

# **An Analysis on the Link between Education and First Demographic Dividend of Bangladesh**

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# Introduction

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- Demographic Dividend can be roughly defined as the opportunities offered by a larger working age population. Two types of opportunities.
  - a) First Demographic Dividend
  - b) Second Demographic Dividend

# Why & How DD is important?

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Increase in the share of active age population offers some opportunities

- ❖ Through an increase in labor force participation rate
- ❖ Household Asset Reallocation
- ❖ Reallocation of National Resources
- ❖ A right and efficient investment can increase a country's factor productivity, yielding a level impact.

# Research Objectives

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The objective of this paper is to separate the effects of education and age on economic growth from the demographic dividend.

- Estimating Demographic Dividend (ESR)
- Decomposing the total changes into two effects- **age effect** and **education effect**

**Focus:** First DD

# Relevant Studies

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- A new dimension to the debate on the economic effect of population- positive, negative and insignificant effects
- However, the scholars on DD attempted to study two types of relationship- a **direct** and **an indirect** relationship between the dependency ratio and economic growth
- Bloom and Williamson (1998) estimated 0.4 percentage point contribution to Asia's per capita output growth and 0.6 percentage point to East-Asia's output growth as **purely demographic one**.
- Becker and Lewis (1973): fall in fertility rate allows households to invest more per child leading to human capital accumulation.
- Lee and Masson (2009) showed that low fertility leads to human capital accumulation; and human capital accumulation has a positive effect on growth.
- Missing demographic opportunities can lead a country to **middle-income trap**. Bangladesh's DD has a **negative contribution to convergence** (Ha & Lee) whereas India, Srilanka, China, Indonesia, Malaysia have positive one (Ha & Lee, 2016).

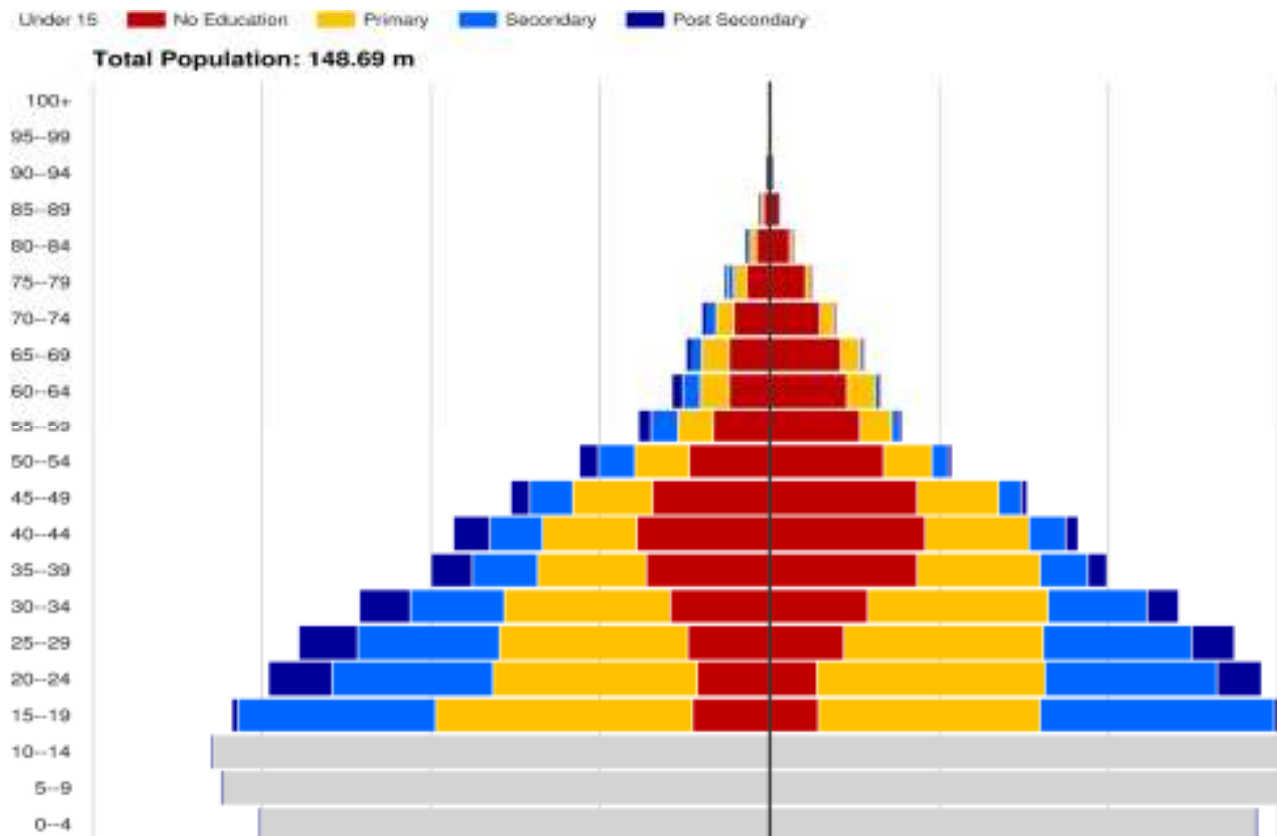
# Relevant Studies...

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- Cuaresma et. al. (2013) investigated whether the demographic dividend is an “Education Dividend” using a **production function approach** disentangling the **productivity** and **translation effect** and attributed the economic growth with the educational attainment substantially.
- Lutz et. al. (2014) argues that **education** is an important **factor to count** to **project population** or a demographic series.
- Finally, **Renteria et. al. (2016)** used a non-parametric approach and further modified ESR series with education data incorporating the income and consumption profiles over different age groups and levels of education.

# Background

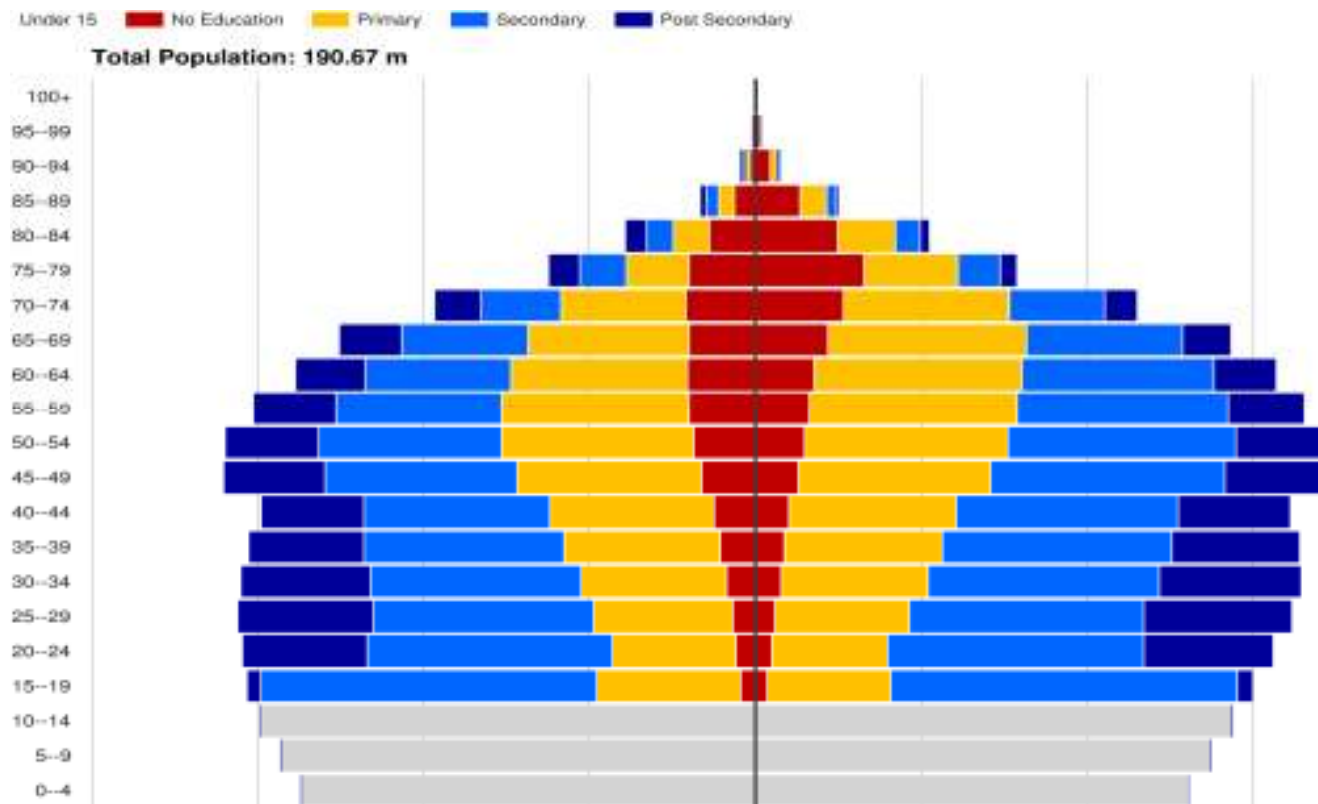
The population Pyramid of Bangladesh in 2010 exhibits falls in fertility rates





# Background...

## Projected Population Pyramid in 2050



# Background...

## A snapshot of Labor Market

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In Bangladesh, the ratio of persons with post-secondary schooling is increasing, whereas the ratio of unemployed graduates are also rising.

- Unemployment rate among the labors with
  - post-secondary education - 9%
  - no formal education- near 2% (LFS 2010 & 2013)
- The enrollment in university education has been doubled from 1 million in 2005 to 2.2 million in 2011 (UGC, 2006, 2011).
- Enrollment in TVET is much lower.
- Low skills (BIDS skill gap survey, 2017).

# Methodology: NTA

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NTA (2013) attempted to measure the demographic dividend.

Percent of working age population => Economic Support Ratio (ESR)

Income per capita can be written as

$$\frac{Y(t)}{N(t)} = \frac{W(t)}{N(t)} * \frac{Y(t)}{W(t)}$$

➤  $y(t) = w(t) * \hat{y}(t)$

➤  $w(t)$  is defined as Support Ratio, contains no information on economic profiles. ESR is the modified version.

➤  $ESR(t) = \frac{\hat{L}(t)}{\hat{C}(t)}$  where  $\hat{L}(t) = \sum_i N_i(t) * l_i$

# Methodology : Gupta (1993)

Renteria (2016) used information on education to disaggregate labor and consumption data  $\hat{L}(t) = \sum_j \hat{L}_j(t) = \sum_i \sum_j N_{ij}(t) * l_{ij}$

Now, ages and education have contributions to ESR.

$$\begin{aligned} \text{➤ } A(t) &= \sum_i \sum_j \frac{esr_{ij}(t) + esr_{ij}(t-1)}{2} \cdot \frac{e_{ij}(t) + e_{ij}(t-1)}{2} \cdot a_{ij}(t) \\ \text{➤ } E(t) &= \sum_i \sum_j \frac{esr_{ij}(t) + esr_{ij}(t-1)}{2} \cdot \frac{a_{ij}(t) + a_{ij}(t-1)}{2} \cdot e_{ij}(t) \end{aligned}$$

- $A(t)$  corresponds to **rate and age standardization of the age effect** at time
- $E(t)$  corresponds to **rate and education standardization** of the education effect
- $esr(t)$  stands for the growth in ESR
- $a_{ij}$  and  $e_{ij}$  are the age and education specific **components of  $\frac{N_{ij}}{N}$** , respectively.

# Methodology : Gupta (1993)...

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- Finally, age effect and education effect in a year are the **change in the standardized** age and education specific **rates**, respectively.
- *Age effect* =  $A(t) - A(t-1)$
- *Education effect* =  $E(t) - E(t-1)$

Once the specific effects are decomposed from overall rate, we can conclude which effect plays what types of role in first demographic dividend.

# Differences from NTA

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- Cross-classified data (by age groups and levels of education)
  - Representative weights, to the population data, to measure  $L$  and  $C$
- Since labor income series has larger variability across the education groups, the result differs from NTA estimates.
- Our method dampens the series of ESR, since the largest population groups belong to below primary level education group

# Data Sources

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- Disaggregated Population Data
- Income profiles
- Consumption Profiles
- Wittgenstein Centre for Demography and Global Human Capital (WICD)
- LFS 2010, BBS
- HIES 2010 , BBS

Per capita income and consumption profiles are harmonized with the NTA dataset (developed by Khandaker & Rahman).

# Results: Income & Consumption Profiles

Figure 4: Income Profile

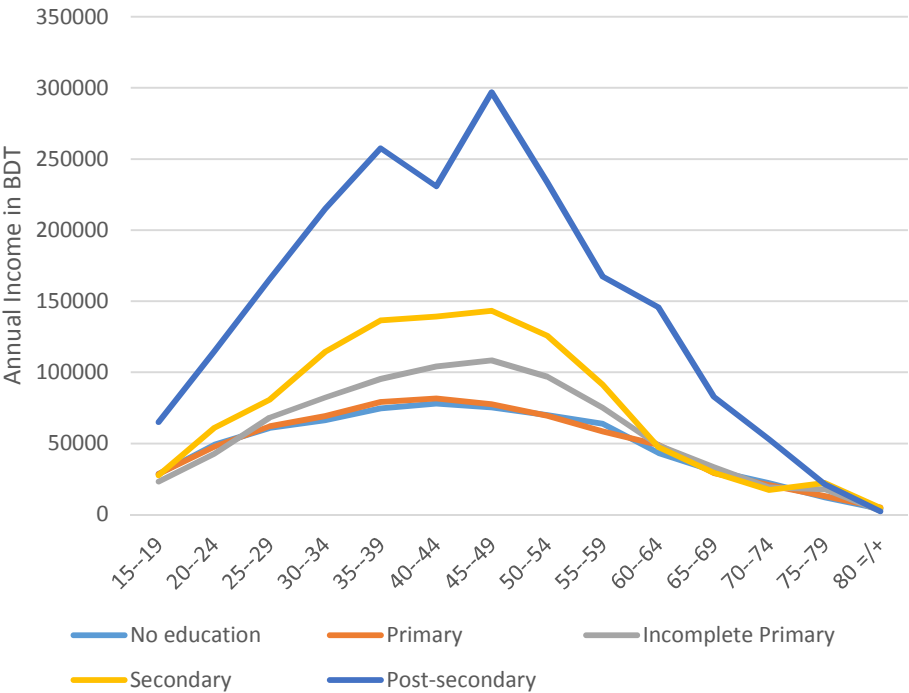
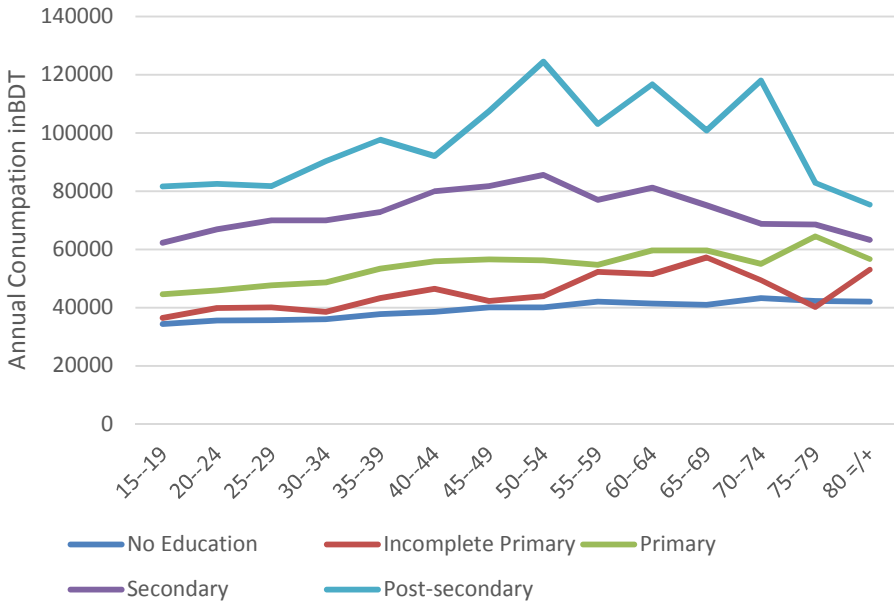


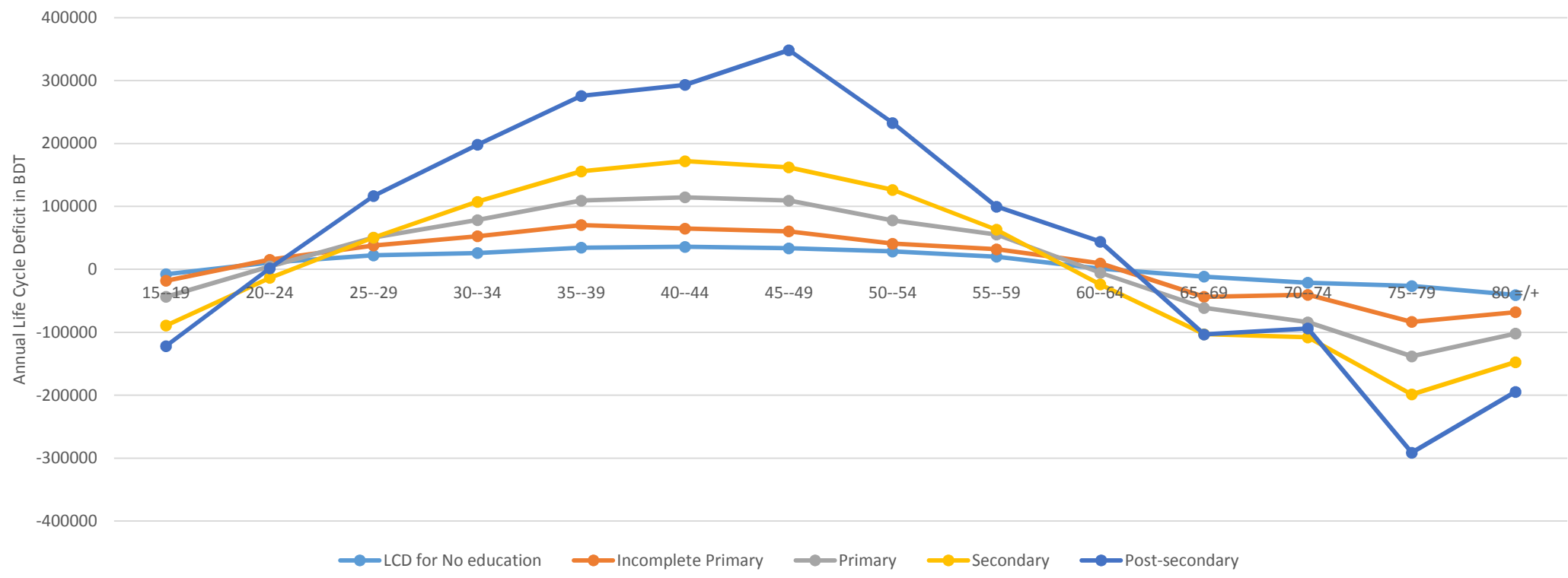
Figure-5: Consumption Profile





# Results: Income & Consumption Profiles...

Figure-6: Life Cycle Deficits



# When the First Demographic Dividend ends in Bangladesh?

Figure-7: ESR Profiles

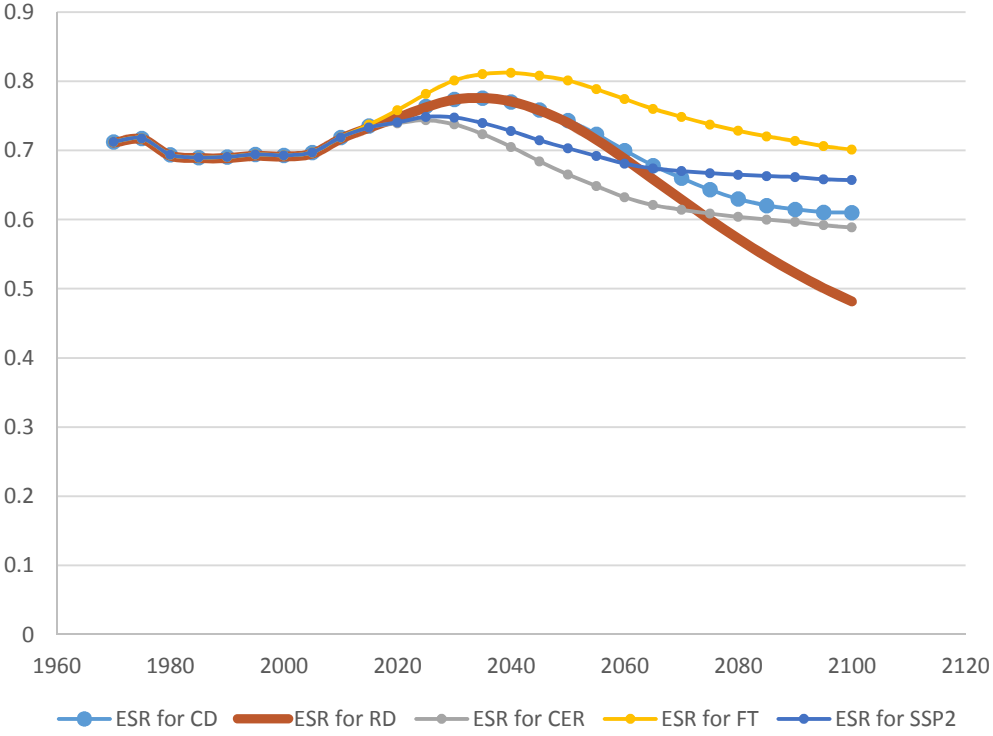
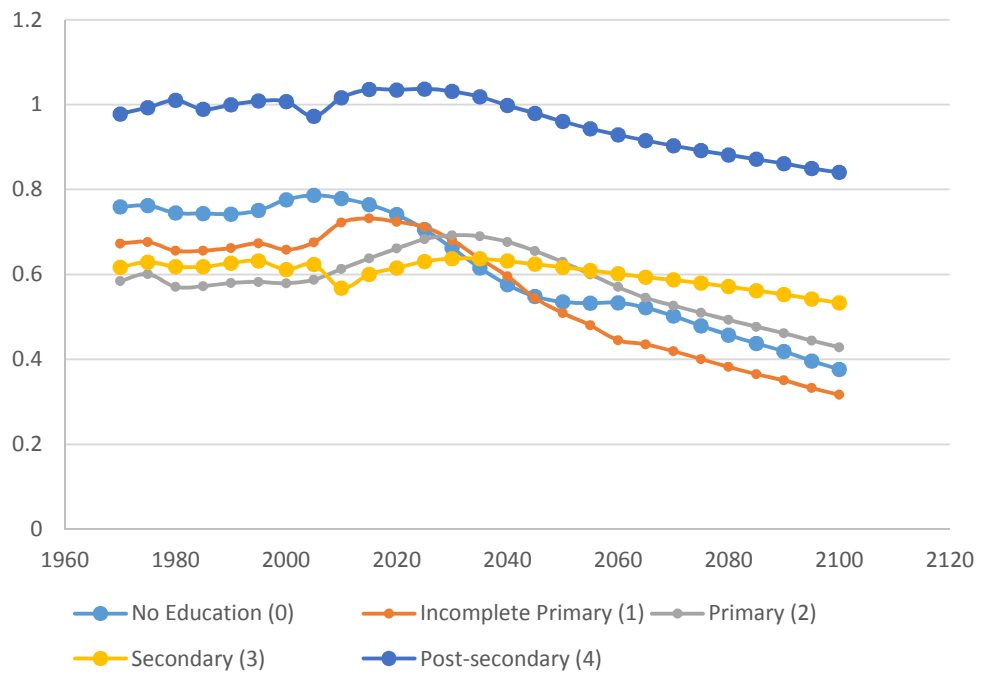
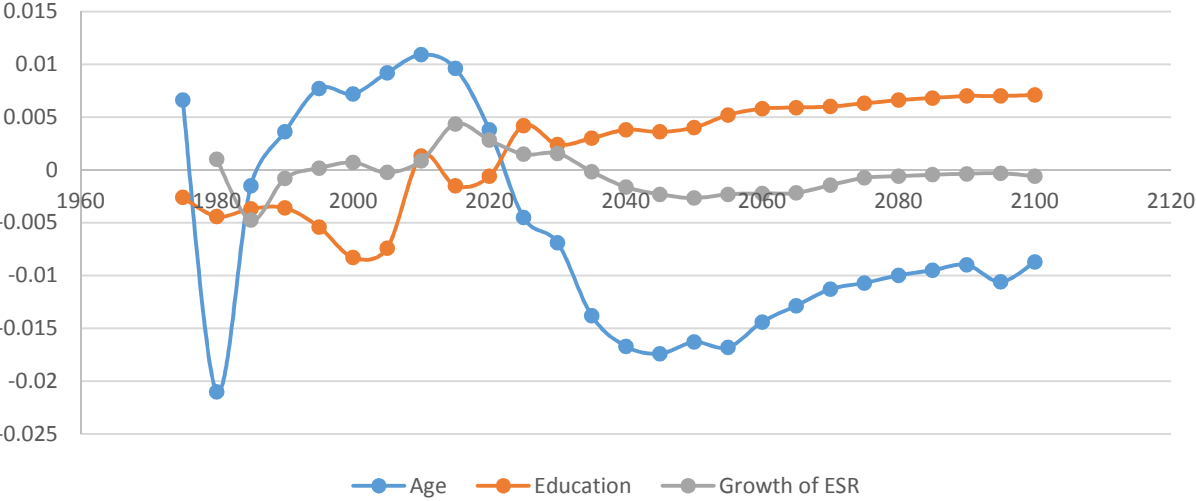


Figure-8: Educational Status-wise ESR: Medium (SSP2)



# Decomposition of Demographic Dividend

Figure-9: Decomposition of Demographic Dividend: Medium (SSP2)



# Age Effect and Education Effect

Figure 10: Age Effects

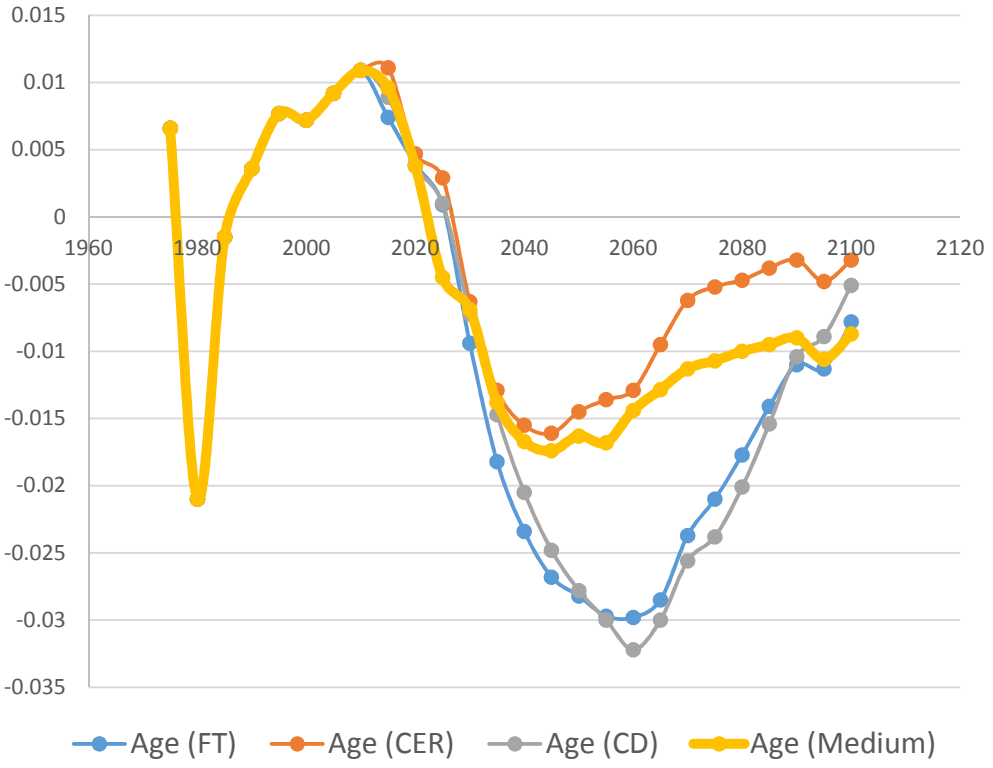
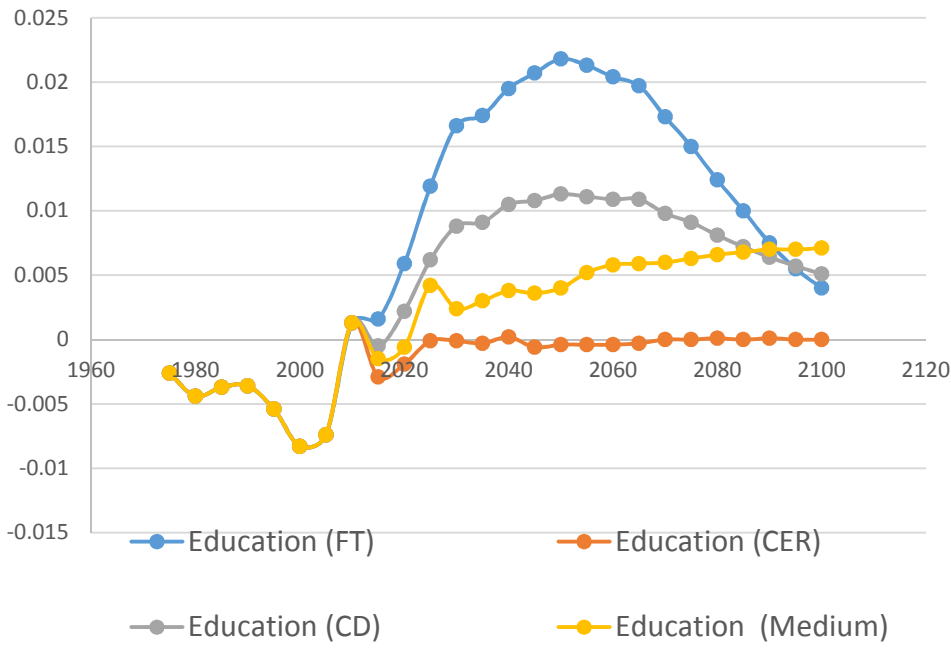


Figure-11: Education Effects



# How non-labor income is important?

>> Non-labor income is important

Ratio of Non-labor Income to Household Income

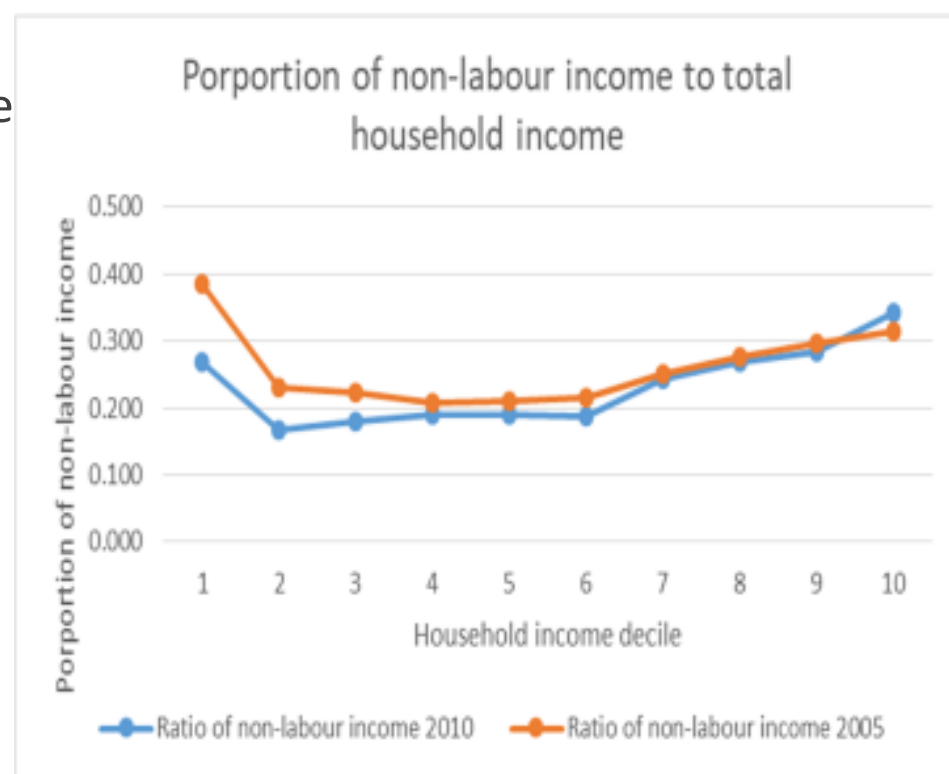
HIES 2005: 28%

HIES 2010: 26%

Asset Market is important:

- Risk (Volatility)
- Access to Credit

Necessity of Social Safety Net will be more Contextual in future.



# Conclusion

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- At the **peak** point of the ESR curve, working age population in Bangladesh can support 75 percent of its population and the range of ESR lies in the interval 66%-75% under SSP2-medium scenario and the current rate is about 73%.
- **FDD** in Bangladesh **ends by the period 2030**. This timeline could be extended by 5 to 10 years if population distribution can make the share of educational attainment higher (or share of population at lower end of education lower). Though this is statistically possible, it is the toughest job to accomplish it within a decade.
- **Education Effect** to the demographic dividend was **negative** throughout the last four decades of Bangladesh.
- It is projected that economic support ratio in **future** will be accompanied by **negative age effect** and this negative effect will be mitigated by positive education effect at some extent.
- Labor **income profile** was **not demographic dividend stimulating** though this is important to have a favorable progress in support ratio.
- The challenge is to keep a vigilant focus on how to mitigate negative age effects and to **support low educated population**, retired from **informal sector employment**, at their old age.

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**Thank you!**