Japan As a Shrinking Society:
What Is the Condition for Recovering the Replacement Level of Fertility?

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Introduction

- Japan has entered the post-demographic transitional phase and will be the fastest aging- and shrinking country in the world.
- This should be called "a shrinking society" (Kaufmann 2005), characterized with the below replacement fertility, rapidly aging and decreasing population.
- Is this merely as the possible historical consequence of demographic transition form high birth and death rates to low ones?
- It begins to threaten the sustainability of Japanese Society itself with the increasing dependency ratio.

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1. Population Prospects of Japan

From Population Growth to Decline: 1872—2110

Expanding Life Expectancy: 1891—2060
Declining Fertility 1930—2060

The total fertility rate (TFR) of Japan was decreasing from 5.10 in 1925 at Taishō period to 3.65 in 1950 (in post-1945 Shōwa period). TFR fell below the replacement level since 1.90 in 1975 until today. The TFR in 2010 was 1.39 and it is expected to gradually drop until it reaches 1.33 in 2024, then it will increase to 1.35 in 2060.

Sources: from 1930 to 2005 (NIPSSR 2012b), from 2010 to 2060(NIPSSR 2012a).

Changing Age Structure 1891/1898—2060

The share of the young age group under 15 in the total population was falling from 35.4% in 1950 to 13.1% in 2010. According to the medium-fertility projection (NIPSSR 2012A), this share would continue to shrink to 9.1% in 2060. The old age group (65 years and over) in the total population was rising from 4.9% in 1950 to 23.0% in 2010. This share is expected to increase up to 39.9% in 2060.


2. Effects of the life expectancy and fertility on the dependency ratio

(a) Intergenerational Contract: The generation in working age is responsible for growing up the following generation in pre working age and for taking care of the preceding generation in post working age (Kaufmann 2005).

A) Actual value = Dependency Ratio

| Total Care Cost$_{total}$ = Child Care Cost$_{total}$ + Elderly Care Cost$_{total}$ |
| Child Care Cost$_{total}$ = number of population aged 0-14 |
| Elderly Care Cost$_{total}$ = number of population aged 15-64 |

Historical Change of Dependency Ratio: 1891/1898—2110

This value was rising from 0.64 in 1891/1898 to 0.72 in 1921/1925 (early Shōwa period) and then began to decrease to 0.44 in 1990 except some short rise around 1980. After that, it started to increase continuously. According to the medium-fertility projection (NIPSSR 2012), it is expected to increase from 0.57 in 2010 to 0.96 by 2060. By 2110, it will reach 1.02 (in auxiliary projection).


Demographic Care Cost (1)

B) Minimum Value: Age structure of Stable Population of Life Table (NRR=1).

- The effects of the rising longevity on the demographic care cost of working age population in future (generation interval c.a. 30 years)

| Total Care Cost$_{total}$ = Child Care Cost$_{total}$ + Elderly Care Cost$_{total}$ |
| Child Care Cost$_{total}$ = stable population aged 0-14 |
| Elderly Care Cost$_{total}$ = stable population aged 15-64 |

Demographic Care Cost (3)

C) Optimal Value (NRR < 1, the effect of the fertility)

- The effect of the decreasing fertility on the demographic care cost at any given life expectancy in time series.

Total Care Cost\textsubscript{optimal} = Child Care Cost\textsubscript{optimal} + Elderly Care Cost\textsubscript{optimal}

Child Care Cost\textsubscript{optimal} = \frac{\text{stable population aged 0-14}}{\text{stable population aged 15-64}} \times \text{NRR}

Elderly Care Cost\textsubscript{optimal} = \frac{\text{stable population aged 65 and over}}{\text{stable population aged 15-64}} \times \text{NRR}

3. Historical relations between life expectancy of women and replacement fertility

Effects of the expanding life expectancy and Below Replacement Fertility on the Dependency Ratio

Optimal Care Cost and Net Reproduction Rate

Historical Change of Optimum Care Cost's Curves

The Effects of the Rising Longevity on the Child/Elderly care cost
The Effects of the Rising Survival Rate of Women at Age 50 on Fertility

The extending life expectancy means simultaneously the rising survival rate of women at reproductive age. It can raise the total fertility rate (TFR) and the net reproduction rate (NRR) but on the other side it reduce the replacement level of TFR (NRR=1.00). The development of historical TFR seemed to follow the theoretical TFR (NRR=1.00) for the replacement level with certain time lag until at the female life expectancy of 70 years. However, over the female life expectancy of 75 years, the historical TFR continued to decrease and stay at below replacement level.

Decreasing Number of Children

From the birth cohort of '1890 or before' to the one of 1901-1905, almost 5 children in average were born among the married women, then to the cohort of 1928-1932, fewer, 2.3 children were born. After then, the average number of children per married woman was kept slightly above 2.0 up to the cohort of 1956-1960. And since the cohort of 1965 this number was falling from 1.93 to 1.84.

Proportion of the Women by the Number of Children ever born

From the birth cohort of '1890 or before' to the one of 1901-1905, the most of women had more than 4 children. However this category of women began to decrease since the birth cohort of '1911-1915' and shrank fewer than 10% of women in the cohort of '1928-1932'. Replacing this category, the proportion of women with three and then the one with two children were growing up to the birth cohort of '1933-1937', the women with two children became the major group already. And since the birth cohort of '1956-1960', the women with only one child and the childless women are increasing. They are expected to be 49% of women in the 1970 birth cohort.

4. Causal Model of the Demographic Transition in Japan

The first phase (life expectancy of women from 40 years to 70 years)

1. With the modernization, the infant mortality and the maternal deaths began to decrease.
2. The average life expectancy of female was extended and also the survival rate of women at reproductive age rose.
3. This made the replacement of fertility, lower than ever. It creates the pressure to keep the number of births/children small (If not, it should have canceled the new condition).
4. Despite the conflict between traditional social norm to maximize the number of births and the real interest of women (and her children) to minimize the risk, this process should have been gradually advanced.

The first phase (continued)

5. As a result, the life expectancy of women was extended from 40 years to 70 years and the average number of children per married women was reduced from 5 to 2.
6. The increasing life expectancy and the decreasing fertility made the proportion of child population to the one of working age population smaller and reduced the child care cost of the Japanese Society. As for the elderly care, the proportion of aged population stayed at small. This advantage should have realized the rapid economic growth in 1960s.
The second phase (life expectancy of women over 70 years.)

7. The life expectancy of women was extended beyond 70 years, the child/youth mortality and the death rates of the working ages are closing nearly to 0 and only the late mortality rates have rest to decrease. The elderly care cost grows continuously, as a sum, the total care cost exceeded 0.70.

8. On the other hand, the trend of late marriage and the timing shift of the child bearing toward the age of 30 and over were spreading among the women who chose the best timing to minimize the risk on the childbearing/child care.

The second phase (continued)

9. This type of decision making dose not exclude to remain single through the life, and also to be the women with only one child or with childlessness. As a result, the fertility was going lower than the replacement level.

10. This effect of the lowest low fertility was added to the effect of the rising longevity. The optimal total care cost increased from 0.8 to 0.9 and at last the population began to decrease.

5. The conditions for recovering the replacement level of fertility, the policy measures and social innovations

Backgrounds of Below Replacement Level of Fertility

- The modernization of Japanese society was very adaptive and successful in the first phase. The demographic bonus brought the economic growth from 1960's to 1970's.
- In the same process, the individualization of reproduction was going on.
- The responsibility for the child/elderly care was shifted from family as a whole to woman as an individual.

Backgrounds(continued)

- The reduction of average number of births changed the life course of women.
- The education and employment opportunities were expanded and the timing of marriage and the childbearing became more adjustable for decision making and basically shifted to higher ages.
- So called the 'masculinization' of female's life course (Esping-Andersen 2009) are going on.
The conditions for recovering the replacement level of fertility

- To change the cost/benefit balance of childbearing and childcare, especially for the women, toward plus value.
- To grantee the reproductive right for having children as well as not having child.
- A society also should take the responsibility for the reproduction to keep itself sustainable.
- The massive shift of social investment for growing up the following generation from taking care of the preceding generation.

The policy measures and social innovations

- Government sends the clear message to recover the replacement level of fertility as policy target.
- Governmental affirmative actions and the diversity campaign should be taken in central government agencies and major business enterprises to promote the gender equality.
- The budget amount for the family should be more than ten times of the present scale of family support expenditure (the income redistribution policy from the elder generation to next generation).

The policy measures and social innovations (continued)

- The social security systems for elder population should be essentially constricted to the minimum guarantee (as safety net in a long life).
- To minimize the total amount of social security benefits for elder population and the burden of the current workers’ contributions and taxes.
- That will create effective demand. It is also expected that the relative wealthy and healthy elder people will expend more money from their savings and means.

Conclusions

The Principle of the Sustainable Population

- Japan as a shrinking society, one should add, decreased also in a geometrical ratio.
- more exactly, when unchecked to be deviated from the replacement level of fertility, confront the increasing demographic care cost and lost its sustainability.

What’s going on?

- The driving force of the demographic transition of Japan was to reduce the average number of children per woman and to keep the risk on the childbearing and childcare at minimum.
- The cost/benefit imbalance in childbearing/childcare for women’s life course in Japan makes the fertility stay below replacement level and it accelerates the increase of elderly care cost.
What's going on? (continued)

- That is nothing other than the ‘saving’ of the child care cost by the preceding generation and this cost will be shifted to the following generation.
- The demographic onus magnifies the relative volume of the burden in future generation.
- Japan as a shrinking society is going to confront the limits of sustainability.
- We must take up the policy challenges and innovations to avoid this on going crises.

Acknowledgments

Acknowledgments: I would like to thank Prof. Dr. Franz-Xaver Kaufmann for his brilliant work on Germany as a shrinking society, which gave me the basic idea of this paper.

References:


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