serious implications for the country as the logical end of demographic transition is aging of the population. Shrinking job opportunities at older ages stress the need for flexibility not only in the labour market but also in the labour force to cope with the scenario that is bound to take place once the 'echo generation' gets old.

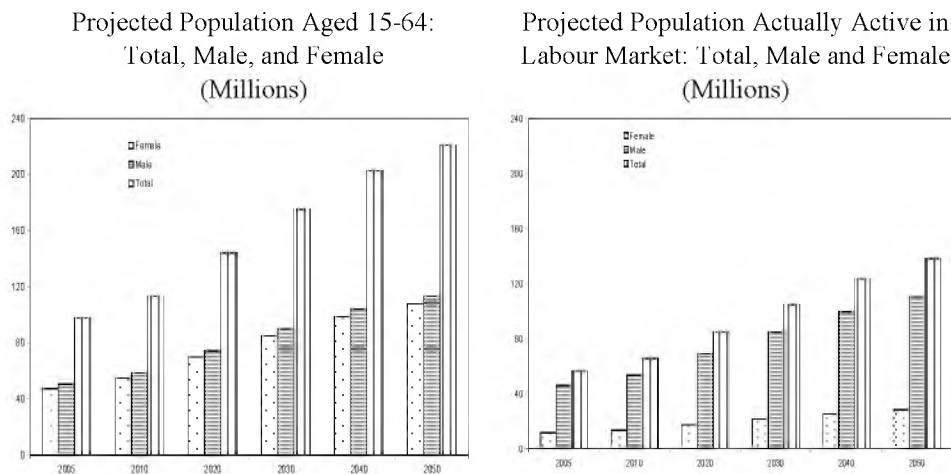
Fig. 10. Pakistan: Age-sex Specific Unemployment Rates and Unemployment Trends over Years



Source: Labour Force Survey 2005-2006; Economic Survey 2005-2006.

Despite less than full participation of working-age population in the labour force, especially females, the unemployment rate has shown an increasing trend over time. Figure 10 presents the unemployment rate over the last fifteen years, 1995-2005, in Pakistan and a generally increasing trend can be observed in the rate of those who fail to find employment. This trend is particularly worrying in the light of increasing numbers that are entering and are still going to enter the working-age groups in the country. Would the labour market be able to provide gainful employment to all those who are willing to work? Would these teeming numbers be actually a “dividend” or would they be more of a threat? The increasing unemployment rate in the country, with its growing population in the working-ages, raises serious questions about the state of employment in future.

Fig. 11. Available Workers and those Active in the Labour Market 2005–2050



Source: Based on medium variant, UN (2005) and Labour Force Survey 2005-2006.

Figure 11 shows the projected population in the working-age groups. Based on the medium variant, by the year 2030, which is not in that distant future, there would be 175 million potential workers in the population, comprising 90 million males and 85 million females, increasing to a total of 221 million individuals in working-ages by 2050. These are huge numbers to accommodate in the labour market in the absence of any sound planning. Given that no population has a 100 percent participation rate, for the sake of having a crude estimate we apply the current LFPRs, total, male and female, to the projected populations till 2050. Results of this exercise are presented in Figure 11. Despite projecting the current low female participations rates into the future, a total of roughly 105 million people would be part of the labour force by 2030, increasing to 140 million by 2050. That is roughly five and seven times, respectively, the whole population of Australia at present. It would not be wrong to say that it is a very conservative estimate as female LFPRs are bound to increase with time, adding to the total number of those looking for employment. If we take into consideration the scenario presented by the high variant the situation becomes even more threatening, with even bigger numbers entering the working-age groups and seeking employment.⁵

All this can pose a dilemma for the policy-makers in the country. Full benefits offered by the demographic dividend cannot be gained unless labour force participation rates are improved, but increased labour force participation implies generating employment for these huge numbers, which by no means is an easy task.

Savings

Lifecycle variations in productivity lead individuals to vary their savings over their lifetime in order to accommodate their consumption [Lee, Mason, and Miller (2000)]. Demographic transition thus encourages savings which in turn can boost country's ability for investment and growth. Leff (1969) did pioneering work in establishing relation between dependency ratio and savings, and found an inverse association between the two. The basic logic behind the negative association being that young and old consume more than they produce, while working-age people produce more than they consume and can save, which can contribute to the economic growth [Bloom, *et al.* (2001); Deaton and Paxson (2000, 1997); Williamson and Higgins (2001); Bloom and Canning (1999); Bloom and Williamson (1998); and Kelley and Schmidt (1995)]. However, not everyone agrees with this logic [like Kelley (1998)]. But as Mason, talking about a population's ability and willingness to save, rightly states, "The changes in age structure define possibilities, but by themselves do not determine the outcomes" (2005a, p. 22).

Pakistan's economic performance during the last three decades has been impressive with the real GNP growing at an average rate of six percent per annum. The saving rate, however, continues to show an almost horizontal trend over the years [Pakistan (2006a); State Bank (2006)]. Household income has been found to be the prime factor influencing saving behaviour in Pakistan and various studies found a strong inverse relation between dependency ratio and savings in the country [Ahmed and Asghar (2004); Khan and Nasir (1999); Burney and Khan (1992); Siddique and Siddique (1993); and Khan, Hasan, and Malik (1992)].

⁵For projected population in working-ages and those active in the labour market based on low and high variants can be seen from Figure A-3 and A-4.

All micro-studies in Pakistan on saving behaviour take household as the unit of analysis which, by design, cannot explicitly measure the effect of changing age-structure of the population on savings, as they generally take the age of the head of the household to estimate the relation between age and savings. Lifecycle profiles are ideally constructed for individuals and not households. As also found out by Deaton and Paxson (2000) while analysing savings in Taiwan, a hump-shaped age-saving profile exists in the population. This is consistent with the hypothesis that greater dependency ratio depresses savings.

A more precise estimation of demographic dividend requires an age profile of: (i) age distribution; (ii) consumption; and (iii) income. For Pakistan such an exercise would be very cumbersome at present due to the absence of any age-specific consumption data and would require a lot of indirect estimation (which is beyond the scope of this paper and would be dealt with separately). No matter what the method of estimation is, two things are almost certain. One, there is an inverse relation between dependency ratio and savings, and two, which is more significant, that savings are important at both national and personal level. At the national level, savings are needed to finance investment and growth, while at the personal level they are vital to maintain a standard of living through the period of retirement. This is truer for Pakistan where no state sponsored social security exists and individuals are primarily reliant on their own savings during older ages.

Aging of population is the inevitable end of demographic transition, and Pakistan, albeit slowly, is moving towards it. In the absence of any state planned old age security system and the existing low saving rates in the country, the demographic dividend can turn into a demographic nightmare for majority of the elderly if they do not increase their savings during their prime working-age.

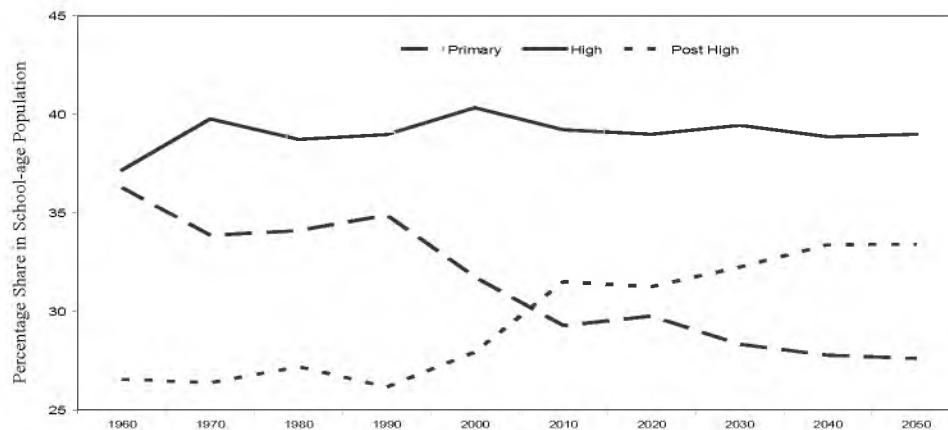
With reference to savings, worth mentioning here is the phenomenon referred to as the 'second demographic dividend' in literature [Lee and Mason (2007)]. Differences can exist among the impacts of the changing age distribution at different phases of the demographic transition. The increasing old dependency ratio, unlike the rising ratio of children, can lead to substantial increase in assets per capita and in capital per worker [Lee and Mason (2007)]. The 'second dividend' depends not just on the lifecycle earnings and consumption of the aging population but also their asset accumulation and saving behaviour. Increased savings thus not only secure an elderly as an individual but also provide potential for a 'second dividend' to the economy.

Human Capital

It is premised that demographic transition has significant effect on investment in human capital. Increasing life expectancy makes parents invest more in their children's human capital as the premium of higher education increases and lasts longer. As a consequence, the labour force becomes more productive, gets higher wages and there is improvement in the standard of living [Bloom, *et al.* (2001)]. With shrinking of young population pressure on the education system is reduced, which can help countries to invest more in improving the quality of education and in higher levels, rather than in making investment in basic education. It cannot be emphasised enough that it is not the quantity but the quality of education that is more important for human capital formation and economic growth [Dupreiz (2003)].

With half the population still illiterate and only 2.6 percent educated up to graduate level [Pakistan (2006a)] the state of education in Pakistan does not present a rosy picture. To make things worse, it is not just a matter of poor 'quantity' but the quality factor is even more questionable. With the advent of demographic transition in Pakistan, the proportion of population entering primary school⁶ ages is bound to decline, followed by a decline in proportion of high school ages (Figure 12). A corresponding increase is projected to take place in the proportion of post-high school goers in the population, see Figure 12.⁷ From 1960 to 2050, the proportion of population in high school ages does not show the kind of shift that is visible in primary and post-high school ages, for which the trends are almost reversed over time (Figure 12). This provides an opportunity to invest more in the higher levels of education instead of lower levels.

Fig. 12. Percentage Share of School Going Population for Different Educational Levels: Pakistan, 1950-2050



Source: Based on medium variant, UN (2005). For low and high variants, see Figure A-5.

The question facing Pakistan right now is to first get all its children to school and it is only then, with the passage of time, that we can hope them to reach higher levels. Countries in East Asia took full advantage of demographic dividend because they made timely investments in primary and then secondary education. The result of this investment in these countries in education reflected in more productive labour which was able to seize the opportunity offered by demographic dividend [Phang (2005); Mason (2003, 2005)]. Just by having school going population in the "right" proportions does not make the demographic benefits automatic. In the absence of any planning it can only result in large segments of population which are uneducated, unskilled and ill-equipped to adapt to the changing world conditions, at both micro and macro level.

The point to ponder here is that if universal primary enrolment could not be achieved in Pakistan with the current size of the primary school going population, what

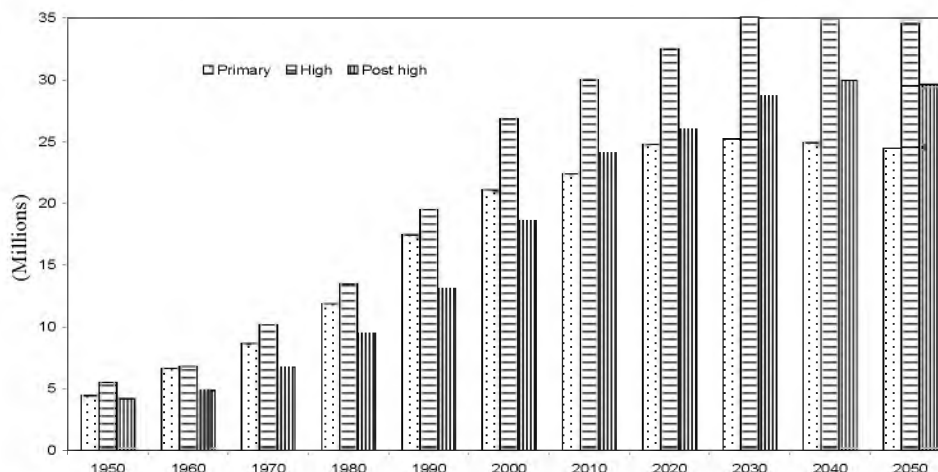
⁶'School' refers to all levels of education in this paper, be it primary, high (middle to intermediate) or post high (degree and professional levels).

⁷For share of school going population for different educational levels based on low and high variants, see Figure A-5.

can be expected with the increased numbers that it would encounter in the coming decades. And with children not getting enrolled at the primary level there can obviously be no ground for population getting higher education. Absolute numbers are as important, if not more, as the proportions and ratios, and Figure 13 shows that Pakistan faces huge numbers in the coming decades to educate.⁸ The numbers continue to grow till 2040 before showing a declining trend, but by then the total population in the school going age would have increased to roughly 90 million from a total of only 14 million in 1950.⁹ From 2000 onwards the numbers grow fastest for the post-high school age population, and slowest for primary school age population (see Figure 13). This is typical of the post-demographic transition phase, but for Pakistan the dilemma lies in educating all these millions if it wants to reap the benefits of the “demographic dividend”.

Improved human capital is a prerequisite for cashing in on the demographic dividend as the sources of higher productivity are becoming increasingly dependent on science-based knowledge and information applied to production. There is an increasing shift from traditional agricultural and manufactured goods to more sophisticated services and agricultural and manufactured products. Changes are emerging in the way economic activities are organised as a shift is taking place from a mass, standardised production to flexible, customised production. All this gives a significant edge to the countries that have a labour force having skills and knowledge to adapt to the changing market conditions. A country like Pakistan that is yet to solve its primary schooling issues can at best have some patches of success but not expect to take full advantage of what “demographic dividend” has to offer.

Fig. 13. Population at Different Educational Levels: Pakistan, 1950–2050



Source: Based on medium variant, UN (2005).

IV. CONCLUSIONS AND POLICY IMPLICATIONS FOR PAKISTAN

Demography provides policy-makers a crystal ball to formulate policies for tomorrow’s world, believes Bloom, *et al.* (2001) and very rightly so. Capitalising on the

⁸For population at different educational levels based on low and high variants, see Figure A-6.

⁹For an account on improving educational spread in the country, see Andrabi, *et al.* (2006).

demographic dividend in Pakistan needs thoughtful and prompt action as 15 years of the “dividend”, which will end by 2045, have already gone by without much gain. Increasing numbers of people entering working-ages in the country can act as a double-edged sword—if they do not enter the labour force the very logic of “demographic dividend” is defied, but if they do become economically active it poses a big challenge to the country’s economy to provide them gainful employment. This is quite improbable in the absence of sound economic policies and educated and skilled workers. With its poor current educational state, training and educating the ever increasing population for a changing economic scenario is another test confronting the country. Importance of savings cannot be over-emphasised for reasons ranging from personal to national, and with the increasing elderly population in the absence of any state planned social security system its significance is heightened even more. Unless immediate measures are taken the period of ‘demographic dividend’ would end with no significant gains and a very complex situation to tackle, having an aging population that is uneducated, untrained and little savings to rely on.

To maximise the opportunities to capitalise on the demographic dividend ingenious planning is needed both during and after the dividend period. Despite a not so encouraging picture at present, all is not lost for Pakistan as 40 years of the dividend period are still left, and if a start is made even now, some gains could be seized at least. Key areas of focus in this regard include: education; public health and family planning; incentives for savings; and most importantly creation of an economic environment that encourages employment generation and labour flexibility.

The East Asian countries took full benefit of the demographic dividend [Bauer (2001); Phang (2005)]. Successful human resource investment was the basic feature behind growing employment and labour productivity growth in these countries. With demographic transition, that was very rapid in the region, the school-age population stopped growing while the working-age population and the tax-base continued to grow rapidly. This had a favourable fiscal effect as spending per student was increased without increasing taxes per worker. Equally important were policies that first stressed primary and then secondary education in these countries. They had a successful research programme that led to huge gains in agricultural yield and there was no need to absorb additional workers into the sector that had no capacity to provide more employment at higher wages. These countries were successful at creating new industries and jobs in the service and manufacturing sectors of the economy. The region took advantage from an encouraging trading environment, but also followed successful export promotion policies. Wise macroeconomic policy created an investment-friendly environment that ensured the availability of capital needed to expand manufacturing capacity initially through foreign funding and then from domestic sources [Bauer (2001); Mason (2003); Bloom, *et al.* (2001); and Phang (2005)].

Lessons are to be learnt by Pakistan from the East Asian experience, and utilised after adapting to emerging world and local conditions. As Haque (2006) argues, there is a need to rethink the whole growth strategy in Pakistan, and implement what he calls a “meritocratic framework” in which success is measured by the market and government’s efficiency is gauged by its ability to develop institutions that aid the market. Although Haque is talking only about economic activity when he says, “institutions need to be built

that preserve individual freedom, provide security, and facilitate market transactions; the government merely provides these institutions, allowing markets to determine where economic activity goes” (2006: 26), but this could be applied to other fields as well, including education and health, improvements in which are crucial to reap the benefits of the demographic dividend.¹⁰

Whatever policy implications are discussed in this paper mainly suggest interventions that need to be made, not directly by the government but more through a mechanism suggested by Haque (2006). Such a strategy would not only encourage growth but also reduce direct burden on the resource scarce government machinery.

Improvement of quality of human resources in the country, particularly those in the productive ages, is imperative. Education and training are vital to determine the productivity of human resources. This cannot be gained by just improving the basic enrolment rates but by providing relevant and quality education. Interventions are needed to upgrade the educational system by including provision to develop skills to meet the demand of a more flexible labour force¹¹ in the new economy.

Can a country grow faster by increased savings? Aghion, Comin, and Howitt believe it does, especially if it is a poor country (2006). They argue that saving enhances growth in the countries that are not too close to the ‘technological frontiers’ but the two, saving and growth, do not have any relation in the countries that are close to the frontier (2006). “Local saving matters for innovation, and therefore growth, because it allows the domestic banks to co-finance projects and thus to attract foreign investment; more specifically, co-financing encourages local bank monitoring effort by giving the local bank a stake that it will lose if the project fails for want of effort on its part” [Aghion, Comin, and Howitt (2006:1)]. Savings have always been low in Pakistan, and as pointed out by Haque (2006), large amounts of capital flight and informal saving, mainly in real estate, have resulted in response to an increased government control over resources. Such forms of private savings are, however, not conducive to growth as are those that provide liquidity to the banking system. As observed by Aghion, *et al.* liquidity of the domestic banking system helps attract foreign investors that brings in the frontier technology that triggers TFP and productivity growth (2006). People though tend to save only if saving is secure and profitable. To promote saving price stability is critical, as motivation to save is higher in environments with low inflation [Hebbel and Serven (1997)]. Bad fiscal management, political instability and corruption, among other factors, can discourage people to save, making transparency and efficiency in financial institutions important for increasing savings. As also observed by the IMF, “... a strong and stable macroeconomic framework—that delivers low inflation and sustainable public debt levels—together with institutional reforms are important elements of an environment conducive to domestic saving, capital inflows and capital accumulation” (2004, p. 786).

To improve and maintain the health of the population is fundamental. This becomes even more important keeping in consideration a growing elderly population in the country. Health is also an important determinant of economic performance, so health

¹⁰For the factors affecting social and institutional development in Pakistan, see Easterly (2001).

¹¹Flexibility means that employers are able to quickly expand and contract their businesses and transfer workers from one area of the business to another more easily. It also refers to a workforce that adapts its working methods as the business environment changes.

of the working-age population needs to be taken care of as well. Although fertility rate has started to fall in the country there is need for creating an environment that is conducive to contraceptives use. The number of women in reproductive ages would be at an all time high in the coming decades (as can be seen from Figure A-7 in the Appendix), and to maintain the declining trend in fertility family planning needs have to be taken care of in the country with increased vigour.

Equal opportunities should exist for both sexes, and reducing, preferably abolishing, the gender-gap that exists in education and labour force is essential. By improving their educational level, along with lowering fertility, women should be encouraged to have a larger share in the labour market. Effective capitalisation on the demographic dividend is not possible with half the population excluded from the process.

Employment generation to accommodate the growing number of people in working-ages would be a major issue for the country. New areas need to be explored to provide employment to the ever increasing numbers. Domestic commerce can be the most-pro-poor possibility in Pakistan to increase employment opportunities [Haque and Waqar (2006)]. According to an estimate it employs 40 percent of the work force and contributes approximately 52 percent to the country's GDP [Haque and Waqar (2006)]. Encouraging this sector would lead to increased employment in the construction activity, warehousing, transport, retail shops, and other service industries. The employment effect of promoting this sector would be far greater than investing in any other sector, as also stressed by Haque and Waqar (2006).

Demographic dividend is inherently transitory in nature. Due to lack of prior planning Pakistan has almost wasted the first 15 years of the opportunity demography has offered it. However, age structure will continue to be an important force in the country for the next fifty years. How economic growth is shaped by demographic changes in the coming years will depend on the ways policies and institutions respond to the challenges and opportunities the future holds. Time is running out to put appropriate policies in place, the absence of which may result in large-scale unemployment, immense pressure on health and education systems. In short a socio-economic crisis may take place making the demographic dividend more of a demographic threat.

APPENDIX

Table A-1

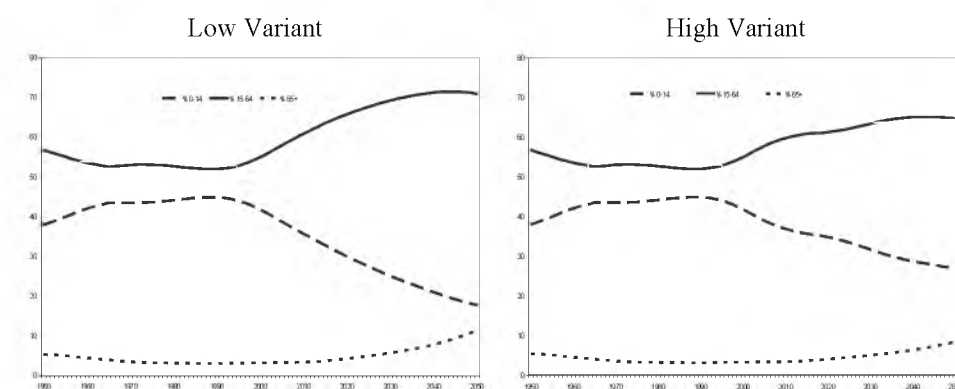
*Timing and Duration of Demographic Dividend in Pakistan:
Low, Medium, and High Variants*

Year	High	Low	Medium
1955	-0.62258	-0.62258	-0.52609
1960	-0.54952	-0.54952	-0.42789
1965	-0.38683	-0.38683	-0.37843
1970	0.15326	0.15326	0.19312
1975	-0.05107	-0.05107	-0.03059
1980	-0.33706	-0.33706	-0.22713
1985	-0.08662	-0.08662	-0.0605
1990	0.36216	0.36216	0.21717
1995	0.39024	0.39024	0.47665
2000	0.97300	0.97300	1.01453
2005	1.00912	1.16912	0.99153
2010	0.67919	1.05919	0.73162
2015	0.41792	0.96792	0.56708
2020	0.22497	0.77559	0.38774
2025	0.39014	0.65331	0.44499
2030	0.45992	0.54883	0.41516
2035	0.39427	0.42021	0.30251
2040	0.21661	0.30270	0.13607
2045	0.07610	0.14122	-0.00026
2050	-0.05870	-0.09060	-0.18090

Source: Calculations based on UN (2005).

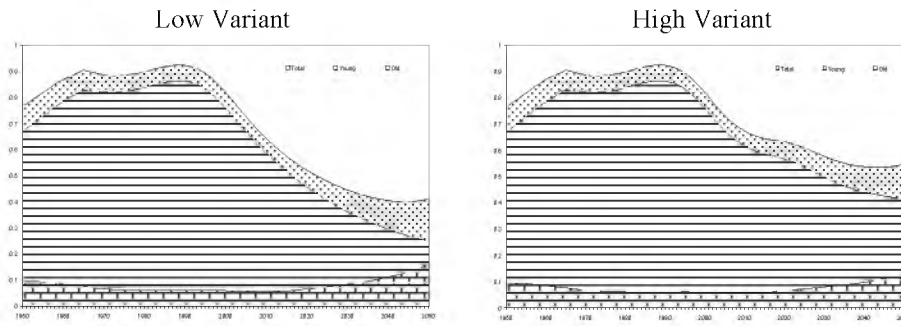
Note: Extended positive sign block represents the demographic dividend period for the respective projections.

Fig. A-1. Percentage Share of Young, Working-age and Old Population



Source: Based on low and high variants, UN (2005).

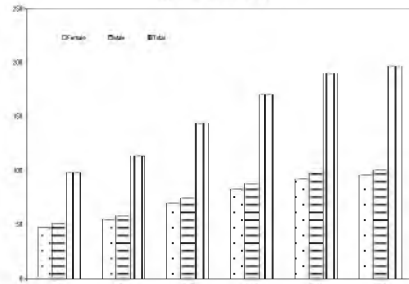
Fig. A-2. Young, Old, and Total Dependency Ratio: Pakistan, 1950-2050



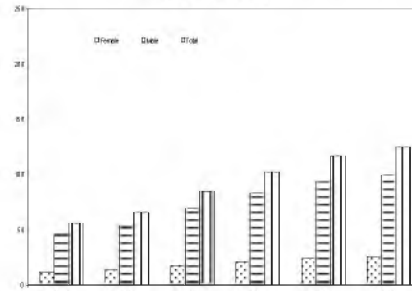
Source: Based on low and high variants, UN (2005).

**Fig. A-3. Available Workers and Those Active in the Labour Market
2005-2050: Low Variant**

Projected Population Aged 15-64: Total, Male, and Female (Millions)



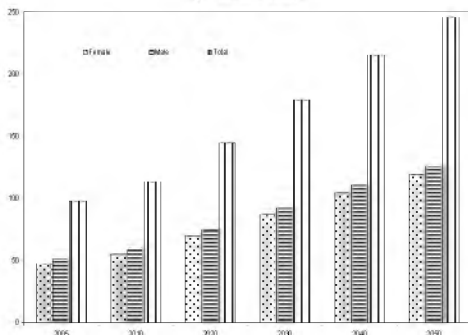
Projected Population Actually Active in Labour Market: Total, Male, and Female (Millions)



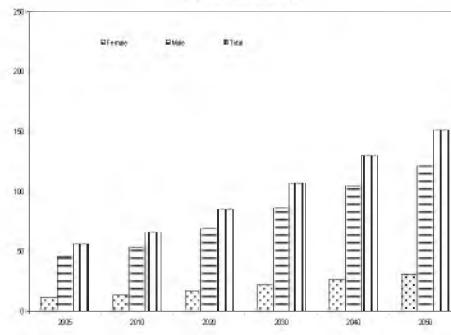
Source: Based on low variant, UN (2005) and Labour Force Survey 2005-2006.

**Fig. A-4. Available Workers and those Active in the Labour Market
2005-2050: High Variant**

Projected Population Aged 15-64: Total, Male, and Female (Millions)

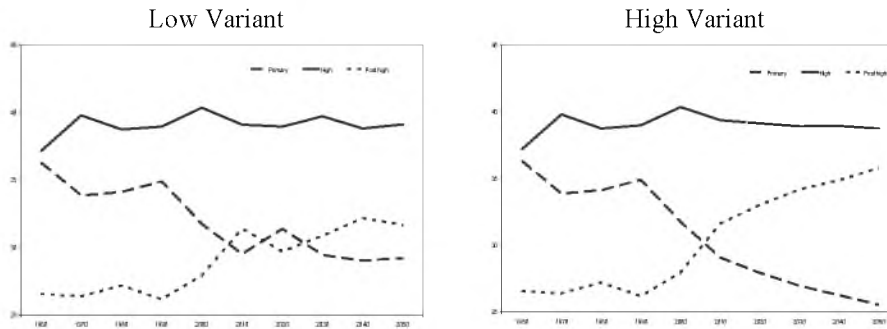


Projected Population Actually Active in Labour Market: Total, Male, and Female (Millions)



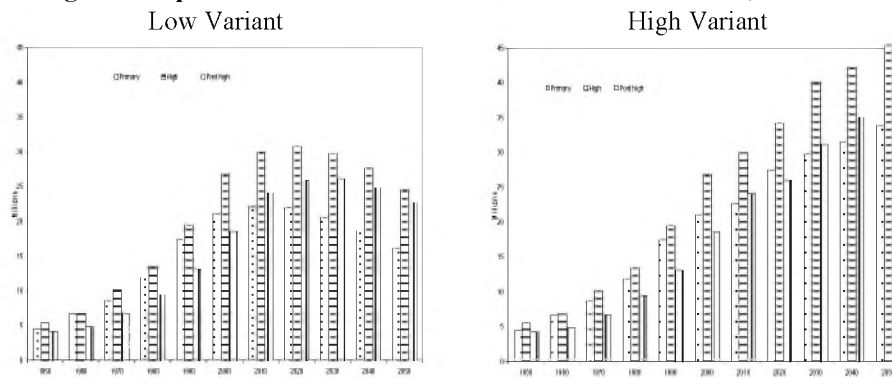
Source: Based on low variant, UN (2005) and Labour Force Survey 2005-2006.

Fig. A-5. Percentage Share of School-going Population for Different Educational Levels: Pakistan, 1950-2050



Source: Based on low and high variants, UN (2005).

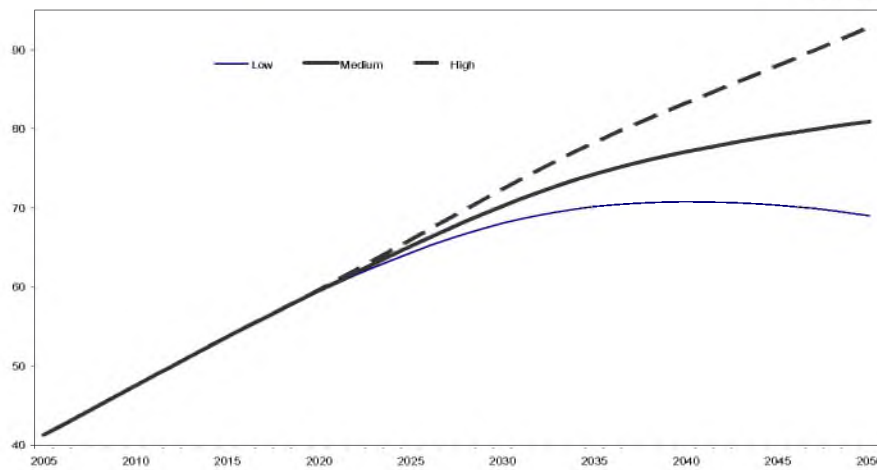
Fig. A-6. Population at Different Educational Levels: Pakistan, 1950-2050



Source: Based on low and high variants, UN (2005).

Fig. A-7. Women Aged 15–49 Years: Pakistan, 1950–2050

(In Millions)



Source: Based on low, medium, and high variants, UN (2005).

REFERENCES

- Aghion, P., D. Comin, and P. Howitt (2006) When Does Domestic Saving Matter for Economic Growth? Cambridge: National Bureau of Economic Research. (NBER Working Paper Series, No. 12275.)
- Ahmad, M., and T. Asghar (2004) Estimation of Saving Behaviour in Pakistan Using Micro Data. *The Lahore Journal of Economics* 9: 73–92.
- Andrabi, T, J. Das, and A. I. Khawaja (2006) A Dime a Day. The Possibilities and Limits of Private Schooling in Pakistan. (World Bank Policy Research Working Paper 4066.)
- Bauer, J. (2001) Economic Growth and Policy in East Asia. In A. Mason (ed.) *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*: Stanford: Stanford University Press.
- Birdsall, N., A. C. Kelley, and S. W. Sinding (eds.) (2001) *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford University Press.
- Bloom, D. E., and D. Canning (2005) Global Demographic Change: Dimensions and Economic Significance. Harvard Initiative for Global Health (Working Paper Series, Number 1.)
- Bloom, D. E., and J. D. Sachs (1998) Geography, Demography, and Economic Growth in Africa. *Brookings Papers on Economic Activity* 2, 207–273.
- Bloom, D. E., and R. B. Freeman (1986) The Effects of Rapid Population Growth on Labour Supply and Employment in Developing Countries. *Population and Development Review* 12, 381–414.
- Bloom, D. E., and R. Freeman (1998) Economic Development and the Timing and Components of Population Growth. *Journal of Policy Modeling* 1, 57–82.
- Bloom, D. E., D. Canning, and J. Sevilla (2001) Economic Growth and the Demographic Transition. Massachusetts Avenue. Cambridge. (NBER Working Paper Series Number 8685.)
- Bloom, D., and D. Canning (1999) From Demographic Lift to Economic Lift-off: The Case of Egypt. Conference Paper for Growth Beyond Stabilisation: Prospects for Egypt. Egypt Centre for Economic Studies, Cairo, February 3–4.
- Bloom, D., and J. Williamson (1998) Demographic Transitions and Economic Miracles in Emerging Asia. *World Bank Economic Review* 12, 419–456.
- Bloom, D., D. Canning, and P. Malaney (2000) Demographic Change and Economic Growth in Asia. *Population and Development Review* 26 (Supplement), 257–290.
- Boserup, E. (1981) *Population and Technological Change: A Study of Long-term Trends*. Chicago: University of Chicago Press.
- Burney, N., and A. H. Khan (1992) Socio-economic Characteristics and Household Savings: An Analysis of Household Saving Behaviour in Pakistan. *The Pakistan Development Review* 3:1, 31–48.
- Coale, Ansley J., and Edgar M. Hoover (1958) *Population Growth and Economic Development in Low Income Countries*. Princeton: Princeton University Press.
- Deaton, A., and C. Paxson (1997) The Effects of Economic and Population Growth on National Savings and Inequality. *Demography* 34, 97–114.
- Deaton, A., and C. Paxson (2000) Growth, Demographic Structure, and National Saving in Taiwan. *Population and Development Review* 26, 141–173.

- Dupriez, O. (2003) Adapting Education to the Global Economy. ERD Policy Brief. Economic and Research Department. Asian Development Bank, Manila.
- Easterly, W. (2001) The Political Economy of Growth without Development: A Case Study of Pakistan. Paper for the Analytical Narratives of Growth Project, Kennedy School of Government, Harvard University. Development Research Group. The World Bank.
- Ehrlich, P. (1968) *The Population Bomb*. New York: Ballantine.
- Feeney, G., and A. Mason (2001) Population East Asia. In A. Mason (ed.) *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford: Stanford University Press.
- Haque, N. U. (2006) *Beyond Planning and Mercantilism: An Evaluation of Pakistan's Growth Strategy*. Inaugural Lecture. Islamabad: Pakistan Institute of Development Economics.
- Haque, N. U., and I. Waqar (2006) *Domestic Commerce—The Missing Link*. Islamabad: Ministry of Commerce, Government of Pakistan.
- Hebbel, S. K., and L. Serven (1997) Savings Across the World. Washington, DC. (World Bank Discussion Paper No. 354.)
- Higgins, M. (1998) Demography, National Savings, and International Capital Flows. *International Economic Review* 39, 343–369.
- Higgins, M., and J. G. Williamson (1997) Age Dynamics in Asia and Dependence of Foreign Capital. *Population and Development Review* 23, 261–293.
- IMF (2004) The IMF on Policies Responding to Demographic Change. *World Economic Outlook*. Semi-annual Report.
- Kelley, A. (2001) The Population Debate in Historical Perspective: Revisionism Revised. In N. Birdsall, A. C. Kelley, and S. W. Sinding (eds.) *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press, 24–54.
- Kelley, A., and R. Schmidt (1995) Aggregate Population and Economic Growth Correlations: The Role of the Components of Demographic Change. *Demography* 32, 543–555.
- Kelley, A., and R. Schmidt (1996) Savings, Dependency, and Development. *Journal of Population Economics* 9, 365–386.
- Kelley, A., and R. Schmidt (2001) Economic and Demographic Change: A Synthesis of Models, Findings, and Perspectives. In N. Birdsall, A. C. Kelley, and S. W. Sinding (eds.) *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press.
- Khan, A. H., L. Hasan, and A. Malik (1992) Dependency Ratio, Foreign Capital Inflow, and Rate of Saving in Pakistan. *The Pakistan Development Review* 31:4, 843–858.
- Khan, Ashfaque H., and Zafar M. Nasir (1999) Household Savings in Pakistan. In South Asian Region Internal Discussion Paper. World Bank, Islamabad.
- Krugman, P. (1994) The Myth of Asia's Miracle. *Foreign Affairs*, 62–78.
- Kuznets, S. (1967) Population and Economic Growth. *Proceedings of the American Philosophical Society* 3, 170–193.
- Lee, R. (2003) The Demographic Transition: Three Centuries of Fundamental Change. *The Journal of Economic Perspectives* 17, 167–190.
- Lee, R., A. Mason, and T. Miller (2000) Life Cycle Saving and Demographic Transition: The Case of Taiwan. *Population and Development Review* 26 (Supplement), 194–222.

- Lee, R., and A. Mason (2007) Consumption, Saving and Capital Accumulation as Age Distribution Change. Annual Meeting of the Population Association of America, New York, March 28–31.
- Leff, N. (1969) Dependency Rates and Savings Rates. *American Economic Review* 59, 886–896.
- Malthus (1798) *An Essay on the Principle of Population*. (Reprinted in 1970). Penguin: Harmondsworth.
- Mason, A. (1981) An Extension of the Life-cycle Model and Its Application to Population Growth and Aggregate Saving. Honolulu. (East-West Institute Working Paper 4.)
- Mason, A. (1988) Saving, Economic Growth, and Demographic Change. *Population and Development Review* 14, 113–144.
- Mason, A. (2001) *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford: Stanford University Press.
- Mason, A. (2002) *Population and Human Resources Trends and Challenges*. Manila: Asian Development Bank.
- Mason, A. (2003) Capitalising on the Demographic Dividend. *Population and Poverty, Population and Development Strategies (8)*. New York: United Nations Population Fund.
- Mason, A. (2005) Demographic Dividends: The Past, the Present, and the Future. Towards a New Economic Paradigm: Declining Population Growth, Labour Market Transition and Economic Development under Globalisation. Kobe, Japan,
- Mason, A. (2005a) Demographic Transition and Demographic Dividends in Developed and Developing Countries. United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structure. Population Division Department of Economic and Social Affairs United Nations Secretariat. Mexico City, Mexico.
- Pakistan, Government of (2006) *Labour Force Survey*. Islamabad: Federal Bureau of Statistics.
- Pakistan, Government of (2006a) *Pakistan Economic Survey 2005-2006*. Islamabad: Finance Division.
- Phang, H. S. (2005) Demographic Dividend and Labour Force Transformations in Asia: The Case of Korea. United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures. Population Division Department of Economic and Social Affairs. Mexico City, Mexico.
- Sachs, J. (2002) Rapid Population Growth Saps Development. *Science* 297, 341.
- Siddique, R., and R. Siddique (1993) Household Saving Behaviour in Pakistan. *The Pakistan Development Review* 32:4, 1281–1292.
- Simon, J. (1981) *The Ultimate Resource*. Princeton, N.J.: Princeton University Press.
- Simon, J. (1986) *Theory of Population and Economic Growth*. New York: Blackwell.
- Srinivasan, T. N. (1988) Population Growth and Economic Development. *Journal of Policy Modeling* 10, 7–28.
- State Bank of Pakistan (2006) *Annual Report 2005-2006*. Karachi: State Bank of Pakistan.
- UN (2005) *World Population Prospects: The 2005 Revision*. New York: United Nations.
- Williamson, J. G., and M. Higgins (2001) The Accumulation and Demography Connection in East Asia. In A. Mason (ed.) *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford: Stanford University Press.