Human capital-induced labor productivity growth and first demographic dividends in four Asian countries

Michael R.M. Abrigo, Naohiro Ogawa, Yasuyuki Sawada, Tetsushi Sonobe,

Rikiya Matsukura, Suphannada Lowhachai, and Sharifah Azizah Haron

Background: The era of growth driven by favorable demographics is ending as population ageing deepens globally.

Aim: This paper examines whether improvements in human capital (i.e., health gains and educational attainment) can offset the economic impacts of population ageing.

What we do: To analyze labor productivity improvements and demographic dividends over the past 30 years and project trends through 2050.

Data: Long-term cohort-specific aggregated data from Japan, Malaysia, the Philippines, and Thailand.

Method: A growth accounting framework, combining regression estimates based on demographic, labor income, education, and health data.

Key Findings:

- HC expansion has significantly contributed to per capita income growth across all four countries.
- In Japan and Thailand, this growth has been sufficient to offset the negative effects of population ageing.
- However, in Malaysia, the Philippines, and Thailand, the returns to education and health investments are declining, suggesting future limitations on growth through human capital alone.
- Evidence indicates misallocation of human capital, whereby higher levels of education do not translate into higher labor force participation, particularly in the Philippines and Thailand.

Policy Implications: To unlock growth potential, countries need to tailor education and health policies to their demographic and labor-market realities by identifying and addressing the causes of human-capital misallocation.

Framework:

$$\frac{Y^l}{N} = \frac{Y^l}{L} \times \frac{L}{N}. \tag{1}$$

$$g\left[\frac{Y^l}{N}\right] \cong g\left[\frac{Y^l}{L}\right] + g\left[\frac{L}{N}\right], \tag{2}$$

$$\ln y^l(a,t) = \rho_s s(a,t) + \rho_h h(a,t) + \gamma_a + \gamma_b + e(a,t), \tag{3}$$

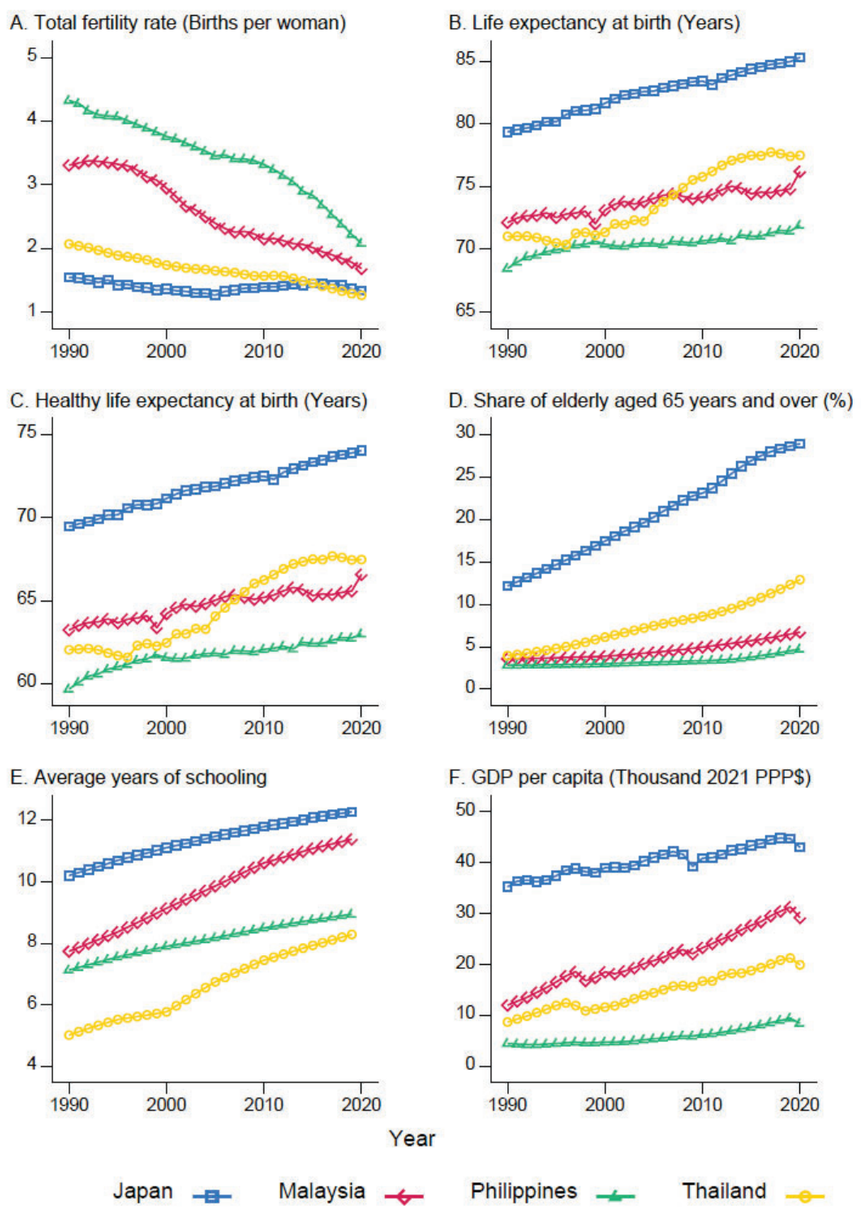
$$\ln y^l(a,t) = \ln y_w^l(a,t) + \ln \ell(a,t)\,, \tag{4}$$

$$\ln y_w^l(a,t) = \rho_s^w s(a,t) + \rho_h^w h(a,t) + \gamma_a^w + \gamma_b^w + e^w(a,t), \tag{5}$$

$$\ln \ell(a,t) = \rho_s^\ell s(a,t) + \rho_h^\ell h(a,t) + \gamma_a^\ell + \gamma_b^\ell + e^\ell(a,t). \tag{6}$$

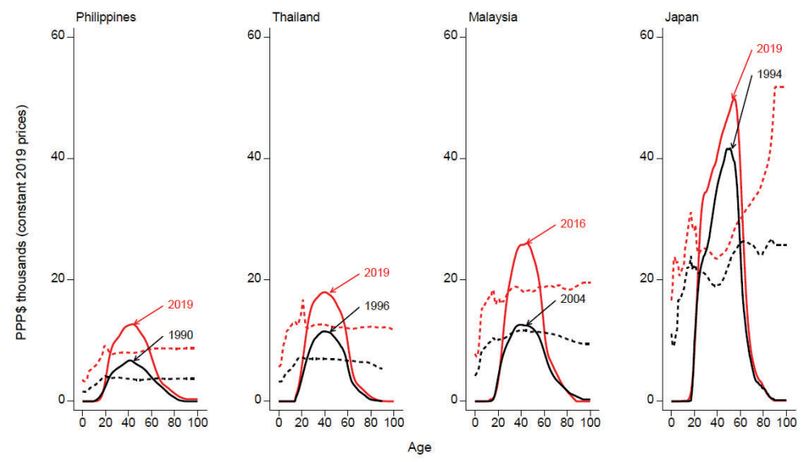
$$E[Y_t^l|\Delta s, \Delta h] \cong \sum_a \left[y^l(a,t_0) \cdot \exp\left(\widehat{\rho_s}\Delta s(a,t) + \widehat{\rho_h}\Delta h(a,t)\right)\right] \cdot P(a,t), \tag{7}$$

Figure 1: Demographic and Economic Trends: Selected Countries, 1990–2020



Source: GBD Collaborative Network (2022), United Nations (2024), World Population Prospects, World Bank (2024), World Development Indicators, and Barro and Lee (2013). Note: We expand Barro and Lee's (2013) database to include up to the age of 79 and the year 2020. See Section 2 for estimation details.

Figure 2: NTA Economic Life Cycle Age Profiles



Note: Solid lines refer to labor income per capita, while dashed lines refer to consumption per capita.

Figure 4: Estimated Contribution of Education and Health to Per Capita Labor Income Growth

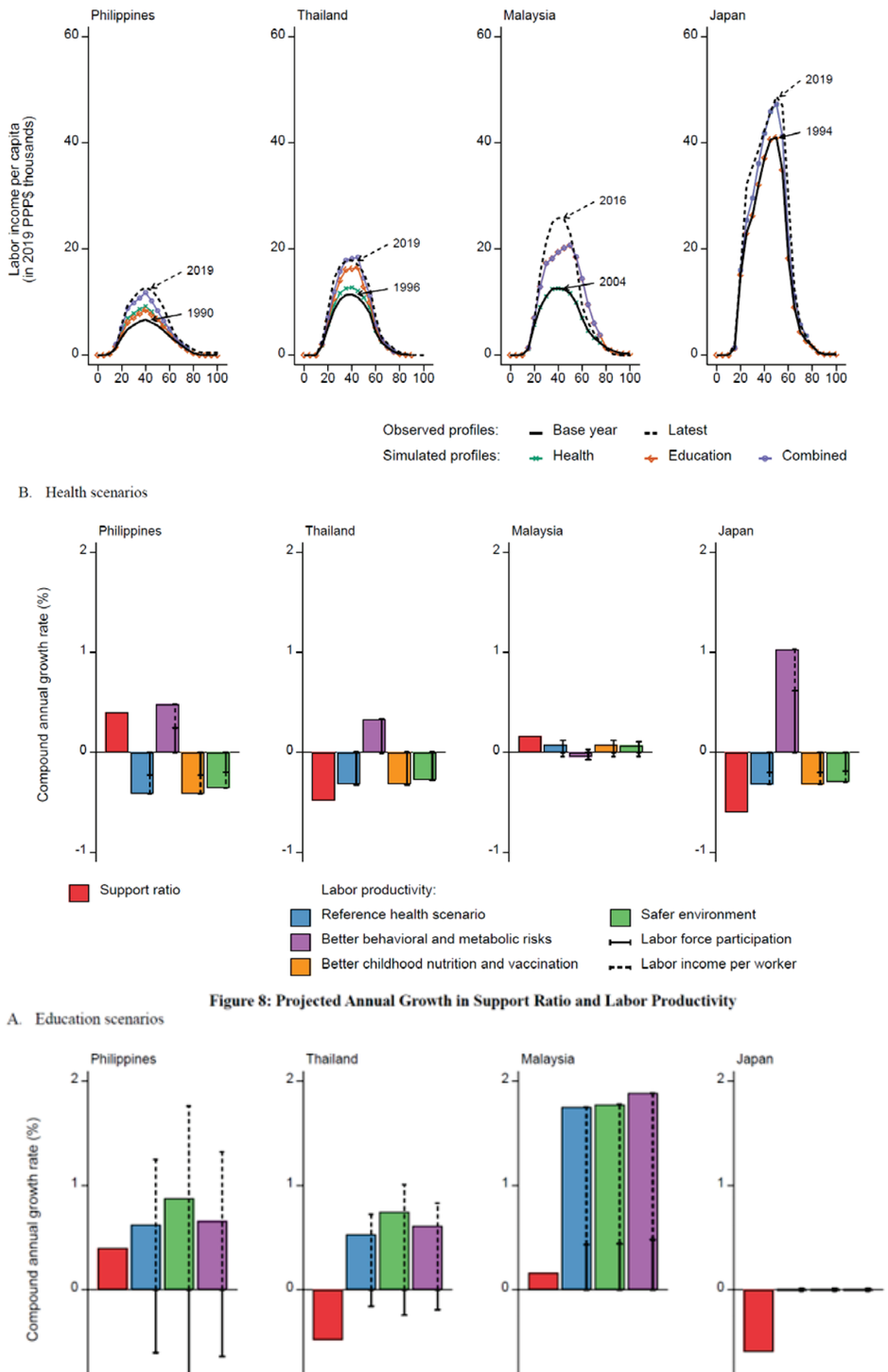


Figure 8: Projected Annual Growth in Support Ratio and Labor Productivity