

Demographic Transition

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Abstract

The differences in the wealth of nations have been in existence historically. The extent of inequalities has been very large and even today they do exist and hence the phenomenon is disturbing. It is an undisputed fact that population of a country does have some effect on the economic growth of a country but the extent to which the population size and composition affects the economy has been a subject of debate and research. On one extreme, there is a pessimistic view, originally propagated by Malthus that population growth tends to depress income growth, as growing population is a drain on the national resources. On the other extreme is an optimistic view that population growth creates opportunities for development by optimum productive exploitation of the available resources that results in capital accumulation and income growth. Recent empirical evidence, however, sets aside both the pessimistic as well as the optimistic views on the effect of population growth on per capita income, which is a good indicator for measuring economic wellbeing of nations. The view called as 'Population Neutralism' had started emerging since 1980s. However, it took about two decades to expel the belief that population growth was the sole important indicator of demographic change. From the beginning of 21st century, people have pointed out that population age structure is perhaps more important a factor than the total population.

Key words: Demography, Population.

INTRODUCTION

In his book "Wealth of Nations", Adam Smith in 1776 had first raised the question of why some countries are rich and other countries are poor. The prominent explanation for the phenomenon with the economists has been the differences in physical capital and technologies. Physical capital includes population of a country also among many other components, which we will discuss later in the paper in detail.

The differences in the wealth of nations have been in existence historically. The extent of inequalities has been very large and even today they do exist and hence the phenomenon is disturbing. It is an undisputed fact that population of a country does have some effect on the economic growth of a country but the extent to which the population size and composition affects the economy has been a subject of debate and research. On one extreme, there is a pessimistic view, originally propagated by Malthus that population growth tends to depress income growth, as growing population is a drain on the national

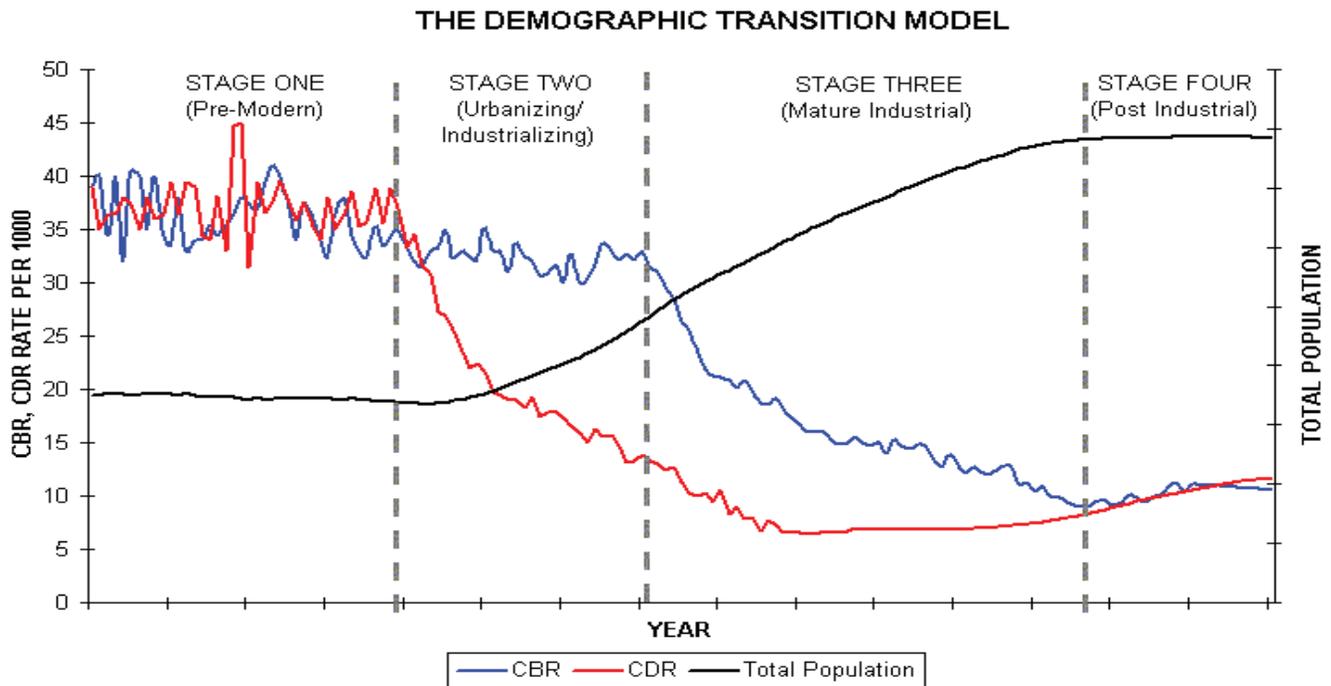
resources. On the other extreme is an optimistic view that population growth creates opportunities for development by optimum productive exploitation of the available resources that results in capital accumulation and income growth. Recent empirical evidence, however, sets aside both the pessimistic as well as the optimistic views on the effect of population growth on per capita income, which is a good indicator for measuring economic wellbeing of nations. The view called as 'Population Neutralism' had started emerging since 1980s. However, it took about two decades to expel the belief that population growth was the sole important indicator of demographic change. From the beginning of 21st century, people have pointed out that population age structure is perhaps more important a factor than the total population.

"Demographic Transition Model"

The twentieth century witnessed the maximum demographic change in the world. We added 5 billion people in a single century. However, since last three

decades, we are adding one billion every 12 to 14 years and as projected this time interval per billion addition of population will increase further in the 21st century. This shows that the rate of population growth of the

world has considerably slowed down. This slowing down is simplistically explained by the popular theory called “Demographic Transition Model” shown below graphically.



This simplistic model assumes that the difference between the Birth Rate and death rate is the rate of population growth. Each country’s demographic transition typically involves several major phases whose duration depends on their timing and pace of changes in mortality and fertility.

- Initially, as infant mortality declines and population growth takes off, the country’s population tends to grow younger, and the youth share of the population expands. The burden of raising large number of children tends to restrain other types of savings and investments and thus the economic growth tends to restrain.
- Later as birth rates decline, the youth share of the population contracts and the working age share expands. With fewer children to care for, the adult population can work, save and invest more, all of which tend to enhance economic growth. When the work force is relatively young, the country is likely to have relatively low saving and comparatively high demand for investment-and therefore relatively high rates of return. However, as a large portion of labor

force reaches middle age, saving may rise and the demand for investment may fall, a phenomenon that tends to reduce the rate of return.

- Still later, as birth rates remain low and adults continue to live longer, the elderly share of the country’s population rises. As a result, working age adults may not have as many children to raise, but they have many more old to people to support and care for. In addition, the rate of saving may decline as retirees run down their savings.
- Other developments such as wars, epidemics, natural disasters, disruptions in the political, economic and policy environment can profoundly change the age-structure of a country’s population in similar ways as well.

However, if we look at the data, they do not look as neat as this. For example, India and China started quite similarly on demographic front, but today China is far ahead of India in terms of GDP growth whereas Japan has long been in the group of top 12 developed. In fact, China had lower GDP per capita than India in 1960 and it continued up to late 1980s until which time India was ahead of China in terms of GDP per Capita. In 1990s,

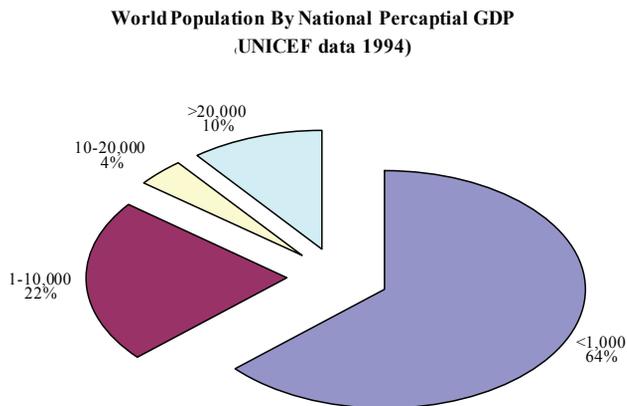
China surged ahead India considerably and now it has per Capita GDP double that of India. Similarly, the population as a whole and the age-structure of Africa is quite favorable in demographic terms; even then, its economic growth forecast in the next 45 years is not promising. The purpose of this paper is to examine and compare the demographic transitions of all the four countries that are presently at differently states of demographic transition-**Japan, China, India and Africa**. This paper also examines the effects of demographic changes on economic growth of these countries and the challenges these demographic changes put forth for them. I will also try to put in perspective the major factors responsible for such differential economic growth across the countries in the world with specific reference to India. At the end of the paper, I will try to draw lessons from success stories across the world and suggest the policy changes to be introduced required meeting the challenges before India on this front before it is too late.

‘Population Neutralism’

Let us now examine the ‘population neutralism’ viewpoint regarding the relationship between population and Per Capita GDP of various countries of the world

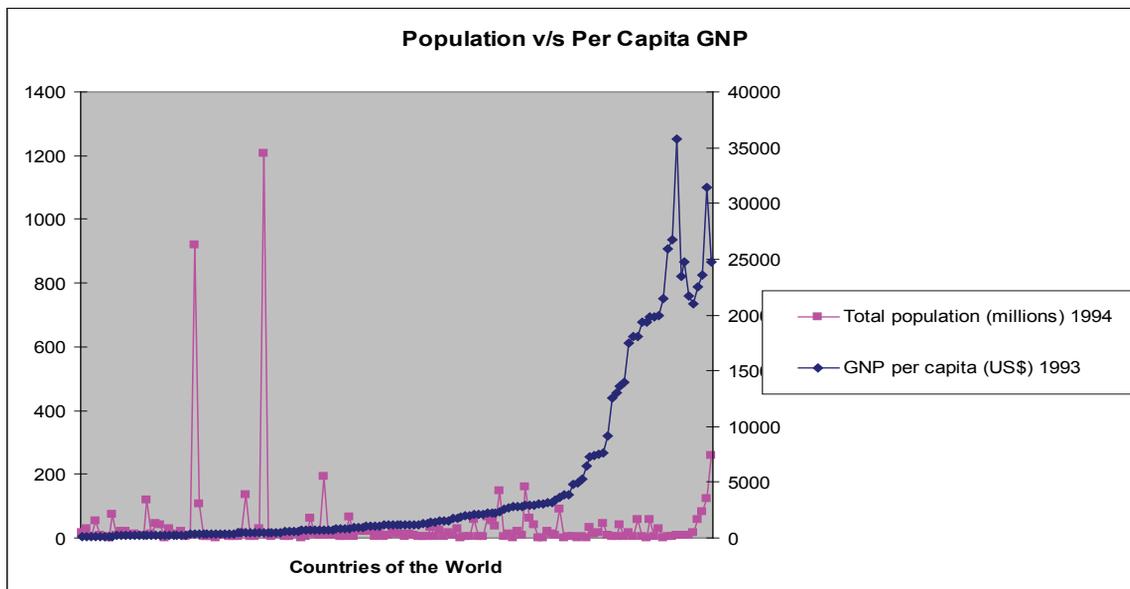
based on empirical data. The following figure classifies the world population in four categories according to per capita GDP¹.

Figure 2



This figure goes to show that 64% of the world population has, on an average, income less than \$1000 p.a. and 10% is having an average annual income more than \$20,000. Most of the world population is poor and a very small population is very rich. The following figure² shows that per Capita GDP is independent of the population of a country. This empirical evidence confirms the “population neutralism” view.

Figure 3



¹UNICEF data, 1994

²Data obtained from UNICEF Basic Indicators, 1994

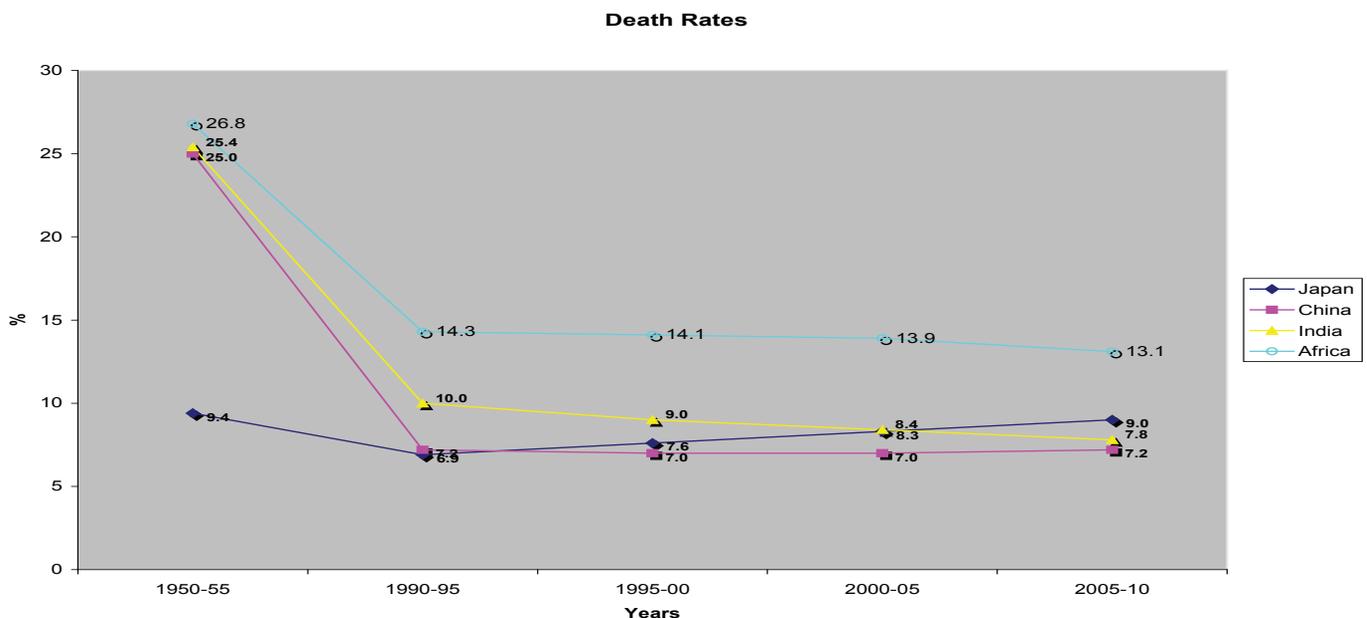
As discussed, demographic transition refers to the transition from high mortality and high fertility to low mortality and low fertility. Mortality declines first which is concentrated among the younger ages (up to 5 years) leading to higher infant survival mostly due to sanitary measures and medical advancement and extension of medical facilities. This declining mortality produces the so-called “Baby Boom” as more children survive to adulthood. This results in increase in population. They reproduce further and a second generation is produced. In the meanwhile, if the fertility rate does not fall sufficiently, the baby boom may continue itself (becoming smaller and smaller) a few number of times until the fertility reduces to the replacement level (i.e. 2.1 children per woman). This rise in population is some times called ‘momentum effect’ that can last for generations depending on the rate at which the fertility decline is taking place. In the countries with the higher initial base of population, fertility and mortality, the boom is higher and larger in duration than the countries that have the lower initial levels of population, fertility and mortality. In the former category, most of the developing countries fall whereas in the later category most of the advanced countries fall. In developed countries, the baby boom followed the Second World War but was immediately

followed by sharp decline in the fertility rates. For the purpose of this paper, let us have a look at the figures and trends in the selected four countries. The initial bases from which they started were markedly different in all the measures. Moreover, the decline in mortality & fertility was very different in pace in all the four cases as discussed below.

1. Mortality Rates

Japan started to decline the mortality rate in 1950-55 from 9.4 per 1000 and reached 6.9 per 1000 in 1990-95. As per one estimate, it may rise up to 9.0 per 1000 by 2010. In India the death rate declined from 25.4 in the period from 1950-55 to 10.0 in 1990-95 followed by constant but slow decline & it is projected to reach 7.8 per 1000 in 2010. China’s decline was from 25.0 to 7.2 in the same period of 40 years, which is more than what India achieved and is projected to remain around 7.2 per 1000 till 2010. In contrast, Africa started decline in mortality from a very high level of 26.8 per 1000 in 1950-55 and attained a decrease to 14.3 per 1000 in the same period of 40 years i.e. from 1950-55 to 1990-95. This is not an impressive decline as compared to the other three and by 2010; Africa may attain the mortality rate of 13.1 only^{3,4}.

Figure 4



³United Nations Population Division, World Urbanization Prospects: The 2001 Revision, March 2002, <http://www.un.org/esa/population/unpop.htm> seen on 21.12.2005

⁴United Nations Population Division, World Population Prospects: The 2000 Revision, 2001, <http://esa.un.org/unpp> seen on 21.12.2005.

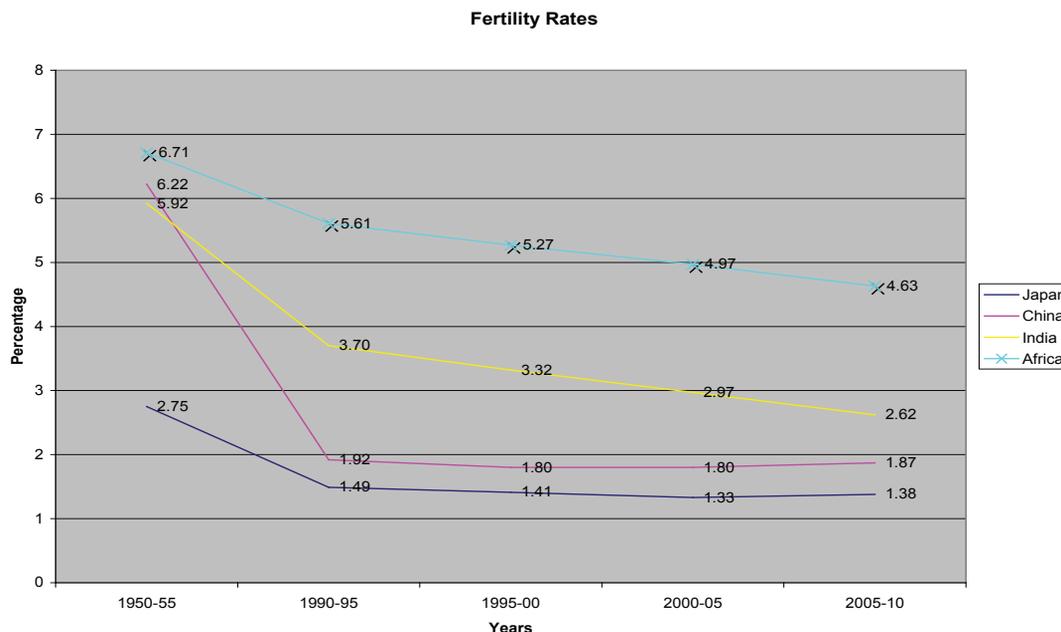
Hence, as far as initial Base Level is concerned, Japan holds the position of benefit among all the four and China holds the benefit in terms of the steepest decline in the first 40 years and further consistent decline in comparison to other countries.

2. Fertility Rates⁵

In the case of fertility rates, also Japan and China are in better position as compared to India and Africa. Japan started from the fertility of 2.75 children per woman in 1950-55 and the rate declined to 1.49 (below replacement level) within 40 years i.e. by 1990-95. China, on the other hand started with an initial high fertility rate of 6.22 children per woman, but by means of certain policies of the state, it achieved the level of 1.92 by 1990-95, which is also below replacement level of 2.1.

Contrary is the case of India and Africa. Their initial bases were high but the decline was not as pronounced as the other two could achieve in the same period. In 2000-05, India still has fertility rate of 2.97 & projected to decline only to 2.62 by 2010. Hence, the population growth due to 'momentum effect' is expected to extend well beyond 2050 because the fertility rate of Indian population is not expected to reach the replacement level even by 2010. In other words, the decline in fertility rate is slow and hence its transition up to the replacement level or below is extended in period, which put these countries to a relatively disadvantageous position. These countries will enter into the next stage of demographic transition many generations later than the other two will. In other words, the transition is expected to get prolonged over more number of generations in case of India and Africa as compared to Japan and China.

Figure 5



Africa has suffered on both the counts i.e. higher initial base and lower rate of decline in fertility. In 2000-05, the fertility rate is still 4.97 & is projected to come down only to 4.63 by 2010. Hence, attaining

replacement rate and population stabilization appears to be very different and still much more distant for Africa beyond what can be expected for India, by at least half a decade to 75 years.

3. Population Rise

The initial base of total population during the period was again in favor of Japan. It started its journey through

⁵Footnotes 3 & 4 ibid

the demographic transition with the lowest base level total population among all the four countries under review in this paper. The comparison of the Base Level

and the co-efficient of Trend Lines representing the rate of growth of population is given in the following figure and table.

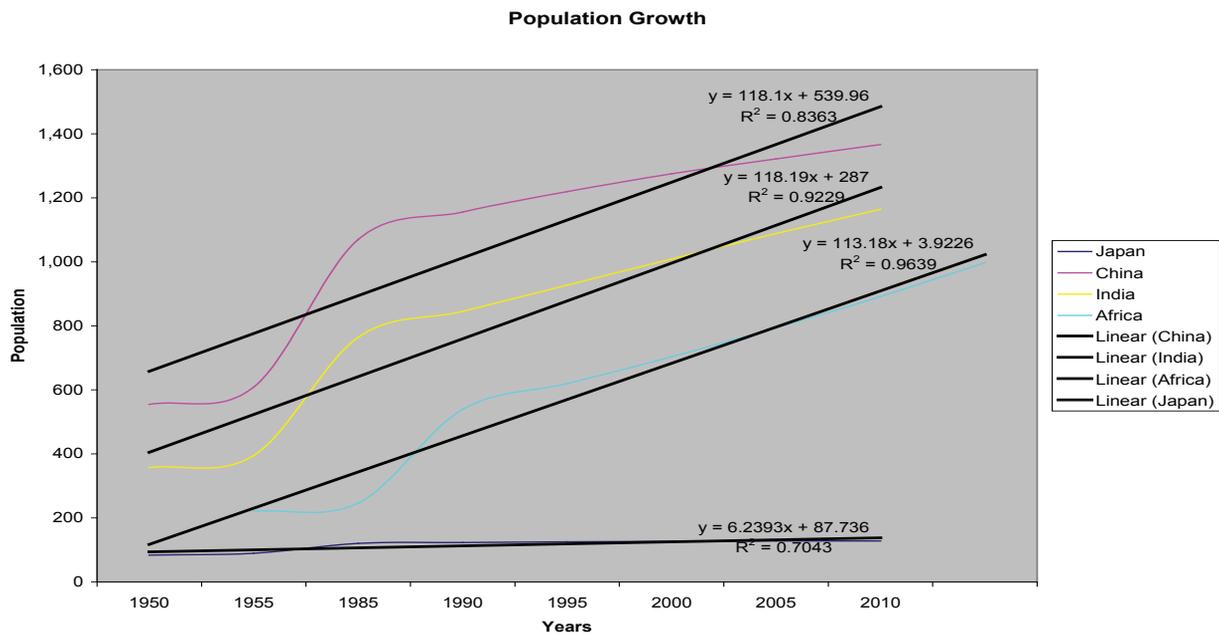


Table 1

Country	Base-Scenario	Coefficient
Japan	84 million	6.23
China	555 million	118.1
India	358 million	118.19
Africa	221 million	113.18

The following facts can be observed:

- a. Japan population started with lower base than other three and increased very marginally due to the advantage it got in decline in mortality rate and fertility rate.
- b. Africa, although had lower base, but still increase was sharp and hence lost opportunity. In other words, despite being in relatively advantageous position as compared to China & India in the initial base level, due to high initial fertility and very slow decline in fertility rate.
- c. Similarly, India was much below China in Base Level, but because of failure to curb fertility rate effectively

& bringing to replacement level, population increase has been sharp.

- d. In case of China, despite initial high population base in 1950-55, due to drastic reduction in fertility rate, it could avoid very explosive situation in population growth. Hence, with continuing lower the replacement rate of fertility, China's population can be surpassed by India's in the first half of 21st century.

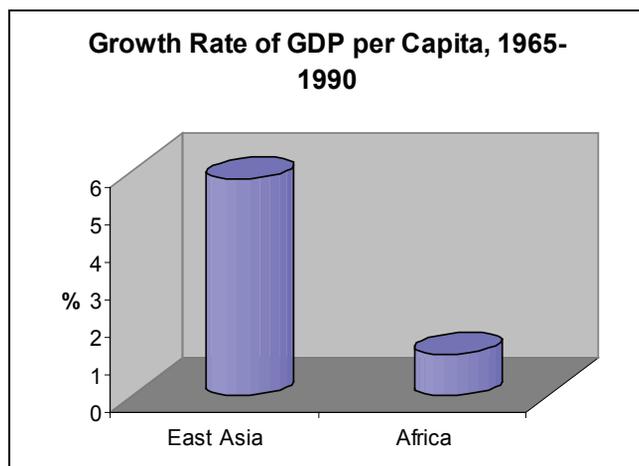
4. Demographic Dividend

As mortality declines the proportion of children in the population eventually starts declining and the cohorts initially benefiting from declining mortality keep the population of working age growing, setting the stage for an increased productive capacity of the economy on per capita basis. This creates a potential for growth, but actual growth varies from country to country as a number of factors affect this conversion of potential into real growth in terms of per capita income. Another important factor is related to the behavioral aspect. During this period when the proportion of working-age population is higher than the proportion of children and old age dependency taken

together, it is expected that a country's output will grow because the working ages are the prime years for saving and investment along with technological innovation. Savings get further boost when longevity increases in the latter phases of demographic transition. People save more in anticipation of longer periods of retirement, promoting further accumulation and economic growth. This process is referred to as the "demographic dividend". There is some empirical evidence that demographic dividend has had a major positive effect on the economic growth of some developing and developed countries. When women begin having fewer children, their employment rate increases and the overall labor, participation increases. This is true at least in theory. The demographic dividend does not always result in increase in productivity even if two countries are passing through the same phase of the transition. For example, East Asia and Africa are the two regions among the low-and middle-income countries, which were passing through demographic dividend phase. However, they are extreme examples. During the period from 1965-1990, a large group of countries in East Asia witnessed unprecedented growth (almost 6%) in their income per capita for such a long period of time, which is often referred to as "East Asian Miracle". On the other hand, at the other extreme, economic performance in sub-Sahara Africa was dismally low of the order of 1% per year growth in per capita income.

As discussed above, the basic pattern of death and birth rates does not look exactly like a typical demographic transition diagram, there are main features contained in them.

Figure 7



The mortality rate came down while the fertility rates were essentially still flat & then eventually fertility rates came down. If we look at data for Japan, we see a baby boom around 1970. It turned out that Japan had a baby boom after World War II, but, most importantly, it lasted hardly "five years" from 1946-51. In 1951, abortion was legalized in Japan and rate of abortions went up, resulting in fewer births. That bump in 1970 would be the echo of the earlier baby boom in Japan. This 'short lived' baby boom was the main factor responsible for rapid growth when the 1946-51 baby crops reached the working age during the period 1965 to 1990. The favorable policy environment led to the East Asian Miracle. China followed the suit and within 'one generation', it attained the replacement levels of fertility. On the contrary, in India, this stage of demographic transition is expected to last for almost a century since 1950 until the fertility reaches replacement level. Moreover, there are very large variations within the country in different states. The fertility rate may take even longer in states like UP, Bihar, Rajasthan and Madhya Pradesh to reach replacement level whereas states like Kerala, Tamil Nadu and Andhra Pradesh have already attained the replacement level of fertility. As per one projection⁶, these states will continue to have TFR above 2.1 beyond the year 2026, the year projected by the UN when on all India level, the TFR is expected to attain 2.1 levels. But the projections for these states are as follows as per Registrar General, India(1997, 2001); Dyson(2002); Retherford and Mishra (2001a).

Table 2

States	Year when TFR=2.1 projected to be reached
Rajasthan	2048
Uttar Pradesh	>2100
Madhya Pradesh	>2060
Bihar	2039

They are the most populous states in India, and therefore, unless they attain the desired level of 2.1, the year 2026 appears to be unrealistic. Health infrastructure & access for majority of rural & backward population is very poor. Moreover, the literacy levels in these states

⁶Registrar General, India (1999, 2001); Dyson (2002); Retherford and Mishra (2001a)

are the worst, both of which are the main factors to change the behavior pattern of people, which determines Total Desired Fertility rate and undesired fertility rate. Moreover, these states have witnessed high levels of political instability. These and many other features have to be taken into account before such forecasts such as caste and religion-based voting, infrastructure facilities, health facilities, traditional superstitious beliefs about children being the gifts of God etc.

In case of Africa, this scenario can be worse and this stage of transition may last even considerably longer than India.

Another very important phenomenon is that there is much less cross-country variation in the timing of mortality declines than there are variations in the timing of fertility declines. This is because there is a common cause of health improvements. These were the years of 'medical golden age' for the world (1965 onwards) when antibiotics and vaccines were invented & many diseases became curable. It is worth noticing that the death rates started declining in Europe as long back as in the 18th century. Similarly, the decline in birth rates in developed countries began in late 19th century and hence, the fertility rate was well below replacement level in many European countries when the medical golden age dawned. Their longevity increased further. Thus, the European countries were benefited by the timing of commencement of this phase of transition in demography despite the fact that the duration of decline in fertility rate phase was almost 100 years. Countries in which these transitions commenced in the 20th century (especially in its later half) or thereafter, were at comparative disadvantage unless they took special policy measures to intervene and decrease fertility drastically. Among them also, those countries will benefit more which have stronger institutional set up and stronger macro-economic indicators.

5. Dependency Ratios⁷

The above-discussed demographic transitions have significant impact on the age-distribution of the

populations of the countries. When the mortality rates initially decline, the ratio of children in the population increases and as a result, the state has to make arrangement for their bringing up, nutrition, education etc. and these sectors take priority over others like construction of ports, infrastructure etc. However, when this baby boom population enters the working-age group, they engage in economic activity and higher level of productivity and higher level of savings is expected from the people in this age group. During this period, per Capita GDP is expected to rise. However, when they enter old age, say above 65 years, the savings rate comes down with decrease in economic activity. In addition, they require old-age pension and greater medical care. They save & invest less. Consequently, this is a period of decreased economic growth.

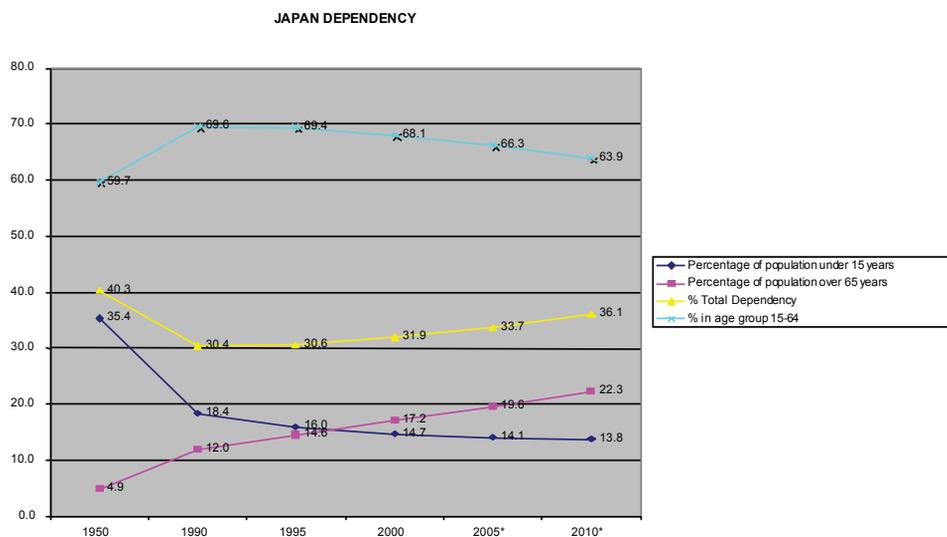
Four ratios are important in this regard—(i) Child Dependency Ratio; (ii) Old Dependency Ratio; (iii) Overall Dependency ratio and (iv) Ratio of working age population to non-working-age population (between 15 & 64 years of age). The following figures depict all the four dependency ratios for the selected countries—Japan, China, India and Africa.

5.1. Dependency Ratios in Japan

We can see that in the case of Japan, the old age dependency has overtaken the child dependency at around 1995 and the gap between the two is increasing. Due to below replacement level fertility rate, the child dependency is going to come down further and old-age dependencies will rise at a higher pace and the gap between the two will rapidly increase in the coming decades. Hence, as per short-term projection, out of total 36.1% of the economically dependent population, 22.3% will be old-age dependency by 2010. Only 63.9% population will be in the age group of 15-64 years. This percentage will further reduce with growing overall dependency.

⁷Data obtained as published in Adam Szirmai, *The Dynamics of Socio-Economic Development*, CUP, 2004.

Figure 8

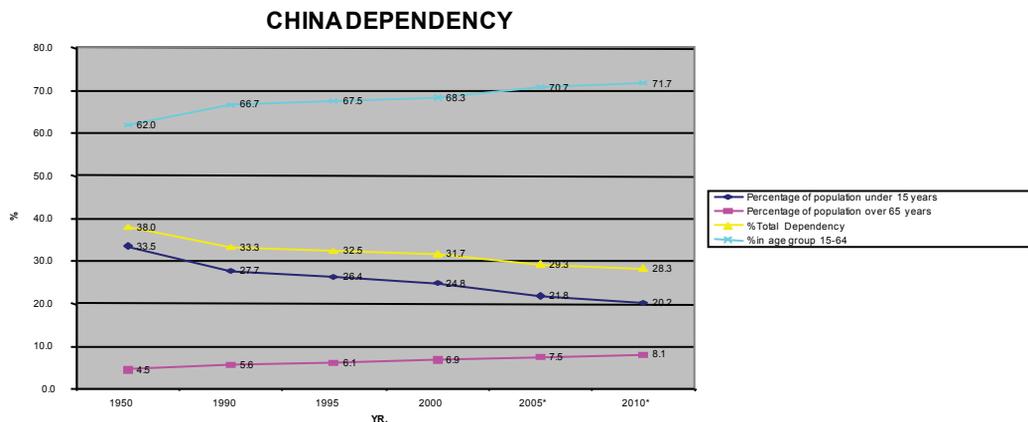


That is, the burden of dependencies will increase on the decreasing number of the working age population. Naturally, the priorities are different for Japan. They have to spend more on old-age population than the dependent younger population i.e. pension, health etc. Different countries facing similar problems are formulating different strategies to deal with them and there are a no. of ways to tackle the situation e.g. increasing age of retirement, increasing taxes on working population, decreasing pension benefits, replacing public pension system with private pensions, allowing immigration from other countries etc. Nevertheless, all these alternatives are attendant to different problems too and each country's political economy has to play a key role.

5.2. Dependency Ratios in China

In China, on the other hand, out of total 28.3% dependency, old-age-dependency will be only 8.1% whereas the child dependency will be 20.2% as projected in 2010. Throughout from 1950 to 2010, child-dependency has been higher than the old-age-dependency; however, the gap between the two is decreasing. Therefore, it may take quite long time before the old-age dependency overtakes child-dependency. In 2010, the working age group proportion is also projected to be 71.7%. This shows that presently, the main burden is of the child dependency in China and has to set priorities accordingly. However, at the same time it should start planning ways to deal with the sharply increasing old-age dependency.

Figure 9 CHINA DEPENDENCY



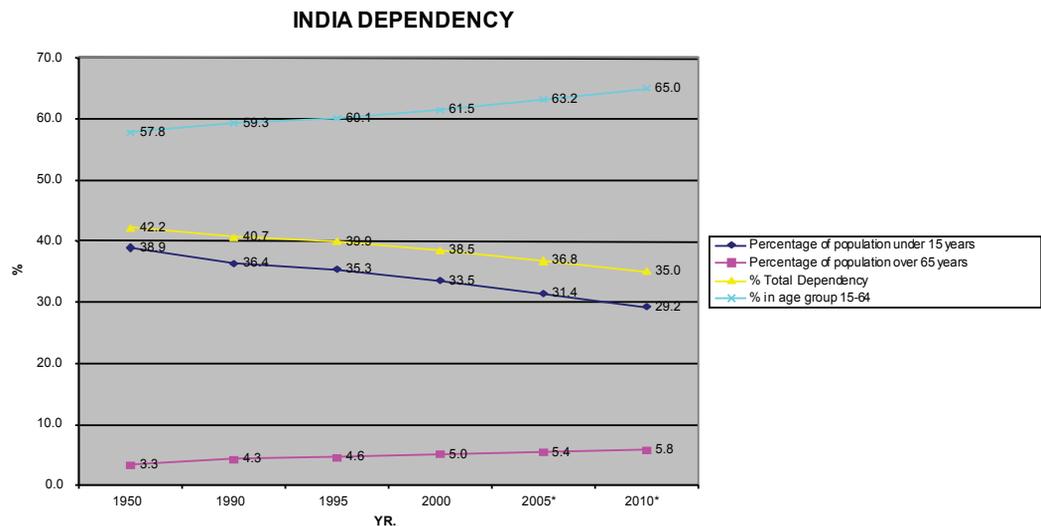
The child-dependency is expected to decrease further beyond 2010 but slowly. But the old-age dependency will increase at a greater pace. Therefore, because of these different paces of decline in child dependency and increase in old-age dependency, the old-age dependency may surpass child-dependency ratio much earlier than India can do it. China is also better placed than India in the matter of generating resources to take care of old-age population, as the per Capita GDP of China even now is more than double of India.

5.3. Dependency Ratios in India

In case of India, overall dependency is more than what China has (35% against China's 28.3% in 2010). Out of this 29.2% is due to child-dependency and 5.8% due to old-age people. Rate of fall of child dependency since

1950 is slower than China because of slower decline in the fertility rates. Moreover, old-age dependency is also increasing. The most important difference from China is that the 1950 cohorts will en-mass be entering into the dependent old-age segment of India, which will continue to grow over a longer period of time during which India can overtake China in terms of the total population of the country. The prolonged transition is because of slow decline in fertility rates in India than China. The child-dependency rate is declining much slowly than in the case of China giving rise to much higher total dependency than expected. The proportion of people in working age group in 2010 is projected to be 65% only as against China's 71.7%. Hence, India has to deal with higher dependency in the prevalent environment of not very good macro-economic indicators. We will discuss policy implications for India in detail a while later.

Figure 10 INDIA DEPENDENCY

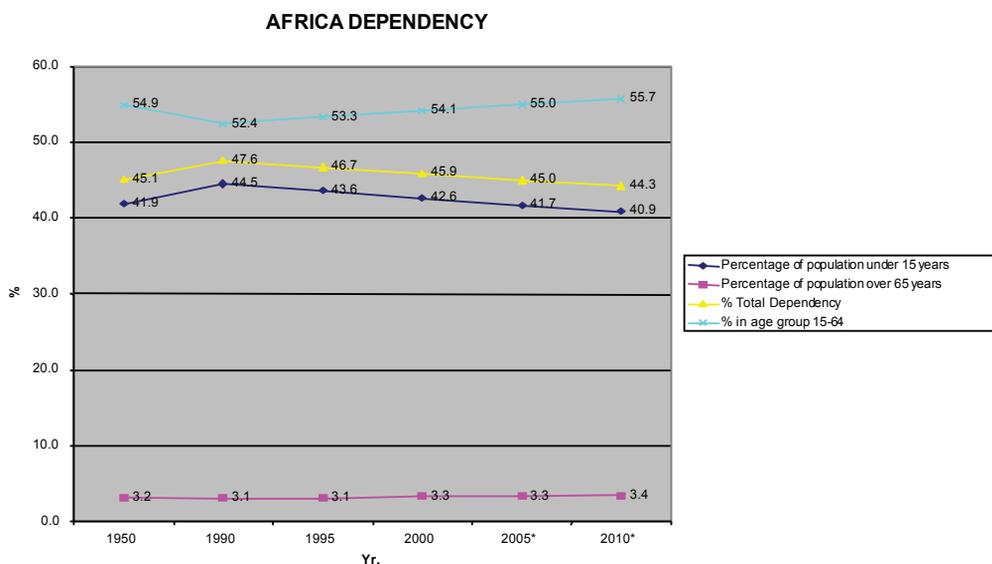


5.4.- Dependency Ratios in Africa

Africa is an aggravated case in terms of very high child dependence ratio, which is not going to fall very much in near future. On the contrary, the aging population is increasing at a very slow pace. They have to adopt policies accordingly. In 2010, the working-age proportion is also projected to be only 55.7% which is too less to take care of such large dependency. In the total dependence, the larger share is of the young dependents, whereas the old dependency is increasing very slowly. With very weak macroeconomic indicators and with the smallest proportion of working-age population among all the four

cases discussed, there can be reasonable apprehensions about its ability to take full advantage of the demographic dividend and convert it into real economic growth in form of per-Capita GDP in near future. However, working age population will grow over-time so also the old age dependency, though slowly. Moreover, other factors like HIV/AIDS etc will also affect the dependency factors. Africa has to ensure through proper policies that the growth-rate increases with increase in productivity of work-force-age population.

Figure 11



6. Economic Impacts of Demographic Changes and vice versa

By shifting the age-structure of a population, a country's demographic transition can contribute to significant changes in its economy. Those changes occur because people's economic behavior –savings and investment- tends to vary predictably over their lifetimes⁸. This is also called life-cycle theory model. Once age structure dynamics are introduced into an economic growth model, the countries obey the common principles of economic growth⁹. These so called 'predictable ways' of shift in economic behavior have already been summarized in the beginning of the paper too (Page 3). Let us summarize the same. Let us assume that we have an economy that is growing at 2 or 3% per year. Let us call it the steady-state growth. The demographic burden transition creates a youth demographic burden initially. That baby boom drags down measured economic growth a bit, but when they reach the working-age, we have the accounting and behavioral effects—more savers and more workers and also higher labor force participation rates and more people earning to save because they think that they have to live longer. That leads to a bump in economic growth. But this bump abates when people reach older age. David Bloom is of the opinion that people in the age group 65 and above are not a drag on the

economy. The argument is that many of them still save even if they are not working, and they may be enabling their sons & daughters to go to work by watching their grand children. They have human capital and may be imparting to other generations to make them productive.

There are evidences that there is nothing automatic about the link between the demographic change and the economic growth of a country. Age distribution may merely create a potential for economic growth. Whether or not this potential is converted into real growth depends on many factors including quality of governmental institutions, labor legislation, macroeconomic management, openness to trade, education policy etc.

But other factors which, in my view, are also very important are: Base-Level development state in terms of population, fertility & mortality, health, education, labor law reforms, land reforms and reforms in laws of inheritance. In addition, infrastructure & trade, communication & technology, employment opportunities, rates of prevalent unemployment in the country and culture and traditions of the county, natural resources, present national income per capita, existing level of poverty, political commitments, political instability, international environment, peace etc. also substantially contribute in realizing the potential presented by the demographic dividend in terms of per Capita GDP.

Had the behavior of people been so predictive once demographic model is superimposed on economic model, the solutions would have been straight forward and simple, specially it is not so in the developing

⁸Browning and Crossely, 2001

⁹Bloom and Canning, 2001; Bloom, Canning and Malaney, 2000.

countries and the least developed countries. I will now discuss some of these factors with special reference to India. However, they may be equally important for other developing countries too. As a number of factors affect growth, I will discuss in some greater detail only four factors which directly influence demography and economy of a country.

7. Base-Level Position of Population, Rate of Fertility and Mortality.

In our discussions about differences in the development status of the four countries we examined, we have noticed that base-level advantage to a country on any of these accounts has benefited the country in the long run. But this rule can also not be generalized. India started on a better population front than China but due to proper and timely intervention its fertility rate plunged below replacement level within 40 years whereas India could not achieve significantly on this front. India is a democratic country and the biggest democracy in the world. The forced sterilizations in the 1970s and the target-oriented family planning programs failed to yield results as the former became very unpopular among the citizens and the latter programs were reduced to achieving targets, which gave rise to a number of immoral practices to achieve the targets. Hence, some couples were sterilized twice and even children and old-age people not in reproductive age were subjected to sterilization. In all these programs, public participation was lacking. Moreover, more importantly, after the sterilization operations the subjects were not afforded post-operative care. In India, the fertility rate consists of two parts. Behaviorally, the couples want to limit fertility to two children in many places, but still there exists a large unwanted fertility in various states of the country, especially in rural areas and less developed states. Most of the unwanted fertility is due to (i) undersupply of family planning measures at village levels; (ii) lack of medical staff to ensure female health; (iii) lack of female education; (iv) lesser importance to reproductive health in many places in the country; (v) predominantly, male-dominated society where the decision to bear children is made by the male members rather than female members. If this unwanted fertility is reduced by various policy

measures, the rate of fertility may decline as desired and India may be able to enjoy the full fruits of the so-called 'demographic dividend'. There is a very huge difference between the Total Fertility Rate (TFR) and the Unwanted Fertility Rate (UFR). If the latter is wiped out, India can achieve the goal of attaining the replacement rate of fertility before the time projected by various agencies. Following are a few cases of selected states, which show the difference between TFR & UFR. Although the data reproduced below are a bit older, nevertheless, they point towards a major problem¹⁰. The data shown in the following table are the results of National Family Health Surveys (NFHS-1) carried out in 1992-93 and the second in 1998-99 (NFHS-2)¹¹.

Table 3

State	TFR -NFHS-1(1992-93) / NGHS-2 (1998-99)	Wanted Fertility -NFHS-1(1992-93) / NGHS-2 (1998-99)	UFR as % of TFR -NFHS-1(1992-93) / NGHS-2 (1998-99)
Madhya Pradesh	3.90/3.31	3.21/2.40	17.7%/27%
Bihar	4.00/3.49	3.18/2.58	20.5%/26%
Rajasthan	3.63/3.78	2.78/2.57	23.4%/32%
Uttar Pradesh	4.82/3.99	3.82/2.83	20.7%/29%
Haryana	3.99/2.88	2.81/2.10	29.6%/27%

These figures have improved over the years. Even then, some facts cannot be ignored. For example, the share of 'high desired fertility' in the total population growth is only 6%. The balance 24% of the growth is due to high-unwanted fertility. The rest 70% increase in population is due to momentum effect. The momentum effect also greatly varies among the states¹². The policy implications are evident in this area. As mortality rates' cross-country variation is lesser than the fertility rates, the mortality rates may more or less follow the global trend. However, in India mortality rate may decline to an extent lesser than desired mainly due to low level

¹⁰International Institute for Population Sciences, 1995

¹¹Serious doubts have been raised about the quality of the fertility estimates of both NFHS-1 and NFHS-2 for certain states.

¹²Leele Visaria, Pravin Visaria, 2003 "Long-Term Population Projections for Major States, 1991-2101.

of technology, problem of reach in remote areas and absence of appropriate policy measures for technology transfer.

8. Health

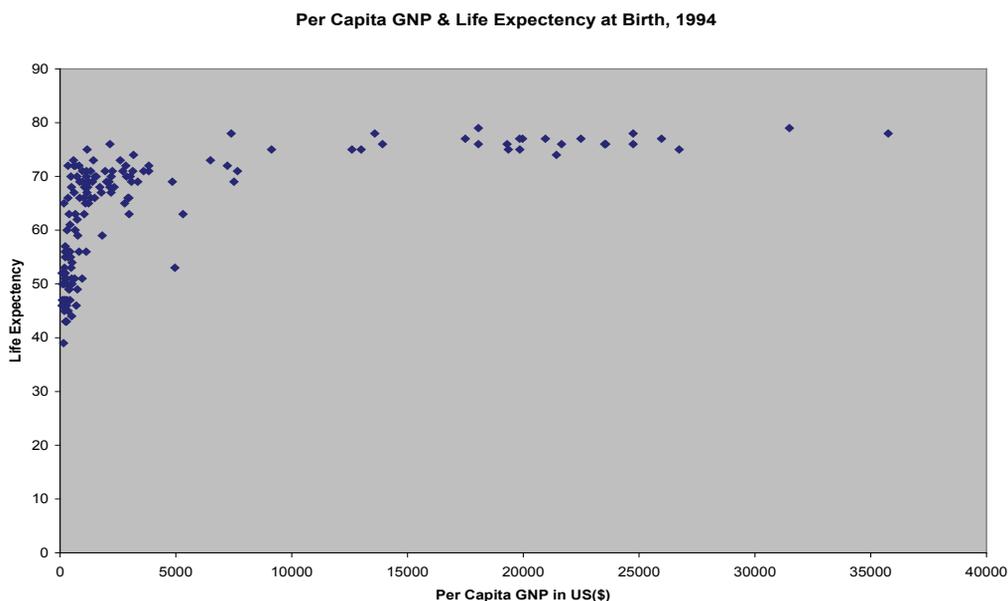
Although the total expenditure on health in India is comparable with other developing countries (5.2% of GDP), but government share is too low (~0.9% of GDP). In absolute terms, it comes to \$94 per Capita in India as compared to \$143 in China¹³. The rest is out of pocket expenditure by the Indians, which is not only ineffective but also economically sub-optimal and inequitable. The health outcomes are very poor. Health has major effects on age structures and on labor output, income, savings, retirement age etc. that cumulatively affect the overall productivity and may have a very large influence on the proper exploitation of the potential produced by the demographic transition in the form of demographic dividend. Hence, mere extended period of high working age population is not an enough a condition to ensure taking full advantage of demographic dividend and India

lags behind many other developing countries on this front. This is another sector that needs extensive reforms. As Health itself forms a very wide area of study, I would not like to go into detailed issues involved.

However, I would just like to introduce another concept about the relationship between health and income. The following curve shows relation between per Capita GNP and Life Expectancy¹⁴. This shows a causality between income and life expectancy, which a good proxy variable of 'health'. It is a two-way causality. There is evidence both ways. Increased expectancy causes health to improve and better health helps in increasing income.

Health is therefore, a very important factor not only for triggering and accelerating demographic transition but also in realizing the potential created by 'demographic dividend' in the form of real growth in per capita income. Health influences productivity of labor & may also increase the working years of older people in economic activity. Both of these effects will help in increasing savings, accumulation of capital and investment, which results in growth per capita income.

Figure 12



Moreover, as per capita income increases, people have better access to health facilities. The relation between income & health is shown in the above figure, which according to me has two-way causality, viz.

¹³WHO 2000 Report; World Development Report, 2001; McKinsey Analysis.

¹⁴Data from UNICEF Basic Indicators, 1994

Health \longleftrightarrow **Per Capita Income**

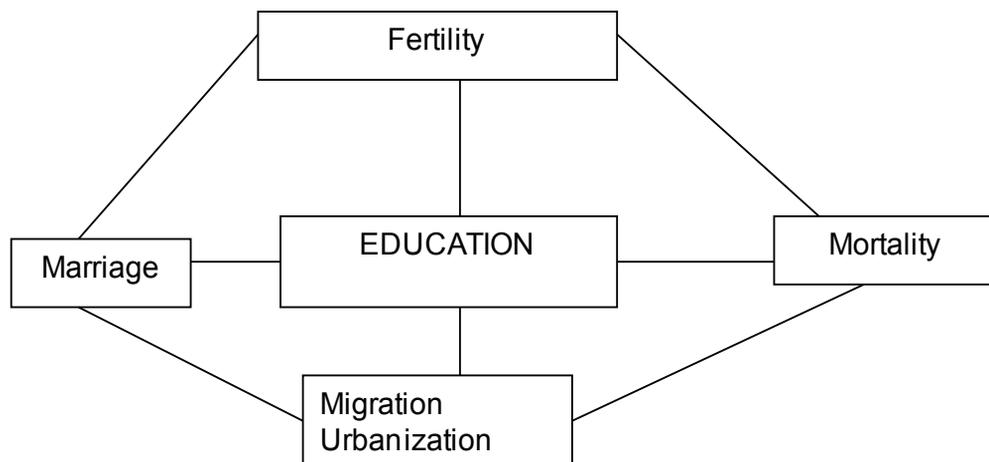
Health has a very important role to play in reducing fertility rates. Better reproductive health facilities in all the rural and backward areas can help eliminate the UFR and also can help to reduce the wanted fertility.

9. Education

This is another very important factor affecting fertility rates in various countries. In India, overall male literacy rate was 75.96% & female literacy rate only 54.28%¹⁵. The distribution of illiteracy is also very uneven within the country. Kerala is the highest literate state with over 94.2% (male) & 87.86% (female) literacy. Female literacy is a major pathway to human development and for reduction in rate of fertility. Women’s empowerment and the meeting of reproductive and sexual rights depend on literacy. Literacy is also important for maintaining sex-

ratio in the society. Literacy levels considerably influence income and employment. Through more literacy, labor participation can be increased and with increased participation rates among the working age population, the economic growth can be stimulated. During the said demographic dividend phase, if more of the working age population is not literate, the participation rate will come down which will put drain on the growth in per Capita income.

Therefore, level of education and participation in economic activities affect the timing as well as the pace of the demographic change. The relation between education and population can be represented as below. The relationship between education and fertility has been studied more than any other researchers around the world. It is too complex in nature and hinges on influence on factors like marital patterns. Education not only raises age of marriage but it also changes the value systems leading individuals to have lesser children.



10. Openness of the economy

There is empirical evidence that open economies, with good institutions and homogeneous populations have higher rates of economic growth. Openness to trade, good governance, and good macro-economic management seem to be very important to realizing the demographic dividend. India is still one of the most conservative countries and needs to open up its various

markets and allow foreign investment to take place in order to stimulate growth. China had opened up its economy long back in 1979. Reforms in various sectors, disinvestments, privatizations etc are the measures, which are required to be taken at, fast pace to maximize our gain on the demographic dividend; otherwise, it will again be a lost opportunity.

¹⁵Census of India, 2001

11. Other factors

Health & Education are the most important factors influencing demographic transition. The other factors do affect the growth in income. Many factors are very important for realizing the demographic dividend presented to India. Labor law reforms, land reforms, reforms in bureaucracy, proper implementation of FRBM Act, 2003 for attaining fiscal discipline etc.

12. Policy Environment

Policy environment is the most important factor responsible for taking full advantage of the demographic change. The so-called dividend available to India must be exploited in full to convert the potential into real growth. This requires favorable political environment in the country and political will. We have to find out ways even in the times of coalition politics for reforms to be carried out. Any shortfall on any front affecting the economic growth during this period will have long-term effect. If the per Capita Income does not rise drastically, employment does not increase substantially by opening up inflow channels of foreign investment, if international trade does not increase in sufficient quantity, the demographic dividend may not yield the desired result in terms of per capita GDP. This is urgent in nature because, with the passage of time, the total dependency will increase. India may get greater percentage of population in working-age group, but mere numbers are not important. **Quality of the working age population is more important than the sheer numbers.** Hence, without substantial achievement in the areas of **health and education**, the quality of the working-age population may decline and consequently, the growth will be adversely affected despite having larger proportion of working age population. Moreover, in future, there will be competition among countries for emigration to developed countries that are facing the problem of population ageing. They may require certain skills in the immigrants. From that point of view also reforms in education becomes very important. Since 1991, India has carried out certain reforms in some sectors but the agenda is highly unfinished on many fronts. Already there is enough literature on the same. What is required to be done is also known. There are also enough success stories available elsewhere in the world in every field. The only point I would like to emphasize is that all the

unfinished agenda should be implemented at the earliest so that we can harvest the fruits of demographic dividend fully. Health, Unemployment, Poverty, and Illiteracy are the biggest roadblocks still lying in our road towards sustainable growth and smooth transition to the next stage of demographic transition.

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