Depopulation/Aging and Development
How should we capture it, cope with it?

(For Discussion Meeting with Delegates from NESDB, Thailand)

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Part I
Trends, Issues

World Population Dynamics
(from UN Population Projections)

- World Population: 2.5 bil. (1950); 6 bil. (2000); 9.1 bil. (2050)
  Developed: 0.81 bil. (1950); 1.19 (2000); 1.25 (2025); 1.24 (2050)
  Developing: 6.66 (2025); 7.84 (2050)
- Growth Rate of Population: 1.8% p.a. (1950-2000);
  0.8% p.a. (2000-2050)
- (Gross) Birth Rate: 37.5/1000 (1950-55); 22.5/1000 (1995-2000);
  13.8/1000 (2045-50)
- Total Fertility Rate: 5.02 (1950-55); 2.79 (1995-2000); 2.05 (2045)
- Life Expectancy: 46.6 (1950-55); 64.6 (1995-2000); 75.1 (2045-50)
- Rate of Population Aging (% of 65 and over in Population)
  Developed: 7.9% (1950); 14.3% (2000); 25.9% (2050)
  Developing: 4.1% (1950); 5.9% (2000); 14.6% (2050)
- Population of 65 and over in Developing Countries:
  66.8 mil. (1950); 250.3 mil. (2000); 1.14 bil. (2050)
  59.4%; 78.1% of World Aged
In Need of Changing Mentality

• 20th Century
  - Population Explosion
    - Low Income
    - Equilibrium Trap
  - Population Bonus
    - Demographic
    - Dividend

• 21st Century
  - Depopulation/Aging
    - Aging w/o Development
    - Sustainability of High Income
  - Burden of Aging
    - Demographic
    - Penalty

World Total Fertility Rate Map (2006)

Note: Replacement rates are 2.07-2.08 for developed countries; 2.5-3.3 for developing countries.
Note: Replacement rates: 2.1 for developed 2.5-3.3 for developing.

Source: Author’s compilation from WDI2007.
Population ages 65 and above (% of total)

Source: Author's compilation from WDI2007.

Labor force participation rate, total (% of total population ages 15-64)

Source: Author's compilation from WDI2007.
Determinants of the private saving ratio:
Income (level), rates of return, uncertainty, domestic/foreign borrowing constraints, financial depth, fiscal policy, pension system, income/wealth distribution, and demographics …

East Asia’s saving ratio (GDS) increased from 22% to 32% in the 1970s, and reached 37% before the AFC, facilitating a healthy increase in the investment ratio… The CA deficit also expanded in the 1990s until the AFC came about. And then?
Aging Japan

Unavoidable depopulation and aging

Population in Japan

Fertility Rate
Until early 1970s
Around 2.2
2000  1.36
2005  1.26
Medium case
Same level as now
2030  1.24
2055  1.26
Lower case
Drop until 2020s
2030  1.04
2055  1.06


Population Pyramid in Japan

Source: http://www.ipss.go.jp/

2008/04/07  low fertility & aged society and social security
Government expenditure for social security
(from Prof. Fujikawa’s PP)


2008/04/07 low fertility & aged society and social security 15

History of Internal Migration in Japan
Toward the Era of Regional Autonomy?

Net inflow of population to Metropolitan Tokyo
Movement inside rural from one prefecture to another
Movement from rural to urban
Movement from urban to rural
Movement inside urban from one prefecture to another

thousand
Figure 2: Decomposition of change in distribution and poverty into growth and distribution effects

Change in Poverty = \( F(\text{growth, distribution, change in distribution}) \) (assuming log-normal distribution)

Recent Movements in Japan’s Gini Indices

<table>
<thead>
<tr>
<th>Year</th>
<th>Gin Index before Redistribution</th>
<th>Gin Index after Redistribution</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>0.361</td>
<td>0.2162</td>
<td>0.14</td>
</tr>
<tr>
<td>2000</td>
<td>0.4162</td>
<td>0.3162</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Source: Author’s unscientific imagination !?
## Speed of Aging in East Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>(1) Share of Aged 7%</th>
<th>(2) Share of Aged 14%</th>
<th>Period between (1) and (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>1970</td>
<td>1994</td>
<td>24</td>
</tr>
<tr>
<td>South Korea</td>
<td>1999</td>
<td>2017</td>
<td>18</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>1983</td>
<td>2014</td>
<td>31</td>
</tr>
<tr>
<td>Singapore</td>
<td>2000</td>
<td>2016</td>
<td>16</td>
</tr>
<tr>
<td>Thailand</td>
<td>2005</td>
<td>2027</td>
<td>22</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2019</td>
<td>2044</td>
<td>25</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2019</td>
<td>2041</td>
<td>22</td>
</tr>
<tr>
<td>Philippines</td>
<td>2026</td>
<td>2049</td>
<td>23</td>
</tr>
<tr>
<td>China</td>
<td>2001</td>
<td>2028</td>
<td>25</td>
</tr>
</tbody>
</table>

Note: Based on the Medium scenario from the UN population projections. Based on the assumption of TFR converging to 1.85. Explanations are added. Source: Oizumi, Kajiwara, and Niitame (2006). Aging in Developing Countries: Viewpoints to New Assistance. Tokyo: JICA. (In Japanese) Table 3-7 (p.57).

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## Part II

### Theoretical/Conceptual Framework
Macroeconomic Impact of Depopulation/Aging
(A Summary)

- Declining (Physical) Labor Inputs
- Declining Domestic Saving
- Increasing Social Security Costs -- Heal Care, Pension, (Poverty)
- Declining Potential Growth Rate

From Growth Accounting: $Y = F(K, L, t)$
contribution from very factor shrinks

Population Bonus – Demographic Dividend
(Demographic Economics)

- Population Conversion Phases
  (1) High Birth – High Death
  (2) High Birth – Low Death
     Population Explosion – ‘Low-Level Equilibrium Trap’
  (3) Declining Birth/Death Rates Population Bonus I
     with declining natural rate of population growth
  (4) Low Birth – Low Death Rates Population Bonus II
     rate of population growth decline further
     entering the phase of population aging
     Thailand in 1990s
  (5) Birth Rate Lower than Death Rate
     depopulation with rapid aging
     Japan after 2005
     Thailand in early 2040s
Population Bonus – Declining DR (or DR<50%)

- **Making the Most of Population Bonus**
  
  (1) Growth Accounting: \( Y = F(K, L, t) \)
  
  (2) Population Bonus only as “Potential Gains”
  
  - Employment generation to take advantage of rising (younger) \( L \)
  - Development of financial market to take advantage of rising \( S \)
  - Conducive environment/institutions/infrastructure for HRD, R&D
  
  (3) Developed cos. entered **Population Bonus** with higher starting income ($5,000+); came out with high accomplishments.
    
    - 1965- if DR<50 is used
    - Thailand: $2,900+- now, ??? at around 2015
  
  (4) Nominal income of $10,000+ would be necessary to cope with Aging with sufficient savings and fiscal capacity.

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**Traditional Two-Sector Model**

(with Unlimited Supply of Labor)

- Redundant labor force in Traditional/Agricultural sector is absorbed in Modern/Industrial sector in the process of ‘industrialization’.
- As redundant labor disappears, modern sector wages start to increase and domestic terms of trade turns against industry.
- To preserve the process of industrialization, 1) food importation and/or 2) green revolution would be necessary. 1) would damage farmers welfare. 2) should benefit both farmers and city workers/entrepreneurs (allocation can be changed by price controls).

- Declining labor force by depopulation/aging will accelerate/strengthen the process of profit squeeze in the modern sector, and this in turn, calls for additional policies/innovation.
Neo-Classical Growth Model

New Growth Theories
(Simple AK Model w/ IRTS)
What Could/Should be the Source(s) of pcY Growth under Depopulation/Aging?

- Knowledge Capital
- Creation of Positive Externalities
- Technology Progress, Productivity Increase
- Efficient Institutions/Systems
  meaning…
- Education, Investment in Human Capital, ICT Development, Public-Public Partnership
- Building Better Institutions, Social Capital

### Development Stages Theory of BOP (cf. Crowther, 1957)

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Korea</th>
<th>Singapore</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt Repayment Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Asset Take-down Country</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Current Account Balance | Surplus |       |       |           |       |
| Trade Balance in Goods & Services | Surplus |       |       |           |       |
| Income Balance (returns on Investment) | Surplus |       |       |           |       |
| Net Foreign Assets | Surplus |       |       |           |       |
| Capital Account Balance | Surplus |       |       |           |       |
Part III
What can/should be done?
Japan & Asia should develop their own model(s)!!

<table>
<thead>
<tr>
<th>Nation</th>
<th>Western Europe</th>
<th>Japan</th>
<th>Ireland</th>
<th>Hungary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Late 14th c.</td>
<td>1730~1800</td>
<td>Late 19th c.</td>
<td>1980~</td>
</tr>
<tr>
<td>Decline</td>
<td>70~80 mil</td>
<td>32 mil.</td>
<td>2 mil. In 10 years</td>
<td>0.3% decline annually</td>
</tr>
<tr>
<td>Reason</td>
<td>Black death</td>
<td>Famine</td>
<td>Famine Emigration</td>
<td>Lower birth rate</td>
</tr>
<tr>
<td>GDP</td>
<td>−0.3%</td>
<td>0.2%</td>
<td>0.7%</td>
<td>0.6%</td>
</tr>
<tr>
<td>GDP Per capita</td>
<td>0.4%</td>
<td>0.3%</td>
<td>1.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Impact</td>
<td>Labor scarcity</td>
<td>Agricultural technology</td>
<td>Change to livestock farming</td>
<td>Marketization Investment</td>
</tr>
</tbody>
</table>

Source: Economic planning Agency (2000)
### Nominal per capita (2006) vs. PPP per capita (2007)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Luxembourg</td>
<td>80,288</td>
<td>Luxembourg</td>
</tr>
<tr>
<td>2</td>
<td>Norway</td>
<td>79,154</td>
<td>Qatar</td>
</tr>
<tr>
<td>3</td>
<td>Qatar</td>
<td>70,754</td>
<td>Norway</td>
</tr>
<tr>
<td>4</td>
<td>Iceland</td>
<td>62,976</td>
<td>Kuwait</td>
</tr>
<tr>
<td>5</td>
<td>Ireland</td>
<td>58,883</td>
<td>United Arab Emirates</td>
</tr>
<tr>
<td>6</td>
<td>Denmark</td>
<td>57,035</td>
<td>United States</td>
</tr>
<tr>
<td>7</td>
<td>Switzerland</td>
<td>56,711</td>
<td>Ireland</td>
</tr>
<tr>
<td>8</td>
<td>Sweden</td>
<td>47,069</td>
<td>Iceland</td>
</tr>
<tr>
<td>9</td>
<td>United States</td>
<td>45,594</td>
<td>Canada</td>
</tr>
<tr>
<td>10</td>
<td>Netherlands</td>
<td>45,429</td>
<td>Denmark</td>
</tr>
</tbody>
</table>

Source: [http://en.wikipedia.org/wiki/Per_capita_income]
- CIA World Factbook
- International Monetary Fund, World Economic Outlook Database, September 2006

### Structural Reform: Agenda for Sustained Growth/SS

- Expansion of Corporate Activity and Investment
- Self-reliance of Individuals
- Job choice society
- Human capital investment
- Portfolio investment diversification
- IT revolution
- Entrepreneurship promotion
- Personal income taxation
- Social security
- Labor market liberalization
- Budget consolidation
- Administrative reform (FILP) Public S-I Channel
- Local govt autonomy
- Electronic government
- Corporate governance
- Corporate accounts disclosure
- Corporate restructuring
- Inward FDI
- Regulatory reform
- Financial system reform
- SME policy
- Public investment reform
- Information network
- Entrepreneurship promotion
- SME policy
- Public investment reform
- Information network
- Budget consolidation
Structural Reform: Scandinavian (N.European) Model

- Expansion of Corporate Activity and Investment
- Corporate governance
- Employment practices
- Corporate accounts disclosure
- Corporate restructuring
- Inward FDI
- Regulatory reform
- Corporate taxation
- Financial system reform
- SME policy
- Public investment reform
- Information network
- IT revolution
- Entrepreneurship promotion
- Corporate pension (401k type)
- Personal income taxation
- Corporate pension (401k type)
- Budget consolidation
- Administrative reform
- (FILP) Public S-I Channel
- Local gov’t autonomy
- Electronic government
- Compact and Efficient Government

Structural Reform: American Market-Based Model

- Expansion of Corporate Activity and Investment
- Corporate governance
- Employment practices
- Corporate accounts disclosure
- Corporate restructuring
- Inward FDI
- Regulatory reform
- Corporate taxation
- Financial system reform
- SME policy
- Public investment reform
- Information network
- IT revolution
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- Corporate pension (401k type)
- Personal income taxation
- Corporate pension (401k type)
- Budget consolidation
- Administrative reform
- (FILP) Public S-I Channel
- Local gov’t autonomy
- Electronic government
- Compact and Efficient Government
What would/should Asia Choose?
(Asian SS System to deal with Depopulation/Aging)

- **Scandinavian Model of Welfare State**
  High costs call for high income/tax levels. Developing cos. cannot afford high welfare.

- **Social Insurance Model of Germany/France**
  For employed. Based on insurance premium/contributions. (J, T)

- **American/Western Model of Market-Based SS**
  Leaving-it-to-the-market (private investment, private insurance) will create winners and losers. Gini will increase with social capital meltdown. Unrealistic with large poor population.

- **Asian Model of Community Networking**
  Mixing national social security with region/community social capital. Traditional family/relative network alone cannot accommodate large aging population.

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**Structural Reform: Japan’s Agenda (mixture)**

- Expansion of Corporate Activity and Investment
- Self-reliance of Individuals
- Job choice society
- Human capital investment
- Portfolio investment diversification

- Employment practice
- Corporate pension (401k type)
- Personal income taxation

- Corporate governance
- Corporate accounts disclosure
- Corporate restructuring
- Inward FDI
- Corporate taxation
- Financial system reform
- SME policy
- Public investment reform
- Information network

- Finance
- IT revolution
- Entrepreneurship promotion
- Education reform

- Social security
- Health care
- Social welfare

- Labor market liberalization
- Budget consolidation
- Administrative reform
- (FILP) Public S-I Channel

- National SS (in reform) + Community-Based SS

- Compact and Efficient Government
- Local gov’t autonomy
- Electronic government
Multipillar Approach Proposed by the WB (Holzmann and Hinz, 2005)

Table 1. Multipillar Pension Taxonomy

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Target group</th>
<th>Characteristics</th>
<th>Main criteria</th>
<th>Participation</th>
<th>Funding or collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>X</td>
<td>X</td>
<td>&quot;Basic&quot; or &quot;social pension,&quot; at least social assistance (universal or means-tested)</td>
<td>Universal or residual</td>
<td>Budget or general revenues</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td></td>
<td>Public pension plan, publicly managed (defined benefit or national defined contribution)</td>
<td>Mandated</td>
<td>Contributions, perhaps with some financial reserves</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>Occupational or personal pension plans (fully funded, defined benefit or fully funded, defined contribution)</td>
<td>Mandated</td>
<td>Financial assets</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>Occupational or personal pension plans (partially or fully funded, defined benefit or funded, defined contribution)</td>
<td>Voluntary</td>
<td>Financial assets</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>Access to internal support (family), other formal social programs (health care), and other individual financial and nonfinancial assets (homeownership)</td>
<td>Voluntary</td>
<td>Financial and nonfinancial assets</td>
</tr>
</tbody>
</table>

Note: The size and appearance of does reflect the importance of each pillar for each target group in the following increasing order of importance: X, X.


Japan as a Relevant Case Study for other Asian Nations

- While the WB’s pillar 4 is a mere suggestion, Japan has already had experience with 「地域福祉」 or ‘Community-based (Social) Welfare’.
- In marginal towns/villages, the aged cannot survive without community-based medical care or community-based welfare.
- In 1990 revisions on welfare-related 8 laws, notions of ‘Community-based Welfare’ were clearly introduced.
- From 1993, local governments had been required (by social work law; social welfare law from 2000) to draw up plans for health & welfare for the aged.
- Participatory institutions/operators of community-based welfare has been diversified. There activities are coordinated by local public offices and Social Welfare Councils (社会福祉協議会) that exist in every city/town/village consisting of residents’ association, PTA, clubs for the aged, NGO, agri-coop, life-coop, welfare facilities, business, public offices, etc.
... Development under Depopulation/Aging ... 

May you enjoy the program!!

Thank You!