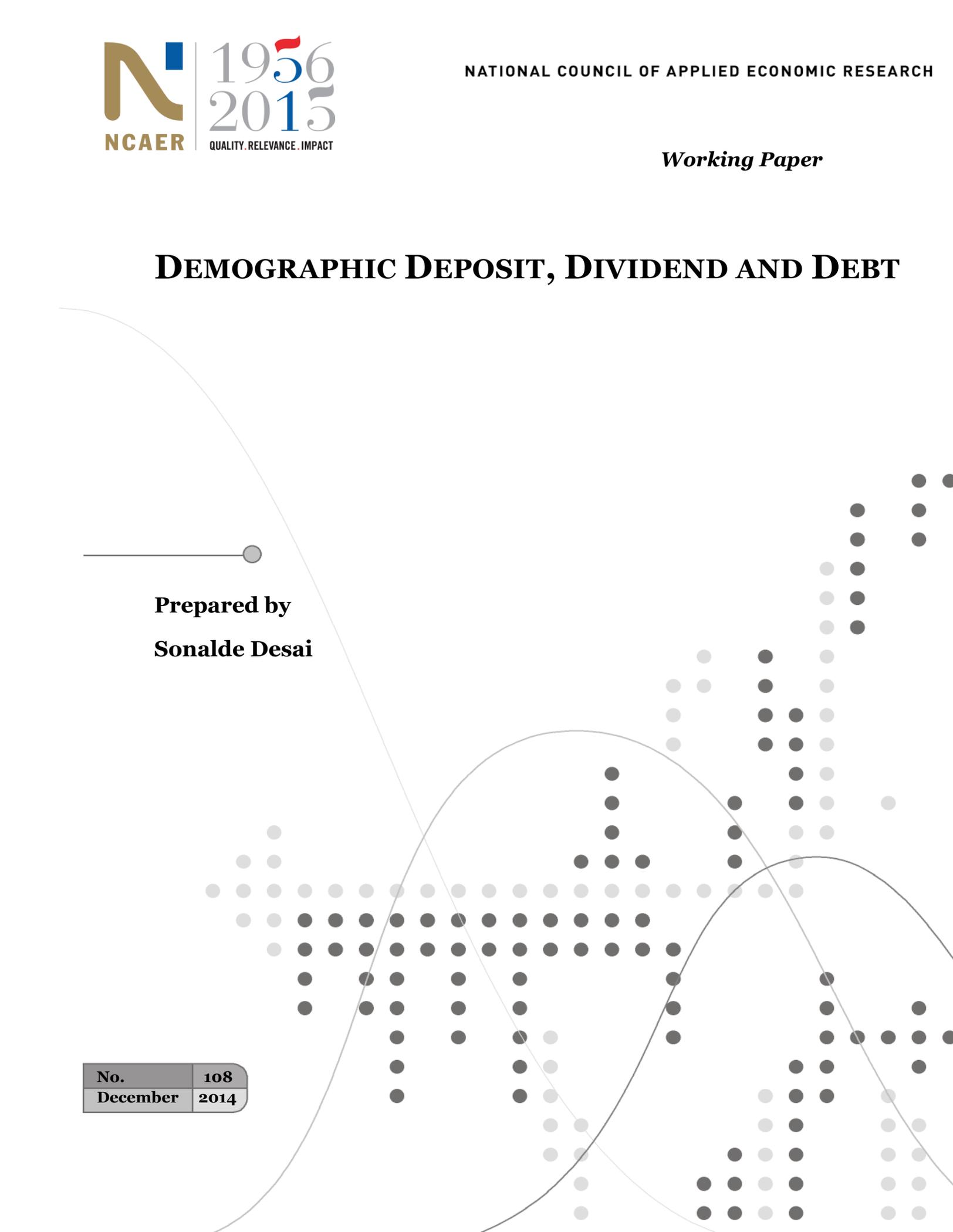


DEMOGRAPHIC DEPOSIT, DIVIDEND AND DEBT



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ABSTRACT

In spite of the rising academic attention to path-dependency in social history, when it comes to the history of economic thinking, we seem to be stuck in a Markovian nirvana where debates of the past are forgotten under the onslaught of new ideas. Nowhere is this more evident than in the discourse on demographic dividend that ignores decades of debates surrounding the relationship between population growth and economic development. This paper seeks to fill this niche by: (1) Placing the discourse on demographic dividend in the context of past debates on population and development; (2) Differentiating between demographic deposit and demographic dividend, i.e. the mechanical aspects of population composition and potentially transformative power of these changes, as well as the conditions under which these may affect Indian economy and (3) Focusing on the upcoming demographic debt as the population ages.

Key words: Demographic Dividend, Age Structure, India, Economic Demography, Aging, Labour Force

JEL Classification: J10, J11, J14, J18, J21

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THE SEESAW OF ECONOMIC DEMOGRAPHY:

Although Malthus wrote little about India, for nearly two centuries his philosophy has governed the discourse on Indian population, partly stemming from his influence on the East India Company's officers. From 1805 to his death in 1834, he was a Professor of Political Economy at East India Company's College, training future administrators (Caldwell, 1998) and setting a stage for the discussion on overpopulation in India. Malthusian concerns about the rising pressure of population on economy and natural resources are probably best reflected in the seminal book on the population of India and Pakistan by Ansley Coale and Edgar Hoover in 1958 where they argue, 'the difficulties of finding useful employment for a rapidly growing labour force imply that a faster growth [population] rate might simply add to the already large pool of unemployed and underemployed' (Coale and Hoover, 1958). These statements build on work by Robert Solow who assumed that both capital and labour had diminishing returns, and illustrated that an exogenous increase in the population growth rate would translate into a growth of labour supply that would outpace the growth of capital formation and ultimately lower per-capita income (Solow, 1956, 1957).

However, even as institutions like the Club of Rome (Meadows et al. 1972) were raising concerns about the catastrophic consequences of population growth on the economy, a number of scholars continued to speculate that population growth may create technological and societal adaptations resulting in a positive relationship between population growth and economic development (Boserup, 1976; Kuznets, 1960), forming a precursor to the modern literature on demographic dividend.

How do we reconcile this concern about declining capital to labour ratios and overcrowding in the agricultural sector with the ringing optimism of the past decade which sees a growth in proportion of working age population as a key determinant of economic growth (Bloom, Canning and Sevilla, 2003)? This optimism is reflected in comments like, 'a substantial fraction of the growth acceleration that India has experienced since the 1980s—sometimes ascribed exclusively to economic reforms—is attributable to changes in the country's age structure. Moreover, relative to the age structure at the turn of the millennium, the demographic dividend could add about 2 percentage points per annum to India's per-capita Gross Domestic Product (GDP) growth over the next two decades' (Aiyar and Modi, 2013).

The following two factors may explain this disconnection: (1) empirical literature using historical data from Western industrial societies and newly independent colonies collected through 1980 presented a different picture than more recent empirical data. A highly controversial report by the US National Academy of Sciences (Johnson and Lee, 1986), failed to establish a strong link (either positive or negative) between population size or structure and economic growth, partly because it noted that significant increases in per capita income in Western industrial nations occurred between the eighteenth and twentieth century when their populations were also rising rapidly and the dependency ratio was high. However, studies that use data from 1980 onwards tend to show stronger relationship between population variables and economic growth (Heady and Hodge, 2009) with a decline in child population being particularly important for economic growth and (2) more importantly, few studies try to follow the recommendation of the classic paper by Kuznets where he suggests that it is important to trace diverse mechanisms through which we expect population to affect economic growth and relate them to institutional and policy climate since population is only one (and possibly minor) factor shaping economic development (Kuznets, 1960). Thus, it is difficult to ascertain that while this relationship has become stronger in recent years, what led to this changing relationship. Are demographic drivers of economic growth facing Europe during the 19th and the 20th century different from those facing East Asia in the later part of the 20th Century? What do these imply for the prospects for India?

TWO DEMOGRAPHIC DIVIDENDS:

How do we expect the population age structure to affect economic growth? In recent years several studies have tried to explore the mechanisms through which such an impact may be visible (Lee, 2003; Lee and Mason, 2011). These studies differentiate between first and second demographic dividend. The first dividend is more or less mechanical, influenced by the fertility and mortality history of a nation and driven primarily by the support ratio – proportion of population in working age (usually aged 15–64 years) to that outside the working age. Depending upon the speed of the fertility decline, this dividend may be small or large and may last from two to six decades. The second dividend involves capital accumulation and increased investments in human capital leading to long term improvements in productivity. With a decline in the number of dependents they must support, workers may be able to save and invest more in having fewer children, thereby increasing future productivity. As Table 1 based on estimates by Lee and Mason (2006) documents, the size of the second demographic dividend is far greater than

the size of the first dividend. Estimates of this type are sensitive to methodologies employed but this analysis gives us some sense of the relative magnitude of the second demographic dividend vis-à-vis the first.

It is important for us to distinguish between the first demographic dividend, what we call demographic deposit, and the second demographic dividend. The first dividend is like change in an accounting system. Number of dependents drops temporarily, reducing expenditure such as educational expenditure, involved in caring for those dependent. The savings can be placed in a simple deposit to be withdrawn when the dependency burden rises again, this time with funds required to care for the elderly. Whether these savings are stored under the mattress or placed in an interest bearing account is a choice that determines whether we really reap the true demographic dividend.

Table 1: Demographic Dividends:
Contribution to growth in GDP 1970–2000

	First	Second	Total	Actual Growth in GDP/N (1)
Industrial economies	0.34	0.69	1.03	2.25
East and Southeast Asia	0.59	1.31	1.90	4.32
South Asia	0.10	0.69	0.79	1.88
Latin America	0.62	1.08	1.70	0.94
Sub-Saharan Africa	-0.09	0.17	0.08	0.06
Middle East and North Africa	0.51	0.70	1.21	1.10
Transition economies	0.24	0.57	0.81	0.61

(1) Actual growth in GDP per effective consumer (GDP/N), 1970–2000, in percent a year. The effective number of consumers is the number of consumers weighted for age variation in consumption needs.

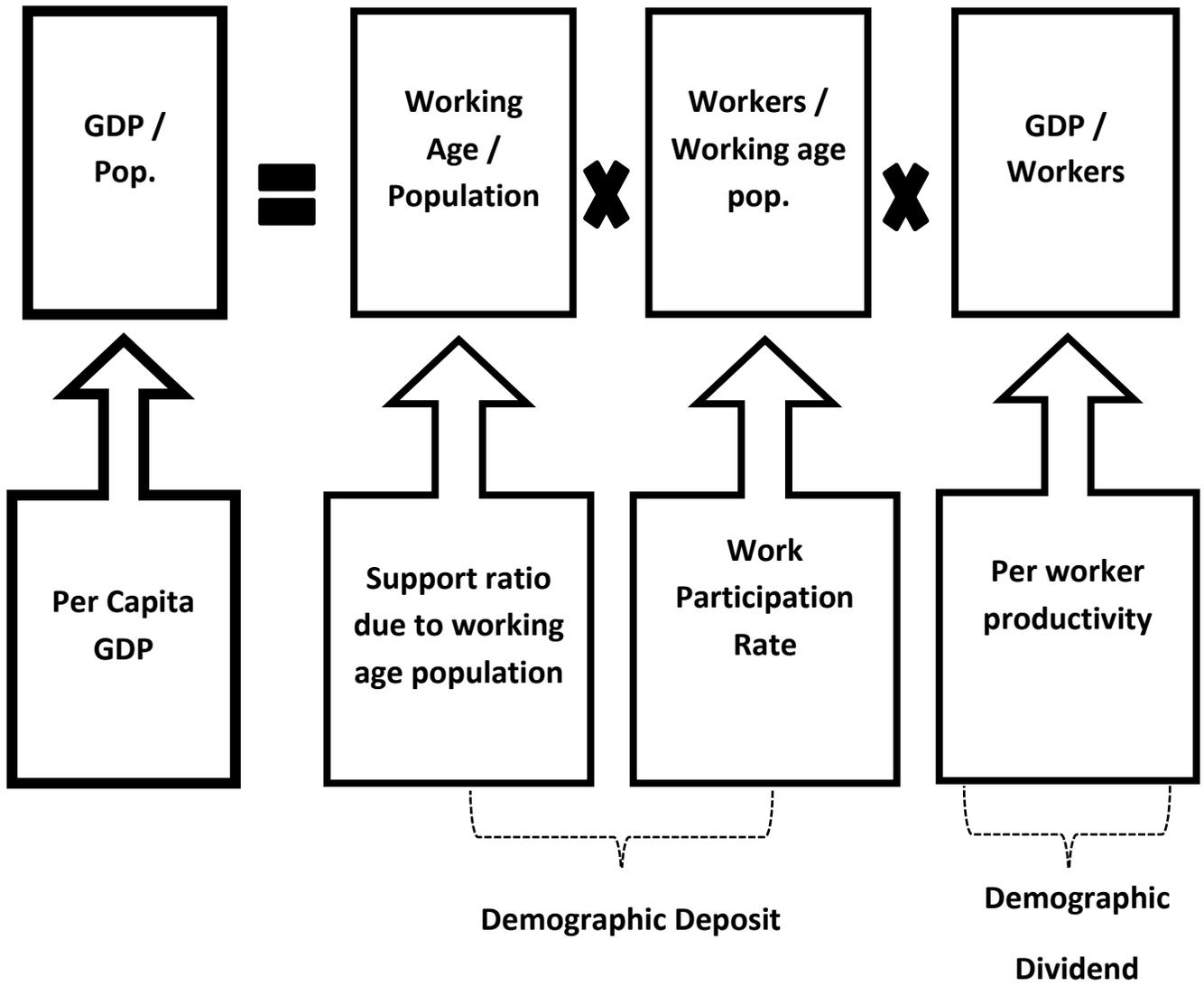
Source: Lee and Mason, 2006.

At the other end of the transition, lies the demographic debt that we incur to the future elderly whereby social and demographic transformations of the present –

rising burden of non communicable diseases and declining availability of children to care for the elderly – transform the conditions under which the future elderly will live. However, whether society will rise to discharge this debt will depend on the social institutions and safeguards we will put in place today. These three aspects – phenomena, demographic deposit and dividend and debt form the core of this paper.

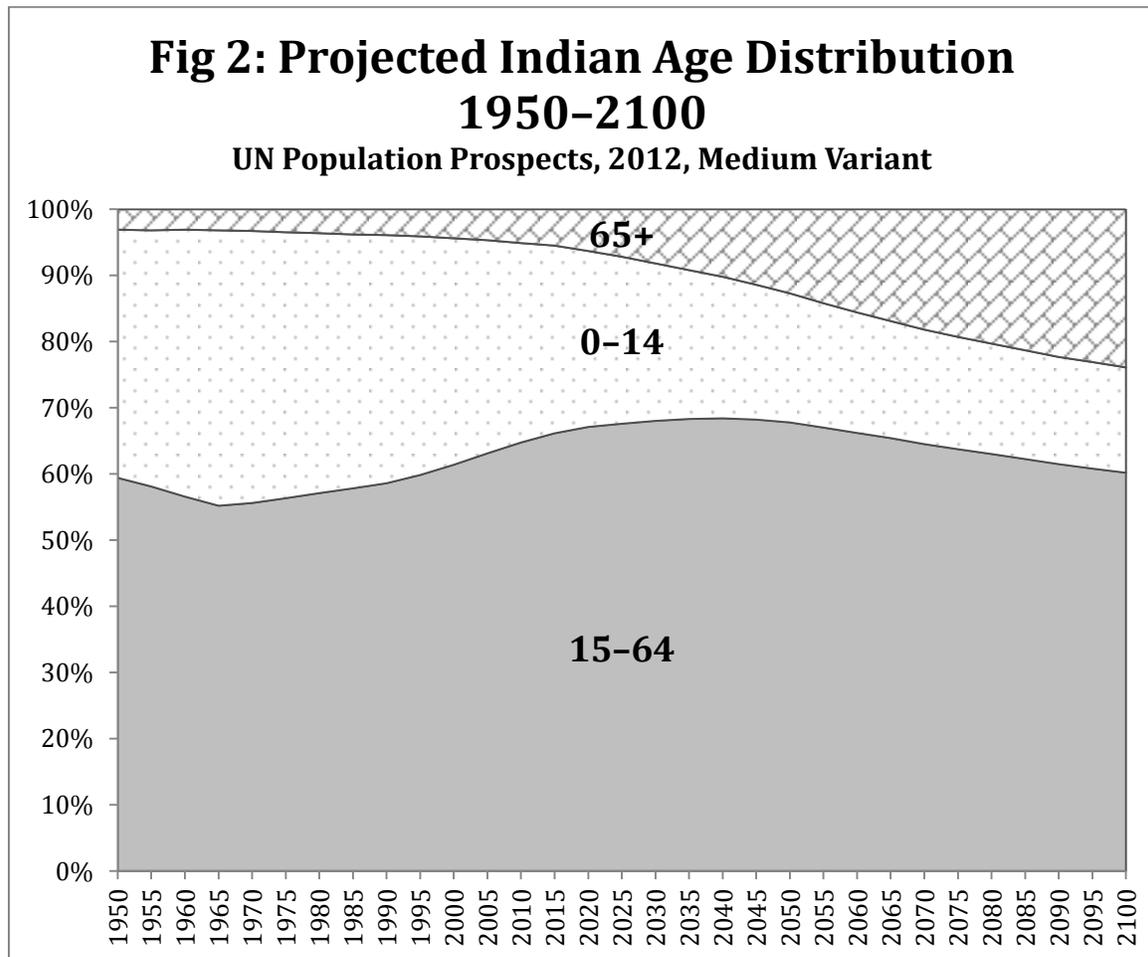
Much of the discussion on demographic dividend in India tends to focus on the proportion in the working age (e.g. Aiyar and Modi, 2013). However, age composition is simply of the sources of demographic influences. Labour force composition is affected by both age distribution of the population and proportion of individuals at each age who participate in the workforce. Moreover, the demographics also shape the ability to save as well as the investments in children, each in turn affecting future productivity. Figure 1 provides a stylized depiction of these relationships discussed in detail below.

Figure 1: Components of Demographic Impact on Economic Growth



DEMOGRAPHIC DEPOSIT: TRENDS IN SUPPORT RATIO:

Unlike the countries of East Asia, particularly China, India has experienced a relatively slow fertility decline, allowing for slow decline in dependency ratio at the start of the demographic dividend phase and slow increase towards the end. Figure 2 graphs projected changes in the age distribution in India between 1950 and 2100.



Source: United Nations, 2013.

These estimates suggest that support ratio (proportion of population in working ages) will continue to rise until about 2040 before beginning to decline. However, what is even more interesting is the change in the composition of the dependent population. Proportion of population below age 15 will continue to decline while that above age 65 will increase, changing the nature of demands placed on the working population, a topic to which I return in a later section.

The assumptions behind the UN Projection are noteworthy (United Nations 2013). The most commonly used projection – medium variant – assumes that Indian fertility will reach replacement level only around 2040. These estimates assume that the Total Fertility Rate (TFR) will decline from 2.66 to 2.16 between 2010 and 2030. However, judging by the decline from a TFR of 3.3 in 2000 to 2.66 in 2010 in the UN estimates and a somewhat more conservative decline from a TFR of 3.16 to 2.66 between 2001 and 2011 by other studies (Guilmoto and Rajan, 2013), it would not be unreasonable to expect a faster fertility decline with India reaching replacement fertility before 2040. As it is, 9 states and Union Territories have a TFR of below 2 in 2011 (Guilmoto and Rajan, 2013). Moreover, although child marriages in India have declined, age at first birth has not risen greatly as yet. It is well recognised that initial declines in age at marriage do not result in changes in age at first birth due to the custom of delayed cohabitation for very young brides (Basu, 1993), but with rising age at marriage this practice has begun to decline and can be expected to result in delayed age at first birth. When that happens, we may see a slump in fertility for a decade or so due to postponement of births. This phenomenon, described as the tempo effect, accounts for substantial drop in TFR in Eastern and Central Europe (Sobotka, 2008).

If these factors lead to a substantial decline in period TFR, the resulting birth deficit will have implications for demographic support ratios speeding up the pace of decline in dependency and increasing the quantum of the demographic deposit while simultaneously shortening its lifespan by about a decade.

WORKING AGE POPULATION IS NOT THE SAME AS WORKERS:

Although majority of the discussion of demographic dividend focuses on working age population (Aiyar and Modi, 2013), it is the ratio of workers to non-workers that is of greatest interest. Since Indian labour markets are characterised by remarkably low female work participation rates and declining youth employment rates, it is difficult to think about support ratios without taking into account trends in work participation. The following two aspects of work participation deserve attention: (1) trends on women's work participation and (2) changes in secondary education and declining youth employment.

Women's Work

It is ironic that even as we celebrate mild changes in support ratios caused by changing age distribution, we fail to focus on the vast untapped potential of our labour force – women. India is characterised by one of lowest female work

participation rates in the world. This difference is striking when we compare the International Labour Organization (ILO) estimates of 29% of the women aged 15 and above participating in the labour force in India compared to 69% for China and 57% for Bangladesh. Moreover, in spite of the economic growth, successive rounds of National Sample Surveys (NSS) (National Sample Survey Office, 2013), have documented declining female work participation rates (WPR) particularly in the rural areas; between 1993–94 and 2011–12, WPR for rural women fell from 32.7% to 24.8% including both primary and subsidiary work status. Literature on economic development documents that women's work participation declines in early phases of development before rising (Goldin, 1995) but a detailed look at women's WPR in India shows that two forces may be at work:

(1) Women's work participation has a U-shaped relationship with education. Moving from no education to primary education reduces women's participation in the workforce as educated women want to move away from manual labour but are unable to find alternative semi-skilled jobs as many occupations such as drivers, carpenters and masons are closed for them. It is not until women move beyond 12th standard and gain office jobs that their work participation increases (Desai, 2013; Klasen and Pieters, 2012).

(2) Increasing household incomes may reduce the imperative of income generation and may increase the importance of social status. Sociological literature has documented the perception of many households in which exposure of women to potential insults in a male dominated marketplace is associated with loss of family status (Derne, 1994; Jeffrey and Jeffrey, 1997; Srinivas, 1977). Thus, rising incomes may also be associated with lower women's work participation rates (Desai et al., 2010).

Participation in activities that are formally counted as 'work' and recorded by surveys like the NSS is not the only mode of women's contribution to the economy. Time use data documents that women contribute a significant proportion of their time to unpaid work such as processing food, fetching firewood and undertaking expenditure saving activities such as stitching clothes (Hirway and Jose, 2011; Jain and Banerjee, 1985) and make substantial contributions to the national economy. However, many of these activities involve long hours of work for minor economic gains and many involve considerable drudgery simply due to mismanagement of natural resources such as forest or water resources (Agarwal, 1997; Desai and Jain, 1994). Thus, even as we recognise the hours women devote to household and the

national economy, it may be possible to ensure that their time is spent on activities that have high returns.

It is sometimes argued that fertility decline will free up women's time from household activities and increase their labour force participation. With some exceptions, the case for the negative relationship between women's work and fertility has been stronger in industrial societies (England, 2005; Lehrer and Nerlove, 1986; Meyers and Gornick, 2005) than in developing countries (Lloyd, 1991). A minor relationship between family size and women's work – either for wages or for family farms and business – is seen in India (Basu and Desai, 2014), possibly because child care is less of a constraint for Indian women who are able to rely on family caretakers than in societies governed by the nuclear family structure.

These observations suggest that harnessing vast untapped resources in the form of the nation's women may serve to magnify the demographic dividend far beyond what simple age structure changes can do.

Age Specific Employment Patterns:

The proportion of workers among adult population is also shaped by age specific labour force participation patterns. Modern India faces tremendous employment challenges. Coupled with rising school and college enrolments, it is not surprising that the proportion of young people who are employed has dropped over the past two decades. Table 2 shows changes in age specific employment pattern, highlighting the decline in labour force participation among individuals younger than 25, both in rural and urban areas.

While decline in youth employment affects the proportion of workers in the population, it should be seen at least partially as a positive phenomenon since it is associated with rising education levels and improving levels of the human capital. Nonetheless, youth unemployment remains a concern. For individuals between ages 15–29, unemployment rate using principal usual status is 6, 8, 9 and 11 percent respectively for rural males, rural females, urban males and urban females. Thus, reduction in youth unemployment may help boost the support ratio and enhance the demographic dividend. With improving health conditions, we may also want to consider providing work opportunities to older workers and thereby improving support ratios, a topic discussed at a later point in this paper.

Table 2: Age-Specific Labour Force Participation per Thousand Population

	Rural				Urban			
	Males		Females		Males		Females	
	2004-5	2011-12	2004-5	2011-12	2004-5	2011-12	2004-5	2011-12
10-14	57	24	51	20	49	31	26	6
15-19	491	308	238	113	365	243	109	72
20-24	874	767	313	203	758	654	209	178
25-29	980	961	387	242	955	949	221	223
30-34	987	989	435	300	986	988	255	224
35-39	990	991	488	349	983	989	278	239
40-44	983	986	480	357	983	988	267	239
45-49	980	987	487	365	975	979	229	212
50-54	960	964	439	338	938	945	226	196
55-59	926	931	396	304	823	867	192	153
60+	631	639	199	159	356	360	86	67
all	546	547	249	181	566	560	148	134

Source: National Sample Survey Organisation (2006, 2013)

DEMOGRAPHIC DIVIDEND: ACCELERATING PRODUCTIVITY

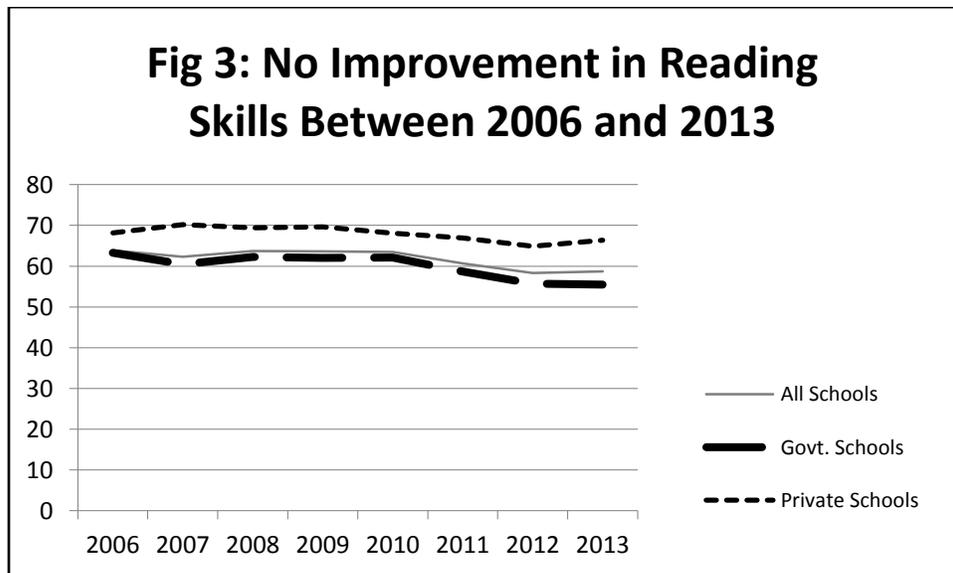
The demographic deposit discussed above is somewhat mechanical. As long as workers consume less than they produce, rising proportion of workers in a population automatically results in an increasing GDP per capita. However, this does not take into account the arguments discussed earlier in this paper that suggested that there are diminishing returns to labour unless greater capital investments are also made (Coale and Hoover, 1958; Solow, 1956) or technological innovations increase productivity (Boserup, 1976; Cassen, 1994).

However, improving support ratios may allow for both of these phenomena. Declining dependency burden may increase households' ability to save and consequently redress capital dilution associated with increased number of workers. Having fewer children may also allow for more investments in the human capital on the part of households as well as the state. As Table 1 indicates, the first demographic dividend that I have termed demographic deposit is far smaller than the second demographic dividend. The second demographic dividend depends upon whether we use the savings generated by this one-time change in population structure wisely to act as a catalyst for future growth. What is India's record on these fronts?

Using data from India Human Development Survey of 2004–5, Alaka Basu and Sonalde Desai (2014) explore the changes in household consumption patterns for households of different sizes. They found that while smaller households invest slightly more in purchasing consumer assets and improve their standard of living somewhat, the greatest difference between families with one or two children and those with 3 or more children is in the amount of money parents invest in children's education. Holding parental education, place of residence and other background factors constant, household investment in children's education is 40% higher in families with a single child than in families with 3 or more children. Children from a single child family are about 6 percentage points more likely to attend private school in rural areas and about 12 percentage points more likely in urban areas.

This is not surprising. Gary Becker’s pioneering work suggests that a desire to invest in child quality is one of the primary reasons for curtailing fertility (Becker, 1993). These increased parental investments came at a time when state investments in children’s education through programmes like *Sarva Shikha Abhiyan* have also risen. All of these point to our being able to reap the rewards of the demographic dividend via increasing human capital. Unfortunately, assessments of educational outcomes point to the opposite direction. Ten years of literacy assessments carried out by *Pratham* (an organisation to enhance the quality of education in India) shown in Figure 3 document a slight decline rather than improvement in proportion of children aged 6–14 years who are able to read a simple paragraph. Smaller assessments in India Human Development Survey (IHDS) I and II by researchers from the National Council of Applied Economic Research (NCAER) and University of Maryland also find a similar slight decline in reading skills rather than an improvement.

Parental investments in sending children to private school give children a slight edge in skill acquisition but studies that control for selectivity into private schools based on parental income and education show that this is a very slight edge (Desai et al., 2009). Over time, Indian schools seem to show worse rather than better performance and it seems likely that increased investments in schooling may not pay off in the form of improved human capital, thereby weakening the prospects for reaping the demographic dividend.



Source: Annual Status Report of Education (ASER) website¹

Detailed analysis of domestic savings is beyond the scope of this paper but it would not be amiss to note the concern raised in the Economic Survey of 2014–15 which demonstrates that while Indian domestic saving rate is considerably higher today than during the 1980s as economic reforms were beginning, after peaking in 2007–8, both household and public as well as corporate sector savings have come down with total savings rate hovering at 30% in 2012–13 as compared to nearly 37% in 2007–8 (Government of India, 2014).

This suggests that the two factors that should play a key role in ensuring that gains from demographic transformation are ploughed back in the economy are somewhat sluggish. Savings rate is down from an all time high of 2007 but remains at a very high level and is likely to recover faster than loss of human capital for a whole generation of school children. Thus, the need for the demographic dividend must focus on developing human capital – an issue that requires a whole new style of pedagogy rather than simple fixes involved in current policy initiatives (Pritchett and Beatty, 2012).

DEMOGRAPHIC DEBT: CARING FOR THE ELDERLY

Figure 2 suggests that as demographic transition proceeds, proportion of children among the dependent population drops and that of the elderly rises. Thus how well we will be able to care for the elderly will depend on the age-specific earnings and consumption profile of the population.

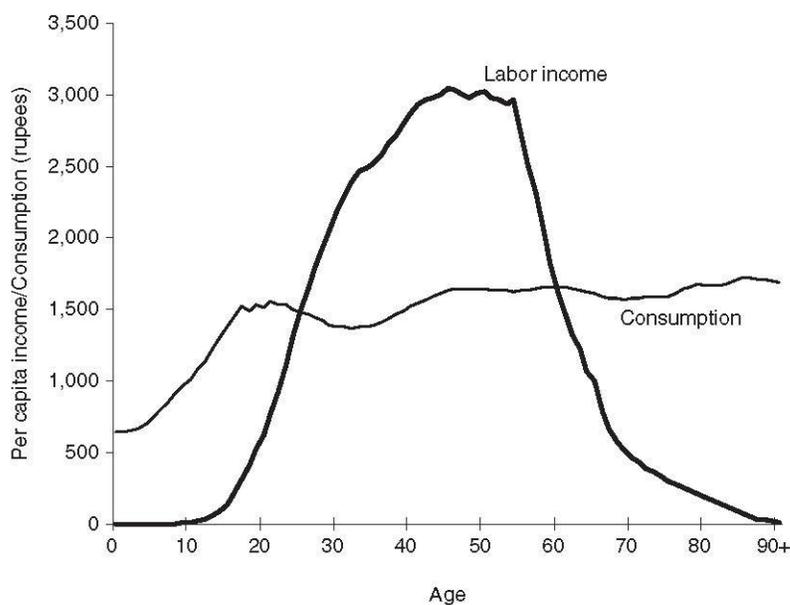
Using data from the India Human Development Survey of 2004–5, Lashiram Ladusingh and M.R. Narayana develop age-specific profiles of consumption and income. Their results, presented in Figure 4, indicate that beyond age 20, the consumption profile does not vary substantially but incomes drop precipitously around age 55 – the retirement age for many formal sector workers. After age 60, the elderly consume more than they earn and consequently must either rely on personal savings or transfers from other family members in order to support themselves (Ladusingh and Narayana, 2011).

At present, most of the support for the elderly comes via transfers from other family members. The India Human Development Survey (IHDS) finds that more than

¹ <http://www.asercentre.org/education/data/india/statistics/level/p/66.html>

80% of the Indians aged 60 and above live with their children or other family members. Moreover, a substantial proportion – particularly those who live without their children – receive transfers or remittances from their children. However, with declining fertility and increasing migration, this support system is fast declining. Even between 2004–5 and 2011–12, the IHDS found that the proportion of senior citizens who live by themselves or with their spouses grew from 13% to 19% for men and 11% to 16% for women (Barik, Agrawal and Desai, 2014). It seems likely that this trend will continue, requiring alternative sources of support for the elderly.

Figure 4: Age Specific Profile of Consumption and Income, India 2004–5



Source: Ladusingh and Narayana, 2011 based on data from India Human Development Survey I.

Public discourse, euphoric about the possibility of reaping the demographic dividend, has paid little attention to the need to plan for the care of the elderly as the proportion of the older population grows. Three issues in particular deserve attention (Desai 2011)²:

First, as mortality declines, health improves and proportion of the elderly population rises, most countries adjust to it by increasing the length of working life

² This section is adapted from a newspaper article in Business Standard by the author.

and raising the age of retirement, including total elimination of compulsory retirement in case of United States. At present, India has a relatively large share of elderly males in the workforce with over half the men above age 60 being employed. However, most are self-employed in agriculture. As agriculture declines and more and more people are employed outside family farms, opportunities for the elderly to work will decline.

This implies that the employment policy will have to take into account a need to create employment opportunities for the older population. While increasing retirement age may well form a part of this, increasing flexibilisation of labour even in formal sector is not conducive to this (Sinha and Kanbur, 2012). Moreover, we also need opportunities for workers who formally retire but have many productive years left. We should consider some creative solutions that generate opportunities for the older population in social sectors e.g. as para-teachers. Research on Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA) documents that exclusion of elderly individuals from wage work does not extend to MGNREGA (Joshi et al. 2014), suggesting this as a possible alternative for expanding work opportunities of healthy seniors.

Managing soaring health care costs forms a second challenge of an aging society. In most industrial societies, health care expenditure in the final ten years of life exceeds the earlier seven decades and the expenditure in the final year of life is the greatest. This is particularly problematic as disease profile shifts from communicable diseases affecting the young to diseases affecting the older population such as cancer and heart attacks. As we rush into expanding public and private health insurance coverage, we may want to learn from the (mostly negative) experiences of countries ahead of us on the demographic curve. How does a society balance the needs of a seventy-year-old looking forward to a new lease on life via cardiac bypass surgery against that of a forty-year-old requiring extensive rehabilitation following an accident? Neither medical ethics nor health care financing structures have been developed to address these complex choices. However, as we rush into an era of shared risks through insurance, we may want to think about layered health care financing structures where basic public health measures are provided through existing public health systems, emergency care is universally provided by programmes such as *Rashtriya Swasthya Bima Yojana* and tertiary care costs are privatised through private health insurance systems. Health care financing is a challenge even now and is likely to become more of a challenge in an aging society but without some forward looking planning, we are likely to get

trapped into a patchwork of systems and create entitlement obligations that may prove burdensome in future.

A third area that may require considerable ingenuity is increasing the ability to save for the old age. Here calculations by Dr. Ladusingh and Dr. Narayana are fascinating (Ladusingh and Narayana, 2011). They estimate that on an average, working age adults spend Rs. 7,25,714 caring for children. With declining fertility, child-dependency ratio will decline and some of the money spent on raising children can be used to save for retirement. But this is not possible while the cost of educating children is also rising rapidly. With nearly 28% children attending private schools and 20% enrolled in private tuitions, private educational costs are rapidly escalating. RTE has already added to the public educational expenditure. Education must form a priority if productivity is to be enhanced. However, as shown above, improving quality of education while controlling educational costs remains a challenge. It takes a leap of faith to imagine that improving efficiency of our educational system is a way of dealing with the problems of aging but unless we can do that, today's young parents will not be able to save for their old age.

DISCUSSION:

In this paper I have focused on three aspects of demographic transformation.

First, rising support ratios as more workers support fewer dependents should have an unambiguously positive effect on economic growth. However, the magnitude of this effect depends on the number of workers in the population and this effect can be magnified many folds if we can ensure that women gain greater access to paid work and their time in poorly remunerated activities can be minimised.

Second, temporarily low dependency burden may allow for higher investments in the future, allowing us to multiply the effects of potential savings associated with fewer children. Unfortunately, our educational institutions have failed to take advantage of this opportunity to build human capital in our students. Studies of children's learning outcomes paint alarming pictures of failure to capitalise on rising public and private investments. Unless this can be redressed, it would be difficult to take advantage of the demographic dividend.

Third, we have paid little attention to the challenges facing India as proportion of the elderly rises. The very demographic transformation that offers the

opportunity of demographic dividend also creates a debt that has been ignored in the public discourse. Demographic dividend is based on transformation of fertility and mortality patterns but declining fertility offers fewer adult children to care for tomorrow's elderly; declining mortality increases the burden of non-communicable diseases whose treatment costs far exceed the cost of treating communicable diseases. Unless we plan to address these future challenges through ensuring adequate health system and a combination of future support that includes private savings and social pensions, we may well be taken unawares at the end of this demographic boom.

While demography is not destiny, it is important to confront all three issues if we want to reap the benefits of the demographic dividend.

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