Population Aging and Its Impact on Economy and Society: The Case of Asian Countries

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I. Introduction:
Dimensions of Population Ageing
Figure 1: Asia Ageing: 1950-2050
Percent of the Population Aged 65+
1. Two Dimensions of Population Ageing

- Two Forces of Demographics: (1) Increasing Life expectancy, (2) Declining Fertility

- **Increasing Life-Expectancy**: + effect on labor supply; - effect on social security thru. Increasing old-age dependency

- **Declining Fertility**: - factor for labor force growth; - effect on productivity (if age – productivity correlates negatively)

- Population Ageing is an outcome of the Two Forces -> the Net impact is open, undetermined
  - Which force is dominating?
2. Definition of the ‘Old-aged’: who are the ‘old-aged’ anyway?

- Varies by country and between population and labor statistics
- 65+ in most population statistics
- 50+ or 55+ in labor statistics of many countries
- As the human life-expectancy ever increasing, we may need to redefine ‘the old-aged’ in the near future
  - Many European countries: plan to raise up their pensionable age (65 -> 67 -> 70?)
  - Improvement of health => biological age becoming younger
  - Social recognition of ‘being old’ => 70+ in social surveys
3. Population Decrease: Size or Rate?

- Population ageing could proceed without a significant decrease in the absolute size of the population and the labor force.

- Ex: ROK => would become ‘aged society’ by around 2020, while her population and labor force will be still growing by then (Taiwan, about the same).

- More critical is Rate!
  - decreasing rate of growth (population or labor force), more closely related to economic growth
  - Esp. the proportion of the economically active population (15-64)
Figure 2. Growth Rate of Population (15-64) and GDP: Trends and Prospects in Asian Countries
II. Population Ageing and its Impact on Economy and Society
1. Does Population Ageing Matter?

- **Yes** – negative impact of ageing population on labor market and economy
- **No** – positive impact of ageing population on productivity and economy
- **Depends** – could be either negative or positive depending on the context, institution and responses
- **Not sure** – wait to be seen
Multiple factors need to be considered

- In projecting the impact of population ageing on economic growth, multiple factors should be taken into account.

- Depending on how (1) future fertility changes are assumed, how (2) labor quality (productivity) changes are predicted, how (3) participation (economic, labor force) pattern and rates are predicted, and (4) how total factor productivity is estimated,

- the projection result could be wildly different.
Critical Variables and Assumptions

- Labor **Quantity**: future **Fertility and Mortality** assumptions: hard to predict, variation large between projections

- Labor **Quality** (**Productivity**) changes: esp. Investment in Education and Job Training

- Labor Force Participation (**LFP**) variable: Pattern and Rates (esp. female, old-aged, youth)

- Technology and Skill Development: Total Factor Productivity (**TFP**)  
  + social organization of production and innovation.

- Physical **Capital**: Savings and Investment
(1) Fertility

- As being notoriously hard to predict (Bongaarts, 1998), there is a significant variation in the future fertility rates assumed across projections by the same agency and between projecting agencies.

(2) Labor Force Participation Rates

- Obviously more active participation of older workers/females could compensate the negative size effect of population ageing on economic growth.
(3) Labor Productivity

• Upgrading labor productivity => recommended as an effective alternative to solve for the problem of labor shortage

• Particularly relevant for the economy where labor input was one of the most important source of fast economic growth in the past (like the Republic of Korea)(Kim, D. S., 2004).

• Upgrading the quality of input(i.e., productivity) is more effective than increasing the quantity of factor input(labor force) (Skirbekk, 2004).
2. How Population Ageing Matters?

- First, **accounting effect**:
  - because a **decreasing ratio of the working-age population** to the total population increases the ratio of consumers to producers
  - This contributes negatively to growth of output per capita

- Second, **behavioral effect**:
  - on growth of output per worker,
  - Negative or positive effects of an ageing population on economic growth as measured by output per worker
  - Participation and Productivity changes are the key!
Impact on Macro-Economy: Production Function

- Impact of Population ageing on Economic Growth: Negative or Positive?

- For economic growth, Capital(K), Labor(L), TFP(A) – each and every factor matters
  - Asian 4 Tigers in the past: most dependent on L

- Population Ageing affecting L, but maybe K and A

- Production Function:
  \[ Y_t = A_t K_t^\alpha (L_t^e)^{1-\alpha} \]
The Impact Path of Population Ageing on Economic Growth

Population Ageing

Labor Force Ageing

Quantity of the Labor Force

Quality of the Labor Force

Economic Growth and Social Wellbeing
Quantity vs. Quality of the Labor Force

• The labor force as the *mediating factor* between population ageing and economic performance

• **Stylized Fact**: Smaller and older labor force in the future
• But critical variable: *quality (productivity)* of the labor force

• The impact of the population aging on economic growth => fair only when both sides of labor input: *quantity and quality*

• Stylized fact = unavoidable, then, *policy effort should be focused on the quality of the labor force* (Borsch-Supan, 2003; Skirbekk, 2004)
The Question is:

• Would it be possible to raise up the labor productivity to the extent that is **large enough to compensate for** the decreasing labor force and output growth?

• **Korea: Labor productivity will reach plateau by around 2015**

• **D.I. Kims(2004)’s simulation:** only 0.2~0.4% growth in labor productivity expected vs. average 2.0~4.0% growth rate in last 30 years
III. Perspectives on Population Ageing
1. Pessimistic View

- Population ageing has negative effects on economic growth through a set of inter-related mechanisms:

(1) decreasing labor input
   - due to low population growth and ageing;

(2) decreasing savings rate and capital accumulation
   - due to increasing dependency ratio and social cost of caring the old-aged;

(3) decreasing investment into the human capital
   - of the young generation due to increasing social welfare cost

(4) lower level of innovation and renovation
   - due to ageing population

* (Bloom et al, 2002; Borsch-Supan, 2002; OECD, 1998; World Bank, 1994)
Basic Concern

- This basic concern is that – with fewer workers, and more individuals in retirement, as the baby-boom generation ages, there will be too few people producing goods and services for the entire population.

- This development is sometimes called a "crisis" (World Bank (1994)), a "crucial" issue (Mintz (2004)) or a "demographic storm" that we should worry about" (Fortin (2006)),

- Auditor General Report (Canada, 1998) concluded that
  - “unless our productivity somehow increases significantly or patterns of work and retirement change substantially …the growth in the economy … will tail off in the coming decades."
Ex: Researchers on Korea

- Many researchers (Choi and others, 2003; Kim, D. S., 2004; Lee, 2001) in Korea put out negative scenarios.

- Labor input was one of the most important source of fast economic growth in the Korean past history

- Extremely low fertility -> decreasing growth of productive population -> low growth of labor input

- It is predicted the potential economic growth rate will be down from 8.8% (2000) to 4.1% (2010) -> 3.1% (2020) -> 2.2% (2030) -> 1.3% (2040) -> 1.0% (2050)
Pessimistic


2. Optimistic View

• On the positive side, in contrast, scholars point out the positive effects of population ageing on economic growth such as

(1) development of labor-saving technology and
(2) increased investment into human capital
  - which will compensate for the lost growth rate

• **If labor will become a scarce resource** → wage will rise → capital will increasingly substitute for labor,
  - i.e., **capital intensity** will rise and with it **labor productivity**

* Cutler and others(1990): decreasing labor force growth results in increasing labor productivity (cross-national panel study)
Neoclassical Growth Model
- generally optimistic

• Neoclassical growth model predicts
  – an increase in output per worker through “capital deepening”
    => ↑ in labor productivity
  – Variable: Savings rate

• With lower labor force growth,
  – there is more capital per worker (capital deepening effect), and
    labor productivity (output per worker) increases

• But, in terms of aggregate output,
  – the negative participation effect always dominates the (second-order) effect of capital deepening
Brandner and Dowrick (1994)

• They find that the capital-deepening effect is weak and insignificant and find a much stronger impact of the working age share of population which is both positive and significant.

• Yet, the most important source of variation in output and growth appears to be a productivity indicator taken to reflect the current stage of technological progress in each country.

Some Macroeconomic Effects of Population Aging on Productivity Growth and Living Standards (Scarth, 2007)

• Lower population growth is not always bad!

• Lower population growth frees up a larger proportion of each year's output to be used for current consumption instead of accumulating capital

• This freeing up permits higher living standards, and acts as a partial counter-balance for the depressing effect that stems from the higher dependency ratio
Population Ageing and Living Standards

• Negative Effects:
  • (i) the higher old-age dependency ratio, (ii) the increase in tax rates that will be necessary to maintain the public pension and health care programs, (iii) the reduction in labor productivity as individuals age

• Positive Effects:
  • Several other dimensions of the aging population will raise living standards: (iv) the lower population growth rate, (v) the higher savings rate
(ref) Optimistic


More Debate than Consensus!

• On the effect of population ageing on economic growth
  – there are still more debate than consensus between researchers

• While the majority of scholars uphold a pessimistic view,

• quite a few scholars advance an optimistic view
  – pointing out over-simplified pessimism ingrained in the pessimistic views so far advanced (see Gee, 2000)
IV. Ageing and Labor Productivity
1. Key Variables

- The sensitivity of projected economic productivity with respect to three key assumptions on the labor market.

- These include: the projected labor force participation rates, the assumption of the age-productivity profile of workers, and the degree of substitutability between labor of different ages.

  - Who participates and to what extent?
    - Same productivity but with lower vs. higher LFP rates
  - Age-productivity Profile: inverted U-shape?
  - Old vs. Young Workers substitutable?
    - In terms of human capital, skill, attitude
Key Variable (A): Participation

- Especially for female non-active population and the old-aged (early retirees)

- Negative size effect of population ageing on economic growth could be compensated by increasing labor force participation rates

- Policy Intervention and Initiatives - make a significant difference
Figure 3. Labor Force Participation of the Old-aged: International Trends

Male (60-64)  Female (60-64)
Figure 4. LFP Rates of the Aged: Int. Comparison (2008)
Key Variable (B): Labor Productivity

• One of the fundamental measures
  – against the adverse effects of ageing population and shrinking labor force will be improving the productivity of the labor force

• Increasing labor productivity is in fact recommended
  – as an effective policy alternative to solve for the problem of labor shortage and stagnant economic growth

  – “If consistent growth in labor productivity and increasing labor force participation among women could be achieved in coming decades, then, the negative effect of population ageing could be much mitigated” (Cho, 2000).
2. Ageing and Individual Labor Productivity

- Aging of the workforce at times of fast technical change - a crucial policy issue
  - Particularly so at times when fast spreading of new technologies makes skills rapidly obsolete

- Yet aging also brings about experience and seniority for workers

- Innovative and absorptive capacity matter
  - Importance of efficiency in innovation, and technology implementation in particular (Jovanovic 1997)
Age and Individual Productivity: 
A Literature Survey (Skirrbeck, 2004)

• How individual productivity varies by age, as well as the causal factors of these productivity differentials

• The weight of the different causal factors in determining individual productivity is steadily changing,
  
  – where mental abilities and education have long been growing in importance, while physical abilities have become less important.

• Continuously changing types of work can imply that
  
  – the ability to absorb new information is becoming increasingly important relative to having long experience.
Skirbekk (2004) – negative view

• presents several arguments why population ageing will most likely decrease economic productivity.

• In general, the evidence suggest that individual productivity tend to follow an inverted U-shaped profile, where significant decreases take place from around 50 years of age.

• His main point is that productivity at the individual level is unambiguously negatively related to age for older workers and this effect will dominate also any countervailing forces at the macro level.

Bo Malmberg, Thomas Lindh, and Max Halvarsson (2005) – positive view

• Productivity consequences of workforce ageing - Stagnation or a Horndal effect?
  - With Data on the Swedish mining and manufacturing industries 1985-1996

• an accumulation of high shares of older adults in manufacturing plants does not seem to have negative effect on plant level productivity

• when plant level effects are controlled for, high shares of older adults are associated with higher productivity than high shares of young adults
V. Policy Measures and Initiatives
Issues Summarized

• Quantity Issue:
  – How to boost up LFP of each stratum of work force

• Quality Issue:
  – How to boost up the Productivity of the participating labor force

• Reform Issue:
  – Education and Job Training system, Labor market institutions and Industrial relations, Social Security (esp. pension) system
  – Labor Market and Social institutions and culture
Challenges

• **Labor Market Institutions**
  – The labor market may be inefficient and not flexible enough to accommodate the changing age structure of the work force and this may cause a productivity decline.

• **Industrial Relations**
  – Very rigid (esp. large, organized firms and public sectors)
  – Seniority wage system backed by strong Union prevailing

• **Age discrimination:**
  – detrimental to the employment of the old-aged
Figure 5. Seniority Wage and Severance Pay: Int. Comparison (2006)
Figure 6. But Now is the Right Time
In Japan, the size of the ageing problem is such, that neither the quality adjustments nor the increased participation scenarios considered here are sufficient to prevent an absolute decline in the labor supply by 2050.
Policy Concerns:
Demand and Supply Side of the Labor Market

• In many countries with ageing population policy concerns for the quantity of labor force tend to precede that for the quality

• However, the effectiveness of supply-side measures is always conditioned by market demand (Fürnkranz-Prskawetz & Fent, 2004).
  – If enough decent jobs are not offered to old-aged job seekers, then, the supply-side measures would not be much effective.

• Actually demand-side condition could be more serious than supply-side issue in many Asian countries (Korea), where job opportunities for the old-aged are quite limited.
Important!
Retirement Policies and Pension Systems

• On the demand side perspective:
  – retirement policies and practices at firm level are an important issue to be discussed for extended employment of the old-aged workers.
  – While retirement policies constitute a ‘push’ factor for non-employment of the old-aged workers, pension systems and policies is a ‘pull’ factor.

• In many countries,
  – mandatory retirement at fixed age is forced at firm level and the old-aged workers are forced to quit their main job even when they are still healthy and productive.

• How and to what extent pension systems in respective countries affect workers’ retirement choice is thus an important research topic to be explored.
(1) **Mobilizing Potential Manpower of Women and Older People**

① Promotion of *Women's Participation* in Economic Activities: strengthening active employment policies for women, and developing workability of women and support their employment/continued work career

② Pursuing “Active Ageing” to Utilize Elderly Manpower: legislation prohibiting age discrimination and improving mandatory retirement system, reform of wage system of corporations and diversification of working hours and conditions, strengthening work incentives of older workers
(2) Promoting Competitive Power of Human Resources and Their Utilization

① Development of Virtuous Circle of Workability and Life-long Education:
   – by strengthening linkage between school education and labor market, expanding opportunities for vocational training life-long learning, modernizing vocational training facilities and national licensing system

② Preventing Loss of Workforce by improving safety and health conditions of workplaces, and strengthening occupational rehabilitation
(3) Creation of Jobs for the Elderly

① Policy Assistance to Provide Work Opportunities to the Needy Elderly
   - esp. decent part-time jobs and flexible work arrangements

② The Korean government began to emphasize job creation for the elderly particularly from 2004, and the five-year plan set a goal of creating about 70,000 jobs every year
Table 1. Old but Willing to Work: 2008, 2009

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<th>To be Active</th>
<th>Other</th>
<th>Don’t want</th>
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<td>38.7</td>
<td>Multiple choice</td>
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<tr>
<td><strong>Singapore (50+)</strong></td>
<td>77.9</td>
<td>12.4</td>
<td>9.7</td>
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(4) Building Stable Old-age Income Security System

- Ensuring the sustainability of the National Pension System and special occupational pension systems (Government Employees Pension, Military Servicemen Pension, Private School Teachers Pension)

- Enhancing portability between National Pension and special occupational pensions
(5) Reforming Retirement and Seniority Wage System

- Restricting the use of early Mandatory Retirement
- Rationalize further the Wage Subsidy for Older Workers
- Boost-up Wage-peak arrangement for longer work life of the old-aged

(6) Improving the employability of older workers

- Job training opportunities for mid-career and older workers
- Target-specific Public Employment Service
- ‘good’ part-time jobs with flexible work hours
- Improve working conditions and safety for older workers
VI. Summary and Conclusion

• Two contrasting perspectives on population ageing: Pessimistic vs. Optimistic

• What will happen to Asian countries?

• Critical Variables can be changed by national strategies and responses

• In sum, 21st Century: not Quantity, but Quality
• Investment into Human Capital and Productivity (both Micro- and Macro-level)

• Encouraging Female LFP and Providing Decent Work Opportunities to the Old-aged – basic requirement

• Reform needed on Labor Market Institutions and Culture, esp. Retirement Policies and Age Discrimination

• National Initiatives for Active Ageing and Social Partnership
The "problems" of an aging population, or "challenges" if one prefers, are not going to go away in a few years, to be replaced by others. They will be with us for a long time. Short-term "solutions" should be suspect. Think long (Denton and Spencer, 2003).

The possibility of a second demographic dividend arises because some of the gain in per capita income can be diverted to raising productivity and thereby raising the standards of living for future generations (Mason, 2008).
Thank You!