Youth ·. Absorption in Workforce and Its Implication for Demographic Dividend in India: A State Level Analysis

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DECLARATION

This is to certify that the dissertation entitled **"Youth Absorption in Workforce and Its Implication for Demographic Dividend in India: A State Level Analysis"** submitted by me is in partial fulfillment of the requirements for the award of the degree of Master of Philosophy of Jawaharlal Nehru University. This dissertation has not been submitted for the award of any other degree in this University or any other University and is my own work.

Mamta Lamba

CERTIFICATE

We recommend that this dissertation be placed before the examiners for evaluation.

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Dedicated to My Buaji &

Fufaji

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CONTENTS

Acknowledgements

List of figures and tables

List of Abbreviations

ASI – Annual Survey of Industries

COI - Census Of India

CSO - Central Statistical Organisation

ILO – International Labour Organisation

IMR - Infant Mortality Rate

NSDP - Net State Domestic Product

NSSO - National Sample Survey Organisation

PCA - Primary Census Abstract

TFPG - Total Factor Productivity Growth

TFR - Total Fertility Rate

UPS - Usual Principle Status

UTs - Union Territories

WFPR - Work Force Participation Rate

Chapter 1

Demographic Dividend: Its Meaning and Scope for Indian Economy

1.1 Population: Inhibiting growth in third world countries

The first obstacle faced by less developed and developing countries when they start climbing the ladder of development is rapid increase in their population size. These less developed countries have low per capita income. In general, it is said *that if the level of per capita income of a country is low, its dependency on natural resources is high.* Alternatively, the dependency of an economy on natural resources is negatively related with per capita income. Thus, in these countries, there is immense pressure on natural resources which leads to their relative exhaustion. Poor in physical and human capital, third world countries are excessively dependent on natural resources for their economic activities. So, these countries are trapped in the vicious circle of exhausting natural resources – low economic growth - exhausting economic growth.

It is not necessary that increase in population always puts great pressure on natural resources as was the case with developed economies when they started with the process of economic development. But certainly it is true for present developing economies which have recently stepped up on the path of economic development. Population which is growing at an increasing rate is a curse for development process in these countries. Why this relationship between population growth and natural resources is different in third world countries when compared with present day developed countries. Answer lies in following lines:

If the pattern of population growth in developed countries during their initial phases of development is taken into account, we find it different from that of third world countries in two aspects:

1.   The rate of population growth that developing countries are experiencing today is much faster then what developed countries faced during their early phases of development. It is true that advanced countries also experienced higher rate of population growth during industrial revolution but it rarely exceeded 2 per cent whereas the average rate of population growth of today's developing countries is about 2.5 per cent and as much as 3 per cent or higher for low income economies.

2.   Phenomenon of population growth was an *endogenous process* in advanced countries. It was induced by accelerated economic growth-increased employment and income because of major productivity growth during industrial revolution. Whereas acceleration in population in developing countries was largely because of importation of health and medical technologies from advanced economies. So this phenomenon was largely *exogenous* in nature in developing countries.

For instance, acceleration in population growth in Europe during industrial revolution was an internal phenomenon. On the other hand, during later half of the 20th century Sub-Saharan Africa witnessed a noticeable rise in life expectancy and fall in infant mortality rate without any corresponding improvement in per capita calorie intake. It was because public health and medical technologies were not developed indigenously with time rather they were adopted from already advanced Western countries.

When this exogenously induced population growth leads to explosive rise in population of a country without any corresponding generation of income, employment and social infrastructure, developing as well as less developed countries are destined to struggle with rapid resource exhaustion, economic decline and isolation as compared to developed countries which have a lower population and higher economic & social resources .

So problem of population growth today is largely a problem of less developed and developing countries. India is also a developing country with second largest population in the world (1.2 billion according to Census of India, 2011) after China and it is expected to become most populous country leaving behind China very soon.

Negative impact of population on economy combined with huge population of India suggests that it is challenging for India to attain an accelerated and sustainable economic growth to become a strong economic power in the world. Will India remain a developing country until its population burden reduces? Is overall population size the only factor which hampers economic growth? Fortunately, answer to these queries can be No!! Hope lies in the theory of demographic dividend. The next section briefly explains this theory and the successive sections explain why India can rely on demographic dividend to foster high economic growth rates despite having population of more than a billion.

1.2 What is demographic dividend?

Demographic Dividend is a bonus which a country earns in form of accelerated economic growth because of rising proportion of working age population (15-64 years) in total population. That is why, it is also known as demographic gift or bonus or demographic window.

Demographic dividend is inbuilt in theory of demographic transition. Broadly, there are three phases of demographic transition. In the first phase, birth rate is high but death rate begins to decline with improvement in medical facilities like popularisation of vaccination programme and provision of better water and sanitation facilities which

results in declining infant mortality and child mortality. Improvement in transportation facilities and agriculture also reduce the impact of famines. As a result, not only population growth rate is high, share of people in young age group (0-14 years) is also high. This leads to higher dependency ratios.

Gradually, with change in social norms which leads to fall in early child marriages, fading preference for male child, declining belief in universal marriage etc. and promotion of family planning programmes, fertility rates begin to decline. Also, according to basic economic theory of fertility, each couple wants to have an ideal number of surviving children. With decline in death rate, the number of surviving children increases and couples adjust their fertility rates (Lee, 2003). This is the second phase of demographic transition which opens up demographic window. This decline in birth rate which follows decline in death rate comes after a lag of one or two generations. So, in this stage where both birth rate and death rate are low, population growth rate declines along with the absolute number of children (0-14 years) in total population. At the same time, due to high birth rate in past, the absolute number of individuals entering in working age group (15-64) is also high. Consequently, dependency ratio declines during second stage of demographic transition.

In the third phase, this high working age population would shift to old age group (above 60 years) and number of individuals entering into working age group will reduce (because reduced fertility rate during second stage of demographic transition had resulted in lesser number of children) as compared to second phase. As a result, dependency ratio would again start increasing but this time due to increase in old age population.

To understand demographic dividend attention should be given to second phase of demographic transition. During this phase, the share of working age population in total population is high. In other words, dependency ratio is the lowest. Supplemented with favourable conditions, this high proportion of working age population can induce higher

economic growth rate. Such acceleration in economic growth rate because of high working age population ratio is known as demographic dividend.

A few points are worth mentioning here to fully understand this phenomenon of demographic dividend. First, the birth rate should decline drastically so that increasing share of working age population can impact economic growth rate significantly. If birth rate declines gradually and slowly, this phenomenon of demographic dividend may pass unnoticed as it had happened in case of western countries.

Secondly, as demographic dividend is associated with rapid decline in birth rate, it is expected to be a very short phase. So as to exploit such an opportunity, quick attention should be given to provide a suitable socio-economic environment.

Thirdly, demographic dividend is not about higher working age population in absolute terms. Working age population was high even in first phase of demographic transition but accompanied by high child population. What makes difference between first phase and second phase is the fact that in second phase, dependency ratio is the lowest i.e. working age population is high as compared to child population and old age population. Demographic window opens due to higher growth rate of working age population coupled with declining growth rate of child population. To sum up, demographic dividend is related to age structure of total population, not with the size of total population.

1.3 Scope for Indian economy

India is emerging as a classic case of a country with a "window of demographic opportunity" wide open. The Total Fertility Rate (TFR) in India was 4.4 during 1978-80. During 1988-90, it had fallen to 3.9 and during 1999-2000 , it had declined further to 3.2.

Finally, in 2011, it had reached close to replacement level of at 2.1 [Registrar General, 2011]. Accordingly, the window of demographic opportunity had began to open up for India around the 1980s and it is expected to remain open till 2035. During 1975-2025, the share of population in the working age group (15-59) (also known as the productive age group) is expected to increase from 54 per cent to 64.3 per cent in India. Consequently, the number of dependants per productive adult will decline by approximately 33 per cent from around 0.9 to 0.6 while the working population will continue to increase at a rate of 2 per cent for next two decades. Table 1.1 gives per centage change in population by broad age groups from 1950 to 2050. This demographic window will not remain open forever. It is expected to close after 2035 and the proportion of the working age group will decline to 59.7 per cent as 2050 will approach. Moreover, during this period of 15 years (2035 to 2050), increase in number of dependents will be solely caused by the rise of the population of old age group (60 & above) and not because of rise in child population (0-14 age group). In fact, during the same period, the population of geriatrics will increase its share from 12.5 per cent to 20.6 per cent while the population of children will decrease from 23.2 per cent to 19.7 per cent. This means that India will have less than one child per senior citizen during and after 2050. Thus, it is essential for India to take advantage of its years of the window of demographic opportunity which will effectively remain open till 2025 to attain higher growth and attain a significantly high level of per capita income (Mitra and Nagarajan, 2005).

This window of demographic opportunity has been continuously widening as the proportion of working age population has been increasing rapidly in the country. According to United Nations projections (2002), total population increased by 63 per cent whereas the population in the working age group increased by 77 per cent during the period of 25 years from 1975 to 2000. Thereafter, total population will increase by 34 per cent where as productive age group will increase by 46 per cent for another 25 years i.e. from 2000 to 2025 Thus, the growth of population in the working age group is going to be significantly higher than the growth in the total population of the country. This implies that the potentially productive population will grow faster than the non-productive population. But after that from 2025 to 2050, total population will grow by 16 per cent whereas working age group will increase by merely 8 per cent. The gap between growth

of total population and working age population will begin to decline. These facts clearly points that this window of opportunity is a one time opportunity for India.

Table 1.1: Population by broad age groups & dependency ratio

India (1950-2050)					
	1950	1975	2000	2025*	2050*
Population (millions)					
Total	357.6	620.7	1008.9	1351.8	1572.1
0-14	139.2	247.1	337.9	314.1	309
15-59	198.3	335.1	594.2	869.2	938.7
60+	20.1	38.5	76.9	168.5	324.3
Population (per cent)					
0-14	38.9	39.8	33.5	23.2	19.7
15-59	55.5	54	58.9	64.3	59.7
60+	5.6	6.2	7.6	12.5	20.6
Dependency Ratio					
Total (0-14 & 60+)	80.3	85.2	69.8	55.5	67.5
Youth (0-14)	70.2	73.7	56.9	36.1	32.9
Old (60+)	10.1	11.5	12.9	19.4	34.5
Change in population (per centage)					
		1950-75	1975-2000	2000-25	2025-50
Total	-	73.6	62.5	34	16.3
0-14	-	77.5	36.8	-7	-1.6
15-59	-	69	77.3	46.3	8
60+	-	91.5	99.7	119.1	92.5

Source: United Nations (2002).

*Projected

According to Economic survey 2011-12: "The census projection report shows that the proportion of working age population between 15 and 59 years is likely to increase from approximately from 58% in 2001 to more than 64% by 2021. In absolute numbers, there will be approximately 63.5 million new entrants to working age group between 2011 and 2016. Further, it is important to note that the bulk of this increase is likely to take place in the relatively younger age group of 20-35 years. Such a trend would make India one of

the youngest nations in the world with huge growth potential." Individuals in comparatively young age group (20-35 years) within working age population (15-59 years) are going to play bigger role in demographic dividend. So, policies should be designed and formulated to enhance skill of the youths. It will facilitate them to work in productive jobs providing higher incomes.

Across countries both developed as well as developing, India is currently enjoying a relatively advantageous demographic position. To quote Chandershekher et el.(2006) "In 2020, average Indian will be 29 years old. Comparable figures for China and the USA are 37, 45 for west Europe and 48 for Japan." In advanced economies, such as Japan, Western Europe, the UK, and the USA have the share of working-age group in total population has reached its summit and then started to fall. In Japan and Western Europe, the share of working age population is declining very drastically. However, in the case of the UK and the USA, the share of the working age population is projected to decline gradually before stabilizing in the range of 60-65% (Kumar, 2010). With appropriate programmes and schemes, India can compete with developed countries on economic front. Higher national savings followed by productive investments in fields of research & development and innovations can bring good results in long term.

On the other hand, in countries such as China, Russia, and Eastern European countries, the proportion of the working-age population in total population is expected to increase continuously till 2015. Unlike the advanced economies, the fall in proportion of productive population among these countries is not going to be very sharp. It is expected to decline slowly and also, the share of the working age population in total population is expected to remain above 60% (Kumar, 2010).

Now if focus is turned towards emerging economies like Brazil and other Latin American countries and Southeast Asian (SE Asian) countries then they are projected to witness an rise in the share of the productive-age population till the middle of 2020s before it gradually starts declining. As the fall will not be sudden but a gradual one, the share of the working-age group in total population is projected to remain above 60%. Table 1.2 below gives age distribution of some other developing and developed countries.

Table 1.2: Distribution of Population by broad age groups in selected countries, 2004

Countries	Age Distribution (per cent)		
	<15	15-64	65+
Sudan	45	53	2
Nigeria	44	53	3
Pakistan	42	54	4
South Korea	20	72	8
Taiwan	20	71	9
China	22	71	7
Thailand	23	70	7
Germany	15	68	17
Japan	14	67	19
Italy	14	67	19
Sweden	17	65	18
India	36	60	4

Source: Population Reference Bureau, 2004 and World Population Data Sheet, 2004.

Comparing the situation of India with above mentioned countries, it is found that India is facing a relatively advantageous position in the world. In India, the share of the working-age population in total population is increasing rapidly and it is expected to continuously increase between 2035 and 2040. After that India will be witnessing a slowdown in growth of share of productive age population and a gradual decline thereafter. The share of the working-age population in India is expected to remain above 59.7% until 2050. Thus, India's demographic window with a growing share of the working-age population in total population is among the longest in the world. India thus seems to be standing in front of a huge opportunity in terms of an explosion in the share of the working- age population. It is right time for India to exploit the potential of its huge population of 1.2 billion with a lion's share in it of working age population to jump to a new and high economic growth path. If not utilised in time, this demographic boon can turn into demographic bomb and India will remain trapped among middle income countries. Moreover, situation will worsen in future when dependency ratios will again start rising due to old age population.

It is also important to understand the regional demographic variations in India to fully understand the scope of demographic window for the future of the economy. All states

did not pass through stages of demographic transition simultaneously. Most of the southern states were ahead of northern states in achieving a low birth rate along with low death rate. For example, as all states were experiencing different birth rates in tune with different stages of demographic transition, states like Tamil Nadu, Kerala, Karnataka, Punjab and Gujarat recorded a decline of more than 10 percentage points in 0-14 age groups i.e. children between 1961 and 2001. On the other hand, states like Madhya Pradesh, Bihar and Rajasthan have shown a decline of less than 3 percentage points. Accordingly, former states can be considered demographically leader states and later laggard states (James, 2008). But trends have changed between 2001 and 2011. Laggard states of Rajasthan. Uttar Pradesh, Bihar and Haryana have also entered in the second stage of demographic transition.

Keeping pace with different stages of demographic transition, the share of the working-age population is different across Indian states. It was 64 per cent in Tamil Nadu and Kerala in 2001 and only 52 per cent in Uttar Pradesh and Bihar. In 2011 also, not much difference has been seen as it is 64.2 per cent in Kerala, 66 per cent for Tamil Nadu, 55 per cent for Bihar and Jharkhand combined and 59 per cent in Uttar Pradesh and Uttarakhand combined. It shows that that though the share of working age population in backward states like Bihar and Uttar Pradesh has increased but it is still far below that of southern and advanced states of Kerala and Tamil Nadu.

As far as growth in share of working age population is concerned, there is a similar difference across various states. If the growth rate of the share of the working age population is higher as compared to growth rate of total population, it implies that either working age population will soon be higher than dependent population or it is already greater than dependent population and dependency ratio is declining continuously. Among northern states of India, the average annual growth in the share of the working-age population was virtually zero in Uttar Pradesh and Bihar from 1971 to 2001 —which would mean that dependency ratios were unaffected. On the other hand, in Kerala, the average annual growth rate of the working-age population was 0.54 per cent for a period of 30-year from 1971 to 2001. But in 2011, average growth rate of working age population in Bihar is 0.82 per cent, Madhya Pradesh (along with Chhattisgarh) has 1.26

per cent, Rajasthan 1.58 per cent and Uttar Pradesh (along with Uttarakhand) witnessed1.51 per cent. On the other hand, in southern states of Kerala (0.16 per cent), Tamil Nadu (0.45 per cent) etc. , the growth rate of productive population is lower than north Indian states. Thus, despite a comparatively low share of working age population in 2011, the northern states will be largest partners in realising demographic dividend with a high growth rate of proportion of productive population. These facts point towards an overall favourable age structure for the economy. BIMARU states are among the largest states of India both demographically as well as area wise. Till previous decade of 2001, their share of working age population was growing at a slow rate but according to Census of India estimates (2010)[1], proportion of working age population has increased rapidly from 2001 to 2011. Thus, despite a decline in growth rate of working age population in southern states, India is still sitting on a huge potential source of economic growth as favourable demography will be carried on by large BIMARU states. But this is possible if and only if favourable conditions and facilities are provided in these states. It includes facilities like like better infrastructure, educational and health facilities to attract investment in these states.

1.4 Potential benefits of demographic dividend

A favourable age structure where proportion of productive population is high can create spurt in economic growth through several mechanisms:

First, savings rate are expected to increase with increasing proportion of working age population [Mason 1988; Deaton and Paxson 1997; Higgins and Williamson 1997; Lee et al 2000 Kelly and Schmidt (1996)]. Children and old people are expected to consume more than their production, thus, creating net dissavings. On the other hand, individuals in the working age produce more and consume less, thus, generating net savings. Now, if the ratio of working age population to total population is high, i.e., dependency ratio is low,

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[1] 2011 Census results were not available when this study was undertaken.

the economy is expected to generate aggregate net savings. It solves the problem of generating surplus required for investment and production.

Demographic transition has a close relationship with stages of economic development. Birth rate starts declining only after death rate starts declining. Death rates fall due to improvement in health and sanitation facilities which also contribute towards improvement in life expectancy. Another factor which stimulates more savings is higher life expectancy. If an individual sees a high probability of living a longer life, he will save more for his post retirement phase.

If these higher savings are mobilised for investment, it will increase capital stock both physical and human in an economy. Consequently, economic growth rate will be pushed upwards. Private household savings had played an important part in the economic growth of East Asian countries where it provided for capital accumulation which fuelled their growth (Krugman 1994). According to Rodrik and Subramaniam "14 per centage point decline predicted in India's dependency ratio between 2000 and 2025 will translate into a roughly equivalent rise in private and aggregate savings, from about 25 per cent of GDP to 39 per cent".

Second, with decline in fertility rate, women would find it feasible for themselves to enter the labour market. This is because women would have to spend less on child care now as compared to when fertility rates were high (Becker and Lewis 1973). With lower fertility rates and longer lives, conditions for greater female empowerment are created. With this, females find more time to break away from their traditional roles within the household and seek to join the labour force (McNay, 2005; Sen, 2000). In this context, the experience of Indonesia is an interesting example: a fall in fertility rates was recorded from 5.5 births per woman to only 2.6 births from 1950 to 1999. At the same time, female labour force participation rates increased from 30.6% to 53.2% (Bauer, 2001). This surge in female labour force participations adds to labour supply. According to estimates, in the East Asian miracle, greater female agency played an important role. As more women joined the labour force, wages were pulled down. With these countries pursuing export led industrialization (Ibid), lower wages provided them cost advantage in international market. Furthermore, empowered women are more likely to educate their children and

spend resources on their child health, which contribute s to building human capital (Dreze et al, 1996).

Third, if parents have fewer numbers of children to take care of, they can afford to spend more on nutritious food and health. With more spending on nutritious food and health, though per capita expenditure on child will increase but total expenditure will fall due to low dependency ratio. Lower expenditure implies higher savings and greater per capita investment in human capital formation. Also, there is a direct relationship between good health and productivity. Productivity enhancement would bring efficiency in production process and higher economic growth rate. According to Lucas (1993), the growth in productivity of factors of production like labour was a significant reason behind East Asian economic miracle.

Fourth, if dependency ratio is low, government has to spend less on various schemes for children to provide education, conduct immunization programme etc. This enables diversion of scarce funds from such public spending to more productive activities (World Bank, 1984). Such activities consist of higher spending on innovation, setting up of capital goods industry, investment in energy sector etc. which are crucial for employment generating secondary sector.

Fifth, high working age population removes the hurdles in path of production activity which are set in due to labour inadequacies. If increasing number of rising labour force is provided with appropriate skill and knowledge required by newer and technologically dynamic industries, it can greatly accelerate economic growth rate. In other words, the quality of bulging work force should be improved to a desirable level in such a manner that workers find sufficient employment opportunities whenever they enter labour force.

All the above channels through which higher proportion of working age population results in higher economic growth rates are achieved at household level first mainly

because of decline in fertility rates which later aggregates as macro level advantages in the economy.

1.5 Policy environment required to exploit demographic window

To quote Bloom and Canning (2004: 22-23), "both empirically and theoretically, there is nothing automatic about the link from demographic change to economic growth. Age distribution changes merely create the potential for economic growth. Whether or not this potential is captured depends on the policy environment." In other words, appropriate policies have to be formulated depending on external and internal environment to harness demographic dividend. There is no fixed set of policy guidelines which every economy can adopt to accelerate its economic growth rates once demographic window opens up.

There are two schools of thoughts regarding how to convert potential of huge working age population into actual accelerated economic growth rates.

One school of thought believes in automaticity about the relationship between demographic structure and economic outcome. It is the "demographic dividend" school of thought. Their thought and belief is built on a supply-side understanding of the determinants of economic growth. A high savings rate is presumed as a prerequisite and investments in health and education to ensure that the quality of the workforce is good are seen as necessary facilitators. Further, policies should be export-oriented one instead of inward looking. This is also seen as an essential pre-condition for growth. The policies are required just to facilitate demographic dividend. According to this school of thought savings are seen as determining investment instead of investment opportunities providing an impetus to higher savings. Once share of working age population is high, savings will be generated automatically irrespective of availability of investment avenues. These high savings will automatically lead to accumulation of capital and thus put economy on higher growth trajectory.

The relation between demographic trends, savings and growth is illustrated by Bloom and Canning (2004) through by the analysis of the Taiwanese success. According to their basic understanding about East Asian miracle, it was increased productive investment and expenditure on education, rather than increases in productivity which finally culminated into East Asian miracle. Bloom and Canning attributed high investment in these economies to high savings rates, which are presumed to be automatically invested in pre-Keynesian fashion.

Another school of thought does not believe in automaticity of demographic dividend. According to them, explanations of the East Asian miracle must revolve around the factors that resulted in higher investment like openness of economy, interventionist state etc. The benefits of demographic dividend depend on "good policies" which can be market based economy, quality of government institutions etc. Due to an increase in the share of working age population, new economic activities will be generated. But policy makers should be cautious about the kind of economic activities that are generated. Broadly, economic activities can be divided into two types: Schumpeterian and Malthusian activities (Reinhart, 2007). Schumpeterian activities have the characteristics of increasing returns to scale. Such activities employ skilled and healthy labour and economic environment is that of imperfect competition, stable prices and sticky wages, all of which creates a burgeoning middle class. Malthusian activities, on the other hand, have diminishing returns, unskilled labour and an inhibitory economic environment and whatever gains are made accrue to a select elite few (Ibid). Merging the policies identified in Bloom et al (2003) with the distinction between good and bad economic activities, Thakur (2012) identifies the priority areas and thus policy interventions which need to be focussed to optimize benefits from favourable demographic structure.

Firstly, policies should be devised to provide productive employment for the huge and rapidly growing worker force. If such opportunities are unavailable, the huge workforce cannot accelerate economic growth rates. If huge productive population is not provided with productive employment opportunities, it will have a double negative impact on the economy. Government will have to spend more on unproductive items like unemployment allowances and high unemployment rates will disturb the social fabric of the society. Such a situation can lead to increase in number of anti-social activities. More

so, in future when huge working age population will shift to the old age bracket, it will increase dependency ratio again. Government will have to incur expenditure on their care and old age pension scheme. This will put fiscal pressure on an economy which could not produce and save enough when demographic window was open. Also, a distinction must be made between simple low paid jobs which do not contribute anything beyond simple sustenance and productive jobs which enhance innovation and accelerate economic growth. Low pay jobs would not generate enough savings for current investment and to finance social needs of future old age cohort.

Secondly, policies must be designed to build human capital. Having a young population is not enough until they have certain skills to match the demand of the industries and thus contribute effectively to the economy. This requires improvement in health facilities to ensure a healthy and productive workforce which can undertake Schumpeterian activities. Education along with vocational training is very important to build up the human capital so that a skilled workforce is present which can innovate and promote faster growth.

Thirdly, economy should be planned in such a manner so as to provide high return investment avenues which can further stimulate savings rate. Unemployment and underemployment in an economy is found usually because of demand-side limitations. With this fact in consideration, even if the presumption that increased longevity would be followed by higher savings rates is accomplished, there is a possibility in which investment rates may fall way behind the savings rates. This will result in deflation rather than growth in the economy.

Fourthly, secondary sector particularly manufacturing sector should be promoted. Primary sector which is dependent on natural resources has limited employment generation capacity. Apart from construction and transport sector, even tertiary sector has potential to employ more of skilled labour only. On the other hand, manufacturing sector has the potential to employ skilled, semi-skilled and unskilled labour. To promote manufacturing sector, infrastructure facilities should be improved, economy should be opened up to attract foreign capital which brings new technology as well, institutions should be strengthened and governance should be enhanced.

Thus, what policies are undertaken by a country experiencing an increasing share of workers will decide whether the chance is seized uponto create rapid economic growth or the country slips into a Malthusian trap.

Experience shows that similar policies are not fruitful for all the countries. European countries advocate that large and young populations create a growth opportunity which can be exploited with open-door strategies and flexible labour markets. Contrary to this, with rapid liberalisation of their economic policies, conscious export-orientation and the availability of a surplus workforce, Latin American countries went through a "lost decade" in the 1980s. In fact, governments in East Asian countries were deeply protectionist and adopted strict interventionist measures, even when they pursued mercantilist policies of export expansion involving discipline of the domestic industrial class fostered by the state and supported by a range of incentives. So, if these countries are seen as having exploited the demographic dividend, this resulted from the adoption of policies that were significantly interventionist.

Before policy implementation, GDP composition, occupational structure, international markets, terms of trade etc should be very prudently analysed to exploit demographic dividend optimally. Also, Chandershekher and Ghosh suggest "to understand what kinds of policies can help exploit the window of opportunity created by a demographic bulge in the working age groups, it is necessary to recognise that the dependency ratio must be defined not as the ratio of the non-working age to working age population but the ratio of actual non-workers to workers. The difference between the two is determined by the extent of absorption into work of the available labour force, which must take account of underemployment in addition to unemployment." If we rely on age structure to calculate dependency ratio, then it will 0.48 in 2030 but after taking into account work force participation rate to calculate it, it increases to 1.26 (Sonalde Desai, 2010). Only the cautious approach suggested by Chandershekher and Ghosh can reflect the employment reality of an economy and can pressurize political masters to generate sufficient employment opportunities. If this is not taken into account, economy will end up generating sub-optimal outcomes.

1.6 Motivation and Objective of the study

It has been projected that about a quarter increases in the global working age population aged 15–64 years between 2010 and 2040 will occur in India (United Nation, 2006). As the population growth rates will decline, the share of working-age population in the country will rise from approximately 64 per cent at present to 69 per cent in 2040. In absolute terms, with this rise in ratio of working age population just over 300 million working-age adults will be added to the population of India. This implies that over the next three decades India- both absolutely and relatively- is the single largest positive contributor to the workforce of the world. So, it is important to understand how to exploit this opportunity for the good of economy. What are the priority areas to be focussed so that this demographic opportunity is not lost? Is India generating enough employment to absorb rapidly increasing labour force? Is India generating Schumpeterian kind of jobs so that the impact of demographic dividend is ever lasting?

Indian story till now is something like this: for two decades after independence, fertility rate and infant mortality rate were high. This resulted in huge child population and high dependency ratios during this period. Gradually, fertility rates began to decline with improvement in health facilities which resulted in high child survival ratio (as reflected by fall in infant mortality rate). With this, the number of dependents in age group 0-14 years began to come down and large child population of previous decades entered into working age population cohort. With negligible change in old age dependency, it resulted in declining dependency ratio. Table 1.3 below shows how dependency ratio has moved in Indian case. As dependency ratio declined to 79 in 1970 window of demographic opportunity opened for India. Further, it is estimated that dependency ratio will fall to 60 in 2005 and will continue to fall to 48 in 2025 before it increase to 50 in 2050. Thus, actually India had begun to exploit the demographic dividend not later than the mid-1970s and it will continue a just before 2050. Thus, the process is likely to spread itself into first half of twenty first century. Along with this, the United Nations population division's population database expects the youth population (15-24 age group) in India to begin to decline only by 2025.

One thing to be noticed is that the beginnings of the population boom in the working age groups in India was coinciding with the shift up of the economy to a new and higher growth trajectory. During first three decades of post independent India, the economy was growing at the "Hindu rate of growth" of around 3.5 per cent. Then it transited to a higher growth rate trend of close to 6 per cent in 1980s. It can now move on to a new growth trajectory along which growth could average as much as 9 per cent per annum.

Table 1.3: Trends in the dependency ratio in India

Year	Dependency Ratio
1950	73
1955	74
1960	76
1965	78
1970	79
1975	77
1980	74
1985	72
1990	69
1995	68
2000	64
2005	60
2025	48
2050	50

Source: Population division of the department of economic and social affairs of the United Nations secretariat, world population prospects, The2004 Revision and World Urbanisation Prospects: The 2003 Revision, http://esa.un.org/unpp, accessed December 27, 2005.

With this, the question arises if this shift to high growth trajectory which coincided with declining dependency ratios was merely the result of the demographic dividend and its supply side effects on the rate of savings and investment?

At the same time, advocates of economic reforms claim that opening up of the economy in 1990s has accelerated economic growth rate. Opening economy for foreign investors and MNCs has brought new technologies and generated more employment opportunities. With infusion of more capital, total factor productivity has also increased. Rodrik and Subramainam (2004) stated that the base rate of total factor productivity growth (TFPG)

is 2.5 per cent. According to them it was the experience of 1980-2000. Similarly, Kelkar (2004) stated that in India TFPG is at a base rate of 2 per cent which was again reflected in the experience of two recent decades. As a result of reforms and other factors, Kelkar also forecasted a possible doubling of TFPG rate in the coming decade. With this labour productivity must also be going up in India and expected to increase further in coming decades.

Also, an enquiry into the employment growth rate reflects that the high growth rate has actually led to jobless growth rate. With increasing GDP growth rate, labour absorption rate of the economy has not increased. According to Chandershekher et al., the period between 1993 and 2000 showed a dramatic deceleration in employment generation. Also, it was a period which coincided with the lowest rate of growth of rural employment after independence. Situation was no different in urban areas. There also the rate of growth of employment was noticeably lower when compared with the previous periods since the early 1980s. Subsequently, the NSS large survey of 2006 indicates a recovery, although still not to the rates achieved in the period between 1987-88 and 1993-94.

To sum up, there are many positive factors working in favour of Indian economy. India is passing through the phase of declining dependency ratio since 1970s. Economic reforms were introduced during 1991. Total factor Productivity has been on rise. Along with all these developments, economic growth rates have also attained a new trajectory. Considering these facts, the objectives of my study are

1. To check significance of demographic variables - share of working age population and its growth rate, and labour productivity in determining higher economic growth rate. It will enable us to decide about kind of work - less productive or highly productive which should be generated in an economy in short run as well as in long run.

2. Effect of economic reforms of 1991 on relationship between demographic variables and economic growth rates. This will help in pin pointing if policy of

globalisation, privatisation and liberalisation are beneficial for Indian economy to reap demographic dividend.

3. To see where youth of the country aged between 15-29 years is moving. If they are entering into educational institutes, are they finding productive and sufficient employment opportunities once they enter labour market after attaining knowledge and skills. This analysis is very crucial to decide if demographic dividend (in case reaped in India) is long lasting i.e. sustainable or not.

The rest of this paper is organized as follows. Chapter 2 gives a brief literature survey about what has happened in different countries due to higher share of working age population. This chapter also reports various studies which have been taken up in Indian context so far with different set of states and different time frames. Chapter 3 explains theoretical model through which demographic variables enter as a determinant of economic growth in standard growth model. It also explains various hurdles faced in collecting and utilising data for this study. Finally, it reports state-specific trends in the age structure of the population, growth in share of working age population, labour productivity and their correlations with income growth. Chapter 4 describes an econometric framework for this study and reports regression coefficients to quantify the contribution of the demographic dividend and labour productivity in the past four decades. Using NNSO large sample survey, this chapter also looks into sustainability of demographic dividend. Chapter 5 points towards various loopholes in policy designing in India and concludes with policy suggestions.

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Chapter 2

Literature Survey

2.1 Debate: Effect of population growth on economic growth

Debate on impact of population growth on economic development has been as old as 200 years. There has always been a tussle between economists and demographers regarding if population growth restricts, promotes or does not impact economic growth.

Earlier, researchers were very pessimistic about the impact of population on economic growth. There view is popularly known as "*pessimistic view of population*". Thomas Malthus' "*An Essay on the Principle of Population*" was a landmark in explaining the negative impact of population on economic growth and how nature keeps a check on rapidly growing population. According to him, the ability of man to reproduce is indefinitely greater than the capacity of earth to produce food for subsistence of man. If left unchecked, population increases geometrically whereas, food production can increase only arithmetically. Due to these two unequal powers, when population of the world increases, it impacts economy in two ways: firstly, it depresses labour wages and secondly, it increases food prices (Malthus, 1798). Malthus' model implied that real wages determined by the market would always be pulled down to the subsistence level. When real wages rise above that level, population increases, as a result, firms are provided with a larger labour supply which induces a decline in nominal wages. Moreover, huge population would result in an increase in the demand for goods, which would force prices to go up and real wages to decrease to their subsistence level. This concept was known as the *Iron Law of Wages*. Thus, societies with a low fertility rates are better than societies with high fertility rates as a large size of population would depress the wages and increase food prices. Nature has its own strong and constantly operating check on population like starvation, famines etc which brings population back to equilibrium. Paul R. Ehrlich in his famous book 'The population bomb' had warned of mass starvations due to overpopulation during 1970s and 1980s. Studies undertaken by the U.S. National Academy of Sciences (NAS) in 1971 and the United Nations in 1973

also predicted that the net effect of population growth would be negative (National Academy of Sciences, 1971; United Nations, 1973).

Another adverse impact of a large population size on economic activities comes from the fact that huge population leads to resource dilution. Increasing population requires more homes, infrastructure, employment etc. It can be provided in long run but rapidly increasing population would reduce per capita availability of capital and lowers standard of living. When population increases, limited capital needs to be shared among more individuals thus bringing per capita resource availability down (Cassen, 1994). All these view combined together reflect pessimistic view of population. This pessimist view has its roots in diminishing returns to scale advocated by David Ricardo (Reinhart, 2007).

Neo-Malthusians such as E.A. Wrigley's work has supported Malthus' theory. He focussed his research on Britain and found that Britain, before and immediately after the industrial revolution, displayed all the main features of a Malthusian economy. Wrigley demonstrated that in modern Britain, from 1566 to 1871, prices and population were moving closely: for instance from 1781 to 1806, when population increased the price index also rose. On the other hand, downturns in population corresponded with decline in prices.

In the later years of the 19th century, the predictions of constant real wages and population explosion did not materialize and Malthus's influence disappeared (Kelly et el.,1996). Some new researches give an optimistic view on population growth. According to these researches, predicted disaster due to population growth never materialized. The root of their belief lies in the principle of economies of scale and specialization. The world population has exploded in just 50 years from 2.5 billion in 1950 to 6 billion in 2000 and at the same time, per capita income has also increased exponentially instead of declining (Birdsall et al, 2001).

The distinctive features of modern economic growth are the extremely high rates of growth for both population as well as per capita income- at least five times as high for population and at least ten times as high for per capita product as in the observable past (Kuznets, 1967). In response to such researches, National Academy of Sciences revised

its previous view on population and economic growth (Bloom et el.). Rise in per capita income along with the rise in population can be explained through the argument that as the stock of human population grows, stock of human capital also grows which is a major contributor to economic growth (Kuznets, 1967;Simon, 1981; Kelley and Schmidt,1996; Johnson and Lee, 1986). Optimists have stressed that with given productive capacity of earth, huge population would pressurize humans to innovate and find new ways of sustaining themselves (as it is often said scarcity is mother of all discoveries). Esther Boserup, who is a specialist in the field of food production shows that similar pressure has induced innovation in the field of food production as well. Rising populations have induced humans to innovate and food production technologies have constantly evolved since the beginning of time (Boserup 1965).The recent green revolution which uses intensive farming, irrigation, fertilizer and a hybrid seed which has improved agriculture production markedly around the world is best example of such pressure induced innovation in field of agriculture. On mineral and depletable resources like fossil fuel, Prof. Joseph J. Spreleger has said that improvement in fission procedure would remove limits imposed by shortage of energy. Once supplies of energy are ensured, heavy volume minerals like iron, aluminium etc. can be economically extracted. Purely technological and economical factors allow sufficient margins in most underdeveloped countries to permit substantial and sustained economic growth, even with a significant rise in population (Krugman, 1967).

With accumulation of empirical research, the foundation of the pessimistic view weakened gradually. More so, the theory of economic growth elevated the importance of human capital accumulation and technical change vis-a-vis land and natural resources, and downgraded the relative role of physical capital accumulation. Further, the analysis of demographic factors was broadened to include indirect, as well as direct effects, and to encompass the intermediate to longer run. This gave rise to "revisionist view of population" in 1980s which was moderate in nature as compared to traditionalist view. Though it concluded that many, if not most, Third World countries would benefit from slower population growth but it did not give a net assessment of population consequences (Kelly, 1996). Julian L. Simon in his book 'The Ultimate Resource' in 1981 said that in the intermediate-run, rapid population growth was likely to exert a positive impact on economic development in many Third World countries. According to revisionists,

population has both negative and positive impacts on development. They have partly silenced the neo-Malthusian onslaught on the adverse consequence of population increase in the 1980s. They argued that population growth is not a major deterrent to economic development [Kelly 1988; National Research Council 1986]. According to them, the net impact of population increase on economic growth depends upon the specific conditions in each country and no definite conclusion can be derived on this relationship. Countries with weak institutions are typically burdened with high population growth but the effect of these two aspects should be analysed separately. So, while rapid population growth has an overall negative effect on the economy, this causation gets weakened when one takes into account the country specific characteristics of institutions, policies, markets and technology (Birdsall et al, 2001). The association between population growth and economic growth is quite ambiguous: in some countries high rates of growth in per capita product are accompanied by high rates of population increase, and in others by low rates. In case of rise in per capita income accompanied by population growth, the rise in the knowledge and technological power of human societies has resulted in greater control over health and economic production problems. This fact has lead to an accelerated growth of both population and per capita product in some societies (Kuznets, 1967). The revisionists, thus, downgraded the relative importance of population growth as an important variable determining economic development [Kelly 2001].

Further economic analysis to examine statistical correlation between population growth and economic growth revealed that there is a negative correlation between the two. But once other country specific factors like openness of the economy, country size etc. were taken into consideration, the negative correlation between population growth and economic growth begins to dilute. Little cross country evidence was found if rapid population growth impedes or promotes economic growth. This view is popularly known as "neutralist view of population". Kelly suggested three major research areas which gave to population neutralism:

a) Population growth has not been found to adversely impact stock of natural resources, which was once predicted by pessimists.

b) Studies did not reveal any negative impact of population growth on savings which consequently impact economic growth.

c) Studies have failed to conclude that population growth would lead to diversion of resources from physical capital formation to social capital formation (once predicted by pessimists).

There has been variations within neutralist school of thought like : in 1986 NAS concluded that "on balance...slower population growth would be beneficial for economic development of most developing countries" (National Research Council,1986); whereas many of the World Bank studies suggest that in some economies, bigger population can boost economic growth. Despite these variations, neutralist view has accorded population growth a minor role within broad policy environment that impacts economic growth.

Because of this general finding of the researchers, key development agencies give less importance to population and reproductive health as a potential determinant of economic growth (Bloom and Canning, 2004).

2.2 Age structure of population matters more than size of population

Some more researches have been conducted to ascertain the impact of population growth on economic growth. Consequently, a new dimension of demography is being found to impact economic growth more than overall population growth. It has challenged previous views concerning impact of population growth on economic growth and argued in favour of changes in population characteristics, i.e., age structure as an important determinant of economic growth. According to this new argument, an increase in the share of the working age group usually identified as between 15-64 years of age will have a positive impact on economic growth. This theory is known as *"demographic dividend* or *demographic bonus* or *demographic gift"*. Contrary to the neutralist view, the emerging evidence indicates that population does matter to economic growth, with age structure playing a central role. As the dependency ratio falls, opportunities for economic growth tend to rise, creating what is now referred to as a "demographic dividend." The demographic bonus or gift is a term used to understand the second phase of the age

structure transition. This phase is expected to be short .This phase passed unnoticed in the western countries as the fertility decline was slow and steady. But the developing countries today are experiencing a rapid and sudden decline in fertility. As a result, the age structure transition is vividly evident and is expected to be present for over 40 years. It is claimed by Lee (2003) that in India even if income per person remains constant, a decrease in number of dependents which will occur between 1970 and 2015 will boost income per capita by 2%. What matters for economic development of a country is not the size of the population, but its age structure. A surge in working age population of is a great advantage for a country irrespective of the size of population. This rise in working age population is popularly known as "demographic dividend" (Chandershekher et al, 2006). This theory is influenced by the Life Cycle Hypothesis and the human capital approach (Navaneetham, 2002). It should be understood that the growth of the working age population may be higher even in the first stage of the age structure transition along with a high growth of child population. But, the second stage of the age structure transition is mainly significant due to higher proportion of working age population and not because of higher working age population in absolute terms (James, 2008).

The concept of the demographic dividend has its origin in neo-Malthusian analysis of the adverse impact of rapid population growth on economic development. Coale and Hoover in their classical work of 1958 explained in unequivocal terms the detrimental impact of some demographic factors on economic growth. They have pointed particularly towards three demographic forces which adversely affect economic development in a different ways. They are:

a) the size of the population;

b) growth rate of population and

c) population's age structure.

First and foremost, there will be capital swallowing effect of large population size. Rapidly growing population leads to a fall in the ratio of capital to labour. Second, if the age-dependency effect creates a worsening dependency ratio, i.e., a rise in the population of children below 15 years of age and older people 64 years of age and above, then it will ultimately erode the savings of the household. Finally, the investment diversion effect which leads to large amount of money being spent by the government on the social sector

like primary education, old age pension etc. rather than for productive, growth-oriented investment. The periods characterised by high dependency ratios would be characterised by a slow economic growth, unless this imbalance created by such demographic conditions is neutralised by higher productivity which raise the output of a smaller proportion of workers enough (Chandershekher et al, 2006). The explanation provided by Coale and Hoover (1958) suggests that decline in fertility rate can promote growth as such a decline leads to decreases in the dependency ratios. Chandershekher says that a decline in the dependency ratio make surpluses available for investment. But such phases of low dependency ratio would be characterised by higher growth, only if the inducement to invest surpluses exists in the economy.

Apart from this, the age structure transition boosts economic growth in several ways. First and foremost, during the age structure transition, saving rates are expected to increase [Mason 1988; Higgins and Williamson 1997; Deaton and Paxson 1997; Lee et al 2000]. A combination of both low dependency rate and increased life expectancy results in an increase in savings rates. Secondly, with the decline in fertility, women are more likely to enter into the labour market during this stage as they can invest their time in economic activities which otherwise would have to be spent on child care. Thus, economic activity expands and consequently, economic growth (Becker and Lewis, 1973). Thirdly, increasing productivity would also support higher economic growth. Productivity will increase as people will invest more on their own health when children are fewer in number. Lucas emphasised that economic miracles in East Asian countries can be attributed to productivity growth as people spent more on their health (Lucas, 1993). Finally, the government will also be in a position to divert its spending and investments in more productive activities from education and health with the decline in the number of children (World Bank 1984).

These recent researches have great implications for developing countries of the world. Many developing countries particularly in the Asian continent are experiencing a rapid decline in fertility; there has been overwhelming optimism that the demographic bonus experienced by these countries will manifest itself in greater economic growth and development (Asian Development Bank, 1997; Bloom and Williamson, 1998; Cyrus Chu and Lee, 2000; Mason, 1988).

2.3. a) International findings

Bloom and Williamson (1998) carried out an analysis of 78 Asian and non-Asian countries covering period from 1965 to 1990. In basic model no significant relationship between population growth and per capita GDP growth was observed. This confirmed with the neutralists view of population. However, when two more variables controlling for demography and economic geography were incorporated in the analysis, population growth was found to have a significant negative impact on per capita GDP growth rate and growth in working age population was found to have a strong positive impact on per capita GDP growth rate. Therefore, when population belonging to the age group 15 – 64 grows faster than population below 15 and above 64 years, GDP per capita growth is faster. Opposite is true if the growth rate of total population exceeds that of economically active population. In fact, they had included variable controlling for demography to distinguish between total population and share of working age population as factors impacting economic growth.

Also, a cross-country analysis was conducted for the period 1965 to 1995 where estimates have shown that somewhere between 1.4 and 1.9 point GDP per capita growth per annum or around one-third of the East Asian miracle of 1990s can be attributed to experiencing a 'demographic dividend' (Bloom and Williamson, 1998; Blcom et al 2000; and Mason 2001). Bloom (2008) carried out another study on East Asian countries to re-examine the role of the demographic transition in explaining cross-country differences in economic growth. These earlier studies used the 1960-1990 sample period, but since 1990, Asia has undergone major economic reforms in response to financial crises and other factors. Moreover, rapid demographic change has continued in East Asia, and in Asia more generally, with fertility rates falling below replacement level in many of these countries. This new study covers the period 1960-2005. Results revealed that while population growth has a negative and significant correlation with economic growth, growth of the working-age population is a significant positive correlate of economic growth. These results are consistent with those of Bloom, Canning and Malaney (2000). Factors such as expanding trade openness, high savings rates, a focus on education, and effective macroeconomic policy were later identified as key factors driving the East Asian growth

miracle (World Bank, 1993; Kim and Lau, 1994; Krugman, 1994; Leipziger and Thomas, 1994; Ranis, 1995; Stiglitz, 1996). In the last decade, further analysis has shown that economic growth performance of East Asia was no miracle at all, and to a large part was explained by demographic factors. The rise in the working-age share in Asia created this accounting effect, but it also brought with it behavioural changes. Female labour force participation increased as fertility declined (Bloom, Canning, Fink and Finlay, 2007), savings increased as life expectancy increased (Lee, Mason and Miller 2000; Bloom, Canning, Mansfield and Moore 2007), and consequently investment increased.

By contrast, the absence of age structure transition in favour of relatively higher working age population is held responsible for a large portion of Africa's economic backwardness (Bloom, Canning and Sevillia, 2002; Bloom and Sachs 1998). Initially, most of the model for economic growth had significant regional dummies, usually positive for East Asian economies and negative for African economies. Such results forced to believe that there is something exceptional about East Asian countries and idiosyncratic to African countries.

In fact, African demography is unique. It is the only continent that is going to double in population size, reaching 2 billion people by 2045 at current population growth rates. With 12% of the world's population, sub-Saharan Africa accounts for 57% of the deaths of mothers at childbirth, 49% of its infant mortality and 67% of HIV infections (The Economist, December 17, 2012). Africa's economic performance is impeded by its demographic circumstances. Africa has the world's highest youth dependency ratios, a consequence of its combining the world's highest rates of fertility with falling levels of infant and child mortality. High youth dependency ratios impose a substantial drag on African economies by reducing their productive capacity per capita. Low life expectancies and extremely youth-heavy age distributions also tend to be associated with lower rates of savings and investment (as conventionally measured), and therefore slower economic growth (Bloom and Sachs, 1998).

On the other hand, in East Asian economies, fertility transition, which had begun in the mid-1960s, was well underway and its dependency burden was falling sharply. Working age population in these countries was increasing nearly four times faster (on an average

2.4 per cent per annum) than its dependent population during 1965-90. Changes in population triggered higher economic growth and high economic growth again pushed down population growth. As a result, savings rate and investment increased in these economies as parents and work force had fewer children to take care of (Bloom, Canning and Sevilla (mention year & don't write all author's name).

Another study by Bloom (2007) tests whether the determinants of growth in general, and the effects of demography in particular, are different in Africa than for the rest of the world. A five year panel covering the years 1960 to 2000 for 85 countries, out of which 19 are located in the Sub-Saharan zone is used for the purpose of this study. The main variables of interest were the log of the size of the working age population (WAS) as well as its growth. Both the level of the working age share and its growth enter the growth equation with a positive and highly significant sign

Taking note of demographic disparities in African and East Asian countries, once age structure dynamics are introduced into basic growth models, these regions are much closer to each other in obeying common principles of economic growth (Bloom and Canning, 2001; Bloom, Canning and Malaney, 2000) and statistical significance of regional dummies disappear.

Bloom and Sachs (1998) report results from a standard cross-country specification based on data for 73 African and non-African countries from 1965 to 1990. A coefficient on the working-age population is positive and significant. This study again confirms that once Africa will pass through a favourable age structure transition, its rate of economic growth will accelerate.

The Case of Ireland is also an interesting one. Ireland has been slow to complete the demographic transition as the death rate, which declined only slightly during the period 1950-2000, has been relatively low by international standards (in the neighbourhood of 10 per thousand) and comparable to the rest of Europe. On the other hand, the birth rate was much higher through the early 1980s (over 20 per thousand). Once societal and legal changes began, decline in fertility rates in Ireland accelerated after 1979 and the crude birth rate fell sharply during the 1980's from 21.0 per thousand to 14.2 per thousand. As a

result, youth dependency declined and the share of working age people increased. From 1960 to 1990, the growth rate of income per capita in Ireland was approximately 3.5 per cent per annum. In the 1990s, this growth rate jumped to 5.8 per cent. Thus, the results are consistent with the view that demographic change contributed to Ireland's economic surge in the 1990s (Bloom et al., 2005).

Anderson (1998) carried out a study on Scandinavian countries using annual data on individual countries - Denmark, Finland, Norway, and Sweden. He regressed yearly growth of GDP per capita on growth rate of investment share, growth rate of total population and logarithm of age share (population was divided into five age groups: youth (0-14), young adulthood (15-29), prime age (30-49), middle age (50-64) and retired (65+). He also found similar results, i.e., there exists a positive association between economic growth and the share of the working age population. Age parameters were jointly significant for all countries and their signs were as expected; the effect from the young adults and prime aged was positive for all of the countries, and, although not significant, the coefficient for the retired is negative in all regressions.

In 1999, Behrman et al used panel data for several countries since 1950 to look at the relationship between the average age of the population and several economic outcomes. This study also found a strong positive association between the age patterns and economic outcome.

From the above mentioned empirical works, it can be concluded that the older popular perception that a large and "excess" population is a problem rather than a benefit from an economic point of view has been defeated by this new concept of "demographic dividend"

On the other hand, existence of positive relationship between age structure and economic development is not observed in the case of all developing countries. Navaneetham (2002) could find a positive impact of favourable age structure on economic growth in South-East Asia but he could not find such a positive relationship in case of south Asian countries.

Another popularly reported instance in Bloom et al (2003) is case of Latin American and Russian experience where the age structure transition seems to have failed to positively impact economic growth. In Latin America during 1965 to 1990, demographics resembled those of East Asia, but its economic performance lagged well behind. Episodes of high inflation, political instability, adversarial labour relations, and an inward orientation with respect to trade through much of the period appear to have prevented many Latin American countries from exploiting its demographic window of opportunity, at least in its early phases. Bloom et al (2007) carried out a similar exercise for Africa which still faces unfavourable demographic characteristics. It was found that that though Africa is on the verge of earning the demographic dividend but there are doubts if it can translate into economic growth. This is because to harness the demographic dividend efficiently, good institutions are an inevitable prerequisite.

To explain above mentioned examples, Bloom and Canning (2004) should be quoted, "both empirically and theoretically, there is nothing automatic about the link from demographic change to economic growth. Age distribution changes merely create the potential for economic growth. Whether or not this potential is captured depends on the policy environment". The age distribution changes create supply side potential but to realise the potential, appropriate policy environment is required in each country, particularly the openness to trade (Navaneetham, 2002; Bloomet al, 2006). Latin America and Russia failed to benefit from large working age population because of state-driven economy insulated from market forces (Bloom et al). The quality of governmental institutions, labour legislation, macroeconomic management, openness to trade, and education policy are other factors which help in achieving higher economic growth when age structure is favourable. In order to capitalise on the demographic dividend, countries must implement favourable policies and invest in key sectors like education, health (including reproductive health), gender equality and employment generation. Good government institutions and functioning markets are also important (UNFPA 2002; Bloom et al 2002; Merrick 2002). It is believed that Russia and Latin American countries could not benefit from its large and young populations because of closed economy and absence of market framework.

Contradicting this, experience from East Asian economies indicates that increased productive investment and expenditure on education were the proximate determinants of the East Asian miracle. Thus, higher investment was the major factor which helped in realising the potential of favourable age structure in East Asian economies. Not only this, the governments in East Asian countries adopted deeply protectionist and highly interventionist measures. Mercantilist policies of export expansion were promoted involving discipline of the domestic industrial class supported by a range of incentives given by the state (Chandrasekhar et al, 2006).

2.3. b) Findings in Indian context

Many less developed countries are currently passing through the phase of demographic transition with decline in fertility rates. The labour force/productive population grows more rapidly than total population in these countries (Bongaarts, 2001). India being one of the emerging economies of the world is also facing one time demographic opportunity. Dependency ratio fell to 79 in 1970 as the child dependency ratio fell as the baby boomer generation moved into working age groups and with old-age dependency remaining constant because of reduced death rates in older age groups. It has been estimated to fall to 60 in 2005.Thus, the window of demographic opportunity for India had actually begun to open around the mid-1970s and the opportunity is likely to extend till first half of the 21st century with the dependency ratio projected to fall to 48 in 2025 as chid dependency ratio will continue to fall. But dependency ratio would then start rising to reach 50 by 2050.

Opportunity of demographic dividend opened for India largely in 1970s and India attained a higher growth trajectory in mid-1980s leaving behind the "Hindu growth rate". This clearly shows that India began to exploit demographic dividend before the economic "reforms" of the 1990s came into picture (Chandrasekhar and Ghosh, 2004).

India has a clear demographic advantage over China, Japan, USA etc. To some extent, this is shown in studies conducted by Bloom et al (2003) and Bloom et al (2006). A positive association between the age structure transition and economic growth in India and China was established by using a panel data of countries from 1960 to 2000. It was also predicted that growth prospects for India are higher as compared to China over the next 30 years. This is because the effect of the fertility decline and the bulge of population age cohort in the working age group will be sharper in India in the coming decades. It has been continuously voiced by some observers that India's long term growth prospects looks more brighter particularly compared to China because China has already reaped the benefits of demographic transition by artificially inducing it through its one-child policy and is now rapidly aging and India is only on the threshold of receiving a demographic dividend (Nilekani, 2009; Economist, 2011).

If we look at Indian states, then all states in India are not facing a homogenous demographic transition. On the one hand, some states are deep into the transition whereas, on the other hand, some have only just begun to experience fertility decline. Most of southern states are enjoying fruits of declined fertility. However, except a few northern states, most of them are about to begin with this phenomenon. For instance, it is encouraging that between 1961 and 2001, states like Gujarat, Karnataka, Kerala, Punjab and Tamil Nadu recorded a fall of more than 10 per centage points among children of 0-14 age groups. But situation is dismal in states like Bihar, Madhya Pradesh and Rajasthan as they have registered fall of less than 3 per centage points. Closely related to that states of Kerala, Andhra Pradesh, Gujarat, Karnataka, Punjab and Tamil Nadu. Maharashtra and West Bengal have registered significant rise in their working age population shares of 15-59 years during the last four decades. About 60% of population is in working age group in most of these states. Contrary to this, Uttar Pradesh has registered a decline in the working age group population. Bihar, Haryana, Madhya Pradesh, Odisha and Rajasthan experienced a marginal increase in their working age population during 1961 and 2001 (James, 2008).

Taking a note of such interstate variations, it is imperative to analyse if India's high economic growth in past two and a half decade can be attributed to declining dependency ratio across states.

To the best of my knowledge, the first ever study of impact of changing age structure of Indian population on its conomic growth was conducted by K. S. James (2008). He tried to empirically estimate the contribution of favourable age structure on economic growth by using a balanced panel data consisting of 15 Indian states for every 10 years starting from 1971 till 2001. Model adopted by him is explained below:

$$Y_1 = \alpha_1 + \Sigma \beta_j x_j + \delta_1 Y_2 + e_1$$

where, Y_1 is the growth rate of per capita income

x_j is the vector independent variables influencing Y_1 except the growth of adult population.

The adult population growth is entered as an instrumental variable in the model $(\delta_2 Y_1)$ derived from the second model given below:

$$Y_2 = \alpha_2 + \Sigma \lambda_j z_j + \delta_2 Y_1 + e_2$$

Where, Y_2 is the growth rate of working age population

z_j's are the vector of independent variables such as life expectancy and adult literacy rate

Y_1 is the growth rate of per capita income.

Using this model, he found that changes in age structure have significant positive relationship with economic growth, i.e., a favourable age structure has a strong potential to enhance economic growth in India. His study supported neo-Malthusian argument as well because he found a significant negative relationship between overall population growth and economic growth. Despite these significant results, James does not test for impact of growth in share of working age population on economic growth. He could not isolate the the difference between overall population growth which includes growth in age group 15-64 years as well and demographic dividend which is concerned with relatively higher growth in working age population group as compared to dependent population age group (0-14 and 64+).

This gap was filled up by Kumar (2010) and Aiyar and Mody (2011) by introducing a variable for growth in share of working age population in their analysis. They applied

following model for their study using a balanced panel data on major Indian states from 1971 to 2001:

$$g\_NSDPpc_{i,t} = \beta_1 NSDPpc_{i,t-1} + \beta_2 WAR_{i,t-1} + \beta_3 g\_WAR_{i,t-1} + \gamma'X_{i,t} + f_i + \eta_t + \varepsilon_{i,t}$$

(notations used by above maentioned authors are different but variables are same)

Where, $g\_NSDPpc_{i,t}$ is the annual average per capita NSDP growth (growth in income percapita) over the previous 10 year period,

$NSDPpc_{i,t-1}$ is the initial income per capita at the beginning of the 10 year period,

$WAR_{i,t-1}$ is the initial working age ratio in the total population at the beginning of the 10 year period and

$g\_WAR_{i,t-1}$ is the growth in the share of working age ratio over the 10 year period.

X represents the control variables which might impact steady state labour productivity.

Kumar (2010) found that coefficient on the growth of share of working age population is positive and statistically significant even after taking into account the phenomenon of reverse causality. But he remains sceptical about the future of Indian states as BIMARU states which will contribute over 52% of increase in the working age population have poor infrastructural facilities and policies to absorb their growing workforce. This might result in positive relation between growth in share of working age population and economic growth to become negative.

Aiyar and Mody (2011) also confirmed similar results: if the rate of growth in working age population increases by 1 per cent, it leads to 0.2 per cent increase in annual average per capita income growth rate over succeeding decade. But unlike Kumar (2010), they were optimistic about demographic dividend taking place in northern lagging states (as their share of working age population increases) which will provide them an opportunity to converge with already demographically advanced southern and western states (as their share of working age population is expected to fall in future).

Thakur (2012) went a step further from previous studies and estimated similar relationship using similar set of states with updated data for decade 2001-2011. She has tried to estimate impact of the increasing share of working age population of BIMARU

states on economic growth rates. Falling in line with conclusion of previous studies, she has found that share of working age population in previous decade has a positive and significant impact on economic growth. All previous studies found a positive impact of the growth of working age population on economic growth. Contrary to that, this study found a negative and significant impact of growth in share of working age population on economic growth rate. This difference between in results can be explained by difference in data set used in previous studies and this study. Previous studies (Aiyar and Mody, 2011; Kumar, 2010; James, 2008) have estimated the relationship by using a dataset starting from 1971 or 1981 till 2001. Until 2001, the largest growth rates in share of working age population were being experienced by the demographic and economic leader states like Karnataka, Himachal Pradesh and Haryana, while the laggard BIMARU states were hardly experiencing any growth in either their economy or working age ratios. The decade 2001-2011 has witnessed the poorer states of Rajasthan and Madhya Pradesh increasing their growth of working age ratio and a decline was seen in the leader states of Tamil Nadu, Kerala and Gujarat. It has been stressed that the relationship between age structure and economic growth is not automatic and complementary factors are needed to deliver higher growth rates. These complementary factors were present in the leader states when they were experiencing high growth in working age ratios. Unfortunately, the same cannot be said for the laggard states which have now started growing.

This study reinforces the claim that favourable population dynamics at best present an opportunity and do not guarantee higher future growth rate (Kumar, 2010).

Providing a clear mechanism behind phenomenon of demographic dividend, Mitra and Nagarajan (2005) states that the growth rate of per capita income in an economy is combination of rate of growth of productivity of employed labour, rate of growth of working age population and rate of growth of productive employment i.e.

$$\frac{Y}{P} = \frac{Y}{E} \; X \; \frac{E}{L} \; X \; \frac{L}{P}$$

Where, Y is aggregate income,

P is population,

L is the population in the age group 15-59, and

E is the level of employment.

Alternatively, $\gamma_y = \gamma_{Y/E} + \gamma_{E/L} + \gamma_{L/P}$

For the rate of growth of per capita income to increase over time in the presence of zero growth in labour productivity, it is necessary that

$$\gamma_{E/L} + \gamma_{L/P} > 0$$

Only then it can be concluded that rate of growth in per capita income is increasing overtime because of window of demographic opportunity.

Given this and claims made by India specific studies to test for demographic dividend, it is important to have a look at employment generation and improvement in labour productivity when India is experiencing high economic growth rates.

2.4 Economic growth, Employment and Labour productivity in India

Economic Growth

India has sustained a high and accelerating rate of growth over the past 25 years. According to official figures, GDP growth has accelerated from its "Hindu rate" origins of around 3.5 per cent per annum during 1960s and 1970s to annual rates of 5.4 per cent in the 1980s, 6.3 per cent during the decade starting 1992-93 and more than 8 per cent over 2007-10 period. Since this acceleration in GDP growth rate was accompanied by limited inflation, the government had targeted a further rise to 9 and even 10 per cent over the Eleventh Plan (Ghosh and Chandershekher).

The period of 1960s and late 1970s was a period of deceleration in industrial growth and it is considered as a period of "stagnation". India's GDP growth rate was as low as 3 per

cent which is popularly known as "Hindu rate of growth". After this period of stagnation, India moved on to a creditable growth trajectory involving GDP growth of around 5 to 6 per cent per annum from the early 1980s. The second half of the decade beginning 2001 suggested a movement towards an even more rapid growth trajectory, with annual rates of real GDP growth in excess of 8 per cent (Ghosh and Chandershekher).

Employment

All age groups

As stated by Dev and Venkatanarayana (2011), based on NSS usual status (which includes both principal and subsidiary status), the overall labour force participation rate (LFPRs) has not been declining steadily or increasing during 1970-71 to 2004-05 but it fluctuated between 40 to 44 per cent. A disaggregated picture shows that during 1970s, the LFPR had increased to its highest ever level in 1977-78 and began to decline thereafter. LFPR began to decline during 1980s. This downward trend continued till late 1990s. After a marginal increase between 1987-88 and 1993-94, LFPR declined sharply by 2 per centage points between 1993-94 and 1999-2000. LFPR again gained momentum between 1999-2000 and 2004-05 with sharp increase of 2.4 per centage points. Again during 2007-08, the LFPR has declined by 1.7 per centage points from the level of 2004-05. This has been clearly shown in a table given by Mahendra Dev and Venkatanarayana (2011).

Table 2.1: Labour force participation rate in India

Year	Rural and Urban			Rural			Urban		
	P	M	F	P	M	F	P	M	F
1	2	3	4	5	6	7	8	9	10
1972-73	42.0	54.5	28.6	43.9	55.1	32.1	34.5	52.1	14.2
1977-78	43.9	56.0	31.0	45.8	56.5	34.5	37.5	54.3	18.3
1983	43.0	55.1	30.0	45.2	55.5	34.2	36.2	54.0	15.9
1987-88	42.2	54.5	29.0	44.3	54.9	33.1	35.6	53.4	16.2
1993-94	42.7	55.6	28.7	44.9	56.1	33.0	36.3	54.3	16.5
1999-2000	40.6	54.0	26.3	-	54.0	30.2	-	54.2	14.7
2004-05	43.0	55.9	29.4	44.6	55.5	33.3	33.2	57.0	17.8
2007-08	41.3	56.3	25.4	42.9	55.9	29.2	36.9	57.6	14.6

Note: Usual status including principal and subsidiary status.

Source: Visaria (1998) and NSS Employment and Unemployment Survey reports.

Increasing attendance rate in educational institutions could partly explain the sharp decline in LFPR during 1990s.

The trend in work force participation rate during the same period shows similar trends. There has not been any sharp decline or increase in WFPR during this period but it fluctuated between 40 to 42 per cent. But a close observation indicates that the WPFR had increased to its highest ever level during 1970s. During the 1980s, WFPR declined which continued till late 1990s. The WFPR declined to its lowest ever level to 39.7% in 1999-2000 and revived between 1999-2000 and 2004-05 with an increase of 2.3 per centage points. But, it declined to 40% in 2007-08. This has been explained by Mahendra Dev and Venkatanarayana (2011) using table 2.2 given below

Table 2.2: Worker population ratios (WPR) in India

Year	Rural and Urban			Rural			Urban		
	P	M	F	P	M	F	P	M	F
1	3	4	5	6	7	8	9	10	11
1972-73	41.3	53.5	28.2	43.5	54.5	31.8	33.1	50.1	13.4
1977-78	42.2	54.2	29.3	44.4	55.2	33.1	34.4	50.8	15.6
1983	42.2	53.3	29.6	44.6	54.7	34	34.3	51.2	15.1
1987-88	41.1	53.1	28.1	43.4	53.9	32.3	33.9	50.6	15.2
1993-94	42.0	54.5	28.6	44.4	55.3	32.8	34.7	52.0	15.4
1999-2000	39.7	52.7	25.9	41.7	53.1	29.9	33.7	51.8	13.9
2004-05	42.0	54.7	28.7	43.9	54.6	32.7	36.5	54.9	16.6
2007-08	40.4	55.0	25.0	42.2	54.8	28.9	35.4	55.4	13.8

Note: Usual status including principal and subsidiary status.

Source: Visaria (1998) and NSS Employment and Unemployment Survey Reports.

In 2004-05, according to usual status, the present (chronic) unemployment rate in India was 2.9 per cent of the labour force. It was the highest ever recorded unemployment rate since 1970s. The unemployment rate based on weekly status was 4.4 per cent of the labour force. As per the daily status (CDS), the unemployment rate stood at 8.2 per cent which was the highest among the three alternative concepts in 2004-05 (Dev and Venkatanarayana, 2011).

The rate of growth of employment, measured in terms of the Current Daily Status (which is a flow measure of the extent of jobs available) declined from 2.7 per cent per annum in

the period 1983-94 to only 1.07 per cent per year during the period 1994-2000 for all of India. This refers to all forms of employment – casual, part-time and self employment. For permanent or secure jobs (UPS), the rate of increase was close to zero. This was well below the rate of growth of population (Ghosh and Chandershekher).

Young population (15 to 29) age group

Currently there have been talks about the potential "demographic dividend" that India can reap because of the young population bulge. So, it is essential to examine what is happening to employment among the youth.

Aggregate labour force participation rates have risen but same is not the case with youth LFPR. Among younger cohorts (below 30 years of age), the labour force participation rate (LFPR) is declining over the period. Labour force participation rates have fallen quite substantially for male rural youth, and it has not increased for young rural women either. In urban areas, there is a slight recovery of labour force participation rates from the low levels of 1999-2000, but only for young women in the age group 20-24 years.

This declining trend within young age cohort can be explained by of increasing enrolment in educational institutions which keeps youth away from labour market (Mahendra Dev and Venkatanarayana, 2011; Ghosh and Chandershekher).

A look at the per centage of persons below 30 years of age attending educational institutions indicates that it has been higher among 5 to 14 years age group and it increased over the period between 5 and 29 years of age (Mahendra Dev and Venkatanarayana, 2011). It has been clearly shown by Mahendra Dev and Venkatanarayana (2011) using figure given below.

Figure 2.1:

School attendance rate in India – Per centage of 5-29 age group attending educational institutions (Usual Status)
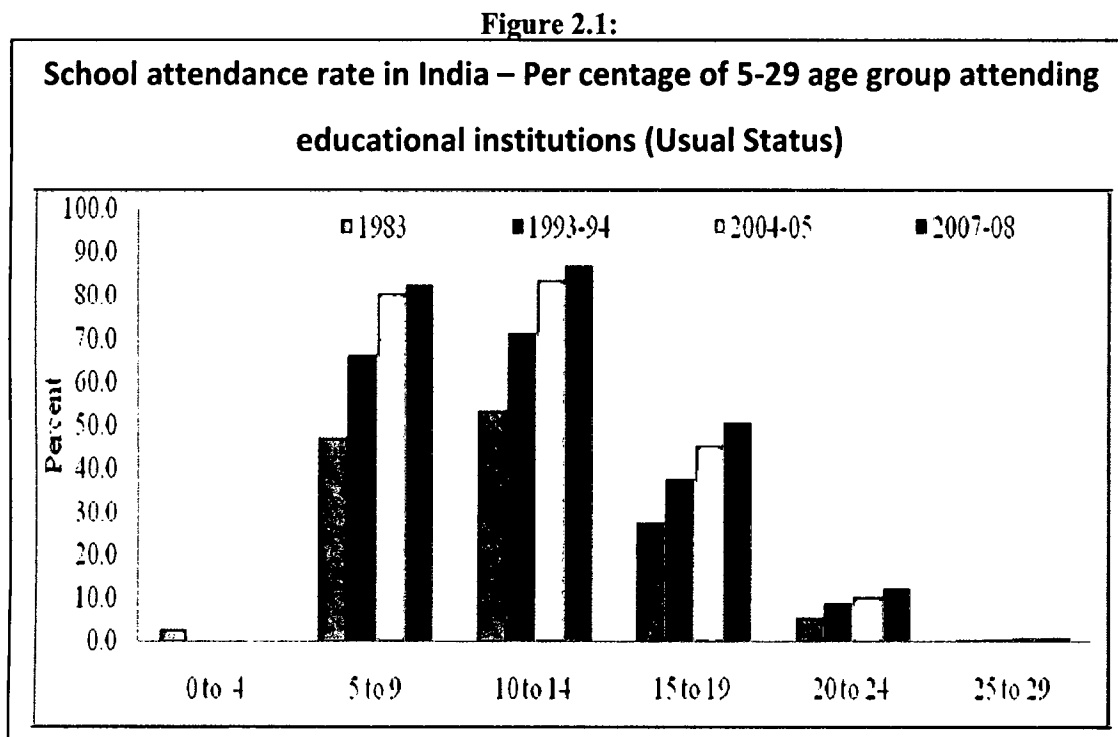
Source: Using NSS Employment and Unemployment Survey unit record data.

The increase in the school attendance rate within young age cohort has a corresponding decline in labour force participation rate. If this is true, then it would be a positive sign, indicating a greater degree of skill formation in the young labour force of the future. But further investigations show that except for rural females, where the ratio was very low to start with, there has been very little increase in the proportion of those reporting themselves as usually engaged in education. For young urban females, there was actually a decline in such a proportion (Ghosh and Chandeshekher).

Even in case of young age population cohort, the work force participation rate (WFPR) indicates the similar pattern observed in labour force participation rate (LFPR). It is declining among younger cohorts below 30 years of age over the period and a slight increase in the older cohorts over the same period.

The unemployment rate was the highest among the younger cohorts especially 15 to 24 years age cohorts, i.e., the incidence or instances of those who are willing to work and available for the labour market but unable to find the work or employment is higher

among the young (below 30 years) when compared to their seniors (30+ age). It was highest among the 20 to 25 years age cohorts (Dev and Venkatanarayana (2011).

Given that open employment by "usual status category" has generally been low in India because of the absence of any sort of social protection for the unemployed, it is disturbing to note that as many as 6-8 per cent of young rural males and 12-14 per cent of urban male youth describe themselves as available for work and seeking it but not finding it. The current daily status also shows that open unemployment levels for the young are truly alarming, accounting for nearly 20 per cent of urban young men in the age group 15-19 years and 30 per cent of urban women in the age group 20-24 years (Ghosh and Chandershekher). Table given by Ghosh and Chandershekher reveals that youth unemployment was substantially higher than unemployment across all the working age population, and what is more, it also increased across all categories of young people – men or women, rural or urban. So, the youth are far more prone to be actively seeking work and not finding it.

In 2004-05, on the basis of usual status, the labour force participation (LFPR) and work force participation rates (WFPR) based among the youth population (15-24 age) in India were around 50 and 46 per cents respectively. In absolute numbers, the size of the youth labour force, i.e., the persons available for the labour market was 107.3 million and the size of the work force, i.e., persons working or employed in one or the other kind economic activity was 98.7 million. The difference between labour force and workforce indicates the unemployed were about 8.6 million young persons in 2004-05.

In 2004-05, the total unemployed in all age groups were estimated at 13.4 million, out of which the share of youth (15-24 age) was around 64.1 per cent in total unemployment. The work force participation rate of youth has been found to be higher than the overall WFPR (all ages) but it has been lower than the WFPR of all adult (15 + age) and senior adults (25 + age). The work participation rate among the youth during the last two decades prior to 2004-05 indicates that it has been declining. It declined 9 per centage points from 55.5 per cent in 1983 to 46.0 per cent in 2004-05.

The status of employment indicates that in 2004-05, about 52.4 per cent of the youth workforce was selfemployed, 34.4 per cent were casual labourers and the rest i.e. only 13.2 per cent were regular or salaried workers.

Table 2.3: Unemployment rates among young people and overall population

		Rural India			Urban Inda		
		15-19	20-24	All 15+	15-19	20-24	All 15+
		Males					
Usual Status	1993-94	3.3	4.9	2	11.9	12.6	5.4
	1999-00	5.5	5.2	2.1	14.2	12.8	4.8
	2004-05	7.9	6.2	2.1	14	12.5	4.4
Current Daily Status	1993-94	9	10.3	5.6	16.2	17	6.7
	1999-00	13.1	11.7	7.2	19	17.1	7.3
	2004-05	15	12.9	8	18.4	15.8	7.3
		Females					
Usual Status	1993-94	1.9	2.8	1.3	12.8	21.7	8.3
	2004-05	6.7	9.3	3.1	15.6	25.8	9.1
	1999-00	13.1	11.7	7.2	19	17.1	7.3
Current Daily Status	1993-94	8.3	8.2	5.6	18.6	28.5	10.4
	1999-00	12.8	12.1	7	18	25.9	9.4
	2004-05	12.6	14.9	8.7	16.4	27.3	11.6

Source: NSSO, Employment and Unemployment Situation in India, various issues

The distribution of young workers by industry division shows that they are concentrated in agriculture and allied activities. About 55 per cent of the young workers were employed in agriculture and allied activities in 2007-08 and the rest 45 per cent were employed in non agriculture activities. The share of agriculture in the youth workforce has declined from 68.6 per cent to 66.6 per cent during the period between 1983 to 1993-94: it was only a two per centage point decline. But a sharp decline in the share of

agriculture was observed during the period between 1993- 94 and 2004-05 from 66.6 to 56.7 per cent: it was about 10 per centage point decline. So, there was a 12 per centage point decline during the period between 1983 to 2004-05 in the share of agriculture and corresponding increase in the share of non-agriculture in the youth workforce which indicates that there has been a significant shift of youth workforce away from the agriculture to non-agriculture activities (Dev et el., 2011).

But for the youth, their population growth rate is increasing over a period and it was lower than population growth for all ages during 1980 s but was higher during the 1990s. Moreover, the rate of growth in employment was always lying below their population growth rate. As in the case of youth population, the rate of growth in youth employment was higher in the 1990s than that of the 1980s.

In general, it would be a potential threat in terms of unemployment and joblessness if the employment growth lies below the growth of population.

The employment elasticity which indicates the responsiveness of employment growth to growth in GDP is lower during the post-reform period (i.e., between 1993-94 and 2004-05) when compared to the pre-reform period (i.e., between 1983 and 1993-94) for all workers. This situation has implications on the employment generating capacity of the increasing rate of GDP growth in India. Whereas for the youth workers, it is otherwise – employment elasticity during the post-reform period is higher than the pre-reform period. It indicates that the growth of economy during the post reform is relatively favourable for growth of youth employment. However, the employment elasticity of youth workers has lagged behind than that of the all workers but the difference (ratio of youth to all) in employment elasticity between all and youth narrowed down during the post-reform period when compared to that the of pre-reform period.

The economic growth process in India exhibits a problem which is increasingly common throughout the developing world: the apparent inability of even high rates of even high rates of output growth to generate sufficient opportunities for "decent work" to meet the needs of the growing labour force.accounts. There are reasons to believe that the pattern of manufacturing growth under an open economic regime tends to be such that the

responsiveness of employment growth to the growth in output declines. It is worth noting that the combination of high output growth and low employment growth is a feature that has characterised both India and China during the years when they have opened their economies to trade and investment. Hence, after external trade has been liberalised, labour productivity growth in developing countries is more or less exogenously given and ends to be higher than prior to trade liberalisation. this is the probably the primary cause of the growing divergence between output and employment growth in the case of Indian industry and some services.

Labour productivity

India's growth since 2004-05 has been driven by labour productivity rather than employment increases. India's experience with growth and employment undermines the causal relationship between private investments and employment. International Labour Organisation (ILO) finds that the robust growth witnessed in the South Asian region, driven largely by India, has been mostly associated with a rapid rise in labour productivity, rather than an expansion in employment. Right from 1991, "as global and domestic economic conditions improved, increased labour productivity became the driver of growth in the region. Between 2007 and 2011, labour productivity increased by 6.4 per cent on an average, while employment expanded by just 1.0 per cent. This situation is prominent in India, where total employment grew by only 0.1 per cent during five years till 2009-10 (from 457.9 million in 2004-05 to 458.4 million in 2009-10), while labour productivity grew by more than 34 per cent in total during this period."

EPW Research Foundation has compiled statewise Labour productivity from 1996-97 to 2001-02 (table given below). This table reveals that in most of the states, labour productivity has increased over time.

Table 2.4 Statewise Trends in Labour Productivity in India

State/Uts	per worker value of output (Rs Lakhs)						per worker value of output (Rs Lakhs)					
	2001-02	2000-01	1999-2000	1998-99	1997-98	1996-97	2001-02	2000-01	1999-2000	1998-99	1997-98	1996-97
Andhra Pradesh	6.86	6.76	6.43	5.68	4.3	4.79	1.19	0.98	1	0.92	0.83	1.04
Assam	7.08	7.77	6.83	7.18	4.79	4.7	1.1	1.14	1.49	1.35	0.92	0.97
Bihar	10.47	11.53	9.85	6.63	9.92	8.13	1.09	1.16	1.61	1.11	3.07	1.83
Chhattisgarh	13.77	13.22	12.75	12.33	-	-	2.41	2.59	2.32	3.25	-	-
Goa	23.44	26.02	24.03	20.05	15.66	16.56	4.68	4.73	4.4	4.58	3.34	4.69
Gujarat	20.43	17.02	14.41	13.87	12.63	10.68	2.43	2.24	2.34	2.32	2.19	1.99
Haryana	15.7	14.85	14.89	8.99	10.37	9.22	2.27	1.85	2.18	1.45	1.63	1.5
Himachal Pradesh	14.37	16.46	13.2	12.81	6.56	6.17	2.82	3.32	2.79	2.6	1.72	1.97
Jammu & Kashmir	6.17	5.78	0.81	-	2.89	4.47	0.73	0.69	0.1	-	0.48	0.86
Jharkhand	10.39	11.11	84.66	11.24	-	-	1.74	2.33	28.54	3.89	-	-
Karnataka	11.04	9.76	8.64	8.26	7.16	6.8	1.44	1.75	1.7	1.66	1.47	1.52
Kerala	7.3	8.52	8.2	7.33	5.64	5.54	1.13	1.13	1.2	1.45	0.97	1.02
Madhya Pradesh	16.43	14.49	16.47	9.48	9.64	9.44	2.56	2.45	2.11	1.47	2.11	2.29
Maharashtra	14.48	15.77	14.9	11.56	11.7	10.93	2.58	2.67	2.84	2.25	2.37	2.44
Tamil Nadu	1.52	-	-	-	3.31	1.86	0.23	-	-	-	1.9	0.89
Meghalaya	13.02	-	-	-	2.33	2.09	1.61	-	-	-	0.38	1.12
Nagaland	3.64	-	-	-	6.66	2.93	0.67	-	-	-	0.55	1.28
Orissa	11.2	10.29	8.96	7.63	8.31	7.55	1.3	1.83	2.03	1.46	2.13	1.87
Punjab	9.29	9.77	11.27	9.52	6.99	6.28	1.31	1.2	1.56	1.55	1.07	0.98
Rajasthan	13.74	13.26	12.77	10.03	9.94	8.61	1.94	2.26	2.26	1.5	2.11	1.91
Tamil	8.56	9.11	8.57	6.82	6.5	6.38	1.37	1.46	1.34	1.21	1.13	1.28
Tripura	2.81	-	-	-	2.56	1.9	1.08	-	-	-	0.43	0.58
Uttaranchal	12.71	11.32	9.15	6.87	-	-	2.26	2.23	1.51	1.12	-	-
Uttar Pradesh	12.82	12.02	10.68	9.36	9.39	8.1	2.18	1.77	1.79	1.69	1.96	1.59
West Bengal	7.53	6.88	5.92	4.95	4.93	4.72	1.14	1	0.97	0.99	1.08	1.04
Andaman & Nicobar	1.28	-	-	-	2.31	1.87	0.19	-	-	-	0.57	0.58
Chandigarh	8.36	9.89	10.65	11.03	4.92	7.21	1.1	1.47	1.51	1.38	0.69	1.2
Dadar & Nagar	36.13	33.78	40.37	31.73	34.81	31.93	5.36	4.6	5.93	6.32	7.84	6.16
Daman& Diu	22.08	18.25	21.06	17.34	17.02	18.63	3.26	3.42	4.09	2.97	2.94	3.94
Delhi	11.65	11.87	13.03	11.77	11.4	9.3	1.7	1.67	2.21	1.86	2.29	1.6
Pondicherry	16.49	15.27	13.66	12.18	10.24	8.76	3.44	3.26	2.33	2.85	2.57	2.16
All	11.88	11.62	11	9.15	8.3	7.78	1.83	1.8	1.9	1.7	1.65	1.62

Source: Annual Survey for Industries (ASI); report for 1996-97 to 2001-02 (http://mospi.nic.in)

This study is different from previous studies in following aspects:

1. A new variable Labour Productivity will be added to regression model to check if it has a significant impact on India's increasing growth rates. This variable has been missing in all the studies conducted in Indian context.

2. It will be checked if demographic dividend is exclusively a post -1991 reform phenomenon or it existed before that as well.

3. A state wise analysis will be carried to see how much of young labour force has been absorbed in labour market using 66th NSSO round data.

Chapter 3

Data & Summary Statistics

3.1 Theoretical estimation

Before this, various researchers have studied relationship between age structure and economic growth. A model which was developed by Barro and Sala-i-Martin (1995) constitutes backbone of such studies. This model which is described below was followed by Bloom and Canning (2004), Aiyar and Mody (2011) and Vasundhra Thakur (2012) for similar studies.

This theoretical model stands as follows:

This model relates age structure with economic growth. Income per capita is not a perfect measure but a convenient way to measure economic growth, standard of living and economic development. Theoretically, income growth depends on production function which links various inputs and their productivity with output. When production function is divided by number of units of labour used, a relationship which links output per capita with inputs per worker and efficiency of using those inputs per worker is obtained. Then, growth rate of income per worker can be written as:

$$g_z = \lambda \, (Z^* - Z_0) \qquad \ldots (1)$$

where, g_z is growth rate of income per worker,

     Z_0 is initial level of income per worker,

     Z^* is steady state level of income per worker,

     λ is speed of convergence.

Equation (1) states that, over any given time period, growth in income per worker depends upon the gap between the steady state level of income per worker and the level of income per worker at the beginning of the period. λ determined the speed of at which

income per worker will approach towards the steady state level of income per worker. This steady state level of income per worker, in turn, depends on many factors, viz. education level of workforce, health, geography, climate etc. which impact labour productivity. Denoting these determinants of labour productivity by the vector X and the associated vector of parameters by β, the equation (1) can be rewritten as:

$$g_z = \lambda \,(\beta\, X - Z_0) \qquad \dots (2)$$

Let us start with an accounting identity to develop a theory of income per capita that links income per capita with income per member of working age population. This identity can be stated as:

$$\frac{Y}{N} = \frac{Y}{L} X \frac{L}{WA} X \frac{WA}{N}$$

Where, N denotes population

L denotes the labour force and

WA denotes the working age population.

The identity states that income per capita equals labour productivity times the participation rate times the working age ratio. Let lower case letters represent the log of these ratios,

$$y = \ln(\tfrac{Y}{N}); \quad z = \ln(\tfrac{Y}{L}); \quad p = \ln(\tfrac{L}{WA}) \text{ and } w = \ln(\tfrac{WA}{N})$$

Equation (2) can be written as

$$z = y - p - w \qquad \dots (3)$$

If it is assumed that participation rates remain constant in each state and UT overtime, equation (3) can be expressed as

$$g_y = g_z + g_w \qquad \dots (4)$$

where, g_y is the growth in income per capita and

g_w is the growth in the working age ratio.

Substituting (3) and (4) into (2), we get:

$$g_y = \lambda \, (X\beta + p + w_0 - y_0) + g_w \qquad \dots (5)$$

This equation forms the basis of our empirical analysis. It clearly states that over a period, per capita income growth is positively impacted by initial share of working age population, the growth rate of share of working age population and labour productivity (which can be considered a good indicator of increase in efficiency because of technological advancement).

This study is not interested in the participation rate and one will assume that it is captured in the constant term in the empirical exercise.

3.2 Data

For the purpose of this study, a balanced panel data of 26 Indian States and Union Territories will be utilised. Data frame on total population, growth in share of working age population, labour productivity, per capita Net State Domestic Product (NSDP) and some socio-economic indicators like infant mortality rate (IMR), total fertility rate (TFR) and literacy rate has been created from 1981 to 2011.

Data on various demographic indicators has been collected from Census of India (COI) documents. For three census rounds- 1981 to 2001- figures on all variables required for

this study are available in COI documents but figures on all required variables for latest 2011 Census round are unavailable. Data on total population, total workers, agricultural and non-agricultural workers has been collected from primary census abstract (PCA), 2011 released by COI. And figures on a key variable- share of working age population- has been calculated from per centage distribution of estimated population by age-group, 2010 published by COI.

Data from 66th NSSO round (2009-10) has been used as most appropriate proxy for census 2011 to check sustainability of demographic dividend. This is because when this study was conducted, COI had not published age-specific data required to calculate share of youth (15-29 years) in working age population and their share in work force. Certain calculations have been made to use 66th NSSO data to arrive at figures for total number of youth and youth employment.

Firstly, COI categorizes entire population as Workers and Non-Workers. Workers includes all individuals engaged in any kind of economic activity irrespective of the time period he or she has been engaged in that particular activity. Remaining individuals are classified as Non-Workers. On the other hand, NSSO categorizes entire sample in several categories and give them codes from 11 to 99[1]. There are three reference periods for NSSO to determine status of employment. These are: (i) one year (ii) one week and (iii) each day of the reference week. Three different measures of activity status are obtained based on these three periods. These three measures are known as usual status, current weekly status and current daily status respectively. To decide the usual principal activity status of an individual, first of all it is identified if an individual can be categorised as one in the *labour force* (either employed or unemployed) and *not in the labour force* depending on the major time spent by him/her during the 365 days preceding the date of survey. Then, if the individual is found to be one belonging to the labour force, his broad activity status of either 'working' (*employed*) or 'not working but seeking and/or available for work' (*unemployed*) is determined. According to UPS, codes 11-51 were assigned to

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[1] Code details given in appendix B

persons classified as workers and codes 91-97 to those not in the labour force. In the usual status approach, a single code 81 was assigned to persons seeking or available for work (unemployed persons) while two separate codes 81 (sought work) and 82 (did not seek but was available for work) were assigned to unemployed persons according to current weekly status and current daily status approach. Also, a person may be engaged in a relatively long period during the last 365 days in some activity and for a relatively minor period, which is not less than 30 days (not necessarily for a continuous period), in another economic activity. The economic activity, which was pursued for a relatively minor period was considered as his/her subsidiary economic activity.

The usual status which is ascertained on the basis of the usual principal activity and usual subsidiary economic activity combined together of an individual taken together, is considered as the usual activity status of that person and is written as usual status (ps+ss). According to the usual status (ps+ss), it includes those workers who perform some work activity either in the principal status or in the subsidiary status. Thus, a person who is not a worker in the usual principal status can fall under the category of worker according to the usual status (ps+ss), if the person pursues some subsidiary economic activity for 30 days or more during 365 days preceding the date of survey. Age-specific data on usual status of employment is used to arrive at number of youth who are in workforce. Youth Work Force Participation Rate (YWFPR) is calculated using following formula.

$$YWFPR = \frac{young\ worker}{total\ population} \times 100$$

To calculate dependency ratio, population in three age cohorts is required: 0-14 (young age population), 15-59 (working age population) and 60 and above (old age population). COI provides age specific data which can be used to calculate dependency ratio by using following formula:

$$Dependency\ Ratio = \frac{young\ age\ population + old\ age\ population}{working\ age\ population}$$

Labour productivity is defined as the amount of real GDP produced by an hour of labour. For example, suppose the real GDP of our economy is INR 10 trillion and the aggregate hours of labour in the country was 300 billion. The labour productivity would be INR 10 trillion divided by 300 billion, equalling about INR 33 per labour hour. Growth in this labour productivity number can usually be interpreted as improvements or rising standards of living in the country.

Because number of labour hours during a fiscal year is not available for all the census rounds, a modified definition of labour productivity has been used for the purpose of this study. It has been defined as output per worker (in monetary terms) during a reference period. Accordingly, Labour Productivity has been calculated using following formula:

$$Labour\ Productivity = \frac{NSDP\ at\ constant\ prices\ (2004-05)}{number\ of\ workers}$$

Among various socio-economic indicators, infant mortality rate, total fertility rate and literacy rate has been used for the purpose of this study. For first two census rounds -1981 and 1991- Census of India occasional papers provides data for infant mortality rate. COI 2001 does not provide data for few states and UTs on IMR but Ministry of Health and Family Welfare provides data for all states and UTs. Noticing that there was no significant difference in IMR figures of states and UTs for which data is provided by both COI and Ministry of Health and Family Welfare and to avoid incompatibility among states and UTs Ministry of Health and Family Welfare figure has been used. For 2011 IMR is provided by two different sources- SRS dated December 2011, October 2012, Office of Registrar General, Ministry of Home Affairs (IMR based on three year period 2009-2011) and Ministry of Health and Family Welfare. Figures given by both sources are similar but to maintain comparison with previous census figures from Ministry of Health and Family Welfare have been used instead of other source.

Figures for Total Fertility Rate have been taken from COI for all four census rounds. For few states and UTs, TFR figures were not available for both 2001 and 2011 census

rounds. TFR for such states and UTs is obtained through extrapolation[2] over two successive decades. For some states, TFR for 2011 turned out to be lower than 1 for 2011. In such cases, TFR is fixed at 1 as it's not possible for TFR to fall below 1.

For literacy rates, figures from economic survey of different years have been used. For 2011, Himachal Pradesh literacy rate figures are missing. They are derived through extrapolation.

Central Statistical Organisation (CSO) provides data on Net State Domestic Product for all census years but with different base. To ensure compatibility, NSDP of all states has been indexed to 2004-05 prices through splicing method[3]. CSO does not provide NSDP 2011 for states of Gujarat, Madhya Pradesh, Maharashtra, Punjab, Sikkim and Chandigarh. NSDP 2011 for these states has been extrapolated.

All these manipulations have been done to ensure enough number of observations while carrying out regression analysis.

Finally, states of Jharkhand, Uttaranchal and Chhattisgarh (which were formed after 2001 census) have been merged with their parent states of Bihar, Uttar Pradesh and Madhya Pradesh, respectively, by giving weight to new state and parent state according to each share in combined population[4].

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[2] Method described in appendix B

[3] Method described in appendix B

[4] Let us take example of Bihar and Jharkhand. Jharkhand was carved out of Bihar.

Suppose total population of Bihar is 'X' and total population of Jharkhand is 'Y'. Also suppose IMR of Bihar is 'p' and that of Jharkhand is 'q'.

While merging Jharkhand with Bihar and subsequently calculating combined IMR, weights equal to share in population are assigned to both states, i.e.,

Weight given to Bihar $= \frac{X}{X+Y}$

Weight given to Jharkhand $= \frac{Y}{X+Y}$

And combined IMR is calculated as

Combined IMR$= \frac{X}{X+Y} \times p + \frac{Y}{X+Y} \times q$

3.3 Descriptive statistics

Table 3.1 represents summary statistics for three key variables of this study- growth rate of per capita Net State Domestic Product, share of working age population and growth in share of working age population- from 1981 to 2011.

Average growth in per capita Net State Domestic Product is reported to be 0.036 per cent. It has a maximum value of 0.15 per cent and minimum falling in negative zone with a value of -0.05 per cent between 1981 and 2011.

Share of working age population on an average is more than 50 per cent over these four decades. Though minimum value of share of working age population is 48.3 per cent but maximum value is as high as 68 per cent.

Table 3.1: Summary statistics over time and states

Variable	Parameter	1981-2011
Growth in Per Capita Net State Domestic Product	Mean	0.036
	Standard deviation	0.029
	Minimum	-0.049
	Maximum	0.148
Share of Working Age Population	Mean	56.2
	Standard deviation	4.14
	Minimum	48.3
	Maximum	68.0
Growth in Share of Working Age Population	Mean	0.45
	Standard deviation	0.43
	Minimum	-1.14
	Maximum	1.58

Average rate of growth in share of working age population between 1981 and 2011 is 0.5 per cent with a maximum growth rate of 1.6 per cent and minimum growth rate of -1.14 per cent.

Same procedure is applied for other states and other variables like literacy rates and TFR.

Table 3.2 reports summary statistics of above mentioned three key variables for each decade separately which provides a clearer picture of direction in which all three variables are moving.

Table 3.2: Summary statistics from 1981 to 2011

Variable	Parameter	1981	1991	2001	2011
Growth in Per Capita Net State Domestic Product	Mean	0.021	0.025	0.041	0.058
	Standard deviation	0.023	0.023	0.031	0.026
	Minimum	-0.033	-0.033	-0.025	-0.049
	Maximum	0.071	0.072	0.149	0.092
Share of Working Age Population	Mean	53.9	55.4	56.6	58.9
	Standard deviation	4.22	3.58	3.12	3.98
	Minimum	48.3	51.5	51.9	51.9
	Maximum	68.0	67.9	63.0	65.9
Growth in Share of Working Age Population	Mean	0.309	0.211	0.426	0.87
	Standard deviation	0.334	0.381	0.261	0.42
	Minimum	-0.346	-1.145	-0.049	-0.014
	Maximum	0.887	0.789	0.919	1.583

On decade-on-decade basis, average growth rate of per capita Net State Domestic Product has been growing. It was 0.021 per cent in 1981 and increased to 0.058 per cent in 2011. It shows an increase of approximately 176 per cent within four decades in growth rate of per capita NSDP. Minimum value for this variable has an oscillating trend but maximum value has been increasing continuously in each decade.

Average share of working age population increased from 53.9 per cent in 1981 to 58.9 per cent in 2011. If we look at maximum values for share of working population, it has been declining consistently over four decades. On the other hand, minimum value has increased from 48.3 per cent in 1981 to 51.9 per cent in 2011.

Growth in share of working age population among 26 states in 1981 was just 0.31 per cent which increased to 0.87 per cent in 2011. There is a 180 per cent increment in average growth of share of working age population in these 40 years. Maximum rate of growth in share of working age population increases from 0.9 per cent to 1.58 per cent during this period, whereas minimum value declined over the decades.

As has been discussed in earlier chapter, all states in India do not have identical demographic composition. Some are at a comparatively advanced stage and some are lagging behind economically, socially as well as demographically. Table 3.3(a) and Table 3.3(b) explains this point by taking in consideration 12 Indian states. In 2001, the share of working age population at all India level was 56.93 per cent. If share of working age population of these 14 states is compared with all India figures then Andhra Pradesh (60.2%), Gujarat (60.2%), Karnataka (60.3%), Kerala (63.4%), Maharashtra (59%), and Tamil Nadu (63.7%) have share of working age population above national level. Such states are considered as demographically leader states.

On the other hand, states having share of working age population less than national level have been classified as demographically laggard states. Such states include Bihar (51.9%), Haryana (56.3%), Madhya Pradesh (54.4%), Rajasthan (52.9%) and Uttar Pradesh (51.8%). A closer look at the two categories of state reveals a very interesting fact. All of the demographically advanced states lie in Deccan and peninsular region of India. On the other hand, states which are lagging behind are located in Northern and Central India. The group of laggard states includes all BIMARU states. Figure 3.1 compares share of working age population at all India level with advanced and backward states.

In 2001, average growth in share of working age population in leader states is 0.44 per cent, whereas it is just 0.13 per cent in laggard states. Thus, on an average, share of working age population in leader states is growing three times faster than in laggard states.

Similarly, average growth in per capita NSDP in demographically advanced states is approximately 0.04 per cent, whereas for laggard states, it is 0.03 per cent.

Thus, states which are demographically advanced are economically advanced as well and states which are demographically backward are economically backward as well.

Table 3.3(a): Share of working age population
Leader States and Laggard States in 2001

		1981	1991	2001
Leader States	Andhra Pradesh	54.77	57.00	60.20
	Gujarat	55.27	57.47	60.20
	Karnataka	53.75	56.45	60.30
	Kerala	57.52	61.22	63.40
	Maharashtra	55.14	57.01	59.00
	Orissa	53.93	56.55	58.40
	Punjab	55.22	56.99	59.30
	Tamil Nadu	58.57	61.42	63.70
Laggard States	Arunachal Pradesh	55.80	55.06	55.00
	Bihar	51.49	51.92	51.91
	Haryana	51.86	53.00	56.30
	Madhya Pradesh	52.28	53.50	54.52
	Rajasthan	51.46	52.61	52.90
	Uttar Pradesh	51.47	52.13	51.87

Source: Census of India and author's calculation

Table 3.3(b): Growth in share of working age population
Leader States and Laggard States in 2001

		1981	1991	2001
Leader States	Andhra Pradesh	0.27	0.41	0.56
	Gujarat	0.62	0.40	0.47
	Karnataka	0.40	0.50	0.68
	Kerala	0.69	0.64	0.36
	Maharashtra	0.37	0.34	0.35
	Orissa	0.42	0.48	0.33
	Punjab	0.72	0.32	0.40
	Tamil Nadu	0.35	0.49	0.37
Laggard States	Arunachal Pradesh	-0.22	-0.13	-0.01
	Bihar	-0.03	0.08	0.00
	Haryana	0.73	0.22	0.62
	Madhya Pradesh	0.31	0.23	0.19
	Rajasthan	0.18	0.22	0.05
	Uttar Pradesh	-0.01	0.13	-0.05

Source: Census of India and author's calculation

Table 3.3(c): Growth in per capita NSDP

Leader States and Laggard States in 2001

		1981	1991	2001
Leader States	Andhra Pradesh	0.031	0.031	0.039
	Gujarat	-0.003	0.013	0.052
	Karnataka	0.014	0.035	0.047
	Kerala	0.013	0.022	0.044
	Maharashtra	0.022	0.033	0.038
	Orissa	0.003	0.017	0.018
	Punjab	0.033	0.029	0.023
	Tamil Nadu	0.030	0.032	0.043
Laggard States	Arunachal Pradesh	0.055	0.053	0.017
	Bihar	0.002	0.016	0.002
	Haryana	0.022	0.038	0.024
	Madhya Pradesh	0.024	0.012	0.027
	Rajasthan	-0.008	0.031	0.035
	Uttar Pradesh	0.014	-0.014	0.047

Source: Central Statistical Organisation

Figure 3.1
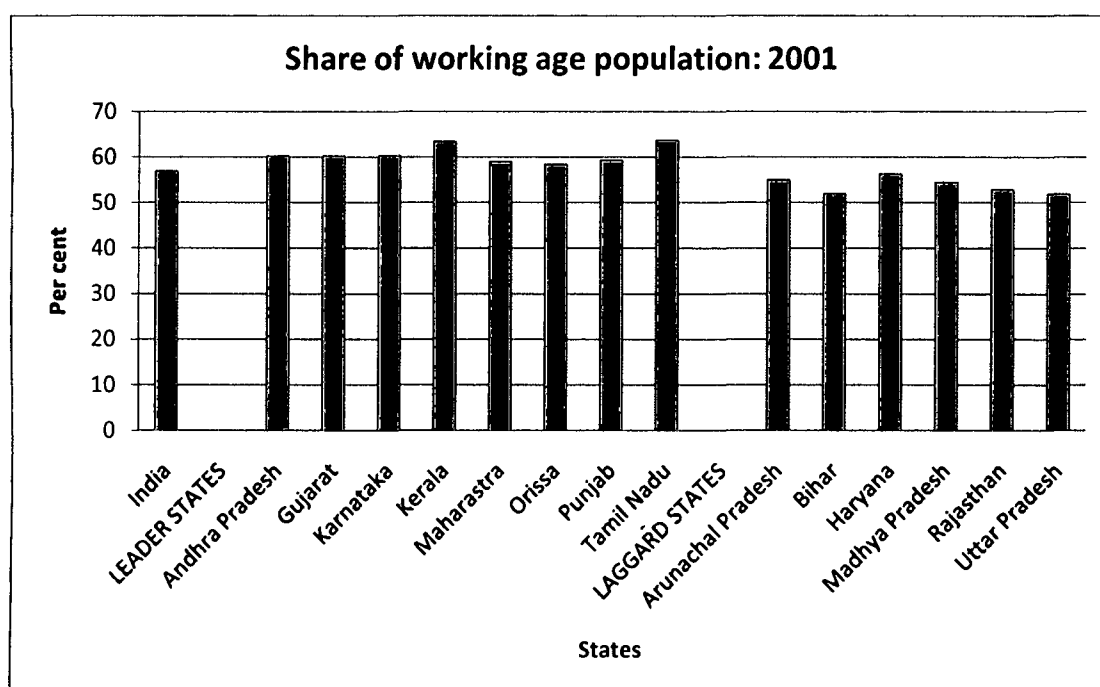
Source: Census of India, 2001

Table 3.4(a), (b) and (c) report a similar classification of states as Leader states and Laggard States for census year 2011.

Share of working age population increased to 59.9 per cent during this census year. When share of working age population of individual states was compared with all India level, two more states shifted to category of demographically advanced states. These states were Haryana (63.3%) and Madhya Pradesh (60%). Arunachal Pradesh (54.9%), Bihar (55.3%), Rajasthan (58.9%) and Uttar Pradesh (59.6%) are still trapped under category of laggard states.

Table 3.4 (a): Share of working age population
Leader states and Laggard States in 2011

		2011
Share of working age population		
Leader States	Andhra Pradesh	65.80
	Gujarat	63.40
	Haryana	63.30
	Karnataka	65.50
	Kerala	64.20
	Madhya Pradesh	60.01
	Maharashtra	63.30
	Orissa	61.90
	Punjab	65.10
	Tamil Nadu	66.00
Laggard States	Arunachal Pradesh	54.94
	Bihar	55.31
	Rajasthan	59.60
	Uttar Pradesh	58.15

Source: Per centage distribution of population estimates by age-group, 2010, COI

and author's calculation

Table 3.4 (b): Growth in share of working age population

Leader states and Laggard States in 2011

		2011
Leader States	Andhra Pradesh	1.16
	Gujarat	0.66
	Haryana	1.55
	Karnataka	1.08
	Kerala	0.16
	Madhya Pradesh	1.26
	Maharashtra	0.91
	Orissa	0.75
	Punjab	1.22
	Tamil Nadu	0.45
Laggard States	Arunachal Pradesh	-0.01
	Bihar	0.82
	Rajasthan	1.58
	Uttar Pradesh	1.51

Source: Per centage distribution of population estimates by age-group, 2010, COI

and author's calculation

Table 3.4 (c): Growth in per capita NSDP

Leader states and Laggard States in 2011

		2011
Leader States	Andhra Pradesh	0.067
	Gujarat	0.080
	Haryana	0.068
	Karnataka	0.054
	Kerala	0.075
	Madhya Pradesh	0.049
	Maharashtra	0.082
	Orissa	0.063
	Punjab	0.047
	Tamil Nadu	0.071
Laggard States	Arunachal Pradesh	0.046
	Bihar	0.058
	Rajasthan	0.049
	Uttar Pradesh	0.046

Source: Central Statistical Organisation

Figure 3.2 represents advanced and backward states when compared with all India level. But surprisingly, average growth rate of share of working age population in laggard states is 1.11 per cent which is higher than that of leader states. For leader states, it is growing at an average rate of 0.95 per cent.

Figure 3.2
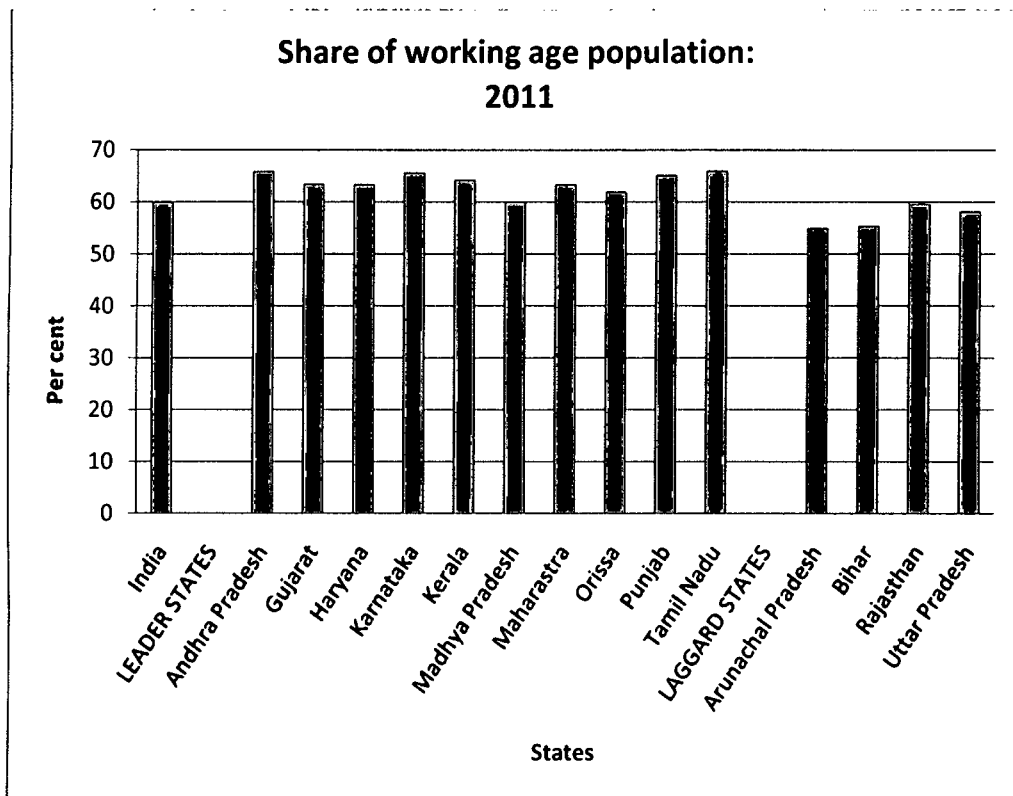
Source: Per centage distribution of population estimates by age-group, 2010, COI
and author's calculation

A comparison of demographic parameters between 2001 and 2011 revels that India is continuously experiencing rise in proportion of working age population. Consequently, dependency ratios are declining. It confirms with what has been asserted in earlier chapter. Also, in 2011, more states have entered in category of demographically advanced states.

Figure 3.3 below shows growth in share of working age population for 14 states from 1981 to 2011. It represents that in 2011, not only three more states entered into category of leader states, also the growth in share of working age population in most of the states in 2011has increased at a rate much higher than previous census year. It implies that India is proceeding rapidly towards achieving lowest possible dependency ratio.

Figure 3.3
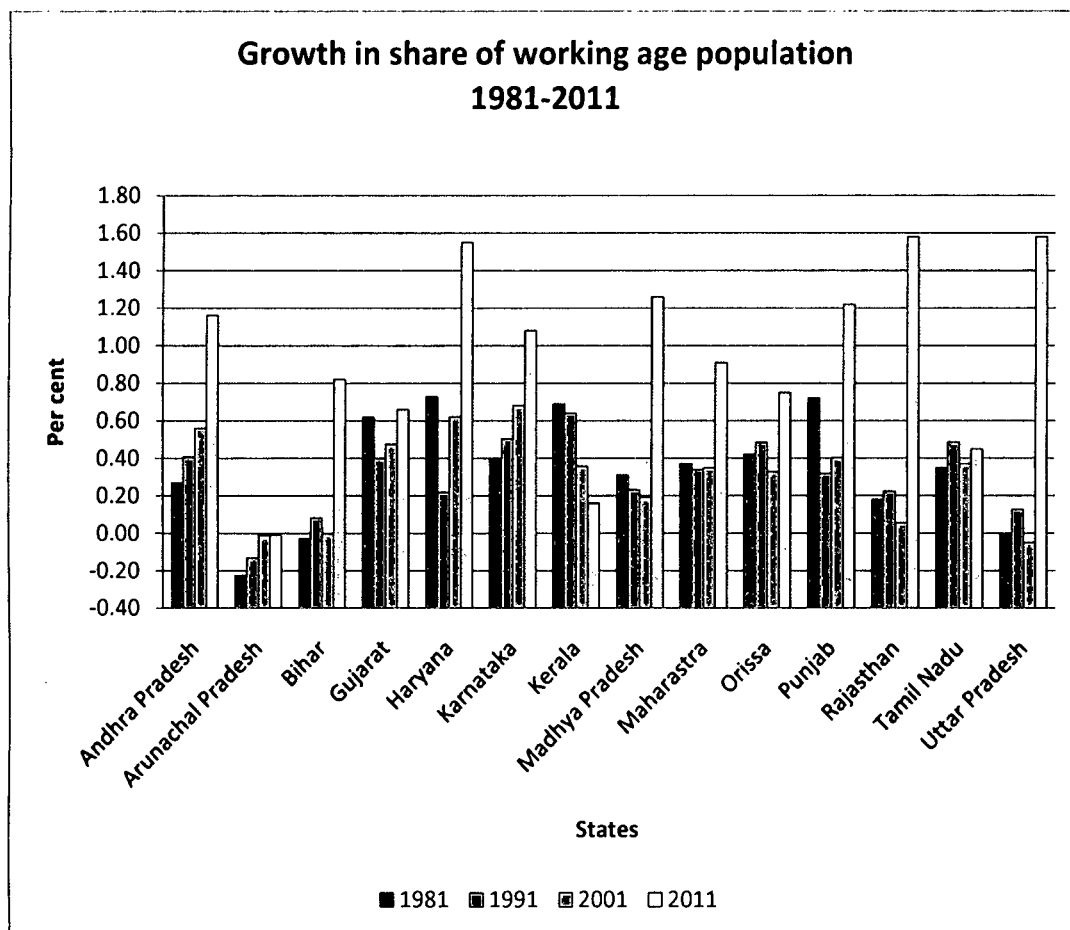
Growth in share of working age population 1981-2011

Source: Per centage distribution of population estimates by age-group,2010, COI and author's calculation

Figure 3.4 below shows growth in per capita Net State Domestic Product for 1981-2011. Similar to previous graph, it also shows that per capita NSDP in 2011 has grown at a rate much greater when compared with 2001.

Figure 3.4

Growth in Per Capita NSDP
1981-2011

States

::1981 ::1991 ::2001 □2011

Source: CSO and author's calculation

A synchronisation of figure 3.3 and figure 3.4 reflect a high positive relationship between growth in share of working age population and growth in per capita NSDP. This is exactly what is asserted by theory of Demographic Dividend.

Figure 3.5 shows share of working age population for same set of states over four census years. Share in working age population has increased from 1981 to 2011 in almost all states consistently except Karnataka. Karnataka's share of working age population is less in 2011 (57.17%) as compared to 2001 (60.3%). Figure 3.4 also shows that growth in share of working age population for Karnataka has declined in contrast to other states. It simply means that Karnataka has already experienced lowest possible dependency ratio

and now it has began to proceed towards higher proportion of old age population. Other southern states are also expected to follow suite in coming decades.

Figure 3.5

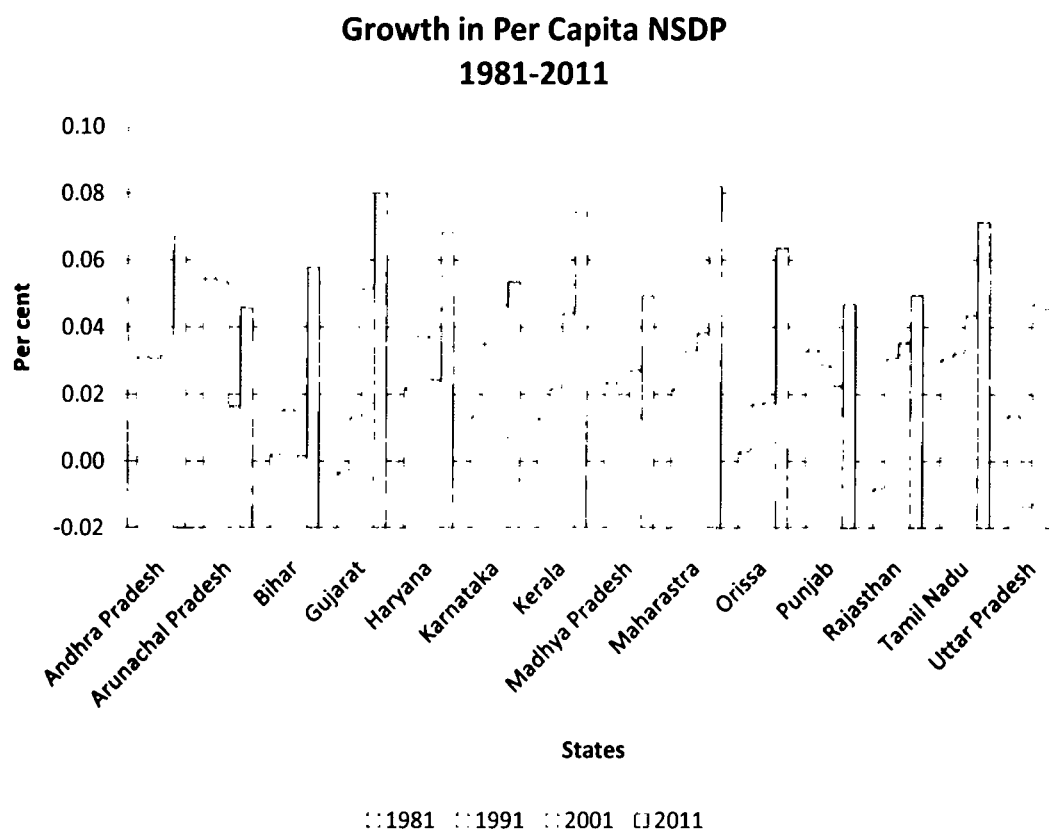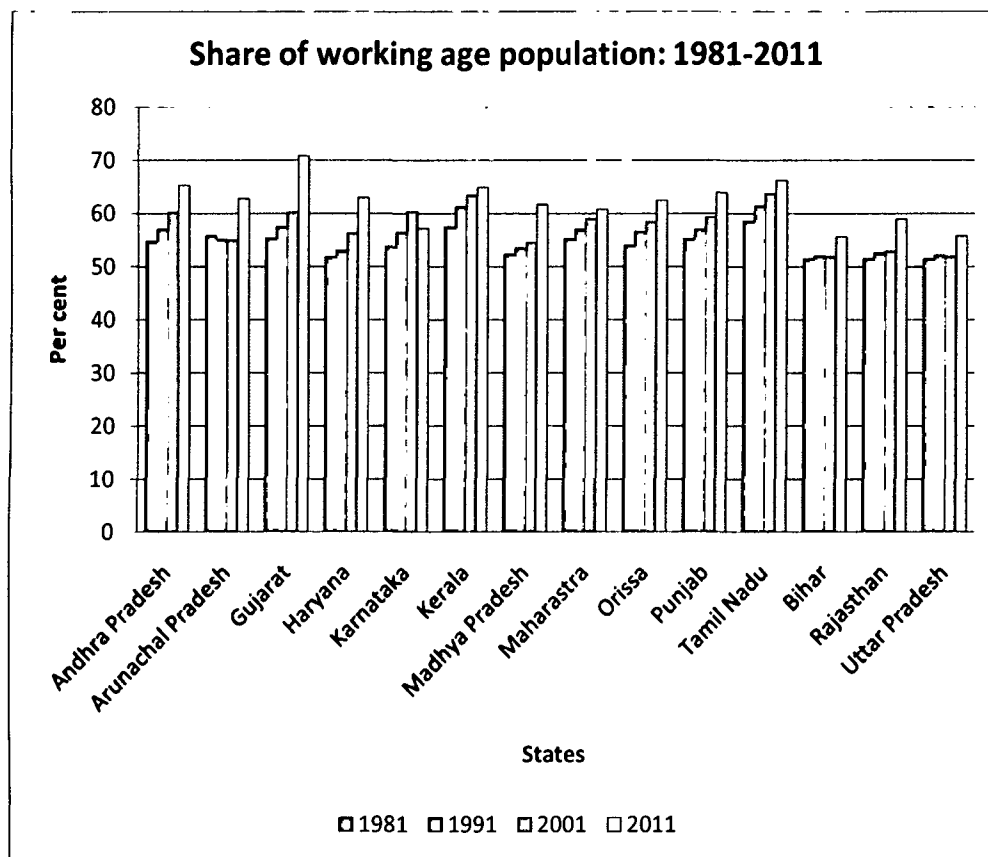
Share of working age population: 1981-2011

□ 1981   □ 1991   □ 2001   □ 2011

Source: Per centage distribution of population estimates by age-group, 2010, COI and author's calculation

Figure 3.6 shows a key variable which has been introduced in this study- labour productivity. It can be observed that along with other variables, labour productivity has also increased drastically in 2011 as compared to previous census year. For some states like Karnataka, Madhya Pradesh and Maharashtra, it is higher than other states.

Figure 3.6

Labour productivity
1981-2011
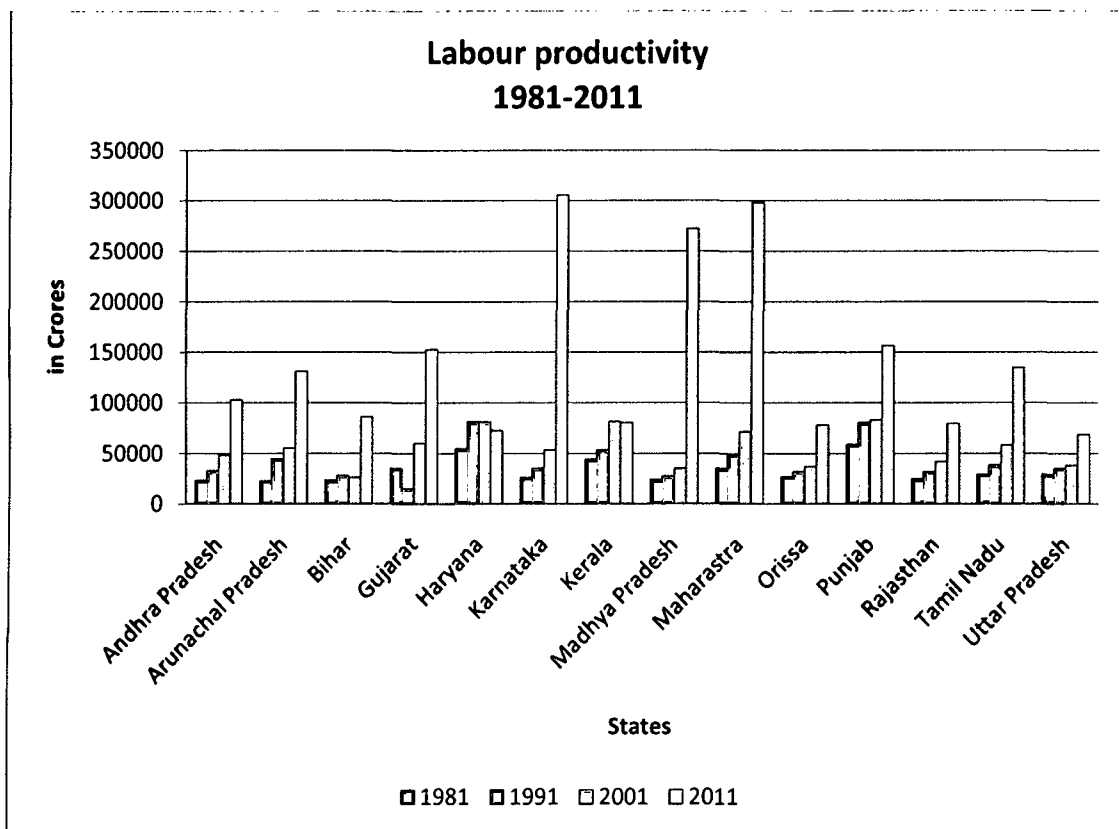
Source: author's calculations from CSO and COI

Last variable of interest is proportion of youth (15-29) in total working age population (15-59).

Table 3.5 gives figure for this variable for 2011.

Table 3.5: proportion of youth in total working age population: 2011

State	Share of youth in total working age population
Andhra Pradesh	43.2
Arunachal Pradesh	45.8
Bihar	42.8
Gujarat	42.3
Haryana	48.3
Karnataka	43.3
Kerala	36.2
Madhya Pradesh	45.4
Maharastra	44.3
Orissa	40.1
Punjab	45.5
Rajasthan	46.9
Tamil Nadu	38.1
Uttar Pradesh	47.8

Source: author's calculation using NSSO 2009-10 data

It can be observed that a major portion of working age population consists of youth. On an average, youth constitutes 45 per cent of working age population. The share of youth in working age population is pretty high in states of Haryana, Madhya Pradesh, Punjab, Rajasthan and Uttar Pradesh. These north Indian states need to focus comparatively more on young if entire country wants to reap the benefit of demographic dividend.

Using the data and statistics explained in this chapter, we will proceed with our analysis in next chapter.

Chapter 4

Estimation

4.1 Econometric model

Using the constructed data set of 26 states and union territories for the period 1981 to 2011, this study will observe the impact of growth in share of working age population and labour productivity on economic growth. Growth in per capita output is explained by a fairly standard set of explanatory variables by adding our demographic variables. The econometric model used for this study is derived from theoretical model explained in previous chapter. It is similar to model used by Kumar (2010), Aiyar and Mody (2011) and Vasundhra Thakur (2012) but with one exception. This study includes labour productivity as a new variable to check if improvement in labour productivity has contributed to growth in per capita income. This is so because the main purpose of this study is to see if economic growth in India in past few decades is exclusively due to increasing growth rate of share of working age population or it is due to improvement in labour productivity. Model used for study has been explained below:

$$g\_NSDPpc_{i,t} = \beta_0 + \beta_1 \ln NSDPpc_{i,t-1} + \beta_2 \ln WAR_{i,t-1} + \beta_3 g\_WAR_{i,t-1} +$$

$$\beta_4 \text{ labour productivity}_{i,t} + \gamma' X_{it} + \alpha_i D_i + \eta_t Y_t + \varepsilon_{i,t}$$

Where, $g\_NSDPpc_{i,t}$ is the annual average growth rate of per capita income in state i over the previous decade. It is the dependant variable of model.

$\ln NSDPpc_{i,t-1}$ is the log of initial per capita income at the beginning of decade,

$\ln WAR_{i,t-1}$ is the log of the initial working age ratio in total population at the beginning of decade,

$g\_WAR_{i,t-1}$ is the growth rate of the working age ratio over the decade.

labour productivity$_{i,t}$ is labour productivity at the beginning of decade

X_{it} is a vector of explanatory variables that might impact steady state labour productivity. It includes variables like literacy rate which indicates quality of labour, IMR which indicates health status in the economy etc.

α_i is a time-invariant fixed effect, capturing state specific effects,

while η_t is a time dummy, capturing effects unique to the decade. All these are independent variables of the model.

Growth rate of working age population cannot be considered exogenous. Theory of demographic transition provides theoretical support to this fact. To address this concern, Difference in - Sargan statistic is used as a formal test to check for exogeneity. This statistic is constructed as the difference between two Sargan-Hansen statistics. One of the value is arrived at when the suspected regressor is treated as endogenous, and another value is obtained when suspected regressor is treated as exogenous. Under the null hypothesis, the suspected regressor is taken to be exogenous. Difference in - Sargan statistic is distributed as chi-squared with one degree of freedom. In the present case, the null cannot be rejected at conventional levels of significance under either of the IV specification. So, to address endogenity between population growth rates and economic growth rates, 2SLS technique has been deployed for this study. It has been emphasised that if the possibility of reverse causality between population growth and economic development is not taken into consideration then the empirical estimates often leads to erroneous conclusions (Bloom and Williamson, 1998). Along with this, recently many studies which were conducted to understand the phenomenon of demographic dividend have found that the ordinary least-square (OLS) regression estimates are not the best way to explain the impact of age structure on per capita growth rate (Bloom and Williamson 1998, Bloom et al 2006). Difference in conclusion obtained by using OLS and 2SLS has been shown by Aiyar and Mody (2011) and Vasundhra Thakur (2012) as well.

Similarly, labour productivity is suspected to be an endogenous variable: an increase in per capita income growth rate can lead to increase in labour productivity through improvement in nutrition intake, accessibility to health care services etc. Difference in −

Sargan statistic lead to rejection of null hypothesis at an appropriate level of significance which means labour productivity is not an endogenous variable.

4.2 Estimation

Table 4.1 presents the results from the estimation using data for all four decades i.e. 1981 to 2011. Column 1 and column 2 represent results excluding labour productivity. Column 3 and column 4 include labour productivity. Column 2 and column 4 includes control variables- literacy rate and Infant Mortality Rate (IMR). Keeping in mind reverse causality between population growth rate (which directly effects growth in share of working age population) and economic growth rates, the growth in the share of working age ratio has been instrumented by total fertility rate (TFR). A random effects model has been used which was chosen after running a Hausman test which indicated that the error term was not correlated with the regressors.

Column 1 and column 2 in Table 4.1 below presents the results from a 2SLS regression using two demographic variables only—initial working age ratio and the growth rate in working age ratio together with state-specific fixed effects and time period dummies. Both of the demographic variables have expected sign and are significant as well. Moreover, they have a large value which implies that there a very substantial impact on income growth of age structure. If the log of the initial working age ratio increases by 0.01 units i.e. a 1 per cent increase in the working age ratio then it is associated with a 0.33 per centage points increase in annual average per capita income growth over the succeeding decade. This implies that states which have a high proportion of working age population are expected to witness higher per capita income growth rates.

Table 4.1: Regression results (1981-2011)

Dependent ariable: Average annual per capita NSDP growth				
	(1)	(2)	(3)	(4)
Constant	-0.97***	-1.09**	-0.58**	-0.72*
	(0.17)	(0.36)	(0.19)	(0.39)
Log initial NSDP	-0.04***	-0.03***	-0.04***	-0.04**
	(0.01)	(0.01)	(0.008)	(0.01)
Log initial Working age ratio	0.33***	0.36***	0.26***	0.29**
	(0.05)	(0.09)	(0.06)	(0.10)
Growth rate of Working age ratio	0.06**	0.06*	0.06**	0.05*
	(0.02)	(0.03)	(0.02)	(0.02)
Labour Productivity	NO	NO	2.5***	2.44**
			(6.78)	(7.10)
Control/Instruments				
Literacy Rate	-	-0.0009*	-	-0.0008**
		(0.0004)		(0.0004)
Infant Mortality Rate	-	-0.0002*	-	-0.0002*
		(0.0001)		(0.0001)
Total Fertility Rate	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT
Time dummies	YES	YES	YES	YES
State Dummies	YES	YES	YES	YES
Observations	104	104	104	104

***significant at 1 % level of significance   **significant at 10% level of significance*

**significant at 5% level of significance

Similarly, growth in working age ratio has a positive and significant effect on growth in per capita income. If growth in working age ratio increases by 1 per centage point, there will be a 0.06 per centage point increase in per capita income growth rate. Column 2 controls for variables like literacy rates and IMR which also gives similar results. As dependency ratio in India is declining, it opens up new door of opportunities for the economy. This can prove true for states like Haryana, Madhya Pradesh, Maharashtra, Punjab, Uttar Pradesh, Himachal Pradesh and Andhra Pradesh because these states have witnessed a high share of working age population and a higher growth in working age ratio. This is possible if and only if enough employment opportunities are generated in these states to accommodate increasing number of individuals in labour force.

These results are as per expectations and similar to conclusions drawn by Kumar (2010) and Aiyar and Mody (2011) using data from 1981 to 2001. However, these results are opposite to what has been found by Thakur (2012) for the time period 1981-2011 which is the time period used in this study as well. One of the possible reasons behind such diversion could be most updated data used in this study. Census of India is gradually publishing data on all variables. It had published with primary census abstract. Full data was yet to be published when this study was taken up.

Column 3 adds labour productivity as a new variable. This is the variable of interest in this study. As expected labour productivity has positive and significant effect on per capita income growth rate. If labour productivity increases by one unit per capita, income growth increases by 2.4 per centage point. Though the impact of growth in share of working age population on per capita income growth rate remains unchanged, impact of working age ratio in previous decade is pulled down. Now, one per cent increase in initial working age ratio increases growth rate of per capita income by 0.26 per centage point instead of 0.33 per centage point. After controlling for literacy rate and IMR, impact of both demographic variables and labour productivity remains positive and significant. It can also be observed that impact of labour productivity (2.5) is much higher than demographic variables- intial working age ratio (0.26) and growth in share of working age population (0.6). It indicates that much of the impressive growth story of Indian economy is explained by improvement in technology which is captured by improvement in labour productivity instead of favourable age structure.

These results are in line with the claims made by studies in past few decades that increase in labour productivity have been a significant factor behind higher per capita income growth rates. Chinese economy's performance can be attributed to improvement in labour productivity instead of demographic dividend (The Economist). In Indian case both demographic dividend and improvement in labour productivity are reinforcing each other to achieve higher economic growth rate but undoubtedly role of improvement in labour efficiency is far greater than that of declining dependency ratio.

In this analysis, we have taken in account endogenity between per capita income growth rate and working age ratio growth rate. Inter-state migration is another one of the obvious

channels through which per capita income growth could influence the growth rate of the working age ratio. Cashin and Sahay (1996) had studied migration between the Indian states in their empirical work. They did not find much evidence in support of inter-state population migration followed by income differentials between sates. In fact, they found that there are strong barriers to the mobility of labour from one state to another. These barriers include local labour unions that are there to resist competition from migrants, lack of urban housing and other basic facilities in migrant hubs, and most importantly, language and culture which places obstacles in the path of cross-border labour substitutability. In fact, in India much of the migration tends to be in the nature of within-state female migration when married woman shifts to her husband's village (Datta, 1985; Skeldon, 1986).

Aiyar and Mody (2011) shows the results for impact of the growth rate of the working age population adjusted for migration on per capita income growth rate. They found that both pf the demographic variables- the initial level of the working age ratio and its growth rate remain significant when data is adjusted for migration. But there is shange in magnitude of coefficients: the point estimate of the coefficient on the adjusted growth rate of the working age ratio falls slightly but still it could not be statistically distinguished from the co-efficient which was non-adjusted for migration. These results provide further confirmation that inter-state migration in India due to difference in per capita income growth rate is not an influential factor.

4.3 Economic reforms and demographic dividend

The economic reforms started in year 1991. The economic performance of India in the post reform period has been quite appreciative. Apart from 1991-92, which was not a good year from the point of view of GDP growth rate, the average annual growth rate between 1992-93 and 1999-2000 was approximately 6.3 per cent. This trend continued in the first decade of twenty first century as well. Rather before global melt down of 2008 growth rate of 9 per cent was experienced. During 1992-2001, both per capita income and capital accumulation were higher when compared with the decades of 1970s and 1980.

During 1990-91 to 2000-01, the GNP at Factor Cost at current prices also grew by 300 per cent as against 283 per cent in previous decade i.e. during 1980-81 to 1990-91. During 1990-91 to 2000-01, the NNP at Factor Cost at current prices also went up by 304 per cent as against 278 per cent during 1980-81 to 1990-91. Story of per capita NNP at Factor Cost at current prices was also similar, the increase in this variable was 232 per cent during 1990-91 to 2000-01 which was 206 per cent during 1980-81 to 1990-91. The Indian economy had jumped to a new growth trajectory after reforms when Indian economy was opened up for foreign investors and foreign companies. These foreign countries brought new technology with them and generated more employment opportunities in India.

India had begun to experience decline in dependency ratio in 1970s and this declining streak is still continuing. Prior to 1991, Indian economy was trapped into Hindu growth rate of around 3 per cent only. Only after 1991, economic growth rate has doubled to around to around 6 per cent. Keeping these two trends in mind, the main purpose of this section is to see if a favourable age structure had a noticeable impact on economic performance of country since 1970s or it was economic reforms which enabled higher proportion of working age population to become a significant factor behind higher growth story.

To analyse the relationship between economic reforms on demographic dividend, entire data set has been broken into two data sets. First data set consists of pre-reform phase, i.e., 1981-91 and second data set consists of post-reform phase, i.e., 2001-11. Each data set has 26 states and union territories. Model explained in section 4.1 has been deployed for this analysis as well and 2SLS technique has been used.

Table 4.2 below presents results for pre-reform period. Column 1 of the table takes into account just demographic variables. Growth in share of working age population of previous decade has a positive and significant impact on dependent variable. A one per cent increase in initial working age ratio increases per capita income growth rate by 0.3 per centage point in succeeding decade. Impact of growth in share of working age population is positive but insignificant. Column 2 of the table reports impact of labour productivity on per capita income growth rate. Impact of initial working age ratio and

growth in share of working age population remains unchanged. Labour productivity affect per capita income growth positively and significantly in decades prior to economic reforms. If labour productivity increased by one unit, per capita income growth rate increased by 4.42 per centage point. This implies that though favourable age structure had a favourable impact on economy but an increase in growth rate of working age population, i.e., accelerated fall in dependency ratio could not effect economic growth positively. During this phase, new employment avenues were not easily available to labour force. As a result, a fast growth in number of individuals entering working age group could not have any significant impact on economy.

Taking a look at development literature, whether of the unlimited supplies of labour which is explained in Lewis model or the structural change school of Chenery, it has been asserted and formalised that in the early stages of development, the higher growth that an economy experiences is due to the shifting of labour from the low productivity agricultural sector to the higher productivity non-agricultural or more precisely industrial sector. After this stage only, later factor like accumulation of capital and technological changes act as stimulants for to higher income growth. During this phase, there was a substantial relocation of workers from agricultural sector to industrial sector. As it is known that industrial sector is more productive than agricultural sector. Also, it has potential to employ more individuals. That is why, both labour productivity and initial working age population has a positive and significant impact on economic growth rate in this phase. At the same time, process of capital accumulation was very slow during this phase which made absorption of rapidly growing working age ratio in workforce a tough task and consequently a non-determinant in economic growth.

Table 4.2: Regression results (1981-1991)

Dependent variable: Average annual per capita NSDP growth		
	(1)	(2)
Constant	-.88**	-.68
	(.42)	(.45)
Log initial NSDP	-.03***	-.04***
	(.01)	(.01)
Log initial Working age ratio	.30**	.27 **
	(.11)	(.12)
Growth rate of Working age ratio	.05	· .05
	(.034)	(.04)
Labour Productivity	-	4.42**
		(1.82)
Control/Instruments		
Total Fertility Rate	YES	YES
Time dummies	YES	YES
State Dummies	YES	YES
Observations	52	52

***significant at 1 % level of significance*

**significant at 10% level of significance*

***significant at 5% level of significance*

Table 4.3 represents results for post-reform period. Column 1 of the table excludes labour productivity. Both initial working age ratio and growth in working age ratio has positive and significant impact on per capita income growth rate. Magnitude of impact of initial working age ratio is as high as 1.02 per centage point. Growth rate of per capita income in succeeding decade increases by 1.02 per centage point with 1 per cent increase in intial working age ratio. If growth in working age ratio increases by 1 per centage point, per capita income growth rate increases by 0.4 per centage point. After controlling for other factors like literacy rate and IMR which affected economic growth rates indirectly, impact of both demographic variables remains positive and significant.

Table 4.3: Regression results (2001-11)

Dependent variable: Average annual per capita NSDP growth				
	(1)	(2)	(3)	(4)
Constant	-2.88***	-2.92**	-1.54**	-1.31**
	(.55)	(.84)	(.74)	(.52)
Log initial NSDP	-.13***	-.07***	-.15***	-.11***
	(.02)	(.03)	(.02)	(.02)
Log initial Working age ratio	1.02***	.94***	.74***	.62**
	(.16)	(.24)	(.20)	(.13)
Growth rate of Working age ratio	.04**	.06**	.04**	.04**
	(.01)	(.03)	(.01)	(.02)
Labour Productivity	NO	NO	4.03***	3.45***
			(1.05)	(7.65)
Control/Instruments				
Literacy Rate	-	-.002**	-	-.001**
		(.001)		(.0004)
Infant Mortality Rate	-	.0001	-	-.0005
		(.001)		(.0005)
Total Fertility Rate	INSTRUMENT	INSTRUMENT	INSTRUMENT	INSTRUMENT
Time dummies	YES	YES	YES	YES
State Dummies	YES	YES	YES	YES
Observations	52	52	52	52

***significant at 1 % level of significance*

significant at 10% level of significance

**significant at 5% level of significance*

Column 3 includes variable of interest for this study- labour productivity. When it is included in model, both demographic variables remains positive and significant. Magnitude of impact of growth in working age ratio remains same but that of initial working age ratio goes down from 1.02 per centage point to 0.74 per centage point. This implies that inclusion of labour productivity in analysis overshadows the impact of initial working age ratio.

Labour productivity has a positive and significant impact. If labour productivity increases by one unit, growth rate of per capita income increases by 4.03 per centage point. After controlling for literacy rate and IMR, impact of both labour productivity and initial working age ratio goes down where growth in share of working age ratio remains equally effective. Labour productivity has been a significant factor every time which affects

economic growth rates. This observation implies that Government of India should focus on creating Schumpeterian kind of work instead of Malthusian type.

A comparison of pre-reform and post-reform results shows that phenomenon of demographic dividend was in process prior to economic reforms. But rising growth rate of working age population has had a positive and strong impact only after 1991. Also, in first phase, impact of initial working age population was 0.30 which increased more than double to 0.62 in second phase. This implies that economic reform triggered relationship between demographic variables and economic growth. Not only this, after economic reforms if working age ratio increases at an increasing rate, it will also impact economic growth significantly.

After 1991, employment opportunities have tremendously increased in economy because more and more new domestic private companies as well as multinational companies (MNCs) were established in the country. After 1991, many public sector companies have been privatized. Aftermath, public sector companies which were growing at a snail's pace were reported to have attained higher productivity and production due to efficient management and use of resources. Not only this, many of the foreign companies also began to show interest in Indian economy. They started to outsource their jobs to India. This led to increasing the job opportunities in the country. In 1991, many Indians speculated loss of millions of jobs. But things turned to be in favour of Indian economy. Today, American politicians are taking prudent measures as they are scared that millions of jobs from USA will be outsourced to India. In fact, it is true as BPO is one of the most flourishing industries of India. Now, India has been outsources various health services such as pathological and radiological tests by many countries. More and more jobs have come up in computer software and call centres. This was seen as an impossible avenue for India ten years before the reforms. The economic reforms have not benefitted India just in terms of increased the job opportunities, but have increased pay packages in many of the sectors benefiting the youngsters from the middle-class. Most important sector, which has vastly expanded and has generated vast employment opportunities specially for the educated youth in the country after 1991 is the 'InformationTechnology' Other notable

sectors in this connection are the telecom, civil aviation, automobiles and electronics which have expanded due to higher FDI in these sectors.

4.4 Youth absorption in workforce and implications for demographic dividend[1]

Regression results in previous section indicate that favourable age structure is an important factor in determining higher income growth in India in past two decades. But question arises if demographic dividend is sustainable. Dependency ratio in India is expected to decline till 2050 after which it will again start rising due to more number of old dependents. The sustained economic growth along with rising proportions of working age population is feasible if productive employment is provided to higher working age population. This section is devoted to analyse if sufficient employment opportunities are provided to those falling in working age cohort. States which have witnessed a higher growth in share of working age population and have high share of working age population have been chosen for this analysis. These states are Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Uttar Pradesh and West Bengal[2]. This is so because future of demographic dividend depends upon employment generation capacity of these states.

Figure 4.1 below shows what proportion of individual falling in working age group are employed. It shows that situation is far from satisfactory. On an average, only 60 per cent of working age individuals are employed. Rural areas, on an average have higher proportion of working age population employed (64 per cent) as compared to urban areas (50 per cent). In state of Andhra Pradesh, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan, rural employability of working age group is higher than urban employability. Some of the reasons behind rural employment being higher than urban employment are success of MGNREGA scheme, disguised employment

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[1] Tables for all the figures in this section age are given in appendix 1.

[2] States of Jharkhand, Chhattisgarh and Uttaranchal have been merged with their parent states of Bihar, Madhya Pradesh and Uttar Pradesh respectively.

prevailing in agrarian sector and non availability of stable jobs to rural migrants in urban areas.

Figure 4.1

Working age population employed across different states
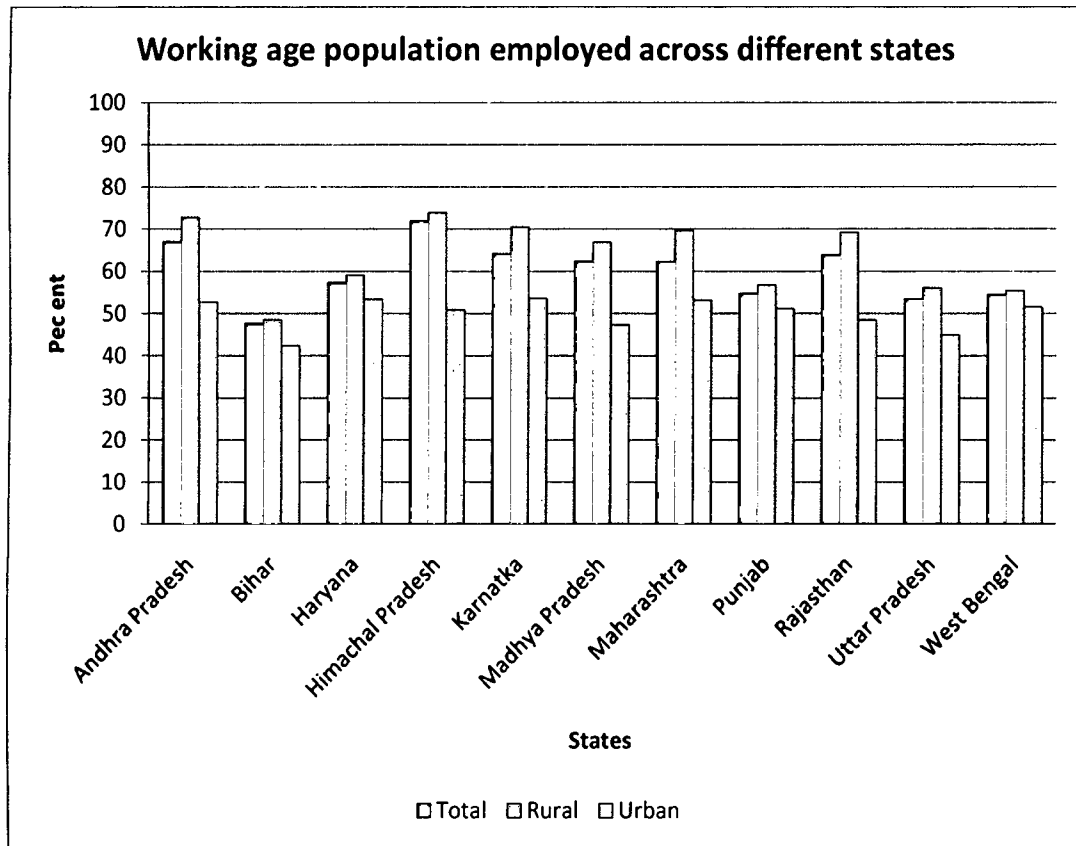
Source: NSSO survey 2009-10

Instead of proportion of employed working age population, employment situation of youth between 15 to 29 years of age can give a much clearer picture of sustainability of demographic dividend. India has entered the third phase of demographic transition recently. The baby boom of second stage of demographic transition has entered into young age group of 15-29 in this third stage. These young individual constitute bulk of working age population. Table 4.4 shows proportion of young in working age population. It is clear from the table that on an average, 45 per cent of working age group consists of young individuals' irrespective of rural area or urban area. It is important to provide productive employment to younger population to harness demographic dividend in long run.

Table 4.4: Proportion of young (15-29) in total working age population (15-59)

State	Total	Rural	Urban
Andhra Pradesh	43.24	42.79	44.34
Bihar	42.82	42.62	44.11
Haryana	48.34	48.32	48.39
Himachal Pradesh	40.97	40.91	41.60
Karnatka	43.26	41.60	46.05
Madhya Pradesh	45.44	45.46	45.38
Maharashtra	44.34	43.78	45.03
Punjab	45.52	45.31	45.88
Rajasthan	46.94	46.80	47.34
Uttar Pradesh	47.84	47.25	49.77
West Bengal	42.40	44.27	36.87

Source: NSSO survey 2009-10

Let us first compare the proportion of youth in total working age group to proportion of employed youth in employed working age population. Figure 4.2(a) gives an insight into such comparisons for overall population. It is visible from the diagram that the proportion of young among employed working age population is far below their proportion in working age population. Average share of young in working age population is 45 per cent whereas average share of young in employed working age population is just 34 per cent. This gap is greater than average in states of Bihar, Punjab, Rajasthan and Uttar Pradesh. This might point towards a troublesome future as young which forms a higher proportion of working age population are not employed proportionally.

Figure 4.2(a)

Youth in working age population & youth in employed working age population: Total

□ Share of youngs in working age population □ Share of youngs in employed working age population
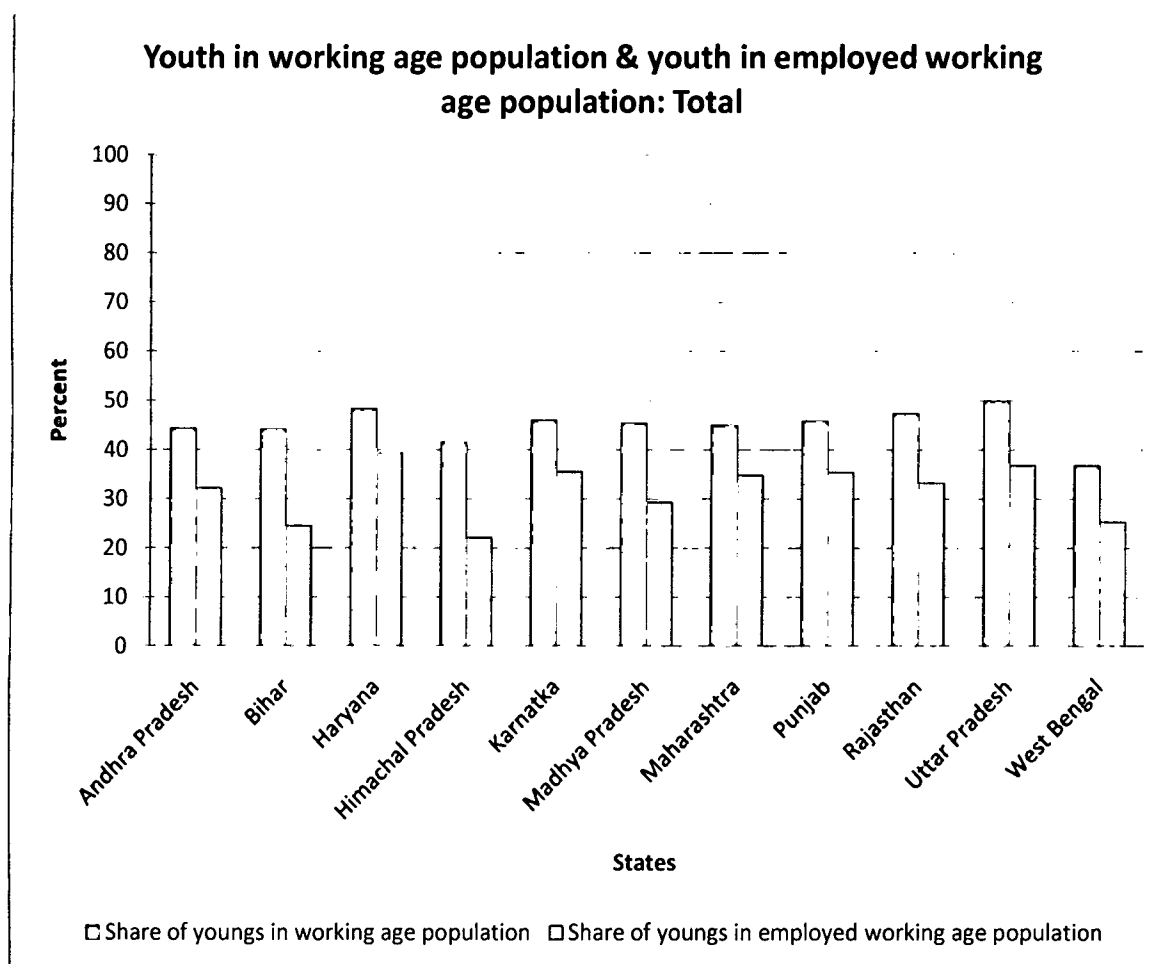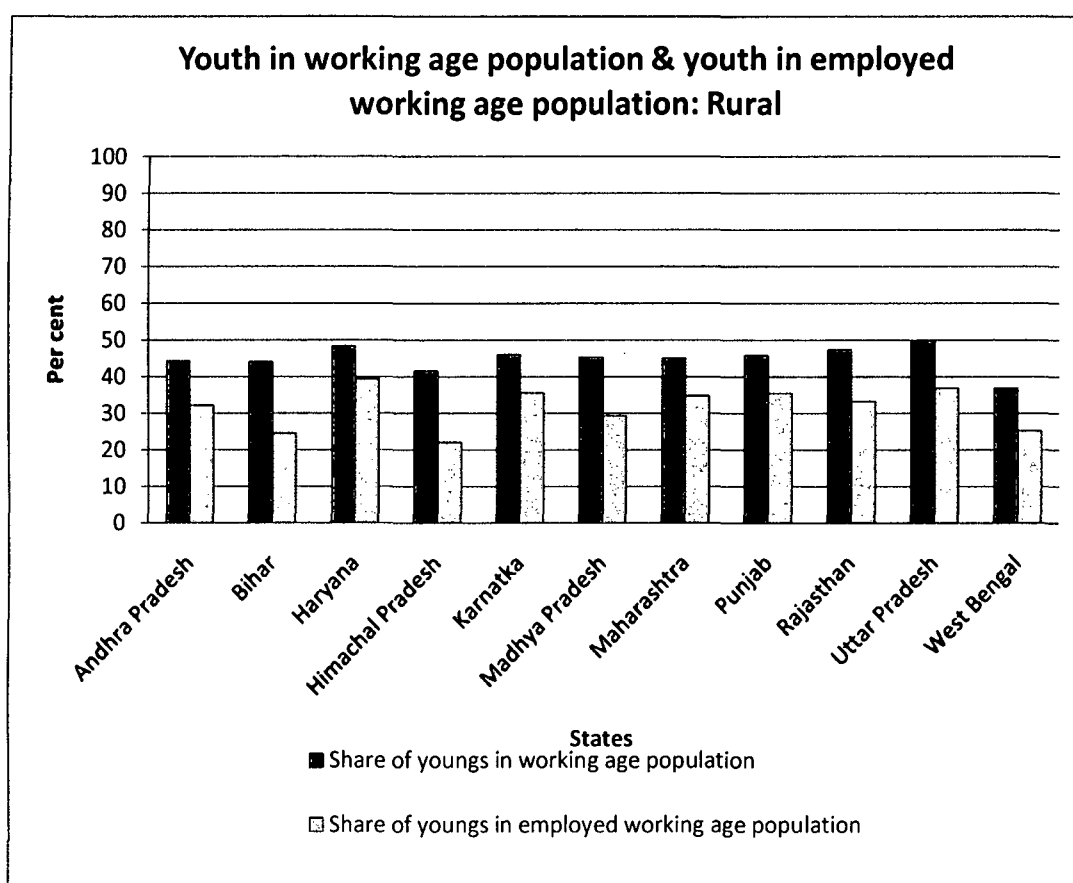
Source: NSSO survey 2009-10

In India, there is a visible difference between rural economy and urban economy. So, difference can be expected in employability of young workers as well. Figure 4.2(b) represents situation in rural economy and 4.2(c) represents urban economy. In rural areas, the average share of young in working age population is 45 per cent whereas their share in employed working age population is just 34 per cent. This gap is higher than average in states of Bihar and Himachal Pradesh. On the other hand, in urban areas, the share of young in working age population is 45 per cent and their share in employed working age population is 32 per cent. This gap is high for states of Bihar, Himachal Pradesh and West Bengal. In Bihar, such a dismal performance is because majority of youth in the state are

poorly equipped for employment for which there is a market demand. They are neither adequately educated nor equipped with vocational skills. Just one in three young men and one in eight young women has completed secondary education which is a necessary prerequisite to participate in the skill demanding labour market in the context of globalisation.

Figure 4.2(b)

Source: NSSO survey 2009-10

Also, the gap between two proportions is higher in urban areas as compared to rural areas. Rural areas are largely dependent on agriculture. Youth can enter into agriculture without requirement of any particular skill and even without contributing much to agricultural

productivity. However, this is not the case with urban economy which is largely based on secondary and tertiary sector. Another reason for this gap is difference in work participation of young females in rural and urban areas. In rural areas, female school participation rate is low, as a result, these females are found to be engaged in farm based activities in rural areas.

Figure 4.2(c)

Youth in working age population & youth in employed working age population: Urban
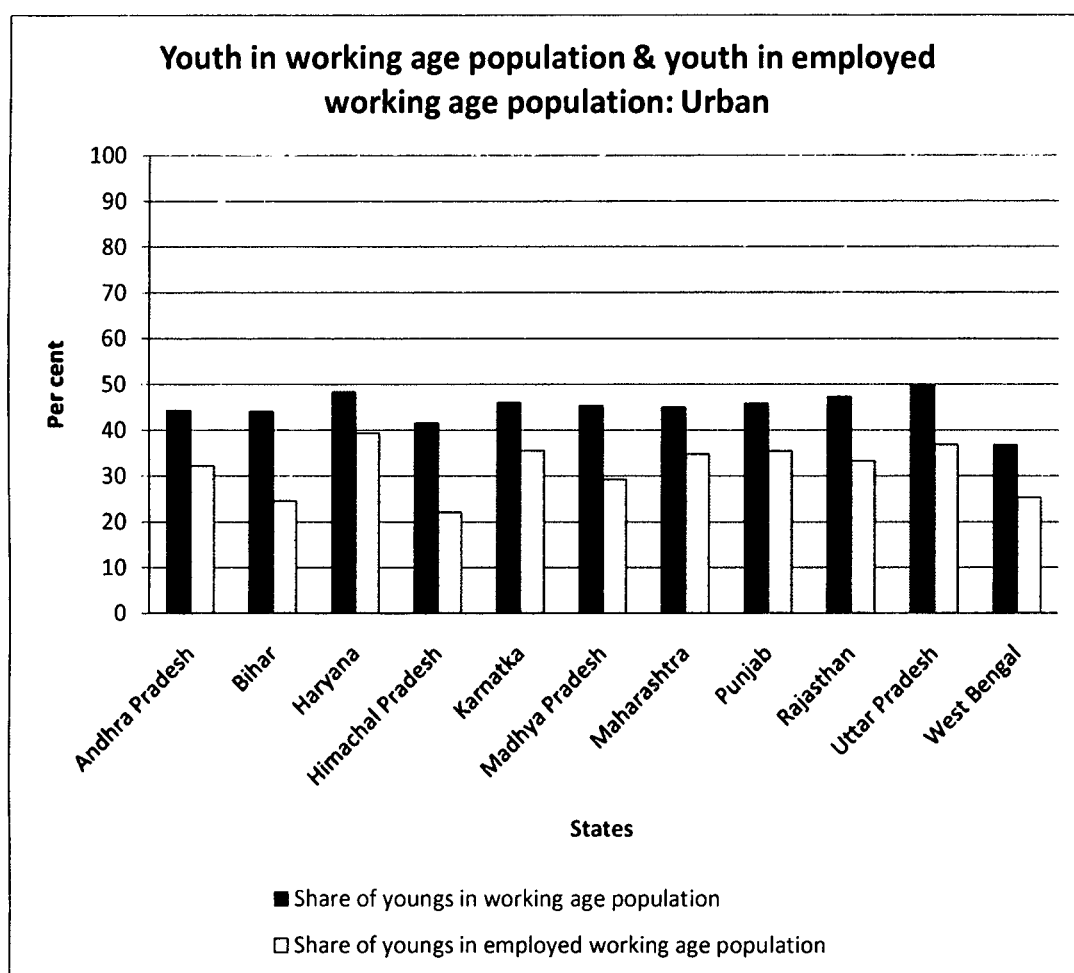
Source: NSSO survey 2009-10

Before concluding anything about demographic dividend, it is important to know where the young population is involved. After independence, higher education has improved

tremendously in the country. Enrolment rates in both primary, secondary and higher education has gone up. Consequently, literacy rate has increased to 79.31 per cent in 2011 (PCA 2011, Census of India) from just 21.82 per cent in 1951[3]. So, it is imperative to take a look at current enrolment ratio of young population. Figure 4.3(a), 4.3(b) and 4.3(c) compares proportion of young employed with proportion of young currently attending educational institutions for total, rural and urban population across chosen states.

Figure 4.3(a)

Youth employed & youth attending educational institutes: Total
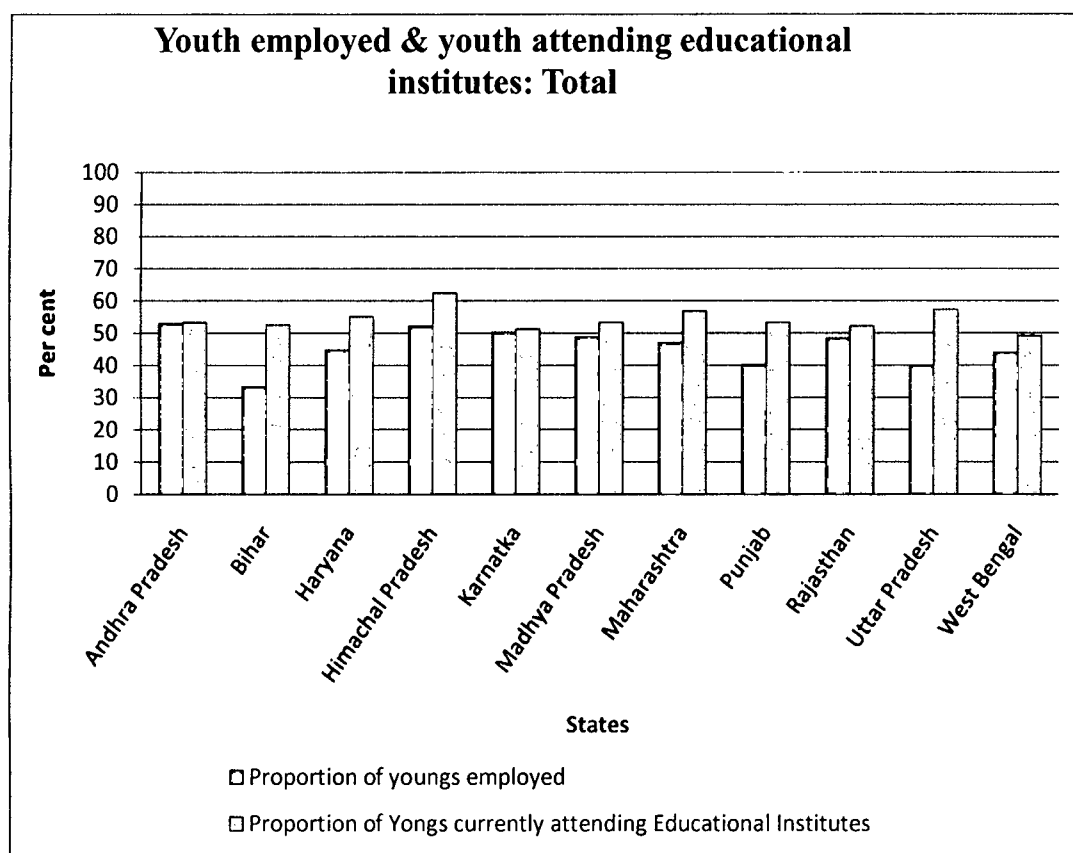
Source: NSSO Survey 2009-10

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[3] Literacy rates for 1951 related to population aged five years and above. The rates for the year 2011 related to the population aged seven years and above.

Figure 4.3(b)

Youth employed & youth attending educational institutes: Rural

■ Proportion of youngs employed

☐ Proportion of Yongs currently attending Educational Institutes
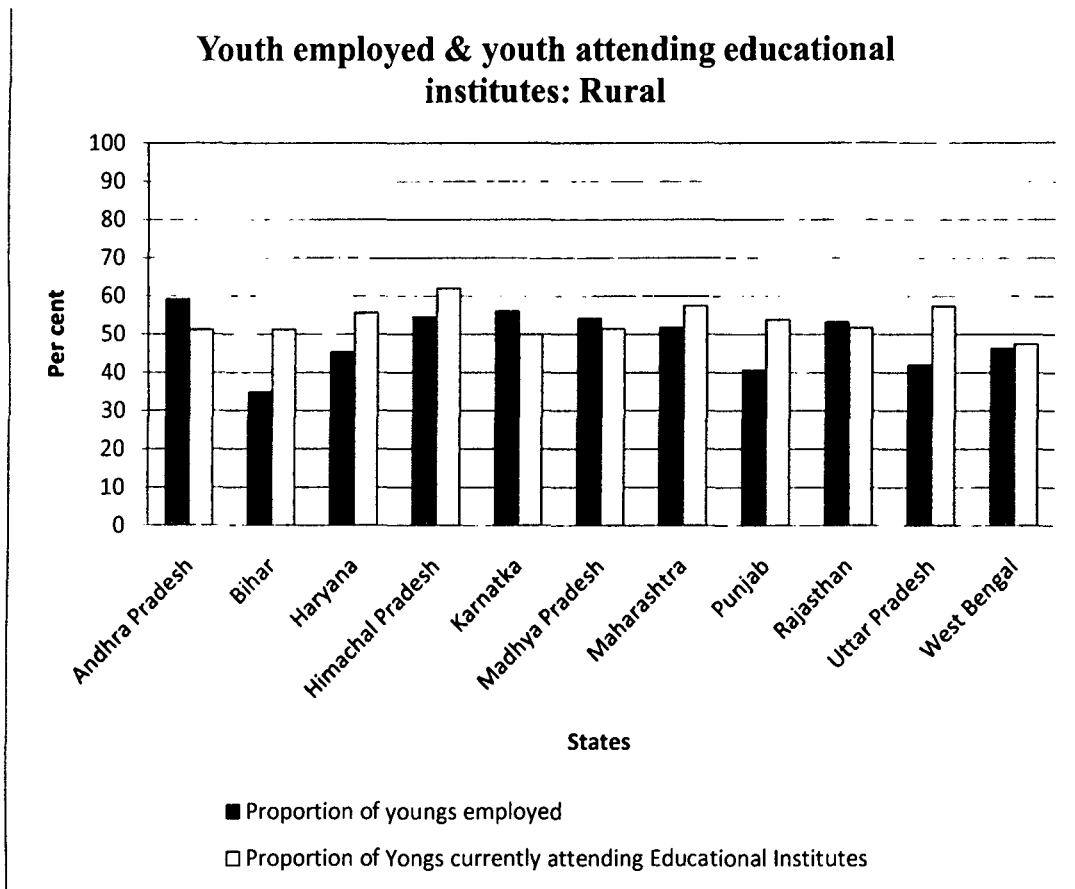
Source: NSSO Survey 2009-10

From the figures, it can be realised that if proportion of young employed is less,then proportion of young currently enrolled in educational institutes is high. This reflects that less proportion of young are engaged in workforce because they are involved in higher education. Increase in higher education enrolment rate will lead to increment in human resource capital of India which is a good sign. Across states, 45.6 per cent of youth are engaged in work whereas 54.3 per cent are engaged in educational institutes. In rural areas, almost 49 per cent of youth are in workforce and higher proportion of 54 per cent is

enrolled in educational institutes. In urban areas, only 35 per cent of youth are engaged in work force but a higher proportion of 57 per cent are engaged in higher studies. This comparison between rural and urban areas removes curtain from reasons behind low work force participation rates among youth in urban areas.

Figure 4.3(c)
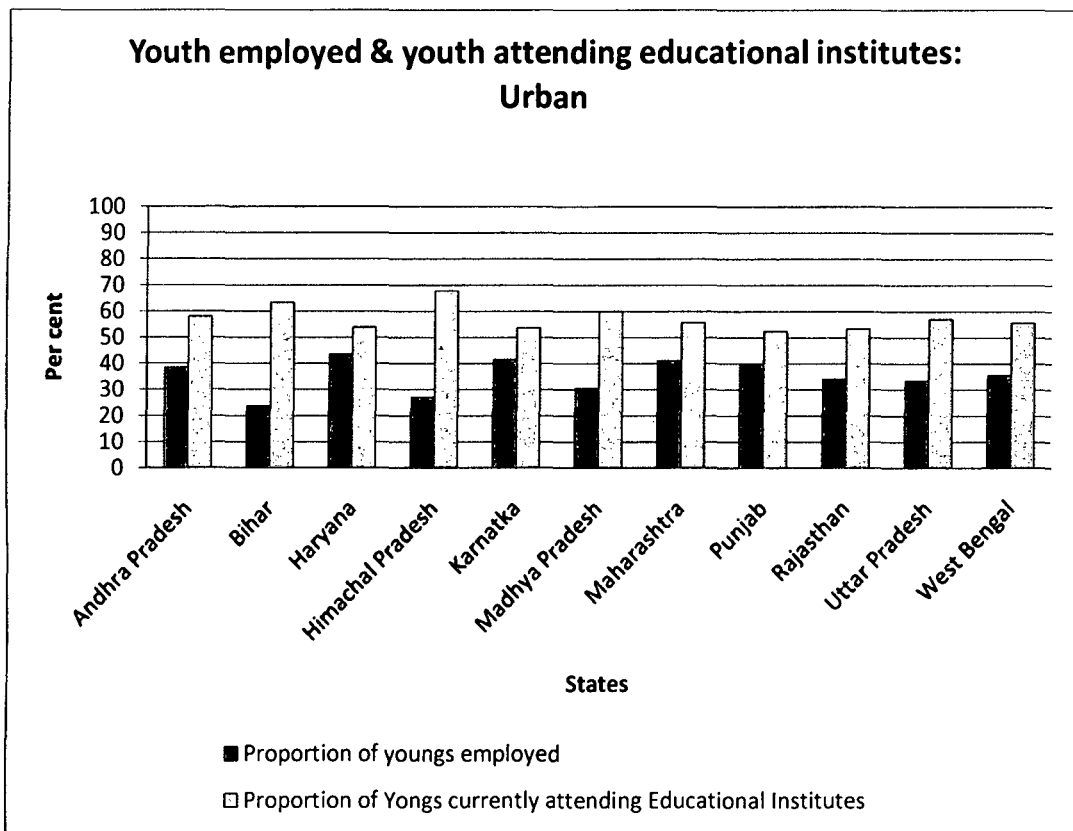
Source: NSSO Survey 2009-10

But high youth enrolment rate in educational institutes is beneficial for the economy only if employment opportunities are available for them once they enter the job market. A recent report, titled 'Aspiring Minds' National Employability Report', is a national audit of employability of three-year Bachelor's Degree graduates. According to the report, the

employability of graduates varies from as low as 2.2 per cent in roles such as corporate communications/ content development and 2.59 per cent in accounting to 15.88 per cent in sales-related jobs and 21.37 per cent for roles in the business process outsourcing (BPO/ITeS) sector. Most of the graduates (35.95 per cent) were found suitable for clerical/secretarial roles. For an analyst's role, close to 84 per cent graduates were found to lack the right levels of cognitive ability. Ninety per cent graduates did not have required proficiency in English communication. Another area of concern is that many graduates from accounting and information technology backgrounds remain 'invisible' to potential recruiters since they do not belong to the top colleges usually preferred by companies. Forty-one per cent of graduates employable in accounting roles hail from colleges beyond the top 30 per cent colleges, whereas for the IT services sector this per centage is 36 per cent (The Hindu, 26 June 2013).

Figure 4.4(a) below shows the proportion of individuals employed in age group 30-44. Though proportion of individual employed in age group 30-44 years is higher than that of youth but it is not satisfactory. Across chosen states, average is 74 per cent. In rural areas, average proportion of such individuals employed is 78 per cent whereas in urban areas, it is just 63 per cent. If hidden unemployment or underemployment is taken into account, the real proportion of educated employed will be pulled down further.

The low employability is also caused by the global financial crisis which was another major blow to educated youth people. This shock is felt more in urban areas where youth attains better education as compared to rural youth and who are employed in secondary and tertiary sector.

But in Indian Society female work force participation cannot be assumed to be similar to that of males. So, it is worth analysing difference in male and female participation in work force in the age group 30-44 (when youth enters labour market after completing education). Figure 4.4(b) shows males work force participation rate in age group 30-44 and figure 4.4(c) represents female work force participation rate for the same age group.

Chosen eleven states give an impression that on an average 98.28 per cent of males in age group 30-44 are working. Employment rate among males in given age group is impressive. States are capable of providing jobs to the males once they enter labour market. But condition of females work force participation rate in given age groups is dismal. Only 51 per cent (approximately) of females, on average are employed in this age group. Situation is grim particularly in states of Bihar (21 per cent), Haryana (42 per cent), Punjab (37 per cent) and West Bengal (24 per cent). Himachal Pradesh is able to employ about two-third of its female population in age group 30-44.

With India passing through second phase of demographic transition and postponement of marriageable age, most of the child bearing females are found in this age group. It results in withdrawal of females from the labour force during their maternity period. Poor performance of above mentioned states in this regard can be easily connected with high fertility rate in those states. Further, security consideration also leaves females with fewer jobs to get into.

Figure 4.4(a)
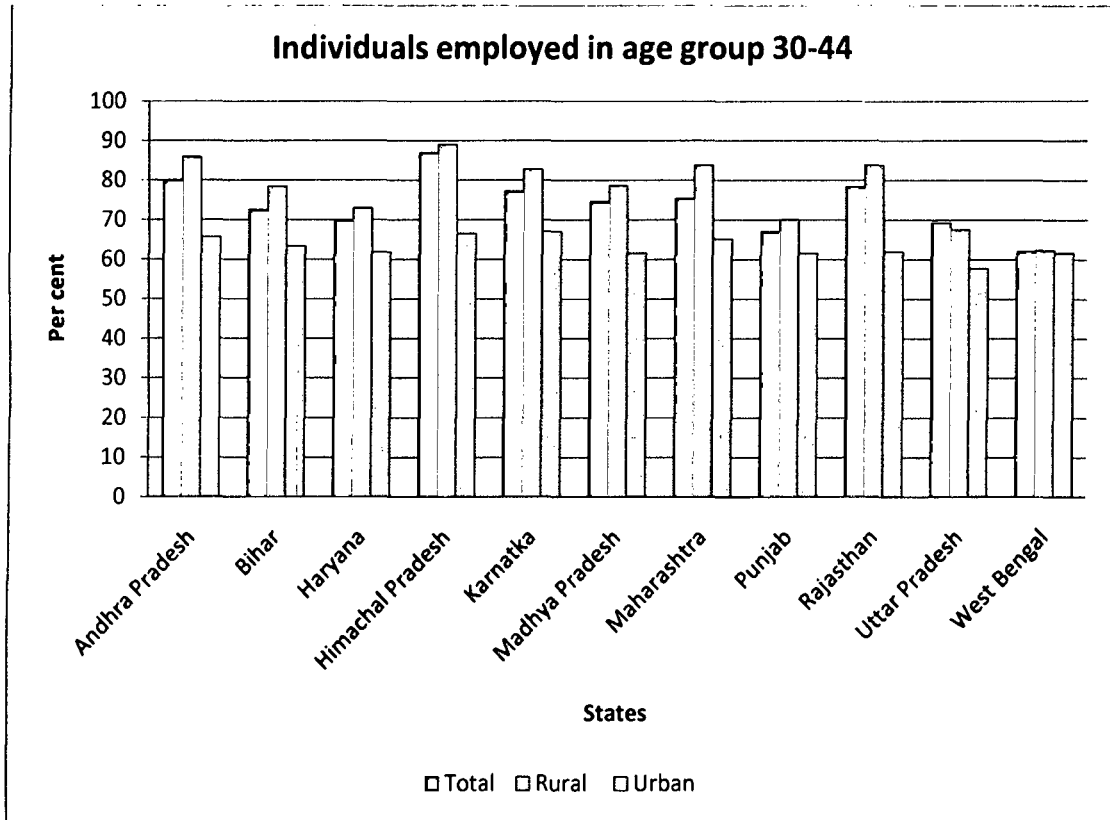
Source: NSSO survey 2009-10

Such low labour force participation of educated individuals can be attributed to informal nature of jobs, with low pay and no social security whereas industries offering more formal jobs are less absorptive of growing work force. Also, the policy environment of India inhibits growth of industries which have a higher potential of absorbing both skilled as well as semi-skilled labour. With more and more Indian youth, both men and women, enrolling in tertiary education a big challenge is thrown for the state that is to provide them decent work options in future. Other reason is incompatibility between education curriculum and employment needs of the country. Also, there is a widening gap between skills and job market needs.

Figure 4.4(b)
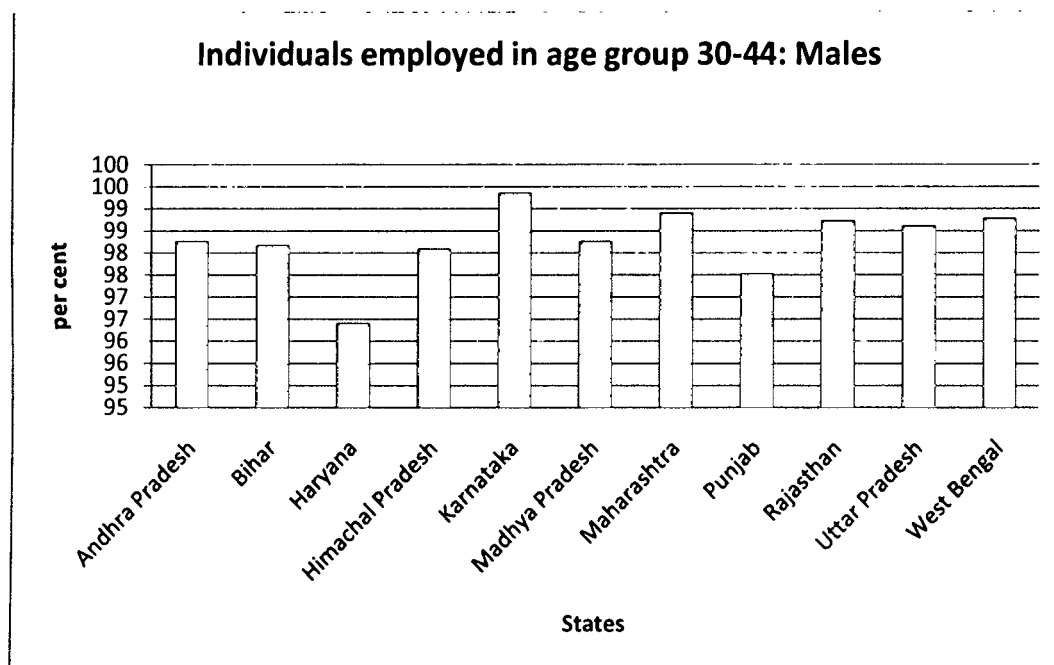
Source: NSSO Survey: 2009-10

Figure 4.4(c)
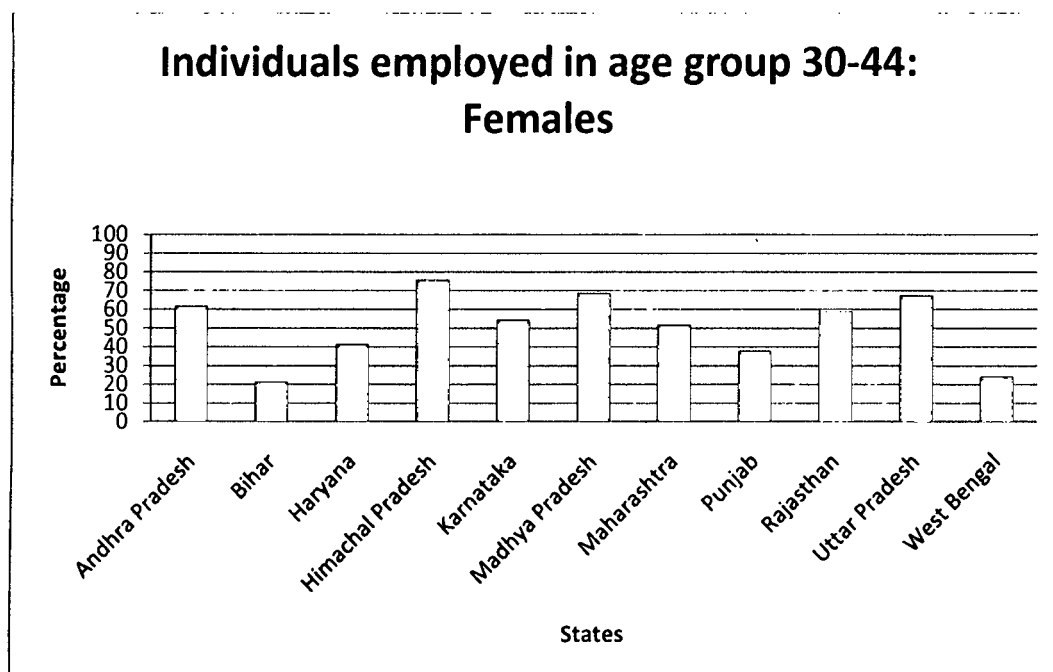
Source: NSSO Survey: 2009-10

This whole gender based analysis says that government should focus more on providing secure working environment and more job opportunities to females. With it exploiting demographic dividend will be a tough task because approximately 50 per cent of our population consists of females.

Next chapter focuses on reasons and challenges of high youth unemployment. It gives some policy suggestions thereafter.

Chapter 5

Youth employment crisis & policy suggestions

5.1 Introduction

Analysis shows that India is reaping demographic dividend and literacy levels have also increased. Despite this fact India faces youth unemployment. This is a big challenge for Indian economy because young individuals seeking job make up 49 per cent of the total unemployed.

World Bank through its analysis gave three facts. First, over two decades i.e. 1983–1994 and 1994–2005, when job growth is compared then it has been found that job growth was constant at 2 per cent over the long run. Second, though employment since 2000 has increased but simultaneously it has been accompanied by a significant deceleration in real wage growth. Real wages even declined for many workers, implying that the number of working poor increased in the past five years. Third, labour market in India is dominated by low-paying, relatively unproductive, informal sector jobs (World Bank 2010). Thus, according to the World Bank, the Indian labour market in the 1990s was better, despite acceleration in job growth in subsequent years.

Further, National Sample Service Organisation (NSSO) Surveys show that from 1999–2000 to 2004–2005, the average rate of employment growth was 2.66 per cent, it declined to a low growth rate of 0.83 per cent only in the following five years i.e from 2000–2005 to 2009–2010. Although job opportunities declined for all in the economy, the burnt global financial crisis of 2008 and resultant meltdown of the Indian economy was felt by young people the most. Moreover, from 2004–2005 to 2009–2010, urban youth employment registered relatively the highest growth rate of 1.92 per cent, as against 4.00 per cent during 1999–2004. From this condition of those rural youth can be easily imagined who are working in low productive agriculture & allied sectors and constitute major part of youth labour force. In tune with above mentioned fact according to the 2011

Census, youth constitutes approximately one-fifth of the total population in India. Also, 84.5 million young people in India live below the poverty line, which is 44.2 per cent of the total youth population. This is the highest rate of poor youth in any country worldwide.

This is not a good signal for an emerging economy because if youth is left unemployed then prevailing impressive economic performance will remain a short term phenomenon. If India want to reap demographic dividend sustainably then it is necessary to understand reasons and challenges of such high youth unemployment. Accordingly, policies and programmes should be formulated and implemented to tackle it. Once this exercise is performed the demographic window can be exploited on time: optimally as well as sustainably. As discussed in previous chapters India is a relatively young nation, with sustainable demographic dividend it can soon join the club of developed countries. This is because if productive employment of youth is emphasised then many other social and economic benefits with flow with it. Such benefits include greater thrust for education particularly vocational education, elimination of poverty (which is reason as well as cause of poor health of citizens, poor sanitation, poor nutrition etc.), development of infrastructure, greater formalisation of economy, greater synchronisation between GDP composition and occupational structure of the economy etc. Thus youth employment can turn into a "big development package" for the economy.

This chapter is entirely devoted to understand those reasons, challenges of high youth unemployment and finally suggesting some policies to generate productive employment in the economy.

5.2 Reasons behind high youth unemployment

Shortage of jobs

Since Independence agriculture has been the biggest employer of labour force but burdened with disguised unemployment and underemployment. In 1991, economy was

opened up for foreign capital and foreign companies. Since then, the shares of the secondary and tertiary sectors have grown faster in GDP but share of these sectors is much lower in employment. Still agriculture is the largest employer in the economy. This created a huge gap between GDP composition and occupational structure of India. Manufacturing sector which has the potential to employ all kind of workers: skilled as well as unskilled, cannot employ sufficient number of individuals because with liberalisation and globalisation methods of working became more capital-intensive. According to various estimates, productivity grew by 34 per cent during the period from 2004 to 2010. India's economic growth story was thus impressive more due to productivity improvement than rise in employment. Tertiary sector which contributes more than 50 per cent to National Income is also incapable of generating jobs. In such a situation where additional jobs creation is limited, youth workers found themselves without any job most of the times. The existing situation pressurizes young workers either to take up unskilled or casual work in the unorganised sector (which does not help in eliminating high number of working poor) or to enrol for further studies. Otherwise, many of them opted for self employment with extremely low returns. Though government introduced MGNREGA to reduce unemployment in the country but it has failed to provide youth with productive jobs which is the need of hour to reap demographic dividend. Further, corruption has adversely impacted implementation of this flagship programme.

Employability

Indian government need to focus on human capital formation. Huge population has always been a burden on the economy. But with high proportion of youth in working age population which is dynamic and quick learner, huge population can be easily supported if emphasis is given on human resource development. It can be done by modifying our educational systems- by providing training to youth in school and colleges only. Students should learn to apply their knowledge in day to day life. They should be taught various life skills. On contrary to this, Indian educational system is restricted to reading and understanding textbooks only. Vocational education has been given least importance in school curriculum. Such an attitude will surely impact employability of youth when they enter labour force. They are well educated according to official definition of educated

youth but still unskilled. At present, only 5 per cent of the work force has been laced up with any kind of vocational training. Among such individuals many of them are not employed anywhere because the skills acquired by them have limited application in the market (Chandrasekhar et al. 2006). India's education system is basically very generalist in nature and has limited synchronisation with the labour market. As a result instead of asset building our education system is increasing the burden of "educated unemployed youth" on the nation. Not only is this, according to NASSCOM, because the education and training acquired by youth in our country are of substandard quality, almost 40 per cent of the skilled workforce does not find employment for itself. The GOI has initiated major work in skills up-grading but most of them have not given desired result. One of the reason behind such poor performance of these programmes is non- clarity and overlapping objectives of two or more programmes.

Skills mismatch

After 1991, MNCs with different projects and production plans entered Indian borders. Accordingly they required workers with different skill which are suitable for the project. But with least focus on skill development India does not have sufficient institutions to impart required skills among the youths. Further, whatever professional institutes are there, fee structure offered by them is unaffordable to the masses. Also, the facilities provided by such institutes are of sub standard quality. As a result, India which is widely considered among labour surplus developing economies has most of its workers with skills which are desired or negligible for market. Furthermore, India has a much skewed stock of skills. On the one hand, there is a large section of work force which is not able to earn even minimum wages that are made mandatory by the government due to lack of appropriate skills; on the other hand, there are a few people who are able to demand higher [a packages because they have acquired marketable skills. This is because demand of such highly skilled labour is high whereas supply is less. Recently, youth has been found to actively participate in the activities which will enable them to acquire marketable skills. Young people in large numbers are attending various technical institutes. This can be very noticeably observed in the information and communication technology sector because this sector has experienced a huge inflow of IT-skilled workers in recent years. Merely attending technical institutes is not sufficient. There should be a

proper information base which enables the youth to know what all skills are in high demand. It will help in generating a diverse stock of skill instead of large number of individuals with few skills. In addition, it will solve two serious problems: first, unregulated growth of private technical institutions in huge numbers; and second, lack of guidance in choosing field of training for youth. Consequently, it will remove an imbalance which has created a surplus number of labour with some skills and very few numbers with other skills in the Indian labour market.

Low female workforce participation rates

The opening up of the Indian economy, employment opportunities for female workers has increased in India, particularly in sectors like IT, retail, travel and tourism. Along with this, declining fertility rate has offered an opportunity to female labour force to take up such jobs. But, with this the patriarchal nature of Indian society has not changed. Women's' maximum engagement remains restricted due to problems of biased attitudes of co-workers towards female workers, personal security and social customs. When females face such insecure environment at the work place they are left with limited set of jobs they can choose. One of the consequences of such lack of job avenues is that many times females continue their education till the time get job which ensures their protection and security. Various studies have indicated that female workers withdraw from the labour market as they are bound to get married and do their child bearing duty. Approximately 50 per cent of our population consists of females. With such obstacles female work force participation will remain low in the economy and consequently youth unemployment rates will remain high.

Labour legislation and minimum wages

Demand for labour would match their supply in an economy, if it is well-functioning economy with competitive product and factor markets (including labour) and this will lead to more jobs and higher output. It all depends on how well labour markets work in the economy. In Indian case it is said that stringent labour laws and minimum wage legislation are a cause of imperfect labour market. It has been argued with regard to labour market institutions, such as employment protection legislation (EPL) and

minimum wages, that such institutions decrease youth employment by making labour too expensive. But, no clear indication to support above mentioned claim is given by any recent analysis and research. In fact, this has been challenged by some of the recent studies. (Cazes and Nesporova, 2003;Freeman, 2005; Godfrey, 2003). Moreover, EPL and minimum wages have a rather limited impact on an economy which is dominated by informal sector where most of the young people in developing countries work. So, labour laws and minimum wages are not among major reasons behind high youth unemployment in India.

5.3 Challenges and implications of youth unemployment

Undeserving jobs

At household level youths have to support the dependents. Also, costs of living is ever-increasing, in such an environment, a young worker is condemned to find some work for him or herself. Out of need, they are forced to accept any job and with any conditions that that they are offered. Many times the youth is over qualified for the job he is employed into. This infuses frustration among the youth. Moreover, most of these jobs are without any rights and privileges. There is no provision for after retirement financial support, health benefits etc. They are paid much less despite working for longer hours, and they have no security of tenure as they can be terminated without any notice anytime. As a result, India is faced with increasing numbers of working poor.

Job insecurity

Insecurity at the workplace is another challenge that young people are facing specially females. Non-permanent job contracts have substituted regular and continuous forms of employment. Such contract based jobs involve a specific project or activity for a defined period of time. Once project is over employment is lost. With contract based jobs dominating labour market, workers are not provided with any kind of employment-related benefits. Also, they lack the capacity to plan their own life in a secured way. The most

visible example in this case is that of Delhi University. Teachers are appointed on ad-hoc basis for four months. Continuously, such young teachers have to keep an eye on openings in other colleges so that they can join it once their contract terminates with present college. This reduces job satisfaction of the teacher and hampers learning process of students in colleges as they have to acclimatise with new teacher if previous one has to leave in between. Such encouragement of contract based job hampers work environment and team spirit as well.

Social conflicts

Lack of employment opportunities for youth may result in social conflicts, such as violence and chaos & lack of care for juvenile, which, in turn, incur high social costs. Moreover, even post-conflict countries have a huge young population which is either unemployed or employed in indecent job. Many of them are deprived of education as they have grown up in violent and disturbed societies and often having been combatants themselves. This can be realised from the experience of Middle East countries. Youth unemployment was the cause of Arab Spring which began from Egypt and inflamed many Middle East countries. Even after conflict has died down these countries are faced with political instability and lesser growth opportunities.

High youth unemployment incurs heavy social cost due to spread of illegal and anti social activities. In developing countries, 75 per cent of the youth living in poverty are found in rural areas. Rural youth are not provided with educational opportunities. So, in most of the cases they are more likely to have started work in childhood. In search of work they migrate to urban areas as well where they are most vulnerable to become the favourite victims of human trafficking and sexual exploitation and are more prone to be recruited by militant extremist groups. Naxalism and Maoism in India can be attributed to high unemployment rates along with lack of development in affected states. In want of money youth might also take support of criminal activities like theft, robbery and murder. High crime rate and illegal activities brings disrepute to the nation as a whole.

Brain drain

When educated youth does not find suitable employment in domestic market, he or she starts looking at foreign nations for better job prospective. Many doctors, engineers, lawyers etc. go abroad in search of job. This is drain of knowledge for a country like India which already suffers with dearth of professionals in the country.

5.4 Policy suggestions

It is inevitable to think and implement various programmes and schemes to make use of demographic dividend. Such plans and schemes should focus on provision of productive employment, information dissemination, skill up gradation etc. This section will suggest some policies and schemes which can be considered for the good of Indian economy. Such suggestions will be made under two heads: labour demand and labour supply.

Labour demand

Enhanced investment

Job creation in an economy by and large depends on economic growth, which itself depends on investment. A stable macroeconomic environment – stable inflation rate, sustainable fiscal deficit and balance of payments etc. - boosts investment both private and public. So, provisions and incentives should be provided to increase investment through national as well as international players. Such a growth is essential for the creation of more and more new formal jobs for all workers in all age group, but formal job creation is of particularly beneficial to young people, who suffer most of adverse effects of economic downturns. Youths are "last in, first out" in work force because of they have short job tenure and less experience as compared to adult workers. More investments will lead to growth of salaried jobs in formal sector and consequently facilitates transition from an informal economy to formal one with higher productivity and better working conditions.

Sectoral emphasis

Some sectors have relatively greater potential to employ youths. Such sectors should be well identified and targeted. Finally, well designed sectoral policies with high potential for employment growth should be implemented. Such well-designed policies are fundamental to promote private initiatives in some of the traditionally "youth-friendly" sectors which includes sectors like tourism, catering, information and communications technology (ICT), basic and social services, including health, as well as in the sports sector. Special attention is required to be given to the agricultural sector by moving away from subsistence agriculture, and introducing productivity improvements and commercialization by providing better technologies to farmers and infrastructure support like warehousing and cold storages. This will help in limiting youth migration from rural to urban areas because of distressed employment situation and it will help in reducing urban poverty as well. On the other hand it will help in meeting food security goals as well.

It has also been asserted that the rapid growth of modern IT-driven services in India offers a big opportunity to exploit the demographic dividend. In fact, it has been widely believed among researchers and policy makers that India would be able to harness the demographic dividend through the growth of its IT and IT-enabled services sector as India has a well established BPO sector. Consequently, this sector offers employment opportunities to skill youth labour force. There is no doubt that both in relative as well as absolute terms, the size of the IT sector in India is now impressive and ever growing on international level. But realising its growth and employment potential this sector should be promoted through higher investment and foreign collaborations.

Another sector which also has a big employment generating potential is Environmental management. Youth being very dynamic shows a strong interest in the conservation and preservation of flora and fauna of our planet. Indian State of Goa has provided with a successful example of youth employment project in this sector. A mix of interventions based on use of best practices, on individual motivation, legislative measures and public–private partnerships has generated more than 2 000 jobs for young people in waste management and recycling in the last three years , with opportunities for further expansion.

Public investment

Through more judicious public spending, Indian public sector can also have a great influence on youth employment directly. Employment-intensive investments in some sectors like infrastructure and construction can create employment opportunities in sectors which are dominated by young people. The problem of productive employment in developing countries like India is usually tackled through public programmes, which mandates employment at minimum wages at least for a fixed number of days. These programmes includes rural employment generating programmes like NREGA which are self-targeting as only the poor turn up for employment at such low wages manual jobs. Government can use such programmes as an golden opportunity to build infrastructure such as bridges, roads, railway tracks and irrigation works. Once, the infrastructure built through such programmes is of good quality then they can promote for entrepreneurial activity, income generation and productive youth employment in the second round of development which is dependent on capital accumulation. But this has not been the case in countries like India. The tendency to come up with quick fix solutions to generate more employment has resulted in the bulk of the expenditure on these schemes to be in nature of wage expenditure and very little is in the form of capital expenditure. Capital expenditure is a inevitable necessity for an emerging economy like India at this moment. So, in first round youth employment should be in such areas which can further increase youth employment in future by increasing productive capacity of the economy.

Innovation accompanied by research and development

Once enough employment opportunities are created in the economy future possibilities should also be taken into consideration. Another problem that growth in employment might face is because of diminishing marginal productivity of various factors of productions including labour and machinery and therefore, a diminishing average product of labour as well. In order to eliminate or at least suppress the effect of this phenomenon, new avenues of production should be devised and promoted. This requires product innovation along with research and development in diverse areas. Types of industries operating in an economy should be diversified. Developing countries like India can

encourage industries like information technology, knowledge industries, and tourism, which might be characterised by increasing marginal product of labour over a certain period of time.

Easing existing barriers to start new business

Societies like India has began to appreciate entrepreneurship, and thus if its values and norms of business aptitude are promoted in our country, it can create a dynamic and vibrant class of young entrepreneurs. Empirical evidence shows that if youths are educated and trained in enterprising behaviour and their confidence is constantly aired up for calculated risk-taking activities, it can increase the incidence of youth taking up entrepreneurship as a career option. The successful development of youth entrepreneurs and their business depends upon good access to well-integrated services such as business mentoring programmes, management training, financial services, support in gaining access markets and networking opportunities.

The promise of youth entrepreneurship as a solution to their unemployment can be maximized only when various barriers to doing business faced by them are addressed through various programmes and strategies. Dearth of appropriate skills and experience among young individuals, their less creditworthiness, and youth having more difficulty in accessing business networks and sources of information are among the reasons why young people face particular challenges in making business as a career option. Though a burdensome business environment is discouraging for entire economy, but less knowledge and experience of business regulations and related legal and institutional frameworks among the youth have put a general constraint on them which discourages them from venturing into a business career and so increase the risk of business failure. So, the government must facilitate youth entrepreneurship with above mentioned pre-requisites. It can turn out to be most potential source of employment. Further, by encouraging investment it can take economy to a higher and sustainable growth path.

Labour supply

Combined educational and training system

Currently, in India an integrated education and training system is not focussed. In fact, on the supply side of labour, a well-linked "dual system" combining school-based education with work-based training and apprenticeship i.e. an educational and training system is required. A smoother transition from school to work can be facilitated through a closer cooperation between this system and the private sector of the economy. Because such strategy is more or less missing in Indian education system, the appropriate labour force needed by the domestic market often provided on time. This mismatch between demand and requirement of skills at a particular point of time generates a cumbersome asnd lengthy process for young labour force to get a good and productive job in the domestic market. As a result, young people's work opportunities are often found to be limited to the unorganised and low pay sector of the economy, which often leads to frustration among youth, or even forces them opt for migration either to urban areas or abroad. This is when there are unfilled vacancies lying in other technical jobs in the country due to lack of skilled labour force.

At present, education and vocational training programmes should be designed such that they are heavily focussed around the unorganised sector, because this is where most young people are found working in India. Also, vocational training programmes should be complemented by remedial education because many young workers in the informal economy undergoing such training may have dropped out of the educational system at an early age.

Social investment

For the increasing youthful population to remain productive, heavy investment in social sectors like health, hygiene and education is required. Public programmes in education and health which will create an educated and skilled labour force can prove beneficial increase the returns of a decline in fertility. Declining fertility on household level itself would provide enough incentives to parents to provide their children with better education

and health facilities [Bhat 2002]. If there is a simultaneous increase in the quality and quantity of education and health care system, then it will ensure supply of productive and efficient labour force to domestic market.

Employment exchange

If employment exchange works efficiently then the gap between skill supply and skill demanded can be plugged and if they were effective, it could have helped to mitigate the problem of huge unemployed youth. Unfortunately, only relatively larger towns and cities are flocked by the Employment Exchanges. Moreover, employment exchanges do not command much credibility among the potential employers. As a result, interest of the youth is hardly served by existing level and kind of functioning of employment exchanges. So more employment exchanges should be set up and their functioning improved to make them more credible.

5.5 Concluding remarks

India is an emerging economy with unique demographic structure. It is having a high proportion of working age population which is increasing rapidly and is expected to increase till 2050. Along with share of productive population, labour productivity has also increased in past few years. Both these positive trends have reinforced each other to take the economy to higher economic growth rates. Earlier studies on impact of rising share of working age population on economic growth had found a positive and significant relationship between two variables. This study looked at the impact of labour productivity on economy and found that there exists a strong and positive relationship between the two. When labour productivity is added as a new variable in the econometric model[1] which has been used in previous studies (on demographic dividend in India), impact of demographic variable- growth in share of working age population- on per capita NSDP reduces by almost 50 per cent.

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[1] This model has been explained briefly in literature survey.

Another observation made by this study is that prior to economic reforms of 1991 growth in share of working age population did not effected per capita NSDP though labour productivity was a significant factor with positive impact. Whereas, after economic reforms, growth in share of working age population also has a positive and significant impact on per capita NSDP. This shows that economic reforms altered the relationship between demographic variables and economic growth rates. Analysis also suggests that high productivity jobs are the need of hour instead of low productivity traditional jobs.

This is good news for Indian economy that despite its huge population of 1.2 billion (according to Census, 2011) it can utilise its working age population positively. But, further analysis regarding employment of educated youth takes much of the cheer away. It seems that with current programmes and policies India will not be able to provide productive avenues of employment to its rapidly increasing productive population. As a result, demographic dividend which is reaped at present moment will become a "demographic bomb". With low income and ultimately low savings and investment along with high number of non-workers, economy will be ruined forever.

To take optimum advantage of once in a life time demographic window programmes and policies need to be modified to provide productive and ever rising employment opportunities. Though theory of demographic dividend is like a cloud with silver lining for countries with huge population, a small population is always beneficial. Exploiting demographic dividend would have been much easier if India had a smaller population.

5.6 Limitations of the study

This study consists of two parts. In first part a new variable labour productivity has been introduced. Labour productivity is generally defined as output per labour hour. But, due to lack of data on labour hour, a modified formula has been used. According to that

modified formula labour productivity has been calculated as NSDP per unit of labour. Now, every worker is not equally efficient and does not work for same number of hours in a day. Using actual method for calculating labour productivity can give a more robust analysis.

In first part of the study Census of India data has been used. But to check sustainability of demographic dividend in second part of the study data workers and non workers has been collected from NSSO 66th round. Using two different sources in same study might have given misleading results. Once Census of India, 2011 data is fully published improvements can be made in this study.

Finally, using Census of India, 2011 data instead of Primary Census Abstract can also alter the results.

Appendix A

Table A1: Proportion of working age population employed across states

State	Total	Rural	Urban
Andhra Pradesh	66.99	72.85	52.76
Bihar	47.70	48.53	42.44
Haryana	57.29	59.07	53.39
Himachal Pradesh	71.95	73.94	50.90
Karnatka	64.16	70.46	53.61
Madhya Pradesh	62.40	66.93	47.32
Maharashtra	62.27	69.54	53.17
Punjab	54.77	56.80	51.20
Rajasthan	63.95	69.22	48.53
Uttar Pradesh	53.45	56.04	45.00
West Bengal	54.48	55.45	51.62

Source: NSSO survey 2009-10

Table A2: Proportion of employed youth in employed working age population

State	Total	Rural	Urban
Andhra Pradesh	34.14	34.71	32.23
Bihar	29.89	30.62	24.57
Haryana	37.78	37.10	39.41
Himachal Pradesh	29.70	30.20	22.15
Karnatka	33.91	33.14	35.60
Madhya Pradesh	35.48	36.79	29.30
Maharashtra	33.46	32.62	34.82
Punjab	33.47	32.43	35.49
Rajasthan	35.49	36.02	33.31
Uttar Pradesh	35.76	35.46	36.94
West Bengal	34.23	37.03	25.35

Source: NSSO survey 2009-10

Table A3: Current Attendance of Youth (15-29)

State	Total	Rural	Urban
Andhra Pradesh	53.30	51.20	58.00
Bihar	52.60	51.30	63.40
Haryana	55.10	55.60	54.00
Himachal Pradesh	62.50	62.00	67.80
Karnatka	51.40	50.00	53.70
Madhya Pradesh	53.40	51.50	60.10
Maharashtra	56.90	57.60	55.90
Punjab	53.40	53.90	52.50
Rajasthan	52.20	51.80	53.50
Uttar Pradesh	57.30	57.40	57.20
West Bengal	49.20	47.50	55.70

Source: NSSO survey 2009-10

Appendix B

B.1 Description of codes

Code	Description
working (or employed)	
A. self-employed	
11	worked in household enterprises (self-employed) as own-account worker
12	worked in household enterprises (self-employed) as an employer
21	worked in household enterprises (self-employed) as helper
B. regular wage/ salaried employee	
31	worked as regular wage/salaried employee
C. casual labour	
41	worked as casual wage labour in public works other than Mahatma Gandhi NREG public works
42	worked as casual wage labour in Mahatma Gandhi NREG public works
51	worked as casual wage labour in other types of works
61	did not work owing to sickness though there was work in household enterprise
62	did not work owing to other reasons though there was work in household enterprise
71	did not work owing to sickness but had regular salaried/wage employment
72	did not work owing to other reasons but had regular salaried/wage employment
not working but seeking/available for work (or unemployed)	
81	sought work or did not seek but was available for work (for usual status approach)
81	sought work (for current weekly status approach)
82	did not seek but was available for work (for current weekly status approach)
neither working nor available for work (or not in labour force)	
91	attended educational institutions
92	attended to domestic duties only
93	attended to domestic duties and was also engaged in free collection of goods (vegetables, roots, firewood, cattle feed, etc.), sewing, tailoring, weaving, etc. for household use
94	rentiers, pensioners, remittance recipients, etc.
95	not able to work owing to disability
97	others (including beggars, prostitutes, etc.)
98	did not work owing to sickness (for casual workers only)
99	children of age 0-4 years

Source: NSS Report No. 537: Employment and Unemployment Situation in India, 2009-10

B2 Extrapolation

Interpolation or extrapolation is the technique of obtaining the most likely estimate of a certain quantity from the given relevant facts given following assumptions:

a) There is no abrupt increments and decrements in the value of dependent variable under consideration for the period under consideration

b) There should be regular fluctuations in the value of variable so that the rate of change in the given data is uniform.

Algebraic method used in estimating values of variables in this study is based on method of finite differences (Newton's forward difference and Newton's backward difference formulae)

Suppose the equidistant values of independent variable t i.e. time are

$$t, t+h, t+2h, t+3h, \ldots, t+nh$$

Where t is initial time period and h is known as common interval of differencing (10 in our case)

let the corresponding values of independent variable y = f(t), be

$$f(t), f(t+h), f(t+2h), f(t+3h), \ldots, f(t+nh)$$

NEWTON'S FORWARD DIFFERNCE FORMULA

This formula enables us to estimate forward value f(T) for any given value of T.

It is given by the formula:

$$f(T) = f(t) + u\,\Delta f(t)$$

$$u = \frac{\text{Period of interpolation} - \text{Period of origin}}{\text{Interval of differencing}}$$

$$\Delta f(t) = f(t+h) - f(t)$$

NEWTON'S BACKWARD DIFFERNCE FORMULA

This formula enables to estimate any previous value f(T) for any given value of T. it uses leading backward differences of the last entry in the table.

It is givenby the formula:

$$f(T) = f(t+nh) + u\quad f(t+nh)$$

$$u = \frac{\text{Period of interapolation} - \text{Last argument}}{\text{Interval of differencing}}$$

$$f(t+nh) = f(t+h) - f(t) = \Delta f(t)$$

B.3 Splicing Method

It is a technique of combining two or more overlapping series of index number to obtain a single continuous series. It is required to facilitate comparison of two of two series with different base. Suppose there is a series of index number with some base 'a' and it is discontinued in the period 'b' and with the terminating period of first series i.e. 'b' as base a new series is constructed using same formula. Splicing method is used to secure continuity for comparison in two series. This method has been explained in table given below:

year	Series I Base 'a'	Series II Base 'b'	Series II spliced to Series I (Base 'a')	Series I spliced to Series II (Base ''b')
a	100		100	$\dfrac{100}{a_r}X100$
a+1	a_1		a_1	$\dfrac{100}{a_r}Xa_1$
a+2	a_2		a_2	$\dfrac{100}{a_r}Xa_2$
. .	. .		. .	. .
b-1	a_{r-1}		a_{r-1}	$\dfrac{100}{a_r}Xa_{r-1}$
b	a_r	100	a_r	100
b+1		b_1	$\dfrac{a_r}{100}Xb_1$	b_1
b+2		b_2	$\dfrac{a_r}{100}Xb_2$	b_2
b+3		b_3	$\dfrac{a_r}{100}Xb_3$	b_3
. .		. .	. .	. .

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