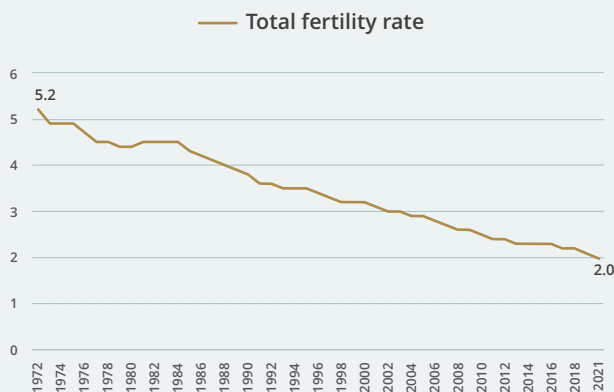


India's Destiny@100: Demography to make her rich before getting old



India is witnessing a demographic transition at a rate faster than expected earlier with total fertility rate (TFR) falling below the replacement level of 2.1 already. A secular drop in mortality ratio and rise in life expectancy, educational attainment, wealth and family planning are factors that are helping in the demographic transition - a trend that is uniformly observed across various sections of the population. However, India's population would continue to grow well into 2060s when it max out at 1.65 bn. Importantly working population and share of working population would continue to grow at least till 2050s.

Figure 1: India's TFR has shown secular decline and now dropped below replacement level

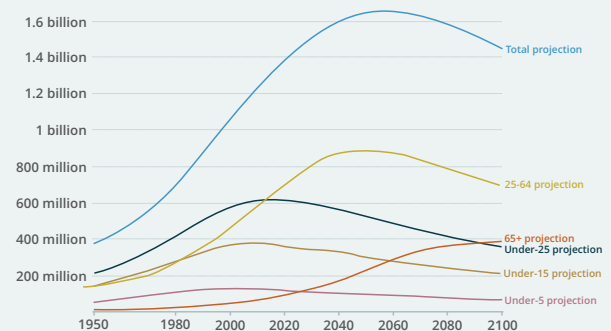


Source: CMIE, World Bank, UN, ASKPW Research

Figure 2: Around 2050 India would face a demographic transition with declining population

Population by age bracket with UN projections, India

Historical population estimates (from 1950 to 2020), and projections through to 2100 based on UN medium fertility scenarios. This is shown for various age brackets and total population.



Global experience clearly point to the link between demographic transition and development. While both GDP growth and per capita income growth were positively related with population growth during 19th century, this relationship inversed for per capita income thereafter. In recent decades these relationships have weakened further. The World Bank global typology (2016) classified countries based on the combined criteria of the growth of working age population share (being positive or negative) and TFR (greater than 2.1 or 4 depending upon the specific grouping concerned). The four groupings arrived at include; i) pre-dividend, ii) early dividend, iii) late dividend and iv) post dividend. India would fall under the early dividend group as per this classification and would remain so till 2050s. Early dividend countries have displayed highest growth rates in the last five decades as well as in each of these five decades while per capita income has trended to grow at the second fastest speed with accelerating trend over these decades. Even major country examples vet the trend of secular rise in per capita income along with a decline in TFR.

Assumptions:

(FY23 to FY50)

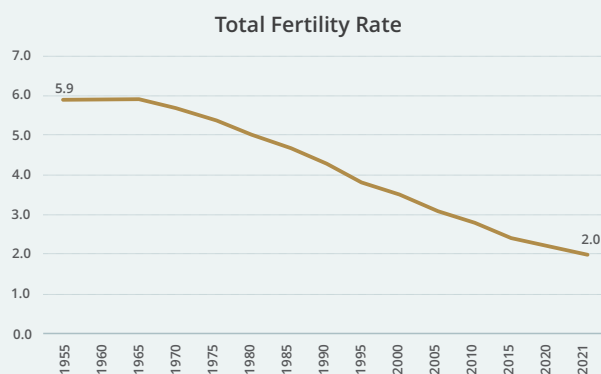
- 1) GDP Growth: 5.5%
- 2) Inflation: 5.5%
- 3) INR Depreciation: 3%

Thus drawing upon the global experience, even if India were to grow at a continually slower rate in terms of real and nominal as well as per capita income and even if INR depreciates at an annual 3% post liberalisation rate, India would not only reach the headline GDP landmarks of USD of 5/10/20 tn; but would transition to a upper middle income by FY30 and to a high income country by FY47 when India reaches its 100th year of independence. Aiding this process would be continued improvement in productivity growth even as employment growth slows down. Migration trends are likely to consolidate and financial planning would need to tune to demographic transition. Finally India would be due for a sovereign rating upgrade by FY30 upon migrating to upper middle income country.

I. India is undergoing a fast demographic transition

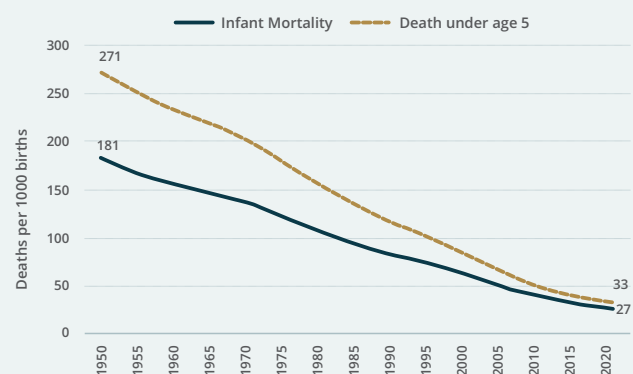
India's fertility rate at 2.0 has recently reported to have fallen below the replacement level of 2.1. This has triggered some concerns whether India is facing a demographic transition faster than the pace thought earlier and whether this would bring in additional challenges for the secular growth path it has enjoyed so far resulting in a large section of the population getting old before they get rich. However, we find unless India messes up big time, both demographics and momentum are in our favour.

Figure 3: Steady decline in fertility rate



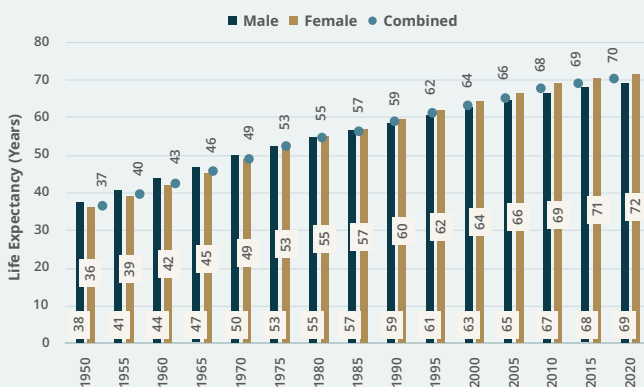
Source: UN, World Bank, Worldometer, ASKPW Research

Figure 4: Sharp decline in mortality rates



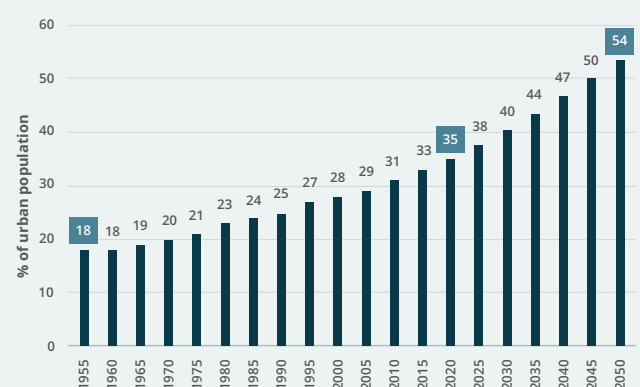
India has faced a rather steady transition unlike many other countries abroad that experienced very rapid demographic transition in the later part of the previous century. While birth rates have fallen, so have the infant mortality and child mortality rates signifying pre-demographic dividend to early-demographic dividend transition. Life expectancy has doubled since independence while urbanisation rate is set to triple. These changes have ensured that the population is growing while the younger cohort as a share of total population has been rising too.

Figure 5: Life expectancy rising steadily



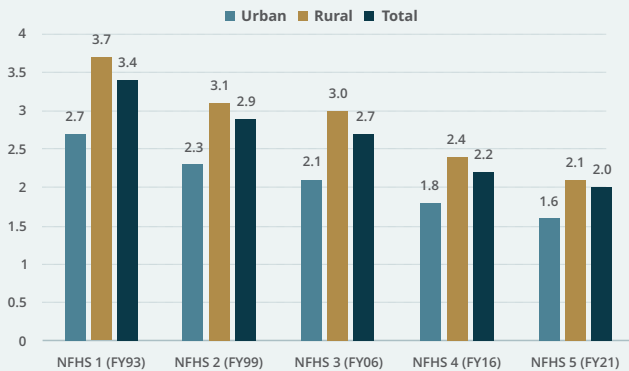
Source: UN, World Bank, Worldometer, ASKPW Research

Figure 6: More than half to stay in urban areas by FY50



There are enough indications that the falling TFR and demographic transition trend would continue and India may witness a demographic change faster than anticipated earlier. First, TFR has been falling in both rural and urban areas and urban TFR is comparable to the advanced countries. Second, the falling trend is spread across all population groups spanning all religion and caste groups and each sub-group is also witnessing a consistent drop across successive rounds of National Family Health Survey (NFHS).

Figure 7: Sharp drop in TFR especially in rural areas while urban is near advanced countries already

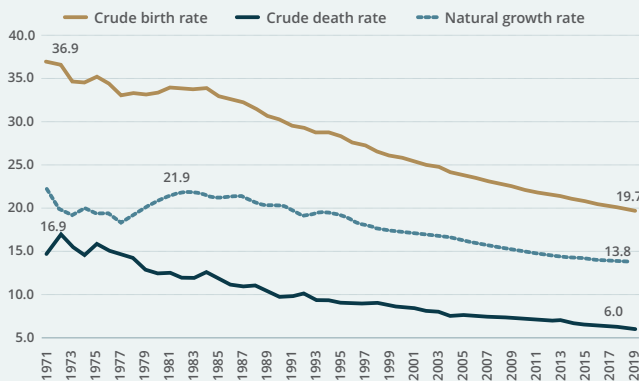


Note: NFHS – National Family Health Survey. Source: Government, ASKPW Research

Figure 8: The decline is spread across all sections of the population

	NFHS 1 (FY93)	NFHS 2 (FY99)	NFHS 3 (FY06)	NFHS 4 (FY16)	NFHS 5 (FY21)
Religion					
Hindu	3.3	2.8	2.6	2.1	1.9
Muslim	4.4	3.6	3.4	2.6	2.4
Christian	2.9	2.4	2.3	2.0	1.9
Sikh	2.4	2.3	2.0	1.6	1.6
Buddhist/Neo-Buddhist	NA	2.1	2.3	1.7	1.7
Jain	NA	1.9	1.5	1.2	1.6
Other Religions	2.8	2.3	4.0	2.6	2.2
Caste/tribe					
SCs	3.9	3.2	2.9	2.3	2.1
STs	3.6	3.1	3.1	2.5	2.1
OBCs	NA	2.8	2.8	2.2	2.0
Other	NA	2.7	2.4	1.9	1.8
Total	3.4	2.9	2.7	2.2	2.0

Figure 9: Sharper drop in birth rate compared to death rate is lowering the natural growth rate



Source: CMIE, Government, ASKPW Research

Figure 10: Consistent drop in mortality rate as recorded in successive rounds of NFHS surveys

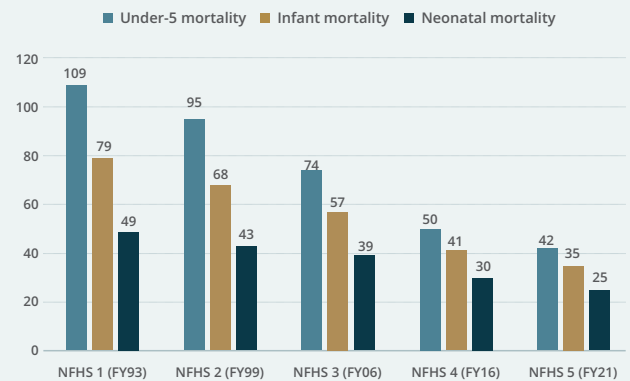
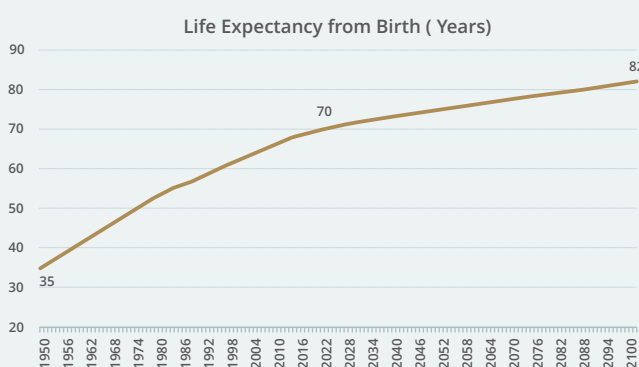
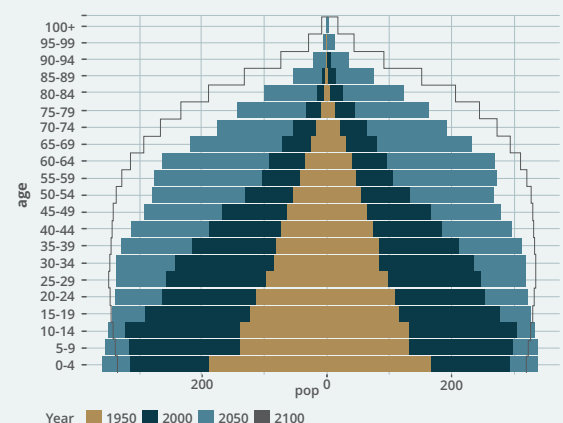


Figure 11: Increased and further rising life expectancy



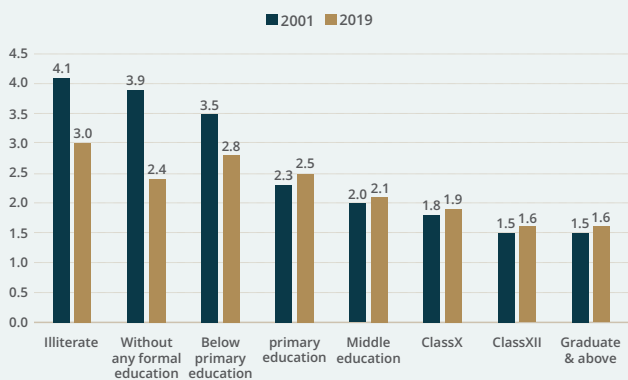
Source: UN, World Bank, Worldometer, ASKPW Research

Figure 12: Population pyramid indicates that young age population share rises with time



Third the combination of consistent drop in mortality and rise in life expectancy has ensured that the population growth would continue albeit at a slowing pace but the share of working population would continue to rise for the next three decades. Fourth, it is clearly seen that the TFR and the levels of education is inversely related; i.e., the higher the levels of education, the lower the TFR. Thus, as India has still a lot of ground to cover in educational attainment, the TFR would continue to decline. Once again the cohort 'graduates and above' have a TFR level that is comparable with that of advanced countries. Higher education also leads to a deferment of the age for first birth. Fifth, higher income and wealth also leads to a drop in the performance. Finally, if one looks at the wanted fertility rates, i.e., the rate desired by the survey respondents, the TFR rates are once again at the level as that of advanced countries. Moreover, the trend of wanted fertility rates being lower than actual is seen across all states of India and the gap is wider for states having higher TFR. In other words, India's TFR is on an inexorable secular decline now. As India gets richer and more educated, TFR drop gets even more crystallized.

Figure 13: Education leads to drop in TFR and TFR has slumped even for people with less education



Source: Government, ASKPW Research

Figure 14: With higher educational attainment the age of first birth gets deferred

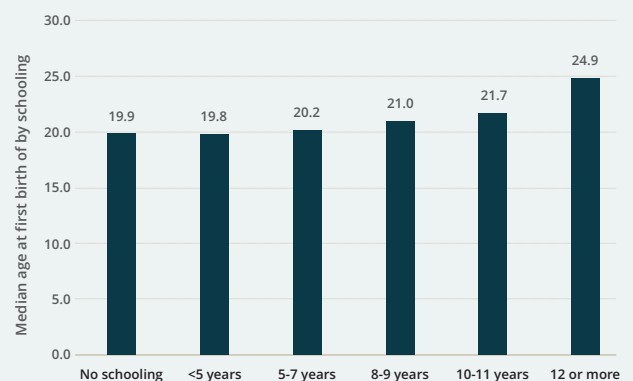
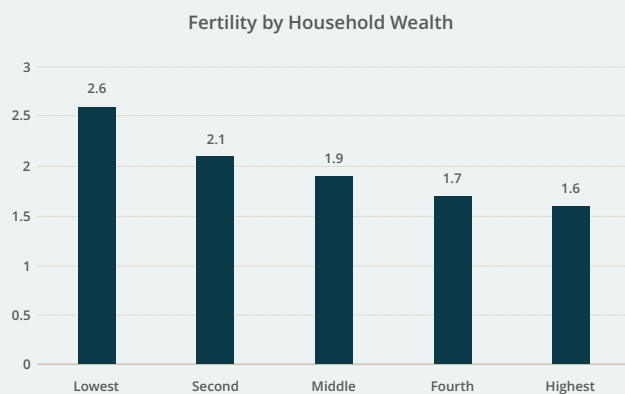


Figure 15: Higher household wealth also leads to a material drop in the TFR



Source: Government, ASKPW Research

Figure 16: Wanted fertility rates are still substantially lower

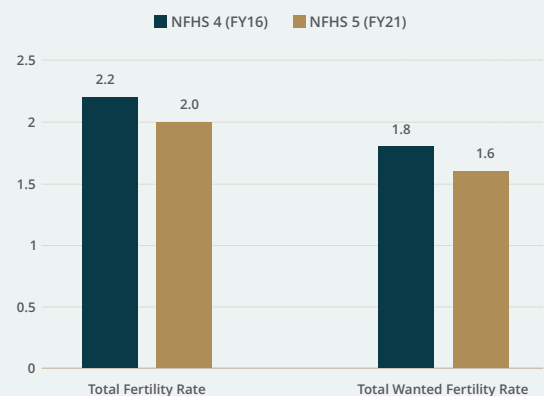
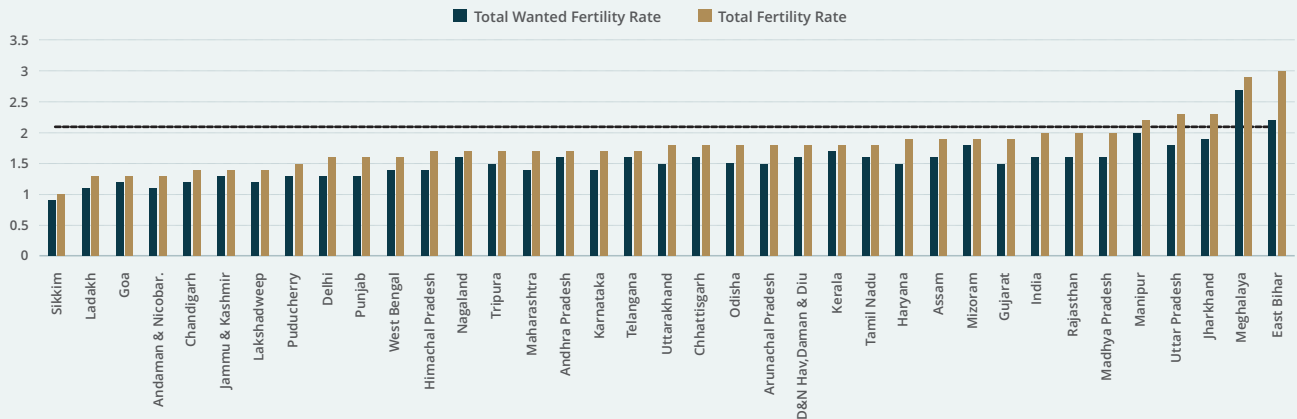


Figure 17: Wanted fertility rates are lower for all states and more so for states with higher TFR

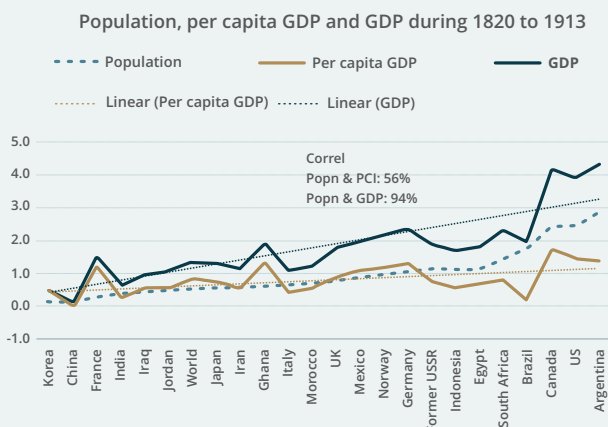


Source: Government, ASKPW Research

II. Global experience points to link between demographic transition and development

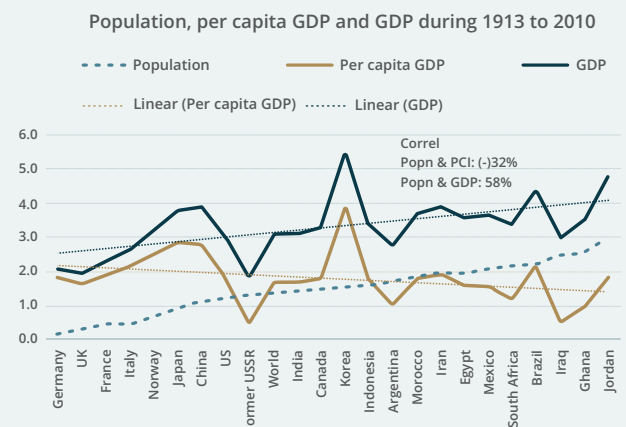
While demographic transition of India is on a secular and predictable path, for inferring its impact on GDP growth and development, global experience is instructive. During large part of nineteenth century and early part of twentieth century (between 1820 to 1913) cross country evidence shows that the GDP growth and even per capita income growth was crucially dependent on the population growth. It is conceivable that during early period capital as well as technological inputs were limited requiring additional production to be supported by an addition to workforce. During the later period however, i.e., between 1913 to 2010, while the GDP growth continued to be dependant on the population growth; a negative correlation emerged between population growth and per capita income implying breakdown of the dependence of per capita income with population growth. Thus with technological progress a higher supply of workforce wasn't a crucial requirement for improving the standards of living.

Figure 18: Population growth and income parameters were highly correlated during 19th century



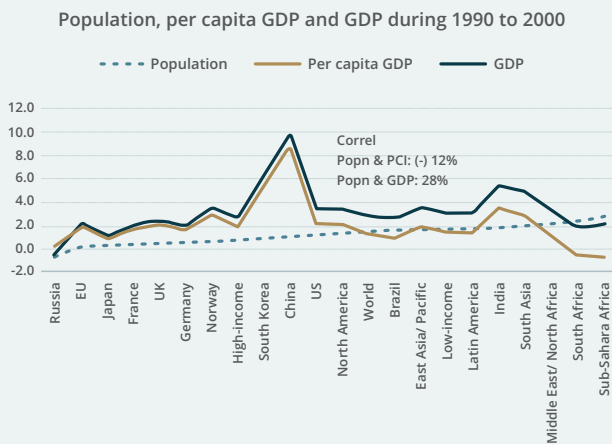
Source: E. Wesley F. Peterson (2017), ASKPW Research

Figure 19: However, the relationship weakened and turned negative for per capita income thereafter



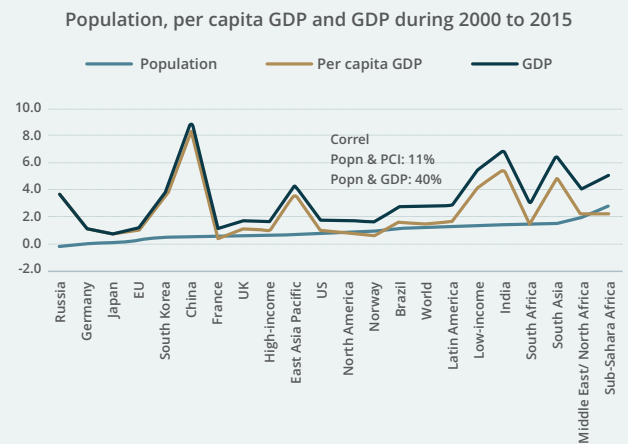
In more recent times, the relationship between these three variables have weakened further. During the turbulent period of 1990s, the GDP and PCI growth weakened thus lowering their correlation with population growth. In the current millennium, GDP growth has improved but the correlation between PCI and population growth have dropped again. However, what stands out since 1990s is the exceptionalism of China and India who have managed a GDP and per capita GDP growth much disproportionate to their population growth during this period.

Figure 20: Weakened relationship between population and income growth during 1990s



Source: E. Wesley F. Peterson (2017), ASKPW Research

Figure 21: Exceptionalism of China and India stands out in the new millennium



It can be argued that these trends need to be seen with a horizon more than a decade and across countries to decipher the link between demography and stage of development more clearly. The World Bank global typology (2016) classified countries based on the combined criteria of the growth of working age population share (being positive or negative) and TFR (greater than 2.1 or 4 depending upon the specific grouping concerned). The four groupings arrived at include; i) pre-dividend, ii) early dividend, iii) late dividend and iv) post dividend. India would fall under the early dividend group as per this classification and would remain so till 2050s.

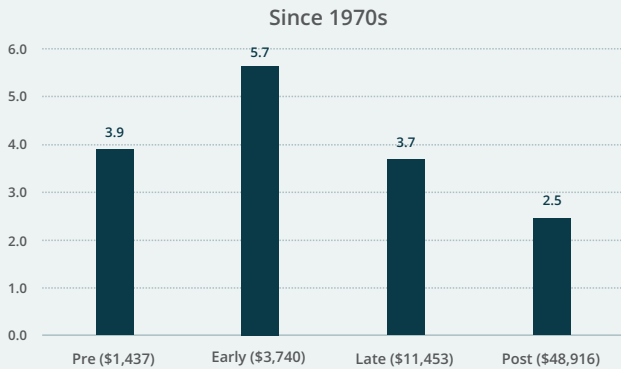
These groups of countries show distinct trend as per as their relationship between population growth and GDP & per capita income growth. For example, for the last five decades it's the early dividend countries that have managed to grow the fastest followed by the pre, late and post dividend countries. Moreover, these trends broadly held for each of the five decades under consideration. This implies that the headline GDP growth broadly comes down with demographic transition.

Figure 22: World Bank typology criteria to identify phases of demographic dividend

Growth of working age	Total Fertility Rate, 1985		Total Fertility Rate, 2015	
Population Share, 2015-30				
	< 2.1	>= 2.1	< 4	>= 4
<= 0	Post-dividend	Late-dividend		
> 0			Early-dividend	Pre-dividend

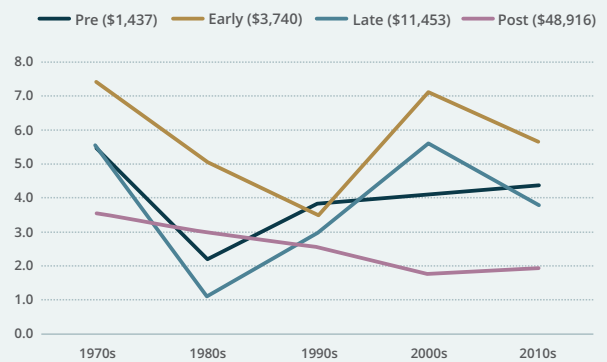
Source: World Bank, ASKPW Research

Figure 23: The early demographic dividend countries have grown the fastest



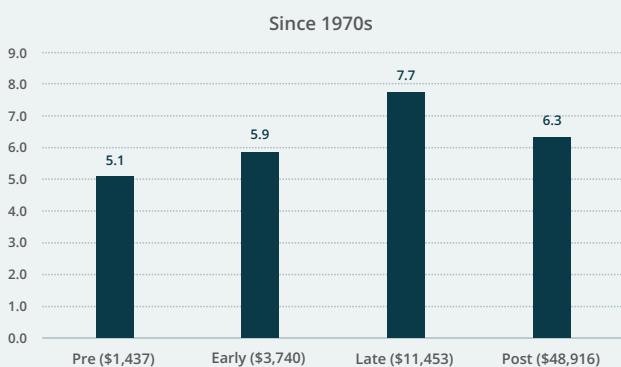
Source: World Bank, ASKPW Research

Figure 24: The pattern remains the same for the last five decades



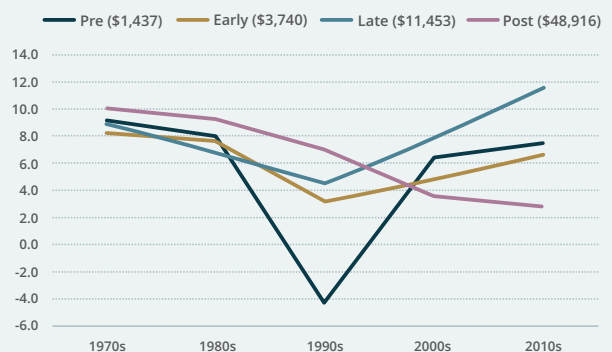
The ordering is somewhat different in case of impact of demographic transition at the per capita income level. Per capita income growth has continued to accelerate with demographic development till the countries transit to the post dividend phase when per capita income too slow down. Since the 1990s the late and early dividend countries have seen an acceleration in per capita income while pre dividend countries have seen fluctuations before recovery. Post dividend countries have seen a secular deceleration in per capita income. These countries are also usually the recipient countries for global migration.

Figure 25: For per capita income, late and post demographic dividend have done better



Source: World Bank, ASKPW Research

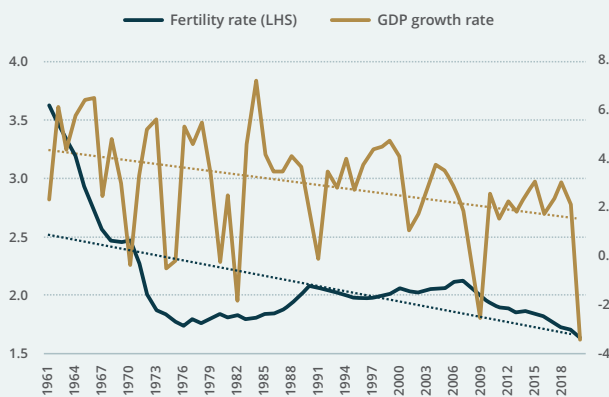
Figure 26: Per capita income is accelerating for early and late dividend countries



The trend described above at the group level is also seen at the individual country level. Illustratively, US, Japan and Euro have all transited to post dividend phase. All of them faced a weakening of the GDP growth rate over the last six decades. Incidentally, US had seen fairly dramatic decline in TFR during the decades of 1960s & 1970s. Euro area too had seen accelerated decline in TFR during the decades of 1970s and 1980s. Japan had much lower level of TFR to begin with in 1960s still faced continued decline till mid 2000s when the trend was moderately reversed.

However, despite the fall in TFR, these countries have continued to enjoy a fairly secular rise in per capita income during these six decades. Evidently, deepening in capital input and productivity growth have resulted in a higher standard of living for these advanced countries with declining importance of growth of labour force for raising per capita income.

Figure 27: US GDP growth has slowed down



Source: World Bank, ASKPW Research

Figure 28: While per capita income kept growing

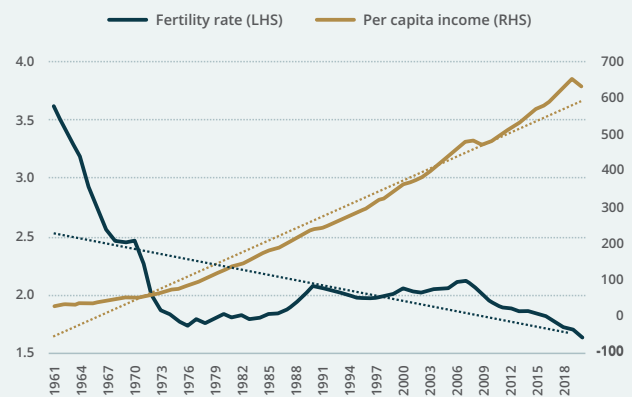
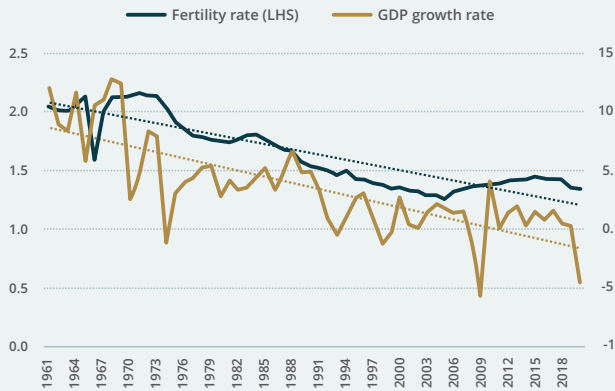


Figure 29: Japan too faced a secular decline in growth



Source: World Bank, ASKPW Research

Figure 30: PCI however, improved markedly

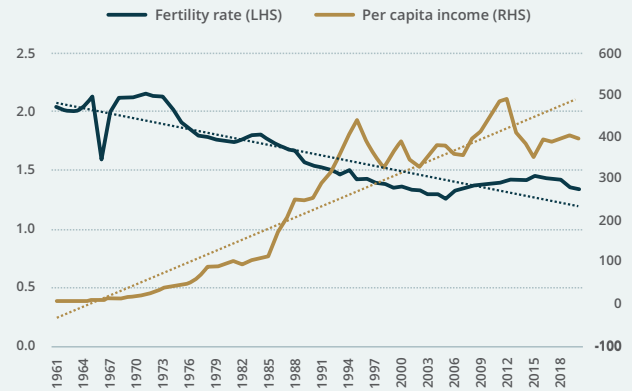
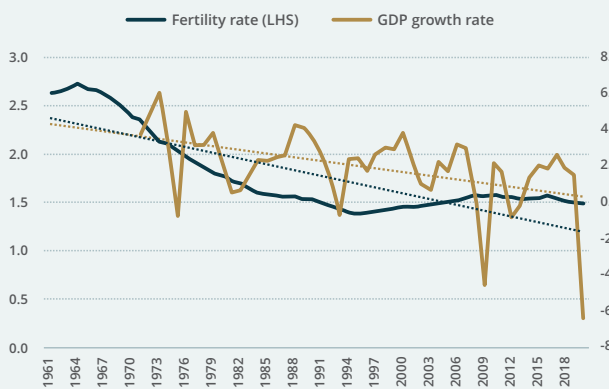
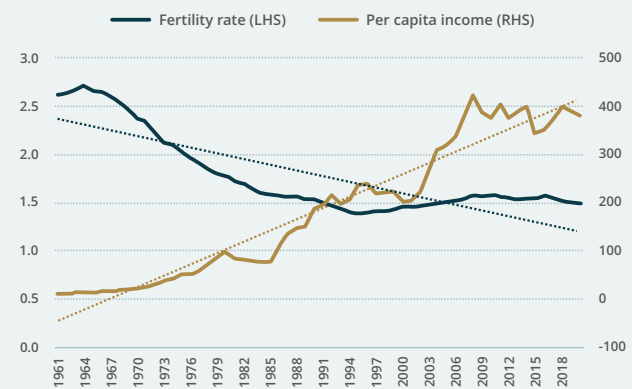


Figure 31: Growth declined in Euro area too



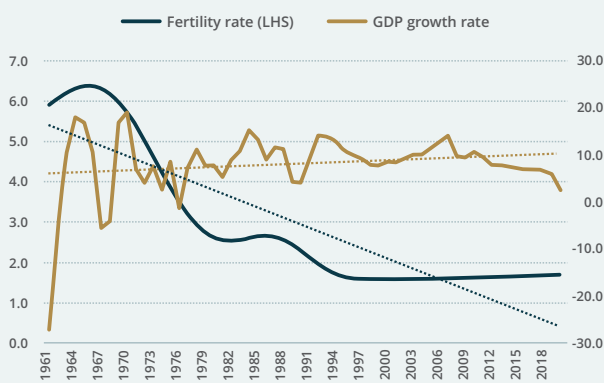
Source: World Bank, ASKPW Research

Figure 32: Still PCI continued to grow like others



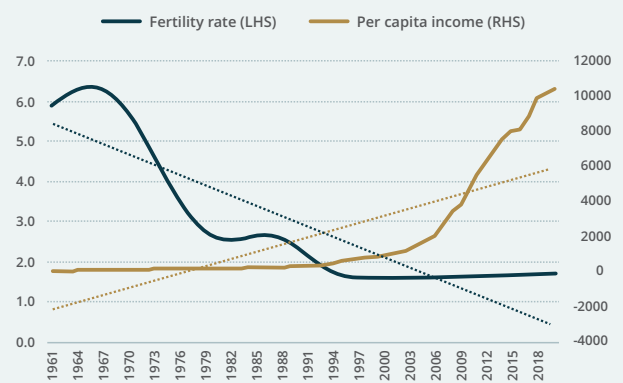
China, a late dividend country however, bucked the trend and have managed to grow steadily over six decades. This despite the substantial fall in TFR during the decades of 1960s and 1970s itself. China indeed reached a TFR of 2 by 1992 which India has just reached three decades later. On the other hand, China's rise in per capita income reached the escape velocity only from 2003 onwards when its PCI was at around USD1,300 and for the next 11 years it had consecutive periods of double digit PCI growth.

Figure 33: China's GDP growth remained steady



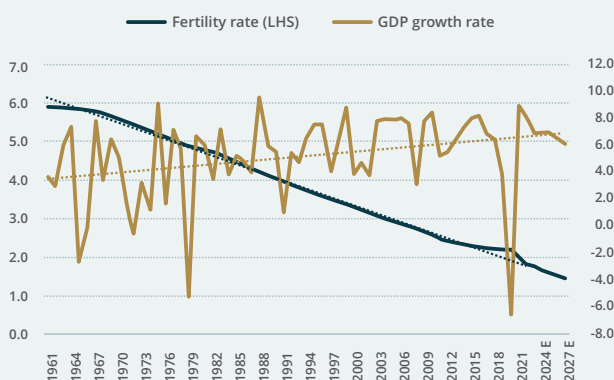
Source: World Bank, ASKPW Research

Figure 34: While PCI accelerated in 2000s



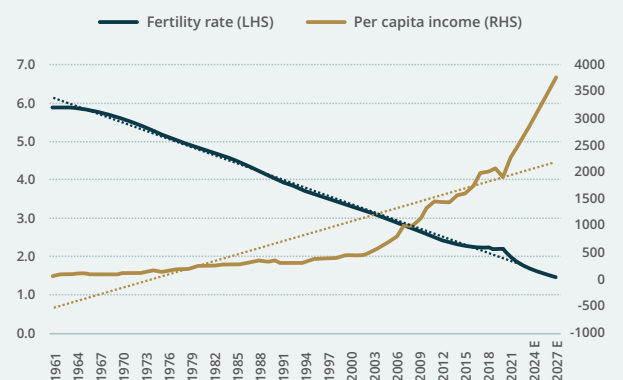
In contrast India's progress has been far steadier. Its drop in TFR has been secular in contrast to earlier examples of accelerated drop in certain decades. A moderate uptrend in GDP growth is also seen during the last six decades. However, India also enjoyed a period of double digit growth in per capita income during 2003 to 2010, coinciding broadly with China's acceleration during the same period and both perhaps on the back of global boom. PCI have continued to grow during the last decade but at a mid single digit growth during the subsequent period. PCI of India is expected to grow at high single digit rate for the current decade excluding the Covid fallout and recovery years.

Figure 35: India has seen steady state improvements



Source: World Bank, ASKPW Research

Figure 36: PCI growth accelerated since 2003



III. India on a demographic autopilot for the next three decades:

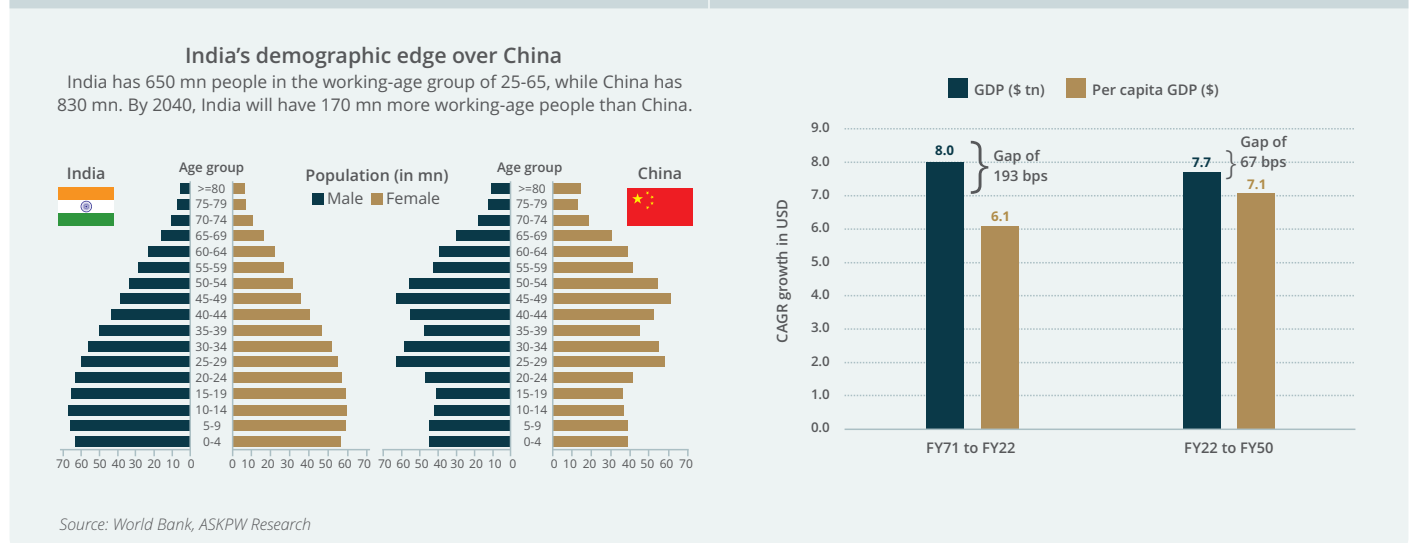
The cross country historical experience clearly brings out a few important points sharply. First, fall in TFR is usually associated with a slowdown in economic growth. However, more importantly, per capita income continues to rise well after the TFR rate has hit the critical value of 2.1, viz., the replacement level. This points to the need to focus on the per capita income more, although in recent times far period projections for India has focussed on reaching a level of USD 5/10/20 tn etc. in terms of overall GDP.

i) Need to focus on 10k+ per capita income from USD 5/10/20 tn GDP talk

As per projections by UN, India's population would continue to grow all the way till the decade of 2050s and start declining after reaching the peak population of 1.65 bn. This would continue to yield a positive population growth each year. Moreover, median age of India would only increase by 10 years to 38 years from 28 years at present implying worker population ratio would continue to grow. Thus India would continue to remain as an early dividend country till 2050 during the period of which Indian economy would undergo major transformation. It is also more likely that India would reach such milestones, even if GDP and per capita income growth were to slowdown to more modest level as the gap between the two reduces in view of the falling population growth.

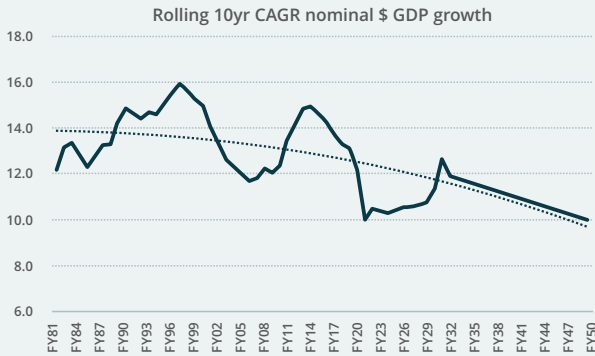
Figure 37: India would continue to reap demographic dividend for the coming three decades

Figure 38: Lower populaiton growth would imply lesser gap between GDP and per capita GDP growth



We show that under some fairly conservative assumptions as following the cross country trend of demography and development, Indian economy is poised to reach a few desirable milestones. These include a continued decline in real GDP growth and inflation from 6% during FY23 to around 4.5% during FY50 along with 3% annual depreciation throughout this period. This would imply that the \$GDP growth would slowdown from 8% during FY23 to around 6% by FY50 while the per capita income growth too would witness a similar moderation. However, even with such sobering assumptions, India would achieve an USD5 tn GDP by FY27, a goal deferred by two years on account of pandemic. Subsequently, achievement of successive USD5 tn GDP would consume lesser number of years. However, more significantly, by FY30 India would transition from a lower middle income country to upper middle income country and by FY47 coinciding with 100 years of independence, India would transition to a high income country.

Figure 39: Even if we assume India's nominal \$ GDP would weaken to single digit levels



Source: World Bank, ASKPW Research

Figure 40: And assume a real GDP growth that would reach below 5% by FY50

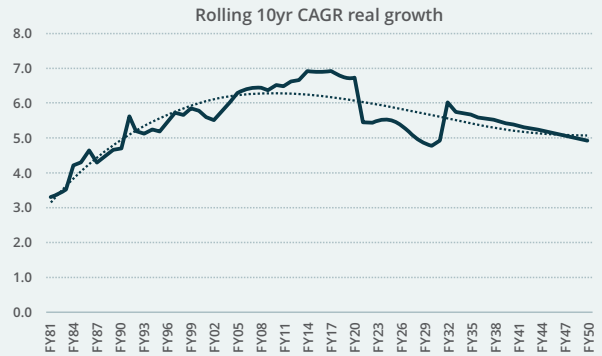
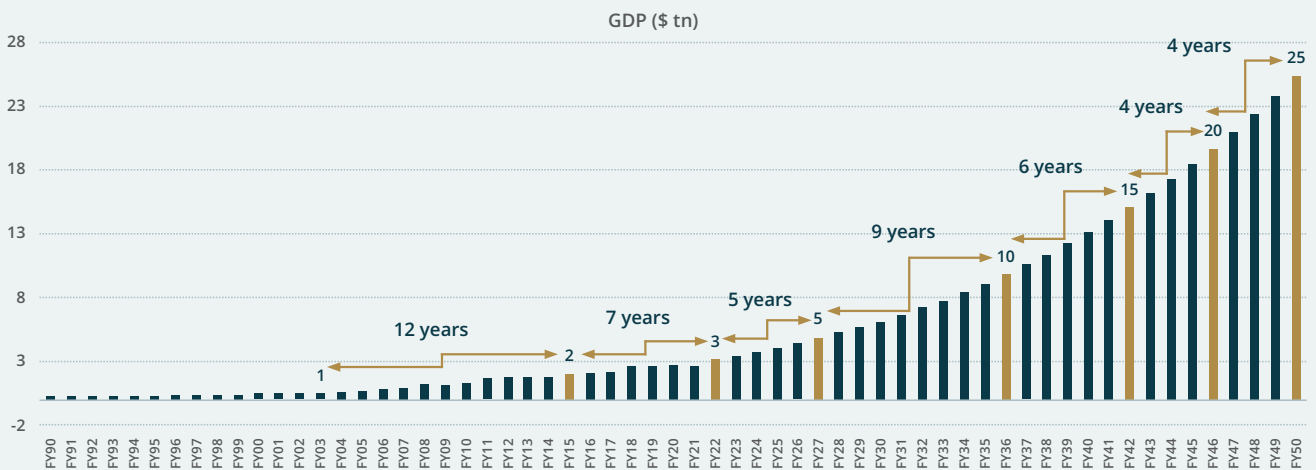
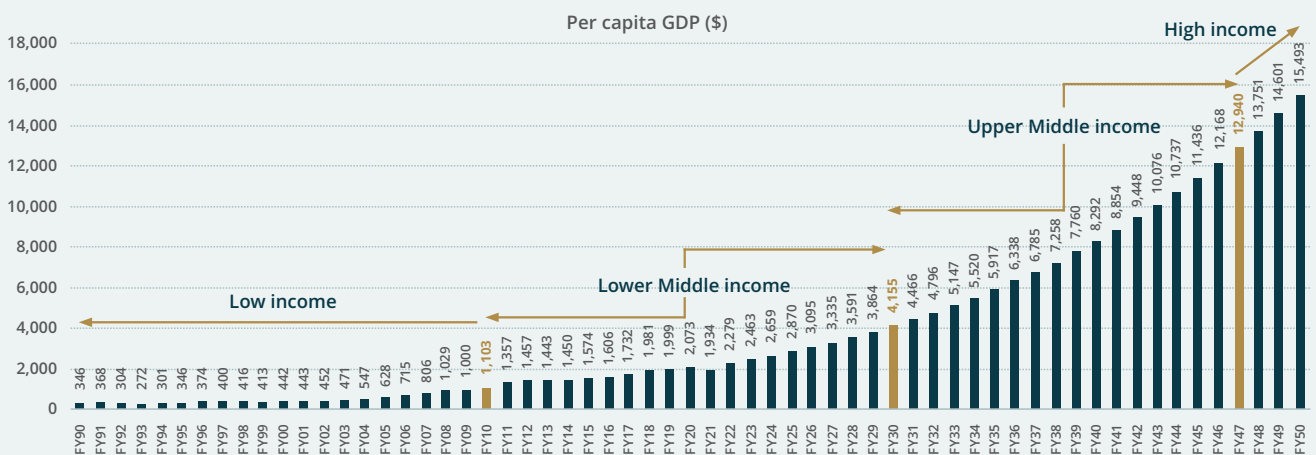


Figure 41: India @100 (FY47) to achieve \$20 tn GDP from \$1 tn in FY03



Source: IMF, CMIE, ASKPW Research

Figure 42: More significantly, India would transition to a high income country by then

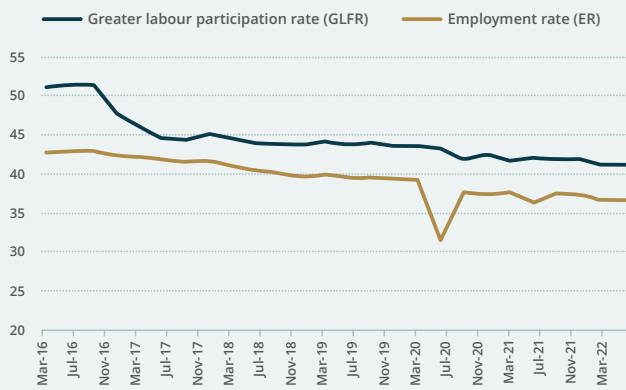


Source: IMF, CMIE, ASKPW Research

ii) Employment weakness compensated by productivity growth

Rising population however, besiege the question of employment, employability and productivity for the growth engine to perform continually. India's recent employment data poses some challenges in that a moderately declining trend is seen both in terms of labour force participation rate (LFPR) as well as employment rate. Correspondingly, unemployment rate too have tended to rise moderately. However, these trends are likely to be more cyclical in nature. Rising labour productivity levels for the last four decades comes a mitigation factor. However, we also observe that most of the increase in labour productivity is a result of capital deepening during this same period and to a lesser extent on account of rising total factor productivity (TFP). Labour quality on the other hand have shown rather minimal improvement.

Figure 43: Continued decline in employment and labour force participation rate

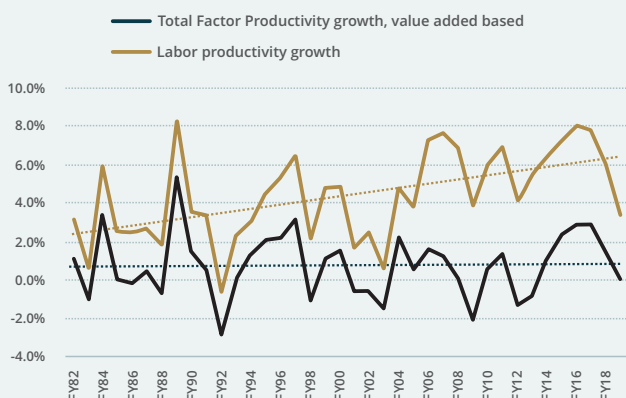


Source: CMIE, ASKPW Research

Figure 44: As a result unemployment has seen mild uptrend along with cyclical spikes

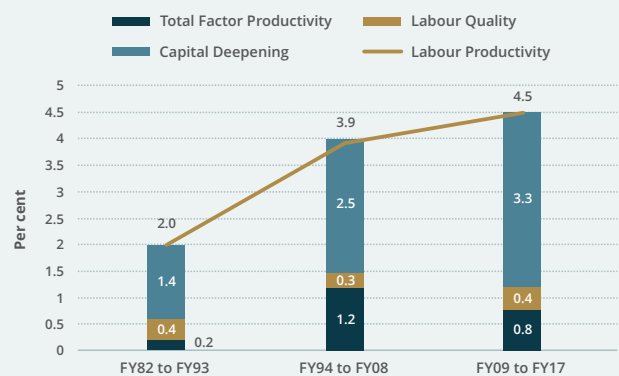


Figure 45: Labour productivity has been steadily rising even though TFP doesn't show much growth



Source: Reserve Bank, ASKPW Research

Figure 46: Capital deepening has led to rise in labour productivity while labour quality was static



Educational and health attainment levels provides an area of policy intervention that can translate into easily encashable opportunity for raising productivity and growth. India has one of the lowest literacy rate among all major comparable countries and it also has starkly higher gender gap in education. Similarly health indicators in terms of life expectancy, mortality rates, nutritional levels, etc. significantly lag other major countries. While the drop in education expenses by the government that had dipped during decade of 2000s, have been restored back, it still lags the 6% of GDP desirable ratio. On health, public spending have shown a stark decline over the years. On both these counts, viz., education and health, public provisioning and potential for private penetration pose a clear opportunity to accelerate the development through higher investment in them.

Figure 47: India has one of the lowest literacy rates among major countries with very high gender gap

Country	Both	Male	Female	Gender gap
India	74.3	82.3	65.8	16.6
World	86.3	90.0	82.7	7.3
Brazil	91.7	91.4	92.1	-0.7
Indonesia	93.9	96.3	91.5	4.7
Mexico	94.4	95.6	93.3	2.2
South Africa	94.4	95.5	93.1	2.4
Malaysia	94.6	96.2	93.2	3.0
China	96.4	98.2	94.5	3.7
Singapore	96.8	98.7	95.1	3.6
Russia	99.7	99.7	99.7	0.0

Source: World Bank, ASKPW Research

Figure 48: India's spending on education has risen somewhat but health spending is low and falling

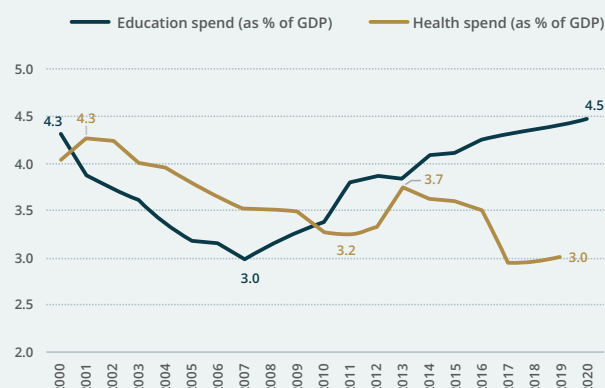


Figure 49: India's spending both in education and health is low compared to most major countries

Education				Health			
Country Name	Education spend (% of GDP)	Country Name	Education spend (% of GDP)	Country Name	Health expense (% of GDP)	Country Name	Health expense (% of GDP)
Saudi Arabia	7.1	Upper middle income	4.3	United States	16.8	Russian Federation	5.6
Brazil	6.1	Italy	4.3	Post-demographic dividend	13.0	Mexico.	5.4
South Africa	5.6	Early-demographic dividend	4.3	OECD members	12.5	China	5.4
France	5.4	Mexico	4.3	High income	12.5	Middle income	5.3
United Kingdom	5.2	Middle income	4.3	Germany	11.7	Low & middle income	5.3
Australia	5.1	Lower middle income	4.1	France	11.1	Arab World	5.1
Germany	5.0	Low & middle income	3.9	Japan	10.7	Low income	4.9
Post-demographic dividend	4.9	China	3.5	Euro area	10.2	Early-demographic dividend	4.7
OECD members	4.9	Arab World	3.4	United Kingdom	10.2	Heavily indebted poor countries (HIPC)	4.6
United States	4.9	Heavily indebted poor countries (HIPC)	3.3	Australia	9.9	Turkiye	4.3
Euro area	4.8	Low income	3.3	World	9.8	Singapore	4.1
High income	4.8	Pre-demographic dividend	3.2	Brazil	9.6	Pre-demographic dividend	3.9
Russian Federation	4.7	East Asia & Pacific	3.2	South Africa	9.1	Malaysia	3.8
Malaysia	4.5	Japan	3.1	Italy	8.7	Thailand	3.8
Late-demographic dividend	4.5	Thailand	3.1	East Asia & Pacific	6.7	Lower middle income	3.8
India	4.4	Indonesia	3.0	Upper middle income	5.8	India	3.0
World	4.3	Singapore	2.9	Late-demographic dividend	5.8	Indonesia	2.9
Turkiye	4.3	Bangladesh	1.3	Saudi Arabia	5.7	Bangladesh	2.5

Source: World Bank, ASKPW Research

iii) Migration - a reality that no one can ignore

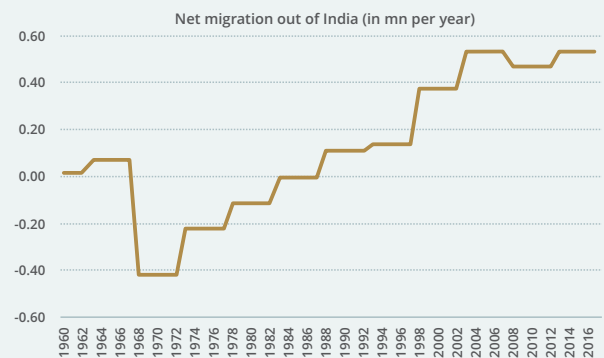
One of the offshoot of India's demographic development has seen her as the country with highest number of migration on an annual basis. Net migration from India also has seen a rising trend over the years. Needless to add that there are many economic benefits both to the recipient as well as donor countries, not least being India emerging as the no.1 in remittance recipient from abroad.

Figure 50: India has seen the highest migration abroad



Source: UN, World Migration Report, ASKPW Research

Figure 51: Net migration rising every year



iv) Rating upgrade for India: Likely by FY30

India's sovereign rating of BBB- implying just about investment grade have been subject of intense debate particularly in view of no default track record. However, among the various parameters used by the rating agencies, it is seen that the most direct correlation is obtained between rating and per capita income followed by external balance while the often cited public debt and inflation is of far lesser consequence. In that aspect India enjoys one of the best rating at her comparable levels of per capita income. Going by this pattern India would perhaps be due for a rating upgrade by FY30 upon migrating to upper middle income country, provided other macroeconomic vulnerability indicators remains stable by then.

Figure 52: Per capita income matters the most for sovereign rating

	Credit Rating	Per Capita Income (\$)	Public Debt (% of GDP)	CPI Inflation (%)	Current Account (% of GDP)
Credit Rating	1				
Per capita income (\$)	-0.78	1			
Public debt (% of GDP)	0.17	-0.02	1		
CPI Inflation (%)	0.18	-0.09	0.51	1	
Current Account (% of GDP)	-0.40	0.44	-0.15	-0.02	1

Source: IMF, Media, ASKPW Research

Figure 53: India may be due for a rating upgrade by FY30

Sovereign Rating	Avg per Capita Income (\$)	Avg Public Debt (% of GDP)	Avg CPI Inflation %	Current Account (% of GDP)
AAA	74,479	62	2.7	8.0
AA+	51,422	60	2.8	2.8
AA	44,683	91	2.6	0.6
AA-	47,211	47	2.8	7.2
A+	23,852	91	2.3	2.2
A	38,398	77	4.0	-2.8
A-	20,848	61	2.8	-0.8
BBB+	8,357	51	3.7	-1.0
BBB	20,520	76	3.0	1.9
BBB-	12,766	68	3.9	-2.9
BB+	10,247	87	3.7	-0.3
BB	4,649	42	5.4	-3.2
BB-	5,621	60	4.8	-3.1
B+	7,967	78	3.7	-4.5
B	4,117	63	3.8	-8.3
B-	4,787	68	6.5	0.6
CCC+	3,621	81	26.7	-3.3
CCC	7,295	41	9.5	2.7
SD	4,508	132	252.7	-1.4
Memo Item: India				
BBB-	2,283	87	5.5	-1.6

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