

4.

## Demographic Transformation in Japan

日本における人口動態の変容

#### IV. DEMOGRAPHIC TRANSFORMATION IN JAPAN/ 日本における人口動態の変容

- 3      The Dilemma Posed by Japan's Population Decline/ 日本の人口が減少することによるジレンマ | *Julian Chapple*
- 16      Impacts of Social Welfare, Education, Retail Shops and Community Budget, On Out-migration/ 4.地域の福祉、教育、生活環境、行財政が人口流出に与える影響 | *Hara Toshihiko*
- 38      Can migration avert population decline and ageing in East and Southeast Asia?/ 東アジア・東南アジアの人口減少と高齢化は移民によって回避できるのか | *Jerrold W. Huguet*
- 54      \* Comparative Analysis of the Low Fertility Situation in East and South-East Asian Countries/ 東アジア・東南アジアにおける少子化の比較分析 | *Makoto Atoh, Vasantha Kandiah, Serguey Ivanov*
- 54      \* Low Fertility and Family Policy in Japan in an International Comparative Perspective/ 日本の少子化と家族政策——国際比較 | *Makoto Atoh, Mayuko Akachi*
- 54      \* Upcoming Changes in Japanese Society and the Future Shape of the Nation: Portrait of Depopulating Society - Diversifying Values and a More Mature Prosperity / 日本社会に顕われている変化と未来の国の姿：人口減少社会——変化する価値とさらに成熟した繁栄 | *Matsutani Akihiko*

*\*Reference to website with complete article*

## THE DILEMMA POSED BY JAPAN'S POPULATION DECLINE

*Julian Chapple*

### Abstract

Japan's population peaked at about 127.5 million people in the year 2005 and has now begun retracting with possible detrimental effects on the nation's labour force and grave social and economic consequences. This paper examines the predicament Japan is in and outlines the main options put forth by Japan's leaders in order to preserve the country's population (namely; increasing the birth-rate and/or immigration), the difficulties posed by each of these and what they reveal about Japanese society, its systems, leaders and democratic maturity. While I argue in part that the issue of immigration be afforded greater importance, more wide-ranging debate needs to be encouraged to allow for other possible solutions being found.

### Introduction

Japan's population is poised to peak at about 127.5 million people in the year 2005. From that point on, if the situation remains unchanged, it will begin a reverse track, contracting markedly to an estimated 105 million people by 2050. According to the much talked about UN paper on this issue<sup>1</sup>, this gross decrease will have a detrimental impact on the nation's labour force with grave social and economic consequences. Shoshika, or the trend towards having fewer children, is by no means unique to Japan – the number of children born to women in industrialized countries has been in decline since the 1970s. What is different, however, is the means available to Japan to somehow try to rectify what could become a cataclysmic imbalance. Further, the decline in number of births in many other nations has at least seemingly stabilized. In Japan it is still falling, down to 1.29 children per women in the latest survey (See Table 1)<sup>2</sup>.

Table 1: Fertility Rates in Selected Developed Countries

	England	France	Germany	Sweden	Italy	USA	Japan
1950	2.19	2.92	2.05(i)	2.32	2.52	3.02	3.65
1980	1.89	1.99	1.46	1.68	1.61	1.84	1.75
1995	1.69	1.7	1.24(ii)	1.74	1.26(iii)	2.02	1.38(iv)
2003	1.73(v)	1.85	1.37	1.66(vi)	1.26	2.07	1.29

Sources: Inex Mundi; BBC News. [http://www.japanesestudies.org.uk/images/papers/Chapple\\_Files/chapple\\_table\\_1.html](http://www.japanesestudies.org.uk/images/papers/Chapple_Files/chapple_table_1.html)

Notes: (i) 1952, (ii) 1994, (iii) 1994, (iv) 1998, (v) 2002, (vi) 2004 (est.) .

This discussion paper aims briefly to examine the situation Japan faces and outline the main options put forth by Japan's leaders in order to preserve the country's population. The two most commonly cited ways to stop the decrease – increasing the birth-rate and/or immigration – the difficulties posed by each of these and what they reveal about Japanese society, its systems, leaders and democratic maturity in this age of increasing interdependence will be examined. As will be discussed later, because Japan's leaders seek to polarize the solutions, they ostensibly ignore debate on other possible ways to alleviate the situation. While I argue in part that the issue of immigration be afforded greater importance, more wide-ranging debate needs

to be encouraged to allow for other possible solutions being found. With more research and dialogue the present situation could be improved to become mutually beneficial to all.

### **The Problems of a Decreasing Population**

Japan is fast becoming the world's oldest ever human population (by 2025, 27.3%, or 33.2 million people, will be aged over 60) (Cornelius, 1994: 378). Coupled with the aforementioned low birth rate, the problems Japan faces in the immediate future are acute. With Japan's labour force expected to decrease by 10% in the next 25 years, the economic outlook is far from bright. In all likelihood the domestic market will shrink, production will fall<sup>3</sup>, the government's revenue base will contract inexorably and it will struggle to meet welfare and medical payments for an increasing number of elderly as the dependency ratio (the number of workers supporting the elderly) will shift dramatically. In 1950 one elderly person was supported by 12 members of the working population, by 1990 it was 5.5 workers, and by 2020 it is estimated to be 2.3 workers. Naturally the government is concerned about such a scenario<sup>4</sup>. This leaves the question – how can Japan ease this predicted slide, maintain its population and therefore ensure economic security and continued prosperity? As Iyotani has shown, the rural population has all but been depleted and is no longer the viable supply source of labour it once was<sup>5</sup>. Other alternatives too, have almost been exhausted. Making greater use of elderly or female workers, for example, is difficult as participation rates (especially among part-time workers) are already quite high (Tsuda, 2001). Similarly, greater automation has taken place in many industries and moving production offshore has its limitations. Consequently, the two most plausible possibilities are either by making more children or through increasing immigration. With relation to both of these, however, the Japanese government is precariously placed.

### **Increasing the Baby Count**

Japan's leaders have been aware of the nation's falling birthrate and its repercussions for some time. According to Laszlo (2002), the word *shoshika* has been appearing in parliamentary records with increased frequency. In 1992 it appeared just seven times, whereas in 2001 it was recorded 168 times. The issue was first brought to the public's attention after the so-called '1.57 Shock' of 1989 when the overall fertility rate hit a (then) record low of 1.57 children per women. In 1994, in order to halt the falling birth rate, a program to support child rearing dubbed the 'Angel Plan' (its official title being "Basic Direction of Measures in Support of Future Child Rearing") was initiated, but without significant results.

The Angel Plan initiatives revolve around lessening the burdens of childcare through counselling services, creating infrastructures to support working parents, and encouraging attitudinal change from one of fixed male and female roles to one of dual parenting and shared responsibilities. After revision in 1999, the 'New Angel Plan' focused greater attention on child rearing support and the placement of day care centres near train stations. Yet many of these plans simply placed the onus on local governments, which are already struggling to cope<sup>6</sup>. Moreover, as will be seen, they lack social backing due to the government's failure fully to debate these issues publicly.

One reason for the difficulty the government has had is that the issue of 'making babies' is, in Japan, significantly more sensitive than perhaps in other developed countries. The main reason for this is historic. From around the 1930s, Japan's leaders urged women to

produce as many children as possible to fuel the war effort. Under the slogan “umeyo, fuyaseyo” (let's give birth! Let's increase [the size and strength of the nation!]) contraceptive goods disappeared and abortion clinics were closed (White, 2002). As a consequence of such forced policies, Japan's politicians today tread wearily around this issue.

Yet the situation in Japan is fast becoming critical and proactive measures are needed urgently. In March 2002 Prime Minister Koizumi Junichiro, reinitiated debate on how to stem the downward trend of Japan's birth-rate. The Health, Labor and Welfare Ministry set up an office named the ‘Anti-Low Birth Rate Measures Promotion Headquarters’ and has since created new policy measures aimed at curbing the decline. Before the policies on the table are examined, first it is useful to examine briefly some of the reasons for the falling birth-rate.

While opinion is divided, a number of major contributing factors can be discerned. Jolivet (1997), in a study of Japanese women and childbirth, examined some of the reasons why Japanese women are recently less inclined to have children. Most of the reasons found were social and included a tendency to marry at a later age (and therefore to have children at a later age – or not at all<sup>7</sup>) or not marry at all, and to study or work instead of having children<sup>8</sup> (former Prime Minister Hashimoto Ryutaro publicly expressed his regret at the huge number of women entering formal education and thus, presumably, deterring them from their principal function in life, i.e. procreating). Goodman (2002) similarly sees the issue as one of lifestyle choices. Today many women would rather seek a career than start a family and this trend – while by no means unique to Japan – is certainly more profound there due to embedded societal constraints<sup>9</sup>. Terms like ‘parasite single’ (referring to young singles who continue to live with their parents while working) today reflect this mind-set. For example, only 27.9% of single female respondents to a recent survey thought child-rearing would be enjoyable (citing loss of free time as a leading reason)<sup>10</sup>. Certainly, social attitudes and trends are important but such things are difficult for the country's leaders to change easily (and require the implementation of laws with ‘teeth’ to back them up). White (2002: 151), on the other hand, tends to see the main cause for the low birth rate as economic in nature (examined later), a view shared by Ogawa and others<sup>11</sup>. Both these social and economic factors are probably equally responsible but it is the latter which seems easier for the government to address.

The government's latest attempt to end the downward trend is named the ‘Plus One Proposal’ – ‘plus one’ indicating the increase the Ministry of Labor, Health and Welfare is hoping for in the average number of children per couple. This new package contains the following proposals:

- A review of working conditions faced by men and women to make their careers compatible with child-raising.
- A study of how local communities can assist people with child-raising.
- To improve social welfare benefits to assist families raising children.

Most notable of the proposals is the idea of making businesses allow male employees to take a minimum of 10 percent of statutory paid paternity leave which they are entitled to, but rarely use (examined below). Other ideas like reducing working hours or tax incentives for companies to encourage them to allow workers to take their allowed child leave would seem like plausible options worth considering. In addition, Prime Minister Koizumi has also pledged to allocate funds for the construction of 50,000 new day-care facilities (of which numbers are still woefully inadequate)<sup>12</sup>.

These factors alone, however, will not likely be enough. Furthermore, they are not that far re

moved from previous attempts of the largely fruitless original Angel Plan. There are a myriad of other contributing policy factors that the government presently seems loathe to address.

Firstly, there is the incredible cost of simply being pregnant in Japan (i.e. the economic factor mentioned earlier). Regular examinations during pregnancy are not covered by health insurance since it is neither a sickness nor an injury. The cost of such visits usually averages around 5000 yen per time. Then there is the cost of delivery (around 300 - 400,000 yen) which, although is refunded in part by insurance, is still an initial out-of-pocket expense<sup>13</sup>. If delivery occurs at night or on a holiday, the cost can be much greater. Following birth comes the cost of health care for infants. This is free for children until the age of 3 in some prefectures, age 5 in others. Naturally if you consider the price of schooling and university education, the average family can realistically only afford one child, two with a sacrifice<sup>14</sup>. Kojio claims that because of the increase in the overall cost of having and raising children, the nation's birth rate has fallen<sup>15</sup>. Furthermore, the continuing uncertain economic climate with increasing redundancies is a clear negative factor. Many say that they would like to have more children but can't afford to. Considering that it costs about 4.4 million yen on average to raise a child to age 6, the financial burden of having children is enormous and an obvious deterrent<sup>16</sup>. Yet this financial aspect – and the gap between desires and realities – seems to be overlooked by the government. While child support is paid (5000 yen per month per child for 1 or 2 children and 10,000 yen a month for nos. 3 on, dependent on income) this barely covers the monthly nappy bill. Making medical care from conception to 5 years completely free would seem like one way of starting to encouraging more people to have children by defraying the cost.

Secondly there is the attitude of lawmakers to children and their health that brings into question their true desire to see more people in Japan. In particular here I am referring to issues of safety. Seventy-six percent of those surveyed recently thought that Japan wasn't a good place to give birth and raise children<sup>17</sup>. While the greater impact and implications of the Japanese government's failure to ensure the safety of its citizens (and in many cases blatantly contribute to their harm) will be examined in more detail in a forthcoming paper, listing a few such issues here seems pertinent:

- When research pertaining to SIDS (Sudden Infant Death Syndrome), its probable causes, preventative actions, etc., became well documented overseas this was not immediately made known to Japanese mothers since it was deemed it didn't apply to Japan's circumstances.
- The dangers associated with shaking babies has only recently (2001) been added to parent-child books in Japan.
- There are still presently no national standards for playground equipment safety. A number of children have died in recent years due to accidents with old or unsafe playground equipment. A recent survey revealed that three-quarters of Japan's playgrounds were potentially dangerous<sup>18</sup>.
- Child abuse has only recently been 'discovered' in Japan (Goodman, 2002a).
- Transplant operations are still banned for any person under the age of 15 (partly because they are less profitable under the present medical treatment remuneration system<sup>19</sup>).
- Infertility treatment is often not covered by insurance and some procedures, such as surrogate births, are not even approved yet (although some have taken place clandestinely<sup>20</sup>).

Thirdly, and directly related to the above point, is the attitude of society in general, and companies in particular, towards child-raising and child-care leave. A child-care law enacted more than ten years ago is still underutilized – especially by men. In 1999, for example, 56.4 percent of working women took child-care leave, whereas only 0.42 percent of men did<sup>21</sup>. It was also reported that the bigger the company, the lower the ratio of employees taking leave tends to be<sup>22</sup>. The Ministry of Health, Labor and Welfare is considering setting quotas for the number of male employees required to take parental leave. This it hopes will help change the present social and corporate climate which makes it difficult for men in particular to make use of such provisions. Yet, given that fewer than 40% of fathers have ever changed a nappy or put children to bed (White, 2002) and only 6% of men say they feel comfortable taking child care leave<sup>23</sup> this is a dubious assumption. Social roles too, need to be re-examined and as the private sector is wary of governmental meddling in personnel affairs, it's doubtful they will have any significant impact<sup>24</sup>.

### **Increasing Immigration**

If Japanese women are opting (or resigned) to have fewer children, then the next obvious option is to try to maintain the population through opening the nation's doors to greater immigration. Furthermore, the situation Japan faces is perhaps more urgent than one that can be fixed by encouraging people to have more babies. Goto (2001), for example, argues that it is already too late to try to increase fertility levels to offset the burden on the working population. To be sure, Japan is presently struggling to emerge from its recession with unemployment at a post-War record high. Given this situation, talk about requiring more labourers may seem misplaced. While some of the immediate issues pertaining to immigration may have been deferred, they will not, however, disappear altogether. Further, as Tsuda (2001) has argued, Japan's immigrant labour population has become a stable feature of industry which is relatively unaffected by economic recessions and declines in production. What is more, greater immigration could in fact help increase demand and innovation in the Japanese economy as well as lead to a larger number of children.

A recent United Nations study estimates that, under certain conditions<sup>25</sup>, Japan may need to bring in a massive 343,000 immigrants annually, until 2050, simply to prevent its population from declining (or face an annual drop in GDP of 7%)<sup>26</sup>. In order to prevent a decline in its working population (15-64 year-olds) in the same period an average of 647,000 new foreign workers may be needed annually<sup>27</sup>. This would mean that by 2050, thirty percent of Japan's population would be foreign immigrants or their descendents.

Again, the Japanese government is well aware of the acute situation the labour force population issue presents. In the Justice Ministry's 'Basic Plan for Immigration Control,' released in March 2000, it mentioned – for the first time – the government's concerns over the nation's aging and declining population. This report stirred controversy too, over the possibility of accepting foreign workers to assist in the nursing of elderly people<sup>28</sup>. The impact of some labour shortfalls has already hit home. The personnel shortage in Japan's computer engineering and programming sector alone has been estimated to be around 13,000. As a consequence, the government announced in 1999 that it would recruit 30,000 skilled IT engineers and researchers from overseas by 2005<sup>29</sup>. Further, the former Director General of the country's Economic Planning Agency, Sakaiya Taichi, has said that the sharp decline in the nation's population sometime after 2007 will make it 'inevitable that Japan will look for foreign workers to make up the... shortfall.'<sup>30</sup> Sakaiya added that the inflow of foreign workers would provide the cultural

stimulus needed to build a creativity-based society in the future. This remark clearly implies that some of Japan's leaders, at least, not only believe that Japan's society is lacking in creativity but also that foreigners could provide a positive stimulus in this regard<sup>31</sup>. Japan lags far behind other nations in terms of foreigners employed. In 1999, fewer than 1% of workers were foreign, compared with 18% in Switzerland or nearly 12% in the U.S.<sup>32</sup>

A Prime Ministerial Commission looking at Japan's goals in the 21st Century also acknowledges the requirement for foreign inputs when they discuss the need to implement change thus:

[t]o respond positively to globalization and [to] maintain Japan's vitality in the twenty-first century... we cannot avoid the task of creating an environment that will allow foreigners to live normally and comfortably in this country.<sup>33</sup>

There is clearly a sense of reluctance in this talk of international factors dictating national policy. Expressions like 'cannot avoid' and 'task' indicate that Japan believes it is undertaking a course of action out of necessity as opposed to having much will to do so. What is also revealing about the above statement is that it appears to recognise that at present the environment in Japan means foreigners are unable to live 'normal' and 'comfortable' lives. The report continues:

It would not be desirable... simply to throw open the gates and let foreigners move in freely. First of all we should set up a more explicit immigration and permanent residence system so as to encourage foreigners who can be expected to contribute to the development of Japanese society to move in and possibly take up permanent residence here. We should also consider preferential treatment for foreigners who study or conduct research in Japan – such as allowing them automatically to acquire permanent residence status when they complete their academic work at a Japanese high school, university, or graduate school.<sup>34</sup>

Likewise, another report issued by Japan's Economic Council, recommended: "we should actively consider aiming to become a vibrant socio-economy that is open to the world by orderly accepting migrant labour from overseas countries."<sup>35</sup> "It is important for Japan to introduce foreign workers in the fields of management, research and technology" wrote the Ministry of Economic Trade and Industry in its 2003 White Paper<sup>36</sup>. A similar message was sent by the Ministry of Justice which called on Japanese to 'aggressively carry out the smooth acceptance' of foreigners<sup>37</sup>. Japan's Health, Labor and Welfare Minister, Sakaguchi Chikara, added his voice of support too, claiming Japan should accept more workers from other countries to cope with the declining workforce<sup>38</sup>.

Thus, on the surface, the Japanese government appears pro migration in principle and advocates increasing the number of foreigners in Japan. The aforementioned report from the Prime Minister's office even recognises that Japan has not yet designed a 'set of policies to deal with foreigners covering such matters as legal status, living conditions, human rights and housing assistance'<sup>39</sup> and proclaims its positive intention to tackle these issues.

However, an even more difficult task than trying to convince people to have more children is perhaps trying to convince them that they should accept more immigrants. This is a worldwide problem as evidenced by the recent immigrant and refugee backlashes in Europe, Australia and New Zealand. Given traditional attitudes towards foreigners (as examined below), however, the Japanese case is somewhat different.

Not all in the government have been supportive of such report findings listed above, though. According to Atoh Makoto, the Deputy Director General of the National Institute of Population Research, the UN's aforementioned proposal would be 'impossible' to implement because of suspicion by Japanese of increased immigration<sup>40</sup>. Other critics say that if Japan formally decided on the introduction of foreign labor, it would receive immigrants from between 50 and 60 countries, and would be bound to become a multiracial society just like the United States (Nishio, 1988), (implying that multiracialism is thus a negative trend). Given the Japanese government's traditionally stern official stance towards foreign immigrants it certainly seems that a massive shift in thinking would be necessary before anywhere near the number suggested could be made welcome and the government's positive policies made to reach fruition.

To be sure, there are numerous negative repercussions for sender-states if there is an increase in the migration of skilled workers to Japan (or other developed states) and these are often overlooked in most public debate. For example, recently the IMF called on Japan and Europe to accept more immigrants so as to minimize the economic impact of their aging population<sup>41</sup>. Yet, no mention was made of the negative impact such a skill drain has on the sender nations. A case in point is the present debate over the free trade agreement between Japan and the Philippines. While the Philippine Government is itself striving to get Japan to agree to allow Filipino health workers freer access to employment opportunities in Japan, the number of health professionals (nurses in particular) in the Philippines continues to decline as more and more head off to higher wages in Britain and the United States<sup>42</sup>. It is this negative aspect of migration that is hardly mentioned, yet is something that needs to be addressed. For the Japanese government to blindly open its doors without providing the proper support or ensuring its policies are not damaging developing nations would be irresponsible and short-sighted. Again, much greater debate is required so as to ensure that all parties are benefiting from migration to the greatest extent possible. Mutually beneficial solutions can be found, I believe, such as training being paid for by the Japanese Government, the setting of quotas or the like.

Others opposed to immigration argue that a large influx of non-Japanese immigrants would lead to a corruption of the nation's work ethic as jobs classified as the 'three k's' (kitanai - dirty, kitsui - hard, and kiken - dangerous) will be undertaken by the newcomers. While this sounds like a positive idea, there is significant evidence to suggest that it is already too late for this (Tsuda, 2001). Japan is home to a large population of undocumented illegal overstay-ers (estimated to be anywhere from 250 - 500,000)<sup>43</sup>. These people provide a vital link in the nation's labour chain, one which can no longer be replaced by native workers. In spite of their importance, these same people are, however, forced to exist in a precarious legal limbo, denied basic rights and social security.

Japan manifestly needs an immigration policy which allows immigrants to come to Japan to work, live and stay if they so desire. It does not yet seem to have the will to implement one, however. Changing peoples' perceptions is perhaps the hardest task facing those who would promote internationalisation in Japan. It remains a daunting and lengthy task, too. When respondents were asked in a recent survey whether Japan should accept immigrants (as a part of its international responsibilities) 17 percent replied yes, while 53 percent said only if all other alternatives have been exhausted<sup>44</sup>.

Consequently, it seems that contemporary Japanese society is caught between the contradictory forces of ethnocentrism and internationalization (Sugimoto, 2003). On the one hand there are those calling for a freer immigration policy, with equal rights for all residents in Japan.

On the other hand, there are those opposed, who fear that any greater influx of workers will threaten the imagined purity of the Japanese culture<sup>45</sup>. Until this fundamental debate is settled, it is doubtful that immigration can be seen as a saviour for Japan's projected population problems.

Again, however, this is the simplistic dualistic argument that Japan's (and other such developed nation's) leaders would have us believe. Some are opposed to greater migration because of other more humanistic reasons such as the aforementioned detrimental impact the plundering of skilled workers has on developing nations. With adjustment, perhaps, the migration of non-skilled workers could provide benefits for both sender and receiver states. They would be able to do many of the jobs urgently required (especially the 3K jobs and others as well after training) while not depleting the skill base in developing countries but in fact enlarging it. Such options require considerable debate and courage on the part of the accepting nation which in turn requires open leadership and an accepting society, neither of which, it could be said, Japan has at present, however.

### **Historical Background**

The problems associated with increasing immigration have a significant history in Japan. Despite trying to portray itself as a nation devoid of migration history, it has in fact been an essential component of the nation's formation<sup>46</sup>. Japan's historic attitude towards immigration speaks volumes about the difficulty for future prospects. In modern times, the country's largest immigrant population has come from the Korean Peninsula<sup>47</sup>.

After the Japan-Korea Treaty was signed in 1965 the 500,000 or so Koreans who remained in Japan became 'Special Permanent Residents,' enabling them to claim national health and welfare benefits but refusing them other such rights as suffrage.

Post World War Two there have been two major policy changes affecting the situation of immigrants. The first was the introduction of the Alien Registration Law in 1952. This law was aimed at controlling all foreign residents by making them carry resident identification cards at all times. All residents over 16 years of age and residing for more than a year were fingerprinted and photographed for these cards (the fingerprinting practice was only abolished in 1999 after decades of protests from human rights groups).

The second major change occurred in 1991 with a partial relaxation of the nation's immigration laws. Ostensibly this allowed more foreigners of Japanese descent into Japan in order to take up nondescript jobs in industries which were short-staffed yet whose jobs were unattractive to Japanese (the aforementioned 'three-k's'). The underlying reason for this was according to an official publication of the ruling Liberal Democratic Party that:

People opposed to the idea of introducing foreign laborers into Japan say that such a move will cause the ethnic structure of our nearly racially homogenous society to deteriorate. However, they will probably agree to the idea of bringing in foreign nationals who, owing to their Japanese ancestry, are thoroughly acquainted with Japanese customs.<sup>48</sup>

These 'foreigners of Japanese descent' (Nikkeijin) were afforded preferential treatment which was justified by the fact that their presence would ease the reunification of Japanese families divided by emigration and that their ethnic ties would facilitate adjustment to and acceptance

by Japanese society (de Carvalho, 2000). The folly of this line of reasoning was to become apparent in the following years. And despite this history, it seems that the nation's rulers have yet to learn from these early attempts at immigration.

In spite of the government's optimistic stance, the fact remained that the prime reason for the influx of the Nikkeijin remained the same as the majority of others to Japan; financial. Thus despite their physical resemblance, that was where the similarities seemingly ended. While the government began welcoming them (the number soared from a mere 3,961 in 1986 to around 220,844 by 1998) society was not so accommodating. Rather than being easily accepted in Japan, they have in fact merely formed a new minority<sup>49</sup>.

Japan's official hard-line attitude towards foreigners can be traced back as far as 1899, when Imperial Edict No. 352 was issued prohibiting the importation of foreign labour into Japan. (Laszlo, 2002). To this day, the policy remains very much the same; accepting only skilled labour and declining (officially at least) the rest. The exception is, however, the government's trainee system which acts ostensibly as a front to allowing the controlled importation of unskilled labour<sup>50</sup>.

I do not intend to assert that Japan is necessarily any more discriminatory than other developed nations. Japan's approach to dealing with cases of discrimination, however, is often seen wanting in terms of results and appears ad hoc at best. Actions such as the employment of non-Japanese on non-renewable, short-term contracts, the lack of provision for a law banning racial discrimination, being denied registration on *jyuminhyo* family registers, being denied access to certain jobs, suffrage, etc. all add-up to a climate of 'unwelcomeness.'<sup>51</sup> Talented immigrants will not remain if they are not allowed to remain in a capacity in which they can support themselves and their families<sup>52</sup>. In situations where such immigrants have Japanese spouses this amounts to nothing less than discrimination against Japan's own nationals as well. Increased immigration cannot be successful unless those invited are afforded the exact same treatment as Japanese nationals. This, unfortunately, is not yet the case in Japan which is unwilling to accept that the forces of globalisation are such that one nation can no longer easily pick and choose immigrants who best suit the host nation's ethnic make-up.

From this brief discussion it is fair to say that Japan's attitude towards foreign immigrants has been one of exclusion, containment and control rather than one that attempts to build a society in partnership. Until this situation is drastically improved there is little hope of immigrants being allowed (or willing) to make up even a few more percentage points of the nation's overall population. Thus, not only is the government's rhetoric (as described earlier) seen wanting in terms of concrete actions, it is highly dubious as to whether society is ready or has been prepared for any immediate change in the status quo. Consequently, there seems little hope of non-Japanese supporting Japan's population in the immediate future.

As mentioned, at present Japan is in the midst of a decade-long recession. In the medium term this recession will delay serious debate on increased immigration. Even if demand does grow, there is still the issue of where Japan might seek its labour from. The total number of Brazilians of Japanese descent is no more than around 1.3 million. While there are large numbers of people of Japanese descent in many Asian nations, as long as the government continues with its policy of offering residence only as far as descendant's grandchildren, this avenue will be quickly exhausted.

In any case, should the problems of an impending decline in population be solved through immigration? Perhaps a smaller society may be a better one? (It could be argued that in fact a smaller population may lead to an increase in efficiency if focused in the right direction.) And what is to be done with the burgeoning illegal immigrant population already here? These are also questions the government needs to address and open public debate on. One thing, though, is certain. If Japan wishes to maintain its economic strength it needs to maintain its population, particularly its labour force. The introduction of greater numbers of foreign immigrants can, if managed properly, also lead to the reinvigoration of the culture and society and provide a stimulus for greater achievement (surely something Japan's economy presently requires). Yet this cannot be achieved without adjustments.

And then there is the unanswerable question of will these people want to stay anyway? According to some research, a high percentage of the minute number of refugees actually granted asylum in Japan do not wish to remain long-term citing discrimination and rigid rules (Itoh, 2000). In order to keep new immigrants in Japan there are a number of aspects of the nation's recent approach that need to be changed. Not least of which is a lingering discriminatory attitude towards resident foreigners.

## Conclusion

Japan's population will, undoubtedly, faithfully follow the predicted downward slide given the government's lack of decisive action on either of the two possible options briefly examined in this paper. The former (that of effecting policies aimed at increasing the birth-rate) seems the most probable possibility, yet this alone will not be enough. There are also, arguably, numerous benefits to be gained by a nation through the latter of the options mentioned (increased movement of people by immigration), however, this requires debate and changes that society has probably not been prepared for yet.

What conclusions can we draw from the government's responses to these issues? Firstly, they have been slow to act as has so often been the case in the past where reaction and not action has been the norm. These issues are still being deferred in a way similar to the non-performing loan fiasco. The time has come for the rhetoric from the government, which has been found wanting in terms of concrete details, to be backed up by solid plans with quantifiably attainable goals. Japan's leaders are seemingly disinterested in the health and safety of their youth and the need to seriously address issues related to the rights of non-Japanese immigrants. Japan's children and young people need care and protection as do the nation's new immigrants. Thus there are numerous similarities here to be seen between these two groups. Secondly, little – if any – long term planning has been made. Serious public debate needs to be opened if the government is to either create an atmosphere where both women and men can work and raise children together, and/or non-Japanese can be welcomed and live 'normally and comfortably.'

These solutions alone, however, will only temporarily alleviate the situation. Long term debate needs to be initiated as to how to best attain economic security while not damaging (and preferably assisting) developing nations as well. Now is a prime time for Japan to show leadership and support to its developing neighbours. If Japan wishes to ensure its future prosperity, sooner, not later, critical discussion on these issues will be essential. Time is, however, fast running out.

## Notes

1 United Nations Population Division (2000).

2 The Daily Yomiuri, 'Birthrate hits record low 1.29 in 2003,' 11 June 2004, 1. There is, however, much regional variation. For example, in Tokyo the rate is as low as 0.9987. The Health, Labor and Welfare Ministry predicts the birthrate will bottom out at 1.306 in 2007. However, their estimate for 2003 was 1.32 which has already been surpassed. In terms of comparison, it is useful to note that demographers cite 2.1 as the required fertility rate to maintain a constant population.

3 While it could be argued that there is ample room in Japan's system for improvements to increase productivity, the IMF suggests that of all the industrialized nations, Japan's economy will be the most severely affected. See: The Daily Yomiuri, "IMF: Aging society to cut Japan growth," 24 September 2004, p. 8.

4 As Kwon (1999, cited in Goodman, *Family and Social Policy in Japan*, 14) has pointed out, Japanese tend to provide less financial support to their parents than is the case in other Asian nations. In Korea, for example, children provided 44.3% of their total income and Taiwanese 53.2% to their parents in 1994 whereas in Japan in 1988 (before the onset of the present recession) the figure was only 9% reflecting heavy reliance on government pensions.

5 Iyotani (1991) cited in Cornelius et al., *Controlling Immigration*, 378.

6 See Inokuma Ritsuko, 'Local governments struggle to cope,' The Daily Yomiuri, 5 November 2003, 3.

7 The average age is 28.5 for men and 26.8 for women. See The Daily Yomiuri, "Survey: Couples planning to have record few children," 29 May 2003, p. 2.

8 This is reflected in fertility rate figures again, which were 0.06 for working women compared with 2.96 for non-working women in the 1990s. See Goodman, *Family and Social Policy in Japan*, 14.

9 Such as employment discrimination, the expectation that women will quit after marriage and so forth. See, for example, Bishop, "The Diversification of Employment...", 93-109; White, *Perfectly Japanese*, 122-153; or Sugimoto, *An Introduction to Japanese Society*, 153-165.

10 The Daily Yomiuri, 'Poll: Many people want 3 children,' 11 March 2003, 3.

11 See Ogawa (2001).

12 Wada Ritsuko, an economist at the Nomura Research Institute, claims that this number is 'far from enough.' She calculates that the government needs to make space for an extra million children by 2012 if enough mothers are to be given the chance to work. See Grudgings Stewart, "Birthrate crisis finds Japan on its knees," The Japan Times, 19 December 2002, 3.

13 It must be noted that some prefectures do offer slightly more than others.

14 a recent survey, 51.6% of respondents cited the cost of paying for education as a reason for having less children. The same survey revealed 45% would like 3 children if they could afford to. The Daily Yomiuri, 'Poll: Many people want 3 children,' 11 March 2003, 3.

15 Asahi Shimbun, "Futarime ni bureki," 1 June 2003, p. 7.

16 "Cost of raising children to age 6 about 4.4 million," The Daily Yomiuri, 3 April 2003, p. 3. Seventy-five percent of respondents to a survey in Japan said the top reason for the falling birthrate was the economic burden involved. See: The Daily Yomiuri, "Singles in Japan, S. Korea say kids cost too much," 3 July 2004, p. 2.

17 The Daily Yomiuri, "Survey: Couples planning to have record few children," 29 May 2003, p. 2.

18 The Daily Yomiuri, "Poll: 75% of playgrounds have defects," 10 Nov 2003, p. 2.

19 The Daily Yomiuri, "ERs for kids need shot in arm," (Editorial), 6 November 2002, 8.

20 The Daily Yomiuri, "2nd surrogate birth last year," 7 March 2003, 2.

21 The Daily Yomiuri, "Men to be encouraged to take child-care leave," 18 July 2002, 3.

22 Ibid.

23 The Daily Yomiuri, "Survey: Couples planning to have record few children," 29 May 2003, p. 2.

24 Inokuma Ritsuko and Sakakibara Noriko, 'Fumbling effort to halt falling birthrate,' The Daily Yomiuri, 5 November 2002, 3.

25 The study's estimated figures are based on 1995 fertility levels and assume zero net migration after 1995. Such an assumption is, as Laszlo (2002) has pointed out, natural considering that the number of foreign nationals legally present in Japan presently number only 1.6 million, or a fraction over 1% of the population.

26 United Nations Population Division, *Replacement Migration*, 2.

27 Other sources put the annual figure at 609,000. See *Migration News* (2000), 7 (6). It must be remembered that these are only estimates and such labour projections are vulnerable to changes in economic cycles, technology and the like. For example, while it was reported back in 1988 by the National Committee for Developing Economic Foundations for the 21st Century that by 2000 Japan would have a labour shortage of 2.7 million workers, in fact in the first half of 2000, roughly that same amount were unemployed. See Komai, *Migrant Workers in Japan*, 213. It should also be noted that the financial burden involved with increasing migration would exceed 1 trillion yen. See Koshiro, *Does Japan Need Migrants?*, 168.

28 According to estimates, demand for home-helpers and nursing care workers would increase from the current 520,000 to 1 million by 2005. See Asahi Evening News, "Immigration policy creates headaches for ministry," 12 January 2001, 7, and Toriyama Tadashi, "Discussion vital over plans to accept nursing-care workers from overseas," The Daily Yomiuri, 26 April 2000, 6. The Ministry of Health and Welfare was strongly opposed to this suggestion as it argued it contravened Japan's policy of not admitting unskilled foreign workers to do menial tasks (most nursing-care-related jobs are considered unskilled).

29 Kajimoto Tetsushi, "Foreign workforce movin' on up," The Japan Times, 1 January 2001, 3.

30 The Daily Yomiuri, "More foreign labor expected," 6 August 1999, 8.

31 There was a predominantly negative reaction to Sakaiya's and others' comments and, consequently this debate was left out of the 1999 Ministry of International Trade and Industry's Economic White Paper.

32 The Japan Times, "Japan needs foreign workers to achieve economic growth: METI", 2 July 2003, p. 11.

- 33 Prime Minister's Commission on Japan's Goals in the 21st Century, *The Frontier Within*, 13.
- 34 Prime Minister's Commission on Japan's Goals in the 21st Century, *The Frontier Within*, 13 [Italics are mine].
- 35 Japan Economic Council, Fundamental Concept Committee, 3.
- 36 The Japan Times, "Japan needs foreign workers to achieve economic growth: METI", 2 July 2003, p. 11. Interestingly, these are precisely the areas where Japan has traditionally stressed its strength.
- 37 French Howard, "Still Wary of Outsiders, Japan Expects Immigration Boom," *The New York Times*, 14 March 2000.
- 38 Japan Today. Accessed 4 March 2003.
- 39 Prime Minister's Commission on Japan's Goals in the 21st Century, *The Frontier Within*, Chapter One.
- 40 Cornell Andrew, "Land of the Rising Sun has Racist Horizon," *Australian Financial Review*, 1 May 2000.
- 41 The Daily Yomiuri, "IMF: Aging society to cut Japan growth," 24 September 2004, p. 8. The IMF stresses, however, that an increase in immigration is still only a 'temporary' remedy.
- 42 One real concern is that the Philippines may lose nurses at a faster rate than it can train new ones. Workers overseas can earn twenty times as much as in the Philippines. *The Japan Times*, "FTA could exacerbate Philippine nurse drain," 22 September 2004, 12.
- 43 According to official government figures, approximately 15% of the foreign population in Japan is illegal. Based on January 2000 figures this equates to 251,697 people (Japanese Ministry of Justice, 1999). See Iwao, *Crime by Illegal Aliens*, 41-3; or Watado, *Jichitai seisaku no tenkai* for other estimates.
- 44 The Daily Yomiuri, "New blood to rejuvenate an aging Japan," 5 October 2001, 7. See also Asahi Evening News, "More Japanese willing to accept foreign residents – with conditions," 10 November 2000, 3, which puts the number of 'yes' replies at 18% (with restrictions on the number and their ages), 'no' at 19%, and 57% who replied the issue should be considered a part of future policy.
- 45 See, for example, Nishio, *Senryakuteki sakoku-ron*.
- 46 See Miyajima, "Immigration and the Redefinition of Citizenship"; Weiner, ed., *Japan's Minorities*.
- 47 For more on this see: Suh (1989), who divides the movement of Koreans into Japan until the end of WWII into four periods.
- 48 Laszlo, *Aging and Immigration*, 12 [Italics are mine].
- 49 For more on the issue of a new minority see: Linger, *No One Home*.
- 50 The Japan Times, "Foreign trainees under exploitation," 7 April 2000, 3. See also The Japan Times, "Labor program accused of profiteering," 22 February 2001, 3, and Ishida Kakuya, "Training program going awry," *The Daily Yomiuri*, 1 March 2002, 1, 7.
- 51 See, for example, Chapple, *Japan's Policy of Internationalisation*, 154-213.
- 52 See: Tsukahara, Mami "Japan struggles to attract professionals from abroad," *The Daily Yomiuri*, 22 November 2003, p. 13

## Bibliography

- Bishop, B. 2000. "The Diversification of Employment and Women's Work in Japan." In Befu Harumi et al. *Globalization and Social Change in Contemporary Japan*. Melbourne: Trans Pacific Press.
- Chapple, J. 2003. *Japan's Policy of Internationalisation: Prospects for a Multicultural Society*. PhD. Thesis. Victoria University of Wellington, New Zealand.
- Cornelius, W. 1994. "The Illusion of Immigration Control." In Cornelius, W., Martin P. and Hollifield J. eds. *Controlling Immigration: A Global Perspective*. Stanford, California: Stanford University Press.
- de Carvalho, D. 2000. "The Making of a Minority in Japan." *The Japan Foundation Newsletter* 27 (3-4) (March): 19-21.
- Goodman, R. 2002. "Anthropology, policy and the study of Japan." In *Family and Social Policy in Japan*. Cambridge: Cambridge University Press.
- \_\_\_\_\_. 2002a. "Child abuse in Japan: 'discovery' and the development of policy." In *Family and Social Policy in Japan*. Cambridge: Cambridge University Press.
- Goto, J. 2001. "Aging society and the labor market in Japan: should the fertility rate Be raised now – No!." *Japan Labor Bulletin*, 40 (9).
- Harada, S. 1998. "The aging society, the family, and social policy." In Banno Junji, ed., *The Political Economy of Japanese Society*. Vol. 2: Internationalisation and Domestic Issues. Oxford: Oxford University Press.
- Itoh, M. 2000. *The Globalization of Japan: Japanese Sakoku Mentality and U.S. Efforts to Open Japan*. London: MacMillan Press.
- Iwao, S. 1998. "Crime By Illegal Aliens." *Japan Echo*. February, 41-43.
- Japan Economic Council. 1999. *Fundamental Concept Committee and Planning Committee Considerations for the Japanese Socioeconomy in the 21st Century*. April 13.
- Jolivet, M. 1997. *Japan the Childless Society?* New York: Routledge.
- Kawamoto, S. ed. 2001. *Ronso: Shoshika Nippon. (Japan: The Shrinking)*. Tokyo: Chuo Koronsha.
- Komai, H. 1995. *Migrant Workers in Japan*. New York: K. Paul.
- Koshiro, K. 1998. "Does Japan need immigrants?" In Weiner M. and Hanami T., eds. *Temporary Workers or Future Citizens?* Bassington: Macmillan.
- Laszlo, T. 2002. "Aging and Immigration." *The Journal*. July, 12-14.
- Linger, D. 2001. *No One Home*. Stanford, Calif.: Stanford University Press.
- Miyajima, T. 1997. "Immigration and the Redefinition of Citizenship in Japan: "One People – One Nation" in Question." In Oommen T. K., ed., *Citizenship and National Identity: From Colonialism to Globalism*. New Delhi and Thousand Oaks, Calif.: Sage Publications.

- Nishio, K. 1988. *Senryakuteki 'sakoku-ron'* [The Strategic 'Closed Country Debate']. Tokyo: Kodansha.
- \_\_\_\_\_. 1992. "Some Believe Accepting Foreign Workers Could Lead to Corruption." *Japan Times Weekly – International Edition*. March 5-11.
- Prime Minister's Commission on Japan's Goals in the 21st Century. 2000. *The Frontier Within: Individual Empowerment and Better Governance in the New Millennium*. (January).
- Roberts, G. 2002. "Pining hopes on angels: reflections from an aging Japan's urban Landscape." In Goodman, Roger. *Family and Social Policy in Japan*. Cambridge: Cambridge University Press.
- Sugimoto, Y. 2003. *An Introduction to Japanese Society* (Second Edition). Cambridge: Cambridge University Press.
- Suh, K. 1989. *Kominka seisaku kara shimon onatsu made* [From Public Policies to Fingerprinting]. Tokyo: Iwanami Shoten.
- Tsuda, T. 2001. *Reluctant Hosts: The Future of Japan as a Country of Immigration*. Migration Dialogue.
- United Nations Population Division. 2000. *Replacement Migration: Is it a Solution to Declining and Ageing Populations?* New York: United Nations.
- Watado, I. ed. 1996. *Jichitai seisaku no tenkai to NGO* [The Development of Local Government Policies and NGOs]. Tokyo: Akashi Shoten.
- Weiner, M. ed. 1997. *Japan's Minorities: The Illusion of Homogeneity*. New York: Routledge.
- White, M. 2002. *Perfectly Japanese*. Los Angeles: University of California Press.

#### 4.地域の福祉、教育、生活環境、行財政が人口流出に与える影響

##### **Impacts of Social Welfare, Education, Retail Shops and Community Budget, On Out-migration;**

##### **Design of a System Dynamics Model for Problems in a Remote, Depopulated Rural Community: Part IV**

##### **Abstract**

This paper focuses on the impacts of social welfare, education, retail shops and community budget in a remote, depopulated rural community, on its out-migration and employers' age structure. This is part of a study to design a theoretical model for sociocultural and economic problems observed in the depopulation process.

Using the system dynamics approach and its new software (Stella Research 4.0 Version), the feedback loops from four sectors of the model, (a) social welfare, (b) education, (c) retail shops and (d) community budget, which were developed and applied to the population and industrial sectors. We simulated the effects of four sectors in different scenarios and their impacts on out-migration and employers' age structure are measured.

The important findings are:

1. The feedback-effects from four sectors to the out-migration have only a limited and secondary impact on the total number of the community population.
2. They have caused also a very small change in employers' age structure. Thus, the problem of rapid aging of labor power observed in a remote, depopulated rural community, can rather depend on the kind of the local industry and its structural problems.
3. The drastic increase of out-migration enlarges the physical distance of human contacts in community life. This feedback effects for out-migration is not negligible.
4. In the case of a rapid decline of population, the number of retail shops pro family increases but the sales volume pro shop declines. As a result, the index of the daily shopping convenience goes down.

5. In the depopulation process, the community budget index in general declines. Contrary, the one for elderly welfare is improved because of reducing number of elderly people. However, the promotion of the elderly welfare policy has a limited influence on the population increase.

#### 地域の福祉、教育、生活環境、行財政が人口流出に与える影響 ー過疎化のシステム・ダイナミックス・モデルの構築 その4ー

##### はじめに

過疎問題は、人口は元より、地域の経済、教育、福祉、生活基盤などの様々な分野にわたる複合的な性質を持っており、その原因や対策を究明するには、それらの関係を組み込んだ包括的な理論モデルの構築が必要とされる。本研究は、この種の包括的なモデルの一つとして、メドウらが地球環境問題の分析に用いたワールドモデル（Meadow:1974, Forrester: 1969）を参考に、過疎地域のシステム・ダイナミックス・モデルの構築をめざすものであり、本稿は、人口流出と少子化・高齢化の関係（原：1995）、外部経済環境が地域の産業・就業構造に与える影響（原：1996）、人口流出が地域の福祉、教育、生活環境、行財政に与える影響（原：1997）という一連の研究の一部をなすものである。また、本研究は、今年度より文部省科学研究補助金（基盤研究 C）として助成を受け、平成9年度から平成11年度の3カ年にわたり、理論モデルから実証モデルへと発展させてゆくことが予定されている。

前稿（原：1997）では、過疎化にともなう人口減少や産業構造の変化が、地域の高齢者福祉、教育、商店街の売り上げ、財政などに与える影響についてモデル化し、シミュレーションを行い、その結果について考察した。本稿では、この次の段階として、前回扱わなかった、これらの要因から人口セクター、産業・就業セクターへのフィードバック・ループの構築を行い、過疎化のダイナミックス・モデルを総合化するとともに、シミュレーションを通じて、このフィードバック効果の影響について検討する。

なお、図表中の変数名は前稿同様、英語・日本語を並記する形とし、本文中の変数名は日本語表記のみに統一した。また今回取り上げるセクター以外のシミュレーション・モデルの詳細については、拙稿（原：1994、1995、1996）を参照されたい。

## 1. 福祉、教育、生活環境、行財政セクターの改良とフィードバックループの構築

### 1.1 記述すべき問題状況

過疎化の進行が地域に及ぼす影響には様々なものがあるが、前稿では、その動向が最も注目される高齢者福祉、学校教育、地元商店街、財政事情の4つに焦点をしぼり、人口減少や年齢構造、産業・経済構造の変化がこれらにどの程度の影響を与えるかを検討

した。しかし、本稿では、逆に、これらの要因が人口流出や産業構造にどのような影響を与えるかをみるための改良が必要とされる。

ここで問題となるのは、人口流出が地域に及ぼす影響という、いわゆる症候群をみる場合には、典型的な事例で代表させることができるが、逆の影響関係をみるには、人口移動に影響を与えうる多くの要因を網羅し、個々の要因の影響力を勘案しなければならない点である。これを行うには、福祉、教育、生活環境、行財政の各分野の要素と人口移動率との関係について、実際の統計データを用い多変量解析を行い、その結果に基づく重み付けを得ることが必要となるが、プロトタイプ的な理論モデルの構築という当面の研究課題の範囲を越えてしまうため今回は断念した。このため、本稿で記述すべき問題状況も、前稿で取り上げた4つの要因に限定するとともに、各要因の人口移動への影響力の大きさは同等であると仮定して改良及びフィードバックループの構築作業を進めた。

なお本稿で取り上げる問題状況は次の通りである。

- ・福祉セクター

過疎地域における高齢者福祉需要の増大は、地域の財政への負荷を高めると予想される。この場合、増大する高齢者福祉需要をすべて満たす形で財政支出が行われれば、他の支出を圧迫するか、財政状況の悪化を招くことが懸念される。一方、高齢者福祉の充実は、高齢者が安心して暮らせる環境を実現し、高齢者の人口流出を抑えるとともに、高齢者の介護を容易にし自らの老後に対する不安を和らげるという点から生産年齢人口の流出にも一定の歯止めを掛けると予想される。逆に高齢者福祉需要の増大に見合う形で財政支出が行われないならば、高齢者や生産年齢人口の流出率を高めたり、あるいは流入率を低下させる効果を生むと思われる。

- ・教育セクター

年少人口の減少は小中学校の統廃合につながる。この場合、統廃合が進められれば、小中学校までの通学距離は増大し、子供たちの教育環境の利便性の低下を招き子育て期の生産年齢人口の流出を加速する効果があると予想される。また地元高卒者数の減少は、地場産業への新規就業者を減らし、就業者の高齢化を招き、結果的に地場産業の活力低下や後継者難による廃業などにつながると考えられる。

- ・生活環境セクター

地元商店街の衰退は廃業による商店街の虫食い化や、活力低下から品揃えが悪くなるなどの状況を生み、地域生活の利便性の低下を招き、結果的に生産年齢人口の流出を加速すると考えられる。

- ・行財政セクター

地方税収の落ち込みによる財政事情の悪化は、地域の自立的で柔軟な財政支出を妨げ、長期的には社会基盤整備の遅れを生み、生活利便性の全般的低下につながるはずであり、これが生産年齢人口の流出を加速すると考えられる。

これら4つの問題は、いずれも長期的に過疎地域の生活環境の質の低下を招き、これが大都市との格差として、過疎地域に住むことの相対的困難さを増し、人口流出を増々加速する可能性を持っていると考えられる。

## 1.2 モデルの構造

### (1) 福祉セクターの改良

前稿では厚生省のゴールド・プランに沿った市町村の老人福祉計画の策定例を参考に、人口セクターで計算した老年人口数から、在宅要援護介護老人の数、必要ホームヘルプサービス量及び必要ホームヘルパー要員数を求めたが、本稿では、全体のコストを算定するため、ホームヘルプサービス以外に、さらに機能回復訓練、デイサービス、訪問健康サービス、訪問看護サービス、ショートステイサービスなどに必要となる人員や施設も追加した<sup>(1)</sup>。(図1)

各サービス需要と必要スタッフ、必要施設数の算定は次の式による。

機能回復訓練需要 = (65 歳以上人口 - 特別擁護老人ホーム収容者 - 入院者) × 出現率 (0.03) × 必要度 (60%) × 年間 52 回

機能回復訓練要員数 = (機能回復訓練需要 ÷ 1 回あたり利用人数 15 人) × 利用時間 7 時間 × 平均従事保健婦 2 名 ÷ 保健婦の平均年間就業時間 (1680 時間)

デイサービス需要 = (在宅寝たきり老人数 + 在宅痴呆性老人数) × 必要度 (60%) × 週 2 回 × 年間 46 週 + 在宅虚弱老人数 × 必要度 (30%) × 週 1 回 × 年間 50 週

デイサービス施設需要 = デイサービス需要 ÷ (一施設の年間サービス供給量: 5 日 × 52 週 × 15 人)

訪問健康サービス需要 = 在宅寝たきり老人数 × 必要度 (100%) × 年 14 回 + 在宅虚弱老人数 × 必要度 (100%) × 年 8 回 + 在宅痴呆性老人数 × 必要度 (100%) × 年 3 回

訪問健康サービス要員 = 訪問健康サービス需要 × 訪問時間 2 時間 ÷ 保健婦の平均年間就業時間 (1680 時間)

訪問看護需要 = (在宅寝たきり老人数 + 在宅痴呆性老人数) × 必要度 (25%) × 年 12 回 + 在宅虚弱老人数 × 必要度 (25%) × 年 6 回

訪問看護要員 = 訪問看護需要 ÷ 看護婦一人あたりの年間訪問回数 (840 回)

ホームヘルプ需要 = (在宅寝たきり老人数 + 在宅痴呆性老人数) × 必要度 (70%) × 週 3 回 × 年間 46 週 + 在宅虚弱老人数 × 必要度 (35%) × 週 1 回 × 年間 50 週

ホームヘルパー要員 = ホームヘルプ需要 × 2 時間 ÷ 年間常勤換算勤務時間 (1200 時間)

ショートステイ需要 = (在宅寝たきり老人数 + 在宅痴呆性老人数) × 必要度 (40%) × 年間 6 回 × 7 日間 + 在宅虚弱老人数 × 必要度 (20%) × 年間 2 回 × 7 日間

要介護支援センター要員 = 2 名 (ソーシャルワーカーまたは介護福祉士 1 名 + 保健婦または看護婦 1 名)

高齢者福祉の必要人員<sup>(2)</sup> = 機能訓練要員数 + 訪問健康サービス要員 + 訪問看護要員 + ホームヘルパー要員 + デイサービス施設需要 × 要介護支援センター要員

高齢者福祉にかかる費用は、大きく人員コストと、施設運営コスト、特別養護老人ホームなどへの委託費の三つに分かれるが、いずれにせよ、当該する市町村が、発生する福祉需要をどの程度、満たすかという政策変数の影響を受ける。

そこで、このモデルでは、高齢者福祉政策という変数を設定し、0.5（ゴールドプランの基準の半分）から 2（同 2 倍）までの範囲で、自治体の施策により、これをコントロールすることにした。また、施策の結果発生するコストは、このモデルの産業・経済セクターの経済単位との整合性をはかるため、すべて人件費に換算し、地域内の標準賃金と掛け合わせる方式を採用した（図 1）。コストの算定は、次の示す式による<sup>(3)</sup>。

高齢者福祉人員数 = 高齢者福祉の必要人員 × 高齢者福祉政策

デイサービス施設数 = デイサービス施設需要 × 高齢者福祉政策

高齢者福祉施設運営費用 = デイサービス施設数 × (デイサービス施設の標準施設運営費用 ÷ 標準ケアスタッフ人件費)

ショートステイサービス = ショートステイ需要 × 高齢者福祉政策

ショートステイサービス事業費 = ショートステイサービス × (ショートステイサービス 1 回あたりの事業費 ÷ 標準ケアスタッフ人件費)

高齢者福祉直接コスト = (高齢者福祉人員数 + 高齢者福祉施設運営費用 + ショートステイサービス事業費) × 地域内賃金<sup>(4)</sup>

このようにして求めた高齢者福祉直接コストは、極めて狭い範囲の直接コストであり、このようなサービスを実施するには、さらに多くの間接コストが発生すると考えられる。そこで、この直接コストを倍数の形で指標化し、行財政セクターとリンクする形を取った。

高齢者福祉費用倍数 = 高齢者福祉直接コスト ÷ 高齢者福祉直接コストの初期値

## (2) 教育セクターの改良と関連指標の設定

まず、地元高卒者数の減少が、地場産業への新規就業者を減らし、就業者の高齢化を招き、地場産業の活力低下や後継者難による廃業などにつながるといった関係を考える<sup>(5)</sup>。

前稿モデルでは、地元高校を卒業し地元就職する若者の数の算定にあたり、地域外への就職率は 50% で変化しないと仮定したが、このように仮定すると、高校進学率上昇の影響がそのまま地元就職する若者の数の増大につながるといった不都合が生じることがわかった。一般に、この年齢層の人口移動率は、生産年齢人口の中でも極端に高いことが知られており、むしろ、生産年齢人口の移動率にこの年齢層に特有な移動率を加味する方が妥当であると考えられる。このため、地元就職率の標準値を 50% として、これに生産年齢人口の移動率の影響を加え、生産年齢人口の移動率が正なら（人口流入）、地元就職率は 50% 以上となり、生産年齢人口の移動率が負なら（人口流出）、地元就職率は 50% 以下となる形に変更した。

地元就職率＝地元就職率の標準値（50％）＋生産年齢人口の移動率

このように一部改訂した式を元に算定した地域の高卒就職者数と就業人口の比を取り、新規就業者比率を算定した（図2）。

新規就業者比率＝地域の高卒就職者数÷就業人口

しかし、後のシミュレーション結果で示すように、就業人口自体が急速に減少して行く状況では、この高卒の新規就業者比率は就業構造の老齢化を示す指標とはならないことがわかった。実際、多くの過疎地域では、毎年、地元高校を卒業し地場産業に就職する人の数は限られており、就業構造の高齢化は、この数が減少することによるというより、むしろ、生産年齢人口の流出と、その結果、65歳以上の老年人口の就業者の比率が相対的に高まることによると考えられる。

そこで、この状況を反映させるため、老年人口を就業人口に算入する形にモデルを変更するとともに、生産年齢人口に所属する労働力人口と65歳以上の労働力人口を求め、この比を労働力人口の高齢化率とした（図2）。

就業人口(t) = 就業人口(t - dt) + (就業人口の変化 - 失業者数の変化) \* dt

就業人口初期値 = 生産年齢人口×生産年齢人口の標準労働力率（60％）+老年人口×老年人口の標準労働力率（20％）<sup>(6)</sup> - 失業者数

就業人口の変化 = 生産年齢人口の標準労働力率（60％）×生産年齢人口の変化率 + 老年人口の標準労働力率（20％）×老年人口の変化率

労働力人口 15-64 = 生産年齢人口×生産年齢人口の標準労働力率（60％）

労働力人口 65+ = 老年人口×老年人口の標準労働力率（20％）

労働力人口の高齢化率 = 労働力人口 65+ ÷ 労働力人口 15-64

このような労働力人口の高齢化が、地場産業の活力低下や後継者難による廃業などにつながるといった関係は十分に予想できるが、実際にこの要素が、生産性をどの程度低下させるか、また、後継者難による廃業をどの程度、生じるかを仮定することは、統計データによる解析なしには困難である。また、このモデルの産業セクターでは、生産性は、投下資本に対応して上昇すると仮定しており、人材の質と生産性の関係は取り上げていない。このため、本稿では、前述の新規就業者比率とこの労働力人口の高齢化率を産業の活性化の指標とするだけに止めることとした。

次に年少人口の減少が小中学校などの統廃合につながった場合に通学距離が増大し、教育環境の利便性の低下から子育て期の生産年齢人口の流出を加速するといった効果を記述する必要がある。しかし、前稿のモデルでは、本校と分校の標準クラス数や統廃合の基準などが不明であるため、1学級あたりの標準人数=40人として、学校設備稼働率を算定する形を取っており、ここから通学距離の変化を求めることは非常に困難である。

そこで通学距離にかわり、年少人口間の距離を算定し、これを教育環境の利便性の指標とすることを考えた。具体的には、年少人口は、すべて住宅地に住んでいると仮定し、この住宅地面積を年少人口で割り、年少人口一人あたりの住宅地面積を算定し、これを

円周率＝3.14 で割ったものの平方根を求め、これを2倍することによって、年少人口間の平均距離を求めた（図3）。

$$\text{年少人口間の距離} = \text{平方根} \left( (\text{住宅地面積} \div \text{年少人口}) \div 3.14 \right) \times 2$$

この指標は、一人の子供がいた場合に、隣接する家にいる別の子供までの平均距離を意味しており、すべての年少人口が住宅地に均等に分布しているという無理な仮定にたっているが、同年代の子供やその親同士の日常的な接触の難易をある程度、反映するものと期待できる。また、小中学校などの統廃合に合わせて住民の居住分布が変化することがないとすれば、この年少人口間距離の増大は、平均通学距離の増大を反映するものと考えられる。

このようにして求めた年少人口間の距離とその初期値との比を取り子育て環境指標<sup>(7)</sup>とした。

$$\text{子育て環境指標} = \text{年少人口間の距離} \div \text{年少人口間の距離の初期値}$$

### （3）生活環境セクターの改良

生活環境セクターでは、まず、地元商店街の衰退が、廃業による商店街の虫食い化や、その活力低下から品揃えが悪くなるなどの状況を生み、地域生活の利便性の低下を招き、これが生産年齢人口の流出を加速すると考えられる。

このうち、廃業による商店街の虫食い化は商店数の減少として捉えられるが、利便性という観点からみて商店数より、一世帯あたりの商店数を指標とする方が妥当だろう。そこで、総人口を平均世帯人員で割り、総世帯数を求め、商店数との比を算定する形をとった。なお、わが国の平均世帯人員は過去 30 年の間に大幅に減少しているため、シミュレーション期間中に5人から3人まで線形的に減少するものと仮定した<sup>(8)</sup>。また、品揃えは、一商店あたりの売り上げ規模に比例すると考え、その初期値との比を指標とした（図3）。

$$\text{総世帯数} = \text{総人口} \div \text{平均世帯人員}$$

$$\text{一世帯あたりの商店数} = \text{商店数} \div \text{総世帯数}$$

$$\text{商店数指標} = \text{一世帯あたりの商店数} \div \text{一世帯あたりの商店数の初期値}$$

$$\text{品揃え指標} = \text{地元商店1店当たりの売上高} \div \text{地元商店1店当たりの売上高の初期値}$$

### （4）行財政セクターの改良

行財政セクターの改良に関しては、まず、高齢者福祉の増大が財政需要にどの程度の負荷を与えるかを算定しなければならない。福祉セクターの改良の結果得られた高齢者福祉需要指数は、ゴールドプランのような高齢者福祉サービスを実施とした場合の直接コストの増加を示すが、このような直接コストは高齢者福祉予算のごく一部であり、市町村財政への全体的負荷を算定するには、他の間接コストも加えて考える必要がある（図4）。

そこで、まず 高齢者福祉予算の初期値を次の式で算定する。

高齢者福祉予算の初期値＝基準財政需要額×民生費比率（10％）×福祉関連比率（70％）×高齢者福祉関連比率（30％）<sup>(9)</sup>

次に、高齢者福祉にかかわる運営費用の増加×市町村の負担割合（5％）が国庫補助金などを除いた基準財政需要額を越える増分と考え、高齢者福祉予算の初期値に高齢者福祉需要指数から1を引いた増分を掛け、高齢者福祉関連の予算の増加を求め、これを基準財政需要額に足したものが、実質的な財政支出の大きさとなる。

高齢者福祉関連の予算の増加＝高齢者福祉予算の初期値×（高齢者福祉需要指数－1）

財政支出＝基準財政需要額＋高齢者福祉関連の予算の増加

財政支出（国庫補助金分を除く）が基準財政需要額より大きくなる場合には、その不足分は市町村債や過疎債などの起債により補充されねばならず、起債が大きくなれば一般財源（基準財政収入額＋地方交付税交付金）の運用の自由度が低下し新規事業の展開が困難となり、いわゆる財政の硬直化が起これと考えられる。そこで、財政支出と基準財政需要額の比を求め、これを財政バランスとして、財政の自由度の指標（高齢者福祉の負荷に関する）とした（図4）。

財政バランス＝基準財政需要額÷財政支出

この指数は、1で均衡、0に近づくにつれ財政状況が悪化し、1を越えるほど財政状況が良いことを示す。

しかし、この財政バランスの指標は、高齢者福祉の負荷の影響をみるには都合が良いが、地方税収の落ち込みによる財政事情の悪化を反映するものではない。そこで、地方税収の落ち込みによる地域の自立性の低下と、その結果としての長期的な社会基盤整備の遅れの指標としては、財政力指数の変化を利用することにした。

財政力指標＝財政力指数÷財政力指数の初期値

さらに、このような財政バランスと財政力指標は、財政の自立度、健全性をみる指標としては有効であるが、住民の生活感覚として、いくら自立的で健全な財政であっても、結果的に予算規模が自体が小さくなって行けば、やはり全般的な生活の利便性の低下という印象を受けざるを得ない。そこで、予算規模の変化の指標として、高齢者福祉の財政規模指標と財政規模指標を設定した。

高齢者福祉の財政規模指標＝高齢者福祉予算÷高齢者福祉予算の初期値

財政規模指標＝財政支出÷財政支出の初期値

#### （5）人口移動率へのフィードバック

最後に、このようにして設定した各種の指標を人口移動率にリンクすることを考えた。

このモデルでは、高齢者の移動に関しては、生産年齢人口の移動率の半分（0.5）を標準値としているが、これは、高齢者が自立的に移動することは稀であり、多くは生産年齢人口とともに移動するが、その移動性は他の年齢人口より低いという仮定に立っている。そこで、先に福祉セクターで設定した高齢者福祉政策指標が高齢者の移動率に与える影響を、次のように仮定した。

まず、生産年齢人口が流出する（高齢者も流出する）ケースで

- ・高齢者福祉政策が 0 に近く国が定めた基準より高齢者福祉サービスが低く抑えられている場合には、高齢者の流出率は最大 2 倍となり生産年齢人口の流出率と同じになる。
- ・高齢者福祉政策が 1 より小さく福祉需要を満たし切らない場合は、生産年齢人口の流出率の半分より大きくなる。
- ・高齢者福祉政策が 1 で福祉需要を国の基準で満たす場合は、格別な影響力なく標準値（生産年齢人口の流出率の半分）となる。
- ・高齢者福祉政策が 1 より大きく福祉需要を国の基準以上に手厚く満たす場合は、流出を抑え流入を促進する結果、高齢者の移動率は 0 に近づく。

老年人口移動率＝生産年齢人口移動率×老年人口移動率倍数（標準値 0.5）×高齢者福祉政策からの老年人口移動率倍

高齢者福祉政策からの老年人口移動率倍＝GRAPH(高齢者福祉政策)

(0.00, 2.00), (0.2, 1.80), (0.4, 1.60), (0.6, 1.40), (0.8, 1.20), (1.00, 1.00), (1.20, 0.8), (1.40, 0.6), (1.60, 0.4), (1.80, 0.2), (2.00, 0.00)

また、生産年齢人口が流入する場合（高齢者も流入する場合）については、高齢者福祉政策の影響はないものとし、標準値のままとした。

老年人口移動率＝生産年齢人口移動率×老年人口移動率倍数（標準値 0.5）

次に生産年齢の移動率に影響を与える指標としては、子育て環境指標、商店数指標、品揃え指標、財政バランス、財政力指標、高齢者福祉の財政規模指標、財政規模指標などが考えられる。

子育て環境指数は、年少人口間距離に基づいており、子育てに関係する生産年齢人口にとっては重要な指標となるが、その一方、子供のいない世帯や、高齢者の扶養が問題となる世帯の生活環境指標とはならない。そこで、子育て環境指標の他に、世帯間距離と高齢者間距離を求め、これを生活環境指標に加えることにした（図 3）。

世帯間距離指標＝世帯間距離÷世帯間距離の初期値

世帯間距離＝平方根（（宅地面積÷総世帯数）÷3.14）×2

老年人口間距離指標＝老年人口間距離÷老年人口間距離の初期値

老年人口間距離＝平方根（（宅地面積÷老年人口間距離）÷3.14）×2

世帯間距離は、隣人との物理的距離の指標で、近所付き合いのしやすさや、住宅地の

賑いの目安となると考えられる。また、老年人口間距離指標は、本来、高齢者の生活環境を示すものだが、高齢者は単独では稀にしか移動しないという仮定に立ち、その介護にあたる生産年齢人口の移動に影響するものと想定した（図3）。

これら三つは、住民相互の交流にかかわるものなので、これらを掛け合わせ交流距離という指標にまとめた。

$$\text{交流距離} = \text{子育て環境指数} \times \text{世帯間距離指標} \times \text{老年人口間距離指標}$$

また、商店数指標、品揃え指標は、いずれも買い物の利便性を示す指標として、一つにまとめられる。

$$\text{買い物の利便性} = \text{商店数指標} \times \text{品揃え指標}$$

さらに財政バランス、財政力指標、高齢者福祉の財政規模指標、財政規模指標のうち、財政バランスと高齢者福祉の財政規模指標は、高齢者福祉のみにかかわるものなので、単なる指標に止め、財政力指標と財政規模指標のみをまとめ、これを生活基盤整備などの指標とすることにした（図3）。

$$\text{生活基盤の整備} = \text{財政力指標} \times \text{財政規模指標}$$

先にも述べたように、これら三つの要因が実際にどの程度、生産年齢人口の移動率に影響を与えるかは、統計データによる多変量解析を行わないとわからないが、このモデルでは、すべて同じ程度に影響を及ぼすと仮定し、次のような式を用い、生活環境指標からの移動率倍数を求めた。

$$\text{生活環境指標} = \text{生活基盤の整備} \times \text{買い物の利便性} \div \text{交流距離}$$

$$\text{生活環境指標からの移動率倍数} = \text{GRAPH}(\text{生活環境指標})$$

$$(0.00, 0.5), (0.2, 0.6), (0.4, 0.7), (0.6, 0.8), (0.8, 0.9), (1.00, 1.00), (1.20, 1.10), (1.40, 1.20), (1.60, 1.30), (1.80, 1.40), (2.00, 1.50)$$

この式では、生活環境指標が0に近づくにつれ、移動倍数は最低の 0.5 となり、1では影響力なし、最大2倍で、影響力は 1.5 倍になると仮定し、生産年齢人口の転入率には、そのままの形で、転出率には、その逆数を掛け合わせる形とした（図3）。

$$\text{生産年齢人口の転入率} = \text{生産年齢人口標準転入率} \times \text{就業機会からの転入倍数} \times \text{賃金格差からの転入倍数} \times \text{生活環境指標からの移動率倍数}$$

$$\text{生産年齢人口の転出倍数} = \text{生産年齢人口標準転出率} \times \text{就業機会からの転出倍数} \times \text{賃金格差からの転出倍数} \times (1 \div \text{生活環境指標からの移動率倍数})$$

## 2. シミュレーションとその結果

### 2.1 条件設定

過疎化にともなう地域の高齢者福祉、教育、商店街の売り上げ、財政などの変化が人口減少や産業構造に与える影響をみるため、ここでは、前稿と同様、次の4つの条件に基づくシミュレーションを行なった（表1）。

想定1：少子化・長寿化のみ

全国的な傾向である少子化・長寿化の影響のみが作用する場合を想定し、シミュレーション開始後30年間に出生力と高齢者死亡率が半減するという条件を設定した。

想定2：人口減少が比較的穏やかな場合

上記の条件に加え、比較的穏やかな人口減少が発生する外部経済環境として、生産物需要の伸びだけが停滞し、製品価格・原材料価格・標準賃金などが年率1%で増加するという条件を設定した。

想定3：人口減少が急激な場合

想定1の条件に加え、最も激しい人口減少が発生する外部経済環境として、生産物需要と製品価格の増加がなく、原材料価格や外部の標準賃金のみが年率1%で増加するという条件を設定した。

想定4：人口が成長する場合

比較対象として、想定1の条件に加え、人口が増加する外部経済環境として、生産物需要のみが年率1%で上昇し、製品価格・原材料価格・外部の標準賃金に変化しないという条件を設定した。

また、高齢者福祉政策の効果を見るため、想定3について、高齢者福祉政策＝1.5（全国並み以上）、高齢者福祉政策＝0.5（全国並み以下）のシミュレーションを行った<sup>(10)</sup>。

### 2.2 結果

#### （1）人口構造の変化

環境生活指標からのフィードバックを加えたケースでは、当然のことながら総人口の増減が大きくなるが、とりわけ、想定1の少子化・高齢化のみの場合に15,650人から10,946人へと－30.1%減少し（フィードバック効果なし、15,183人、－3.0%）その影響が大きかった。これに対し、年齢構成に与える影響は、年少人口比率13.5%（同13.9%）、生産年齢人口比率60.7%（同62.3%）、老年人口比率25.8%（同23.7%）と、他の想定と同様、極めて限定されている。また、人口減少が激しい場合や成長型では、環境生活指標からのフィードバックが、総人口の増減や年齢構造の変化をやや加速する傾向が見られるが、想定2の人口減少が比較的おだやかな場合には、ほとんど効果を持たないことがわかる。

#### （2）産業・就業構造への影響

地域の高卒地元就業者数を比較すると、想定1の少子化・高齢化のみの場合と、想定3の人口減少が激しい場合で、かなりの差が見られるが、他のケースでは同数となって

おり影響は見られない。これに対し新規就業者比率は、すべての想定で **0.70%**（初期値 **0.80%**）となっており、全く差が見られない。これは、就業人口数に対し、新規就業者数が極めて小さいこと、また、地域の高卒地元就業者数が激減するケースでは、就業人口数も同じように減少するため、いずれにせよ、この要素が直接的に就業構造の高齢化を引き起こすとは言い難いことがわかる。

同様に、就業人口の高齢化率を比較すると、想定3の過疎化が急激に場合に **17%**（フィードバック効果なし **15%**）とやや高くなるものの、他はいずれも **11%**から **12%**と、あまり大きな差は生じていない。これは、老年人口の標準労働力率を **20%**と想定したことにもよるが、後に述べるように、一般に観察される過疎地域の就業構造の高齢化の実態とは大きく掛け離れた印象があり、この問題には人口高齢化以外の要因が関係していると考えられる。

### （3）交流距離などへの影響

人口移動へのフィードバックには加えなかったが、人口密度の減少やその結果としての一人あたりの宅地面積の増加には想定によって著しい差が発生する。これらの指標は、大都市生活者の視点からみると住環境のゆとりと捉えることもできるが、過疎地域では空き家や廃屋の増加、集落の無人化などの形で現出することが多く、新規住宅の着工件数などの要素を加え、より現実的にする必要があることがわかる。

子育て環境指標（年少人口間距離）は、成長型では **1.09** 倍と、ほとんど増加しないが、少子化・高齢化のみの場合や、比較的穏やかな人口減少の場合でも **1.22** から **1.46** 倍となり、過疎化がもっとも激しいケースでは、**3.22** 倍（フィードバック効果なし、**2.39** 倍）まで増大する。これに対し、世帯間距離指標は、過疎化がもっとも激しい想定3の場合のみ **1.93** 倍（同 **1.46**）となるが、他の想定では、すべて1以下となり、むしろ距離が縮まる傾向にあることがわかる。これは平均世帯人員が5人から3人に低下する結果、人口減少にもかかわらず総世帯数が増加するためである。実際、過疎地域でも全国同様、世帯数は増加傾向にあるが、その内容が老人単独世帯の増加に片寄る傾向も見れることを考慮すると、この指標はやや単純過ぎることがわかる。

老年人口間距離指数も、同様に過疎化がもっとも激しい想定3の場合のみ **1.70** 倍（同 **1.36** 倍）となるが、他の想定は、すべて1以下となり、むしろ距離が縮まる傾向にある。これは、老年人口の増加が反映されるためだが、過疎化が急激な場合には、老年人口も大きく減少し、老年人口間距離が拡大することがわかる。

これら3つの指標を掛け合わせた交流距離の指標は、全般に1以下となり縮まる傾向を示すが、想定1のフィードバック効果ありで **1.27** 倍と拡大するが、想定3の効果ありでは **10.55** 倍（効果なしでは **4.74** 倍）と極端な増加を示す。無論、これは変数の掛け合わせにより差が増幅されることによるが、そのような相乗効果は現実にもありうると思われる。

### （4）買い物の利便性への影響

前稿でも触れたように、地元商店数の増減は人口数のみでなく住民所得の増減の影響を受けるが、想定3を除き、ほとんど変化しないか微増となっている。しかし、これに

対し、商店数指標は、想定3のフィードバック効果ありが**3.13**倍（同なし**1.88**）で最高となり、逆に想定4が**0.52**倍と最低となる。これは、過疎化が激しい場合には、商店数の減少より、総世帯数の減少の方がより激しいために、一世帯あたりの商店数は、むしろ相対的に増加するためである。過疎地域において、一世帯あたりの商店数の増加が実際に、どの程度、買い物の利便性を高めるかは疑問だが、このような効果は、一般的には成り立つと考えられる。

一方、一店あたりの売り上げは、住民所得がもっとも増加する想定2と想定4で著しく増加し、想定1のフィードバック効果ありが**10.2**とやや低く、想定3のフィードバック効果ありで**2.1**（同なし**3.6**）ともっとも激しい減少を示す。品揃え指数は、この一店あたりの売り上げがそのまま反映されるため、商店数指標のような逆転現象は起きない。この結果、両者を掛け合わせた買い物の利便性は、やはり想定3のフィードバック効果ありが**0.45**倍（同なし**0.47**）で最低となり、想定2が**0.84**倍で（同なし**0.85**）最高となる。

#### （5）行財政への影響

財政力も、また人口数のみではなく住民所得や地場産業の収益性の影響を受けるため、前稿の結果と同じく想定2の場合がもっとも良好となる。また、財政力指数に関しては、生活環境指数からの影響は、ほとんどないことがわかる。このようなことから、行財政関係の指標をまとめた生活基盤の整備でも、想定2の場合がフィードバック効果ありで**3.16**倍（なし**3.11**）と、もっとも良好となり、この点に関しては、前稿同様、住民数そのものより、産業の収益性、とりわけ、地方法人税の大きさが重要であると言えよう。

なお、高齢者福祉の財政支出に対する負荷を見るために設定した財政バランスは、全体としては変化なししか悪化を示しているが、想定3の過疎化が急激な場合のみ、フィードバック効果ありで**1.10**倍（なし**1.04**）と、むしろ余裕を生じている。これは、前稿でも指摘したように急激な過疎化は老年人口比率を上昇させるが、その絶対数を減少させるため、むしろ財政負荷は低下する結果となる。ただし、このような事が起こるには、このモデルが想定しているように老年人口数の減少に比例して高齢者福祉の財政支出も縮小することが前提となる。実際、シミュレーション結果の高齢者福祉予算は、想定3の過疎化が急激な場合は、フィードバック効果ありで**22**（なし**36**）となり、もっとも予算大きくなる想定2の**159**（なし**158**）の7分の1程度となっている。

#### （6）高齢者福祉政策の効果

高齢者福祉政策の効果を見るため、想定3の過疎化が急激な場合を取り上げ、高齢者福祉政策＝**1.5**（全国並み以上）、高齢者福祉政策＝**0.5**（全国並み以下）の二つのケースについてシミュレーションを行った。その結果、総人口は、高齢者福祉の水準が全国並みの場合の**2,533**人に対し、前者が**2,780**人、後者が**2,368**人と、各々増減の効果が現われたが、人口減少率では、－**83.8%**に対し、各々－**82.2%**と－**84.9%**という結果となり、その差は1%程度に留まることがわかった。これに対し、老年人口比率は、全国並みの場合の**34.1%**に対し、前者が**41.3%**、後者が**28.4%**となり、かなりはつきりした影響が現われる。同様に労働人口の高齢化率も、**17.0%**に対し、前者が**22.0%**、後者が**14.0%**となり、高齢者福祉政策を手厚くすると、高齢者の人口流出率が低下し、人口構造や就

業構造の高齢化が加速されることがわかる。一方、高齢者が増加する結果、老年人口間距離は、**1.48** 倍と全国並みの場合の **1.70** 倍（全国以下 **1.93** 倍）より縮まり、これを反映して交流距離指標は **8.83** 倍（全国並み **10.55** 倍、全国以下 **12.27** 倍）と良化するが、他の指標と合わせた生活環境指数では、**0.003** 倍（全国並み **0.002** 倍、全国以下 **0.002** 倍）となり、ほとんど差がなくなってしまう、生産年齢人口の移動率への影響という点では、殆ど無視できることがわかる。これに対し、高齢者福祉の財政への負荷の指標である財政バランスは **1.08** 倍（全国並み **1.10** 倍、全国以下 **1.12** 倍）で三者の中では最も悪くなる。

### 3. まとめと考察

シミュレーション結果では、地域の高齢者福祉、教育、商店街の売り上げ、財政などの生活環境の変化が人口減少や産業構造に与えるフィードバック効果はかなり限定されたものとなっている。これは、生産年齢人口の移動率に他の年齢層の移動率が連動する形を取っていること、また、他の要因がどれほど転入を促進しようと就業機会が不足している限り、転入は起きず人口は転出するという、モデルの構造に一部、起因しているといえよう。しかし、わが国の人口移動統計でも、国内の人口移動で最も重要な移動理由の第1位は「職業上の理由」であり、全体の **38.9%**と圧倒的なウエイトを占めている。これに対し「住宅事情」は **9.0%**、「環境上の理由」は **2.3%**とはるかに少なく（大友：1996）、現実問題として生活環境の悪化や向上が、人口移動に直接大きな影響を持つとは考えにくい。シミュレーション結果にも見られるように、生活環境の変化という二次的要因が人口移動に大きな作用を及ぼすとすれば、過疎化が著しい場合より、むしろ、想定1のように特別な事情がなく少子・高齢化のみが進行する場合である。従って、多くの過疎地域において多大な努力と資源が投入されている生活環境やその利便性の向上などの施策では、過疎化を抑制するといった効果は殆ど期待し得ないことがわかる。

次に、過疎地域では就業人口の高齢化が問題となっているが、シミュレーション結果から判断する限り、過疎化自体が地元高卒者数の減少や老年人口比率の増大を通じ、この状況を加速する効果は、あまり大きくないことがわかる。前者の地元高卒者数の減少は、一般的な少子化の影響と区別できないし、またその絶対数が限られているため、就業人口の高齢化の主要な要因とは成りえない。また、後者の老年人口比率の増大も、老年人口の労働力率が生産年齢人口よりはるかに低いという一般的な仮定の元では大きな影響は持ちえない。

事実、平成7年度の過疎白書によれば（国土庁：1997）、過疎地域における就業人口に占める65歳以上の割合は **15.1%**となっており、これは全国平均の **7.2%**の2倍程度であり、シミュレーション結果の想定3の **17.0%**にほぼ近い。しかし、同じ統計を産業別にみると、農業では **42.0%**、林業 **20.8%**、漁業 **19.2%**となっており、就業人口の高齢化が特定産業で異常に進んでいることがわかる。つまり、これらの分野が基幹産業を占める過疎地域では、就業人口の高齢化の印象ははるかに強くなると思われる。このことから、過疎地域における就業人口の高齢化を分析するには、産業構成や産業ごとの労働力事情を考慮したモデルが必要であることがわかる。

このモデルでは、生活環境の変化の主要な要因の一つとして交流距離を組み込んだが、

シミュレーション結果をみる限り、過疎化が急激に進行した場合、各要素間の相乗効果が発生し、非常に極端な交流距離の拡大が起きることがわかる。これはすでに指摘したように、要素間の関係を掛け合わせるというモデルの構造にもよるが、実際の過疎地域を訪れた印象とも符合しており、必ずしも非現実的とは言えないと思われる。わが国の過疎対策でも集落整備という項目はあるが、その中心は過疎化した集落のインフラ整備にあり、集落そのものを積極的に整理・統合し人口を移動させるといったものではない。しかし、このモデルでもわかるように交流距離の分母となるのは宅地面積であり、これを集約化し過疎化した人口の再集住化を行えば、少なくともこの問題は大きく改善されうると思われる。

買い物の利便性は、やはり過疎化が深刻な場合に最悪となるが、シミュレーション結果からもわかるように、その主要な要因は、主要産業の衰退による住民所得の減少と、これにともなう一商店あたりの売り上げ低下にあり、近年、問題となっている郊外立地型大規模小売店やコンビニエンスストアの進出などの外的要因による地域外での買い物比率の上昇は、むしろ、この買い物の利便性の低下の結果であると解釈できる。また、一世帯あたりの商店数は、過疎化が進んだ場合にもっとも大きくなるが、むしろ世帯数の減少に合わせ小売店数を整理し減少させた方が一商店あたりの売り上げを改善し、問題の解決につながるのではないかという印象を持った。

行財政については、やはり前稿同様、人口数そのものより住民所得や地場産業の収益性の影響がもっとも大きいことがわかった。また、高齢者福祉の財政への負荷に関しては、過疎化が進んだ方が小さくなるという逆説的な結果を得たが、実際に老年人口数の減少に比例して高齢者福祉の財政支出も縮小することができれば、このようなメリットを享受できるはずであり、また支出をそのままにするとすれば高齢者一人あたりの福祉支出を増大できるはずである。ただ、実際問題としてはスケール・デメリットの要素が発生する可能性も考えられ、高齢化対策上、過疎化が有利に働くかどうかについては、さらに統計データによる検証が必要と思われる。

一方、高齢者福祉政策の影響についてのシミュレーション結果は、高齢者福祉を手厚くしても、総人口の増減への影響は限られており、むしろ、高齢者の人口流出を抑制する結果、老年人口比率や財政負荷を増大させるというマイナス効果を生む恐れがあることを示している。また、このモデルでは、高齢者単独の人口移動は基本的にまれであるという想定に立っているが、そうでないとなれば、特定の過疎地域が手厚い高齢者福祉対策を実施した場合に、周辺地域から老年人口が大量に流入する可能性も否定できないと言えよう。

おわりに

本稿では、過疎化にともなう地域の高齢者福祉、教育、商店街の売り上げ、財政などが、人口減少や産業構造の変化に与える影響について、各種の指標を設定しフィードバック・ループを組み込み、そのシミュレーション結果について考察した。次の段階としては、今回、時間の関係で扱えなかった過疎化の進行やその影響を最小化するための施策的可能性について、シミュレーションを行い検討したいと考えている。また、フィー

ドバック・ループの組み込み作業からもわかるように、論理的なプロトタイプ・モデルから、さらに次の段階へと進むには、過疎地域に関する総合的な統計分析が必要であり、この作業を文部省科学研究補助金（基盤研究 C）の助成を利用し進めて行く計画である。

### 註

- (1) 前稿同様、平成 6 年 3 月に策定された北海道厚真町の「老人保健福祉計画」（厚真町、1994）を参考にするとともに、ゴールドプラン以降の要因（厚生省大臣官房老人福祉保健福祉部：1992、厚生省編：1997、武田：1995、総務庁編：1997）も勘案して検討を進めた。なお、実際に高齢者福祉サービスの充実が始まったのは近年のことであり、このモデルが想定している過去 30 年間の動きとは時間的にずれるが、この分野の動きと過疎化の関係を考察するため、あえて最新の状況をモデルに組み込んだ。モデルの結果の解釈上は、仮に過疎化が始まった初期の段階からゴールドプラン的な施策が実施されていたとした場合ということになる。
- (2) 今回は必要ヘルパー要員数の他にデイサービス、ショートステイなど様々な老人福祉サービスをモデルに組み込んだため、高齢者福祉の必要人員は前回より増加したが、最大となる想定 4 の成長型でも 30.04 人（前回 19.9 人）であり、生産年齢人口にかかるマンパワー上の負荷は殆ど変わらないことがわかった。
- (3) 高齢者福祉にかかわるコストの算定は極めて複雑であり、ことに施設関係については、その種別により大きく異なるとともに、人件費が明示されていても施設スタッフ数が明記されていないなどのケースもあるため、ここでの算定はあくまでも概算に過ぎない。また、施設・設備の建設なども財政負担を発生させられると思われるが、国庫からの補助も含め財政支出の方式が複雑なため、経常コストのみに対象を限定した。
- (4) 高齢者福祉に関わる人件費は、パートタイム的なホームヘルパースタッフ、保健婦、看護婦、社会福祉士、医師などの様々な専門性と賃金水準の人々が関係するため算定がむずかしく、ここでは最も数が多いホームヘルパースタッフを基準に、地域内の標準賃金を掛け合わせる形を取った。地域内の標準賃金のかわりに、地域外の標準賃金を用いた場合には賃金格差の関係から、このコストは大きくなると思われるが、その場合には実際に必要スタッフが 100% 充足されるかどうかという別の問題も起きる。
- (5) 教育セクターに関わる内容ではあるが、作業を進めるうちにこのセクター自体の改良には実際の自治体のデータが必要であることがわかり、当面、フィードバック上の関係が深い就業構造、生活距離などで代替する方法を採用した。
- (6) 昭和 60 年の過疎地域の就業人口の年齢構成をみると 15-29 歳が 15.8%、30 歳-64 歳が 74.4%、65 歳以上が 9.8%（全国：各 22.2%、72.4%、5.4%）となっており、当時の年齢別人口数を用いて、ここから年齢別就業率を求

めた結果、15歳-64歳で64.3%、65歳以上で21.0%、全体では57.9%となった。

- (7) 子育て環境の指標として、保育園・幼稚園や、小学校・中学校の設備状況、公園施設や自然環境など、もっと多様な要素を勘案すべきであるが、人口流出との関係がもっとも強いという観点から年少人口間距離のみを取り上げた。
- (8) わが国の平均世帯人員（普通世帯）は、1955年4.97人、1960年4.54人、1965年4.05人、1970年3.69人、1975年3.45人、1980年3.33人、1985年3.23人、1990年3.06人と、ほぼ線形的に減少している（厚生省人口問題研究所：1995 p.115）。なお、平成7年（1995年）のデータ（国土庁地方振興局過疎対策室監修：1997 p.45）では、全国2.99人に対し過疎地域は3.20人となっており、過疎地域の方が世帯人員の減少が遅れる傾向にあると考えられるが、ここでは平均世帯人員が年次が進むにつれ線形減少する場合の影響をみることが目的なので、30年で5人から3人という設定にした。
- (9) 過疎地域の民生費比率、福祉関連比率、高齢者福祉関連比率について一般的な統計が見つからなかったため、北海道上川郡清水町の平成3年度の歳入歳出決算書から独自に算出した。（武田：1995）によれば、市町村の歳出に占める民生費比率は70年代の初めで11.6%だったが、その後の10年間に16.7%まで上昇し、また、この民生費に占める老人福祉費の比率も70年代7.4%から80年代には23.0%に急速に増加したという。将来的には、これらの比率の変動を過疎地域について統計的に分析しモデルに組み込みたいと考えている。
- (10) 生活環境指標の影響がある場合とない場合を比較する形を取った。なお、影響がない場合の数値結果は、就業人口に老年人口からの就業者を組み込んだため前稿のものと微妙に異なる。また、高齢者福祉政策に関するシミュレーション結果表は紙幅の都合で割愛するが、本文で触れる箇所以外には格別の影響は見られなかった。

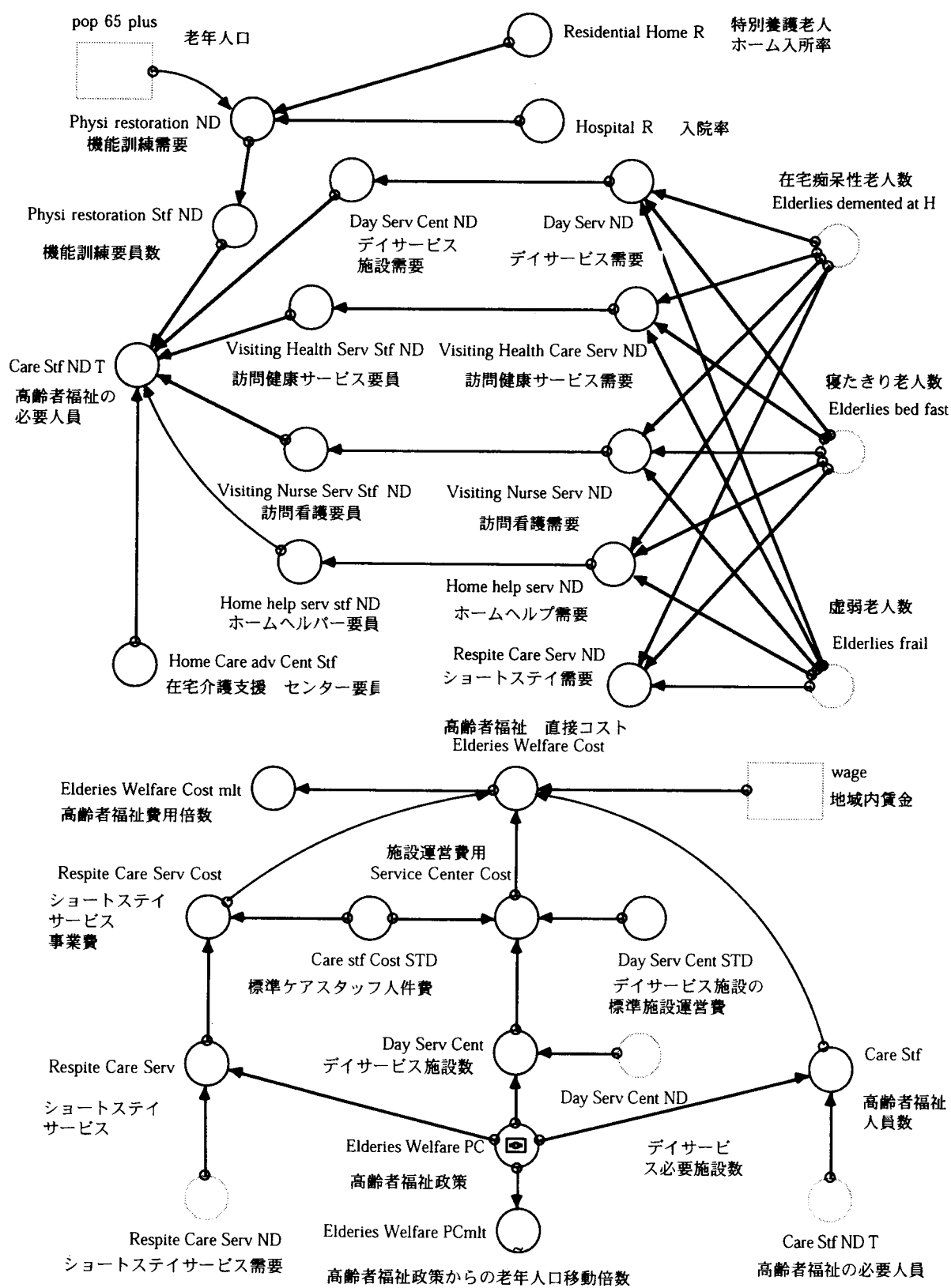


図1 福祉セクターの改良

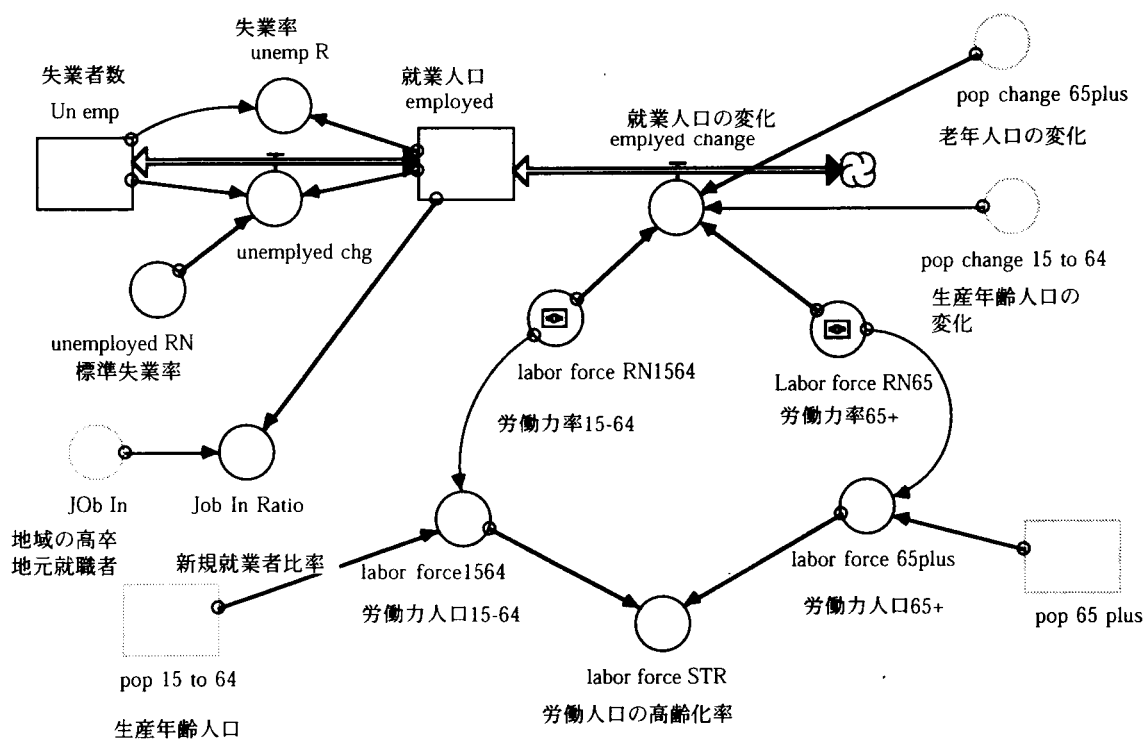


図2 就業セクターの改良

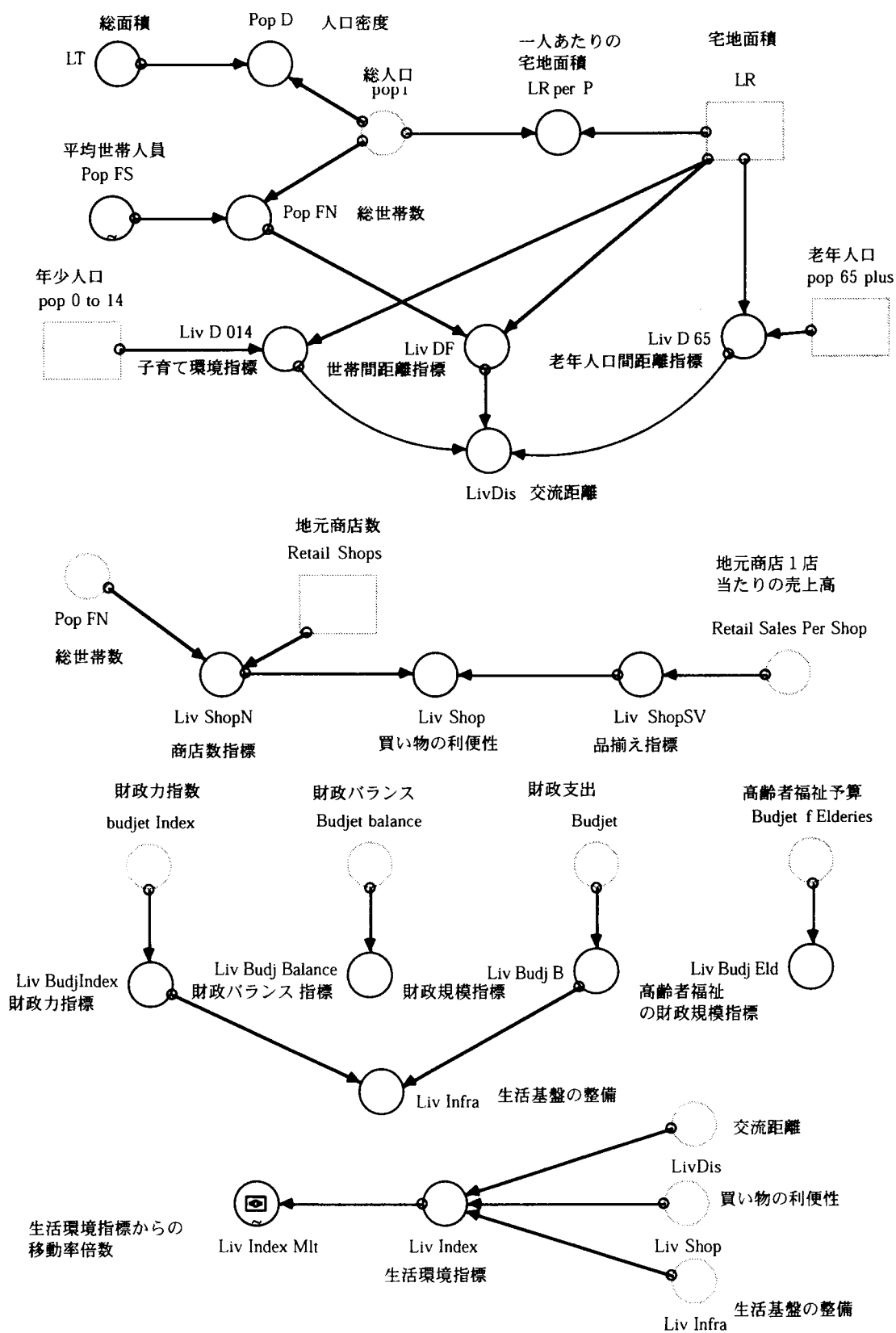


図3 生活環境指標の設定

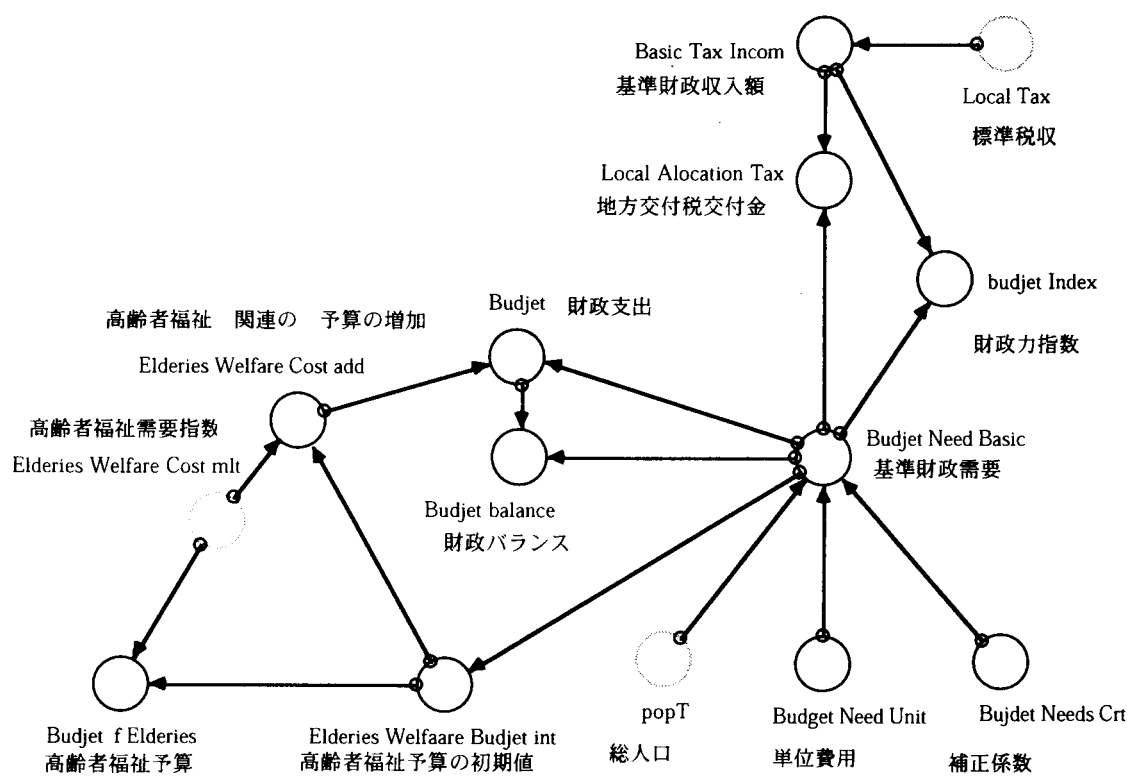


図4 行財政セクターの改良

表1 シミュレーション結果

条件設定 内容	初期条件	想定1		想定2		想定3		想定4	
		少子化・長寿化のみ なし	あり	比較的穏やかな場合 なし	あり	急激な場合 なし	あり	想定長 なし	型 あり
生活環境指標の影響の有無									
総人口(人)	15,650	15,183	10,946	14,558	14,375	4,388	2,533	18,794	20,118
総人口の減少率(%)		-3.0%	-30.1%	-7.0%	-8.1%	-72.0%	-83.0%	20.1%	28.5%
年少人口(人)	3,150	2,112	1,481	2,023	1,987	552	304	2,648	2,842
生産年齢人口(人)	10,000	9,466	6,644	9,069	8,910	2,479	1,365	11,866	12,736
老年人口(人)	2,500	3,605	2,822	3,466	3,478	1,357	864	4,280	4,540
年少人口比率(%)	20.1%	13.9%	13.5%	13.9%	13.8%	12.6%	12.0%	14.1%	14.1%
生産年齢人口比率(%)	63.9%	62.3%	60.7%	62.3%	62.0%	56.5%	53.9%	63.1%	63.3%
老年人口比率(%)	16.0%	23.7%	25.8%	23.8%	24.2%	30.9%	34.1%	22.8%	22.8%
就業人口(人)	6,435	6,337	4,505	6,074	5,981	1,740	982	7,897	7,897
地域の高卒地元就職者(人)	52	43	32	41	41	13	7	52	52
新規就業比率(%)	0.80%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%
労働人口の高齢化率(%)	8.0%	11.0%	12.0%	11.0%	12.0%	15.0%	17.0%	11.0%	11.0%
人口密度 人/km <sup>2</sup>	104.3	101.2	73	97.1	95.8	29	17	125.3	125.3
世帯数(世帯)	3,130	5,061	3,649	4,853	4,792	1,463	844	6,265	6,265
一人あたりの宅地面積 m <sup>2</sup> /人	96	99	137	103	104	342	592	80	80
子育て環境指標	1.00	1.22	1.46	1.25	1.26	2.39	3.22	1.09	1.09
世帯間距離指標	1.00	0.79	0.93	0.80	0.81	1.46	1.93	0.71	0.71
老年人口間距離指標	1.00	0.83	0.94	0.85	0.85	1.36	1.70	0.76	0.76
交流距離	1.00	0.80	1.27	0.85	0.86	4.74	10.55	0.59	0.59
商店数	100	99.9	96.9	103.1	103.4	88	84	103.2	103.2
地元商店一店あたりの売り上げ	14.5	14.3	10.2	18.4	18.1	3.6	2.1	17.9	17.9
商店数指標	1.00	0.62	0.83	0.66	0.68	1.88	3.13	0.52	0.52
品揃え指標	1.00	0.98	0.70	1.27	1.25	0.25	0.14	1.24	1.24
買い物の利便性	1.00	0.61	0.58	0.85	0.84	0.47	0.45	0.64	0.64
財政力指数	0.25	0.25	0.25	0.81	0.83	0.09	0.09	0.28	0.28
財政バランス	1.00	0.99	1.00	0.98	0.98	1.04	1.10	0.99	0.99
財政支出	3,912	3,832	2,745	3,716	3,670	1,051	573	4,763	4,763
高齢者福祉予算	82	118	90	158	159	36	22	146	146
財政力指標	1.00	1.02	1.02	3.27	3.37	0.37	0.35	1.14	1.14
財政バランス指標	1.00	0.99	1.00	0.98	0.98	1.04	1.10	0.99	0.99
財政規模指標	1.00	0.98	0.70	0.95	0.94	0.27	0.15	1.22	1.22
高齢者福祉の財政規模指標	1.00	1.44	1.10	1.92	1.93	0.44	0.27	1.78	1.78
生活基盤の整備	1.00	1.00	0.72	3.11	3.16	0.10	0.05	1.39	1.39
生活環境指標	1.00	0.76	0.33	3.09	3.09	0.01	0.00	1.50	1.50
生活環境指標からの移動率倍数	1.00	1.00	0.67	1.00	1.50	1.00	0.50	1.00	1.00

## CAN MIGRATION AVERT POPULATION DECLINE AND AGEING IN EAST AND SOUTHEAST ASIA?

*Jerrold W. Huguet*

### Abstract

Fertility is currently below replacement level in China, Hong Kong, Japan, Macao, the Republic of Korea, Singapore, Taiwan and Thailand. These low levels are expected to lead to declines in the total population and the number of persons of labour force age. In a report that garnered much attention among policy-makers and the news media, the United Nations Population Division developed the concept of replacement migration. This was defined as the number of international migrants that would be required in order to prevent the declines in the total population; the number of persons of working age; or the potential support ratio (persons aged 15–64 per person aged 65 and over).

This paper reviews the hypothetical replacement migration projections for Japan and the Republic of Korea in the United Nations report and examines similar scenarios for China, Singapore, Taiwan and Thailand, with a brief overview of possible policy implications.

Keywords: ageing, Asia, demographic ageing, immigration policy, international migration, labour force, projections, migration.

The remarkable decline in fertility and mortality in Asia, especially in East and Southeast Asia, during the second half of the twentieth century constituted one of the more fundamental social changes that occurred during that period. For Asia as a whole, the total fertility rate (TFR) declined by more than half, from 5.9 in 1950–1955 to 2.7 in 1995–2000 (Table 1). In East Asia as a whole, and in China, Hong Kong and Korea, fertility declined by more than two-thirds over that period. By the end of the century, fertility was far below replacement level in East Asia; the TFR was under 1.2 in Hong Kong, 1.4 in Japan, 1.5 in Korea and 1.7 in Taiwan. In Southeast Asia fertility declined by more than half during the second half of the century, from a TFR of nearly 6.0 to 2.8 children per woman. Fertility declined by more than half in Indonesia and Vietnam, and in Thailand by two-thirds. Given the modern and highly developed city-state that Singapore has become, it may be a surprise to note that in the period 1950–1955 its TFR equalled 6.4; in 2001, this had fallen by three-fourths to only 1.42.

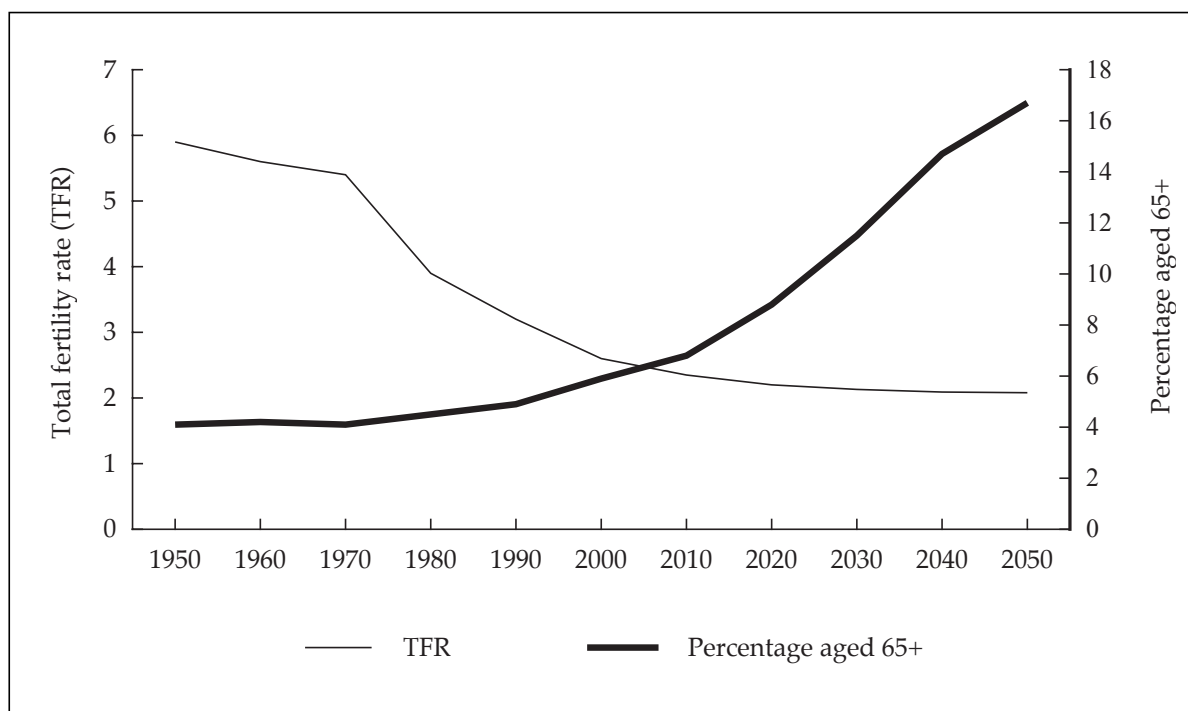
Leete and Alam (1999) credit effective state-supported national family planning programs for much of the reduction in fertility, although fertility in Hong Kong and Japan fell as rapidly as anywhere else even without such government-supported programs. Leete and Alam also note that declines in mortality, including infant and child mortality, were dramatic, and preceded reductions in fertility. They emphasize the importance of rapid increases in female education and literacy in East and Southeast Asia in the reduction of both fertility and mortality. For various reasons, women in East and Southeast Asia were also marrying at much later ages at the end of the century than at its midpoint. Several countries have attempted to stimulate increases in fertility levels, for example, by introducing measures to make childrearing more compatible with employment or reduce the burden on women of caring for older family members, but these have been modest to date and have not reversed fertility declines.

**Table 1** Total fertility rates in Asia by region and selected countries, 1950–1955 to 1995–2000

Region/ Country	1950– 1955	1960– 1965	1970– 1975	1980– 1985	1990– 1995	1995– 2000
Asia	5.88	5.64	5.07	3.66	2.95	2.70
East Asia	5.68	5.16	4.46	2.46	1.88	1.76
China	6.22	5.72	4.86	2.55	1.92	1.80
Hong Kong	4.44	5.31	2.89	1.80	1.22	1.17
Japan	2.75	2.02	2.07	1.76	1.49	1.41
Rep. of Korea	5.40	5.63	4.28	2.23	1.68	1.51
Southeast Asia	5.95	6.09	5.53	4.24	3.24	2.83
Indonesia	5.49	5.42	5.20	4.11	3.00	2.60
Philippines	7.29	6.85	6.00	4.95	4.14	3.64
Singapore	6.40	4.93	2.62	1.69	1.75	1.60
Thailand	6.40	6.40	4.97	3.05	2.10	2.10
Vietnam	5.75	7.25	6.70	4.50	3.30	2.50
South-Central Asia	6.08	6.00	5.60	4.79	3.99	3.58
Bangladesh	6.70	7.10	6.40	5.30	4.30	3.80
India	5.97	5.81	5.43	4.48	3.70	3.32
Pakistan	6.28	6.28	6.28	6.23	5.83	5.48
Sri Lanka	5.94	5.50	4.08	3.40	2.40	2.10
West Asia	6.40	6.21	5.62	4.98	4.23	3.86
Turkey	6.90	6.19	5.15	4.15	3.10	2.70

Source: United Nations 2001a.

The reduction in mortality levels in Asia over the past 50 years has been as impressive as the declines in fertility. In East Asia the expectation of life at birth increased from 43 years in 1950–1955 to 71 years in 1995–2000, while the infant mortality rate fell from 181 infant deaths per 1,000 population to 38, a reduction of nearly 80 per cent. In Southeast Asia, life expectancy at birth increased from 41 to 65 years during the same period and the infant mortality rate was reduced from 168 to 47 (United Nations 2001a). Because of declining fertility and increasing life expectancy, the age structure of populations has also changed. In 1960, 39.4 per cent of the population of Asia was under 15 years of age, and 4.2 per cent was aged 65 and over. By the year 2000, the proportion under 15 had declined to 30.3 per cent and that aged 65 and over had increased to 5.9 per cent. The shifts in age structure put in place by falling fertility and mortality will become more apparent in the next quarter-century. The proportion aged 0–14 is projected by the United Nations (2001a) to decline to 26.3 per cent in 2010, and to 22.9 per cent in 2025; the proportion aged 65 and over is projected to increase to 6.8 per cent in 2010 and to 10.0 per cent in 2025. Figure 1 illustrates the marked reduction in fertility that has occurred in Asia, particularly after 1970, as well as the substantial increase in the proportion aged 65 and over to be expected in the next half-century. As these are regional trends, changes in individual countries have often been much more dramatic.

**Figure 1 Fertility decline<sup>a</sup> and population ageing in Asia, 1950–2050**

a The total fertility rate shown for 1950 is that for the period 1950–1955.

Source: United Nations 2001a.

The United Nations (2001c) has developed the concept of replacement migration and prepared hypothetical population projections to assess the feasibility of using immigration to prevent population decline and offset population ageing. This paper summarizes the projections for Japan and the Republic of Korea. It then examines similar scenarios for four other populations in East and Southeast Asia, namely China, Taiwan, Thailand and Singapore, in which fertility has fallen below the replacement level. It examines the concept of replacement migration and provides an overview of some policy implications of rapidly ageing populations.

### Concept of replacement migration

By definition, if the net reproduction rate of a population closed to migration remains indefinitely below 1.0, at which level each generation exactly replaces itself, the population will eventually begin to decline (Frejka 1973). In Asia, the population of Japan is projected by the United Nations (2001a) to begin to decline after 2010 and those of China and Korea after 2035. Before the total population begins to decline, however, the population of working age begins to decline, while that of older persons expands, often rapidly. Clearly, if enough international migrants are added to a population, it need not decline. Similarly, if most of those international migrants are of working age, then that segment of the population need not decline. Further, international migration could prevent the aged dependency ratio from increasing.

From these premises, the United Nations (2001c) set out a study to determine the net number of international migrants that would be necessary, first, to prevent specific national populations from declining; second, to prevent the population of working age (15–64) years from declining; and third, to keep the potential support ratio (PSR) from declining beyond a specified level. The PSR is defined as the number of persons aged 15–64 per person aged 65 and over

and is an indicator of population ageing. The study was based on the medium variant of the United Nations (1999) World Population Prospects: 1998 Revision. For each of eight developed countries, plus the combined populations of Europe and of the European Union, the study presented six scenarios:

Scenario I is the medium variant of the projections from the 1998 Revision.

Scenario II is the medium variant of the 1998 Revision, amended by assuming zero migration after 1995.

Scenario III computes and assumes the migration required to maintain the size of the total population at the highest level it would reach in the absence of migration after 1995.

Scenario IV computes and assumes the migration required to maintain the size of the working-age population at the highest level it would reach in the absence of migration after 1995.

Scenario V computes and assumes the migration required to prevent the PSR from declining below 3.

Scenario VI computes and assumes the migration required to maintain the PSR at the highest level it would reach in the absence of migration after 1995.

In the replacement migration study (United Nations 2001c), migrants are implicitly assumed to be permanent migrants who remain in and age with the population. For each country, 47.4 per cent of all migrants are assumed to be male and 52.6 per cent female. In the projections, female migrants are subject to the same fertility rates as the national population, such that migrants also contribute to population growth through their offspring. In the hypothetical projections, the same sex–age distribution of migrants is used for each country and scenario. Forty-one per cent of migrants are assumed to be in the young working ages of 20–34 years. These assumptions may reflect permanent migration to Europe or other more developed regions but may be less appropriate for East and Southeast Asia. The implications of these are considered below.

### **United Nations replacement migration projections for Japan and Korea**

Of the eight developed countries for which the United Nations made replacement migration projections, two are in East Asia: Japan and Korea. The summary results for these two countries are presented in Table 2.

When the United Nations prepared the 1998 Revision of its world population projections, net migration to Japan was assumed to be zero between 1995 and 2050. Thus, Scenarios I and II are the same. In the 2000 Revision (United Nations 2001a), however, net migration was assumed to equal 54,000 persons each year between 2000 and 2050, or a total of 2.7 million over the next half-century. Even that number does not prevent the projected total population from declining after reaching a peak of 129.1 million in 2010.

Scenario III in Table 2 demonstrates that an annual average of 221,000 migrants between 2000 and 2025, and 464,000 migrants between 2025 and 2050, would be required to prevent the population of Japan from declining after reaching a peak of 127.5 million in 2005. Even

that net migration of 17 million persons between 2000 and 2050 would not prevent the population of working age from declining from 86 million in 2000 to 73 million in 2050. In order to prevent the population of working age from declining from its 1995 size of 87.2 million, 231,000 migrants per year would be required between 1995 and 2000, then 615,000 migrants per year between 2000 and 2025 and, finally, 679,000 migrants per year between 2025 and 2050. Even with this unlikely scenario, in which 33.5 million migrants would be added to the population between 1995 and 2050, the PSR would decline by nearly half, from 4.0 in 2000 to only 2.2 in 2050.

Scenario VI demonstrates that it would not be feasible to use migration policy to attempt to maintain the PSR even at the modest level of 4.77 that it equalled in 1995. To maintain that ratio would require nearly 6 million migrants per year between 1995 and 2000, then 5.2 million per year from 2000 to 2025, and 15.8 million per year between 2025 and 2050. Because of the implausibility of Scenario VI, a modified version is incorporated in which the PSR is not permitted to decline below 3 (Scenario V). In Japan the PSR in the medium variant reaches 2.96 in 2010, thus, in Scenario V, migration is introduced after 2005 to maintain the PSR at 3. To do so would require an annual average of 1.5 million migrants between 2000 and 2025 and 2.3 million migrants between 2025 and 2050. A total of 95 million migrants would be required between 2005 and 2050. Thus, Scenario V is also essentially implausible for Japan.

To put the projection scenarios into perspective, it may be noted that in early 2001 there were about 1.6 million foreigners living in Japan. Of that number 636,000 were permanent residents; so about one million were temporary residents. In 2001, there were 670,000 foreign workers in Japan, of whom 252,000, or nearly 40 per cent, were unauthorized (Migration News 2001).

The United Nations (1999) medium variant projection of the 1998 Revision assumed that net migration to Korea was 100,000 persons between 1995 and 2000, and that this would decline to zero by 2025 (Table 2). The projection without migration (Scenario II) is, therefore, not much different from the medium variant projection. In Scenario III, no migration is required to maintain the total population between 2000 and 2025, and only 60,000 migrants per year between 2025 and 2050 would be required to prevent the population from declining from its peak of 53.5 million. In the projection without migration, the population of working age would continue to increase until 2020, when it would equal 36.6 million. To maintain the working-age population at that level would require 6.4 million migrants between 2020 and 2050, or 214,000 per year.

The PSR in Korea in 1995 was 12.6, double or more than in any of the other seven populations considered in the study of replacement migration. The projections show that such a ratio cannot be maintained, irrespective of the level of international migration. To maintain the ratio would require a total of 20.8 million migrants in the period 1995–2000, 379 million migrants between 2000 and 2025, and 4.8 billion migrants between 2025 and 2050. In the projection assuming zero migration, the PSR falls to below 3 only after 2035. To maintain it at 3 would require a total of 11.6 million migrants between 2035 and 2050, or an annual average of 773,000 migrants over that 15-year period.

In March 2001, it was estimated that nearly 500,000 foreigners were living in Korea; of these, 300,000 were migrant workers, among whom 200,000 were unauthorized migrants (Asian Migration News 2001a). These numbers are more than offset by the number of Koreans cur-

rently living overseas, however. In 2000, about two million Korean-born persons were living in the United States of America alone, of whom 1.1 million held American citizenship (Asian Migration News 2001b).

**Table 2 Population indicators for Japan and the Republic of Korea by period for each scenario, 1995–2050**

Scenario	II	III	IV	V	VI
Country / Period	Medium variant with zero migration population	Constant total population	Constant age group 15–64	Ratio 15–64/ 65+ ≥ 3	Constant ratio 15–64/65+
<b>Japan</b>					
	Average annual net migration ('000)				
2000–2025	0	221	615	1,502	5,183
2025–2050	0	464	679	2,292	15,758
1995–2050	0	312	609	1,724	10,064
	Total net number of migrants ('000)				
2000–2025	0	5,535	15,366	37,550	129,587
2025–2050	0	11,606	16,965	57,295	393,957
1995–2050	0	17,141	33,487	94,845	553,495
	Total population ('000)				
2000	126,714	126,714	127,923	126,714	158,061
2025	121,150	127,457	141,877	166,849	323,376
2050	104,921	127,457	150,697	229,021	817,965
	Potential support ratio (15–64/65+)				
2000	3.99	3.99	4.03	3.99	4.77
2025	2.24	2.35	2.59	3.00	4.77
2050	1.71	2.07	2.19	3.00	4.77
<b>Republic of Korea</b>					
	Average annual net migration ('000)				
2000–2025	0	0	41	0	15,151
2025–2050	0	60	216	464	189,975
1995–2050	0	27	117	211	93,617
	Total net number of migrants ('000)				
2000–2025	0	0	1,034	0	378,765
2025–2050	0	1,509	5,392	11,595	4,749,382
1995–2050	0	1,509	6,426	11,595	5,148,928
	Total population ('000)				
2000	46,946	46,946	46,946	46,946	68,768
2025	53,020	53,020	54,119	53,020	522,908
2050	51,751	53,470	60,125	65,736	6,233,275
	Potential support ratio (15–64/65+)				
2000	10.67	10.67	10.67	10.67	12.62
2025	4.43	4.43	4.51	4.43	12.62
2050	2.40	2.48	2.76	3.00	12.62

Source: United Nations 2001c.

### Concept of replacement migration applied to other countries and areas

The medium variant of the United Nations (2001a) 2000 Revision indicates that the population of Singapore will begin to decline after 2030 (even with some net migration before then), that of China after 2035, and that of Sri Lanka after 2040. The population aged 15–64 in Singapore is projected to begin to decline after 2015, and that in China, Sri Lanka and Thailand after 2025. Among other larger countries in Asia, the working-age population in Indonesia, Myanmar and Vietnam would begin to decline only after 2045 (Table 3).

The United Nations does not project the population of Taiwan (Province of China) separately from China. Projections made in Taiwan, however, indicate that its total population would begin to decline after 2036, that the percentage of the population aged 15–64 years would decline after 2011 and that the number of persons aged 15–64 would decrease after 2016. The PSR, which equalled 8.15 in 2000, is projected to fall to 3.80 in 2026 and to 2.46 in 2051 (Republic of China 2001).

#### Hypothetical replacement migration projections

In this paper, replacement migration projections are presented for China, Singapore, Taiwan and Thailand.<sup>1</sup> The hypothetical projections are not completely comparable to those of the United Nations although they begin with the same age structure in 2000 and use the same TFR and male and female life expectancy values.

The projections used the DemProj module of the Spectrum system of policy modules (Stover and Kirmeyer 1997). In each case, the Asian model of age-specific fertility rates was used and Coale–Demeny West model life tables were selected. As Scenarios II, III, IV and V for each country were prepared using the same computer program and the same assumptions of fertility and mortality, they are comparable.

Because the PSRs in China (9.96), Singapore (9.90), Taiwan (8.15) and Thailand (13.04) are still relatively high, Scenario VI projections in which the PSR is maintained at those levels quickly become absurd and have not been produced for this paper. As the PSRs for China and Thailand do not decline to 3 before 2050 in the projections without migration, it was not necessary to produce Scenario V for those countries.

Table 4 presents the levels of net migration assumed in the United Nations medium variant projections for China, Singapore and Thailand, and those resulting from Scenarios III, IV and V for those countries and for Taiwan. China has long been the origin of large numbers of international migrants. The United Nations (2001b) projections incorporate the assumption that net migration out of China will equal approximately 300,000 persons per year for the next 50 years, or a total of 15 million emigrants. In this context, replacement migration projections for China are completely hypothetical. Yet the concept of replacement migration for China is attractive because the population is rapidly ageing. Furthermore, were China to begin to attract net immigration, even of overseas Chinese, this would affect migration trends elsewhere in Asia.

Singapore has the lowest fertility and mortality levels among the countries of Southeast Asia and, consequently, the oldest age structure and rapid population ageing. In 1999, the TFR in Singapore was only 1.5. The United Nations medium variant projection assumes that net migration to Singapore will equal 50,000 persons per year during the period 2000–2005 but that after that it will drop rapidly to zero by 2030. In that variant, a total of 650,000 migrants

**Table 3 Summary indicators from United Nations 2000 medium variant projections for selected Asian countries, 2000–2050**

Country	Year popu- lation begins decline	Year % 15–64 begins decline	Year number 15–64 begins decline	Assumed net migration per year (‘000)	Ratio 15–64/65+		
					2000	2025	2050
China	2035	2010	2025	–304	9.96	5.16	2.69
Indonesia	–	2020	2045	–180	13.37	8.17	3.88
Malaysia	–	2020	–	0	14.93	7.48	4.20
Myanmar	–	2020	2045	0	13.56	8.47	4.09
Philippines	–	2025	–	–180	16.70	9.98	4.74
Singapore	2030	2010	2015	+50 to 0	9.90	3.00	2.01
Sri Lanka	2040	2010	2025	–31	10.76	5.49	2.88
Thailand	–	2020	2025	–9	13.04	6.08	2.93
Vietnam	–	2015	2045	–20	11.46	8.41	3.69

Source: United Nations 2001a.

would settle in Singapore between 2000 and 2025. The United Nations medium variant projection for Thailand assumes net emigration of 6,000 persons per year between 2000 and 2025, then 4,000 per year between 2025 and 2050 (Table 4).

With no net migration, the total populations of China, Singapore, Taiwan and Thailand would continue to increase until after 2025. The population of China would begin to decline only after reaching a maximum size of 1,488 million in 2040. Thus, in Scenario III, no migration is assumed until after 2040. Then, the annual number of migrants during each five-year period between 2040 and 2050 that will result in a population of 1,488 million in 2050 is determined. Table 4 indicates that 20.5 million migrants would be required, the equivalent of 820,000 migrants per year over a 25-year period.

Much lower absolute levels of migration would be required to prevent population declines in Singapore and Taiwan, although the number of migrants would constitute a greater proportion of the total population. For Singapore, a net total of 413,000 migrants would be needed between 2025 and 2050 to maintain the total population at 4.3 million. Those migrants would equal nearly 10 per cent of the total population, which is only about half the current level of foreigners in the country. The population census of Singapore (Department of Statistics 2001) conducted in 2000 found that, of the total population of 4 million, 81 per cent were citizens and permanent residents, while 19 per cent were foreigners staying in the country for one year or more.

The summary of a projection made in Taiwan (Republic of China 2001) can be closely replicated by assuming that the TFR will increase from 1.68 in 2000 to 1.90 in 2002 and to 1.95 in 2050. No international migration was assumed in the government projection. In the absence of migration, the population is projected to reach a peak at 25.72 million in 2035. In order to stabilize the population at that level, a total of 476,000 migrants would be required between 2035

and 2050, or nearly 32,000 per year during that period (Scenario III). That number of migrants would equal only 2 per cent of the total population.

**Table 4 Net migration by scenario for China, Singapore, Taiwan Province of China, and Thailand, 2000–2050**

Scenario	I	III	IV	V
Country or area/ Period	Medium variant	Constant total population	Constant age group 15–64	Ratio 15–64/ 65+ ≥ 3
<b>China</b>				
	Average annual net migration ('000)			
2000–2025	–304	0	0	–
2025–2050	–298	820	3,757	–
2000–2050	–301	410	1,879	–
	Total net number of migrants ('000)			
2000–2025	–7,595	0	0	–
2025–2050	–7,445	20,494	93,932	–
2000–2050	–15,040	20,494	93,932	–
<b>Singapore</b>				
	Average annual net migration ('000)			
2000–2025	26	0	21	0
2025–2050	2	17	12	62
2000–2050	14	8	17	31
	Total net number of migrants ('000)			
2000–2025	650	0	529	0
2025–2050	50	413	302	1,558
2000–2050	700	413	831	1,558
<b>Taiwan Province of China</b>				
	Average annual net migration ('000)			
2000–2025	0	0	13	0
2025–2050	0	19	73	128
2000–2050	0	10	43	64
	Total net number of migrants ('000)			
2000–2025	0	0	323	0
2025–2050	0	476	1,830	3,188
2000–2050	0	476	2,153	3,188
<b>Thailand</b>				
	Average annual net migration ('000)			
2000–2025	–6	–	0	–
2025–2050	–4	–	119	–
2000–2050	–5	–	60	–
	Total net number of migrants ('000)			
2000–2025	–150	–	0	–
2025–2050	–100	–	2,976	–
2000–2050	–250	–	2,976	–

Sources: Scenario I for China, Singapore and Thailand: United Nations 2001b. All other scenarios: author's projections.

In the projection for China without migration, the size of the population aged 15–64 begins to decline after reaching 1,007 million in 2025. In Scenario IV, no migration is assumed between 2000 and 2025. After that, the annual number of migrants required to maintain the working-age population at 1,007 million is determined. That scenario requires an average of 3.76 million migrants a year between 2025 and 2050, or a total of 94 million during the 25-year period.

The level of net migration required to prevent the working-age population from declining in Singapore, Taiwan and Thailand would be less than current levels of temporary migration. Without migration, the size of the population of Singapore aged 15–64 years would reach a maximum of 3.11 million in 2015 and then begin to decline. In order to maintain the working-age population at 3.11 million, 529,000 migrants would be required between 2015 and 2025, and 302,000 would be required in the period 2025–2050. The total of 831,000 migrants would constitute only about one-sixth of the total population of 5 million in 2050, or less than the current proportion of temporary residents (19 per cent). It should be noted that the annual numbers of migrants indicated in both Scenarios III and IV are well below the average of 50,000 migrants per year assumed for the period 2000–2005 in the United Nations medium variant projection. Thus, maintaining the size of either the total population or that aged 15–64 years should be well within the capacity of policy measures.

In the projection for Taiwan made without a migration assumption, the population aged 15–64 would reach a maximum value of 17.2 million in 2015. In order to maintain the size of that age group, a total of 323,000 migrants would be required between 2015 and 2025, and another 1.83 million between 2025 and 2050 (Scenario IV). Thus, an annual average of 52,000 migrants would be required each year between 2015 and 2050.

In the projection without migration, the population aged 15–64 in Thailand reaches a maximum size of 53.8 million in 2025. In order to maintain the workingage population at that level, 119,000 migrants per year would be required between 2025 and 2050, or a total of 2.98 million. This number would be manageable, as it is usually estimated that there are currently about one million illegal migrant workers in Thailand (Battistella 2001).

In those populations in which the PSR would decline to below 3 before 2050 in the absence of migration, significantly more migrants would be required to maintain the ratio at 3 than would be required in the other scenarios. In the case of Singapore, more than 1.5 million migrants would be required between 2025 and 2035. As the model sex and age distribution of migrants assumed by the United Nations (2001c) study has considerable growth potential (because of the young age structure and the majority of females), after those 1.5 million migrants are added to the population no further migration would be required up to 2050. Even in the absence of further migration, the PSR would gradually increase to 3.56 in 2050 (Table 5).

Without net migration to Taiwan, the PSR would fall below 3 after 2040, from a level of 8.15 in 2000. To prevent this would require a massive influx of migration. If the age and sex composition of the migration were as assumed by the United Nations, nearly 3.2 million migrants would be required in the ten-year period from 2040 to 2050 (Scenario V). In both Singapore and Taiwan, if the authorities wished to maintain a PSR of about 3, it would probably be more convenient to pursue a strategy similar to that reflected in Scenario IV, in which many fewer migrants are admitted, but over a longer time. For both of these populations, the PSR in 2050 would be 2.95 in Scenario IV (Table 5).

The projected PSR for Scenarios I, III, IV and V presented in Table 5 indicates that in these East and Southeast Asian populations at the early stages of population ageing, even massive inflows of migration would not appreciably halt the projected decline in the PSR. Although Scenario IV for China requires a total net migration of 94 million persons between 2025 and 2050, the PSR would still drop from nearly 10 in 2000 to 5.6 in 2025 and to 3.4 in 2050. For Singapore, the addition of 831,000 migrants between 2015 and 2050 (Scenario IV) would not prevent the PSR falling from 9.8 in 2000 to 3.5 in 2025 and to below 3 in 2050. Similarly, for Taiwan, the PSR would decline from 8.2 in 2000 to below 3 in 2050 in spite of the addition of over 2.1 million migrants between 2015 and 2050 (Scenario IV). Scenario IV for Thailand indicates that the addition of nearly three million migrants between 2025 and 2050 would not prevent the PSR falling from 13.0 in 2000 to 6.5 in 2025 and to 3.4 in 2050. Thus, permanent immigration cannot be viewed as a feasible way of preventing the rapid declines in the PSR that will take place in East and Southeast Asian populations over the next 50 years.

**Table 5 Potential support ratio by scenario for China, Singapore, Taiwan Province of China, and Thailand, 2000–2050**

Scenario	I	III	IV	V
Country or area/ Year	Medium variant	Constant total population	Constant age group 15–64	Ratio 15–64/ 65+ ≥ 3
<b>China</b>				
2000	9.96	9.96	9.96	–
2025	5.16	5.58	5.58	–
2050	2.69	3.16	3.36	–
<b>Singapore</b>				
2000	9.90	9.82	9.82	9.82
2025	3.00	3.14	3.48	3.14
2050	2.01	2.59	2.95	3.56
<b>Taiwan</b>				
2000	8.15	8.15	8.15	8.15
2025	4.34	4.34	4.38	4.34
2050	2.66	2.71	2.95	3.00
<b>Thailand</b>				
2000	13.04	–	13.03	–
2025	6.08	–	6.51	–
2050	2.93	–	3.37	–

Sources: Scenario I for China, Singapore and Thailand: United Nations 2001b. All other scenarios: author's projections.

## Conclusion

Both the projections of the United Nations and those presented in this paper have been used to consider the question of whether replacement migration can be considered a solution to avert the problems of population decline and ageing in East and Southeast Asia. These have implied that the question may require two answers. Permanent immigration could prevent populations from declining but is not a feasible solution to counteract the effects of population ageing. Although net immigration to Japan would need to equal 17.1 million migrants by 2050 and that to Korea would need to equal 1.5 million migrants in order to prevent population decline, those numbers would equal only 13 per cent and 3 per cent respectively of those countries' populations in 2050 (Table 2). However, to achieve these net numbers of migrants, the number of migrants entering a country might be at least twice as large. To put the proportions into perspective, about one-fifth of the population of Singapore currently consists of temporary residents and one-fourth of the labour force consists of foreign workers.

Some of the assumptions used in both sets of projections concerning the characteristics of replacement migration need to be viewed more critically, however. The concept of replacement migration incorporates the assumption of permanent settled migration which could alleviate population decline but does not provide a long-term solution to the issue of population ageing because the migrants themselves will also age and begin to retire perhaps 40 years after entering.

Also, the sex and age pattern assumed by the United Nations and used in the paper in order to produce comparable projections has considerable growth potential built into it: 26 per cent of the migrants are assumed to be below age 15 and 52.6 per cent are assumed to be females. This pattern is not ideal for responding to labour demand. Economies in East and Southeast Asia that wish to alleviate labour shortages by migration are more likely to accept temporary migrants, most of whom are males concentrated in the prime working ages of 20–39 years. In those occupations for which there is a demand for female migrant workers, such as domestic servants or in light manufacturing, employers and governments often impose measures to minimize their marrying nationals or having children in the host country.

## Policy implications

Although the theoretical numbers of migrants that would be required for replacement migration are large in the context of the ability of the countries of destination to absorb them, they are modest in relation to the potential supply of migrants from other Asian countries. Projected labour-force growth in Bangladesh, India, Indonesia, Myanmar, Pakistan, the Philippines and Vietnam combined between 2025 and 2050 (United Nations 2001b) is double the number of migrants required by Scenario IV for the six populations discussed in this paper. The numbers of required migrants are also not especially large in relation to the current populations and labour forces of the destination countries.

China is likely to address declining population and labour-force size by increasing the productivity of its labour force, especially the surplus labour in rural areas. China could also draw on the large numbers of overseas Chinese as migrants rather than absorbing migrants from other cultures. Countries such as Japan and Korea that have historically received few migrants have been reluctant to plan for or accept the numbers of migrants implied by the replacement migration scenarios. It is usually recognized, however, that it will be necessary to receive

some foreign workers to carry out the so-called 3D jobs: dirty, demanding and dangerous. In these two countries, alternative responses are to increase labour productivity and to increase the proportions of women, young people and older persons in the labour force (see Atoh 2001; Cho 2001; Katsumata 2001; Kim 2001).

The PSR in the United Nations study is projected to decline to very low levels over the next half-century in populations with low fertility. The PSR for Japan is projected to fall to 1.71, for Korea to 2.40, for Singapore to 2.01 and for Taiwan to 2.46. Such fundamental changes in national age structures will demand public policy responses.

One possible policy response is to raise the retirement age. This can be done by increasing the official age at which one may draw a pension or provident fund payment, encouraging later retirement on a voluntary basis and providing for part-time or low-intensity employment for older persons. Table 6 presents the PSRs from the different projection scenarios in 2050 if the age of entry into nonworking status is 65, 70, 75 and 80 years. Raising the retirement age would increase the PSR and help to keep pension and provident fund systems solvent. Fairly large increases in the retirement age would be required to raise the PSR significantly, however. In Japan, the retirement age would need to be raised to 75 years in order to obtain a PSR of 3.6 in 2050. Even that level would be lower than the current PSR of 4. A combination of admitting more migrants and raising the retirement age would be possible. If Japan admitted 17 million migrants between 2005 and 2050 and raised the retirement age to 75 years, the PSR could be increased to 4.4 (Scenario III, Table 6).

In populations with younger age structures, a more modest increase in retirement age could achieve the desired result. In China, Taiwan and Thailand, merely limiting emigration and raising the retirement age to 70 years would increase the PSR to 4 or more in 2050. Korea could maintain a PSR of over 4 in 2050 by admitting 6.4 million migrants and raising the retirement age to 70 (Scenario IV, Table 6). In countries where the official retirement age is 60 or 65 years, increasing it to 70 or 75 years would be exceedingly difficult politically and could probably be done only over a period of several years, although the PSR is currently falling rapidly in the populations considered in this paper.

Thus, policy-makers may be faced with the difficult choice of admitting millions of migrants or raising the retirement age by several years, or may need to determine an appropriate combination of the two strategies. The other policy response has been to admit foreign workers on a temporary basis through various channels. Large numbers of temporary migrants are now employed in Japan, Malaysia, Korea, Singapore, Taiwan and Thailand. Some are registered to work in the place of destination; others enter as students or in industrial training schemes but provide a significant amount of labour in the host country or area. Still others who enter legally overstay their visas and work without permission. In Malaysia and Thailand, significant numbers of foreign workers have not entered the country legally.

In the current global economic slowdown, as many firms retrench workers unemployment rates across the region are rising, a trend which may reduce the demand for foreign workers to some extent or render this policy response less popular. However, the number of foreign workers in the main destination countries in the region has not declined in spite of the economic contraction during the Asian economic crisis that began in 1997. The economic, social and cultural environment is a greater factor in determining the demand for migrants than the demographic structure alone. Although the population of Malaysia is less than 40 per cent that

Table 6 Potential support ratio (15–64/65+) in 2050 for each scenario by age at entry into non–working–age population, selected countries and areas in East and Southeast Asia

Scenario	I	II	III	IV	V	VI
Country or area/ age	Medium variant	Medium variant with zero migration	Constant total population	Constant age group 15–64	Ratio 15–64/65+ ≥ 3	Constant ratio 15–64/65+
<b>China</b>						
65	2.69	3.12	3.16	3.36	–	–
70	3.95	4.70	4.76	5.04	–	–
75	6.03	7.38	7.47	7.90	–	–
80	11.34	14.19	14.36	15.19	–	–
<b>Japan</b>						
65	1.71	1.71	2.07	2.19	3.00	4.77
70	2.40	2.40	2.89	3.10	4.41	7.04
75	3.64	3.64	4.36	4.77	6.89	11.40
80	6.48	6.48	7.68	8.50	12.20	21.49
<b>Republic of Korea</b>						
65	2.40	2.40	2.48	2.76	3.00	12.62
70	3.55	3.55	3.66	4.06	4.39	20.96
75	5.61	5.61	5.78	6.39	6.90	39.32
80	10.44	10.45	10.75	11.83	12.81	88.83

<b>Singapore</b>						
65	2.01	2.29	2.59	2.95	3.56	—
70	2.74	3.26	3.66	4.22	4.99	—
75	3.81	4.78	5.36	6.21	7.27	—
80	5.86	7.97	8.92	10.30	12.07	—
<b>Taiwan Province of China</b>						
65	2.46	2.66	2.71	2.95	3.00	—
70	—	4.07	4.14	4.48	4.56	—
75	—	6.97	7.09	7.64	7.80	—
80	—	12.49	12.70	13.67	13.95	—
<b>Thailand</b>						
65	2.93	3.25	—	3.37	—	—
70	4.44	5.04	—	5.23	—	—
75	7.39	8.66	—	8.97	—	—
80	13.96	16.84	—	17.43	—	—

Sources: Japan and Republic of Korea: United Nations 2001c; Medium variant for China, Singapore and Thailand: calculated from United Nations 2001b; Scenario I for Taiwan: Republic of China 2001; Scenarios II–V for China, Singapore, Taiwan and Thailand: author's projections.

of Thailand and growing twice as rapidly, Malaysia has attracted more migrants than Thailand because of its more robust economy and its proximity to populous neighbours with more slowly growing economies.

Finally, it should be added that the policy responses to population ageing and decline are more complex and concern wider issues than the size of the labour force and the absorption of foreign workers. Population ageing and declining population size will require substantial changes in educational systems, health care and social protection systems. The increase in the average age of the labour force alone will require programs of lifelong learning, with training and retraining of workers; and if the number of foreign workers increases significantly, their training requirements will be as important for the economy. In many countries, the pension and insurance systems currently in place are not likely to be sustainable or adequate in the face of rapid population ageing in the coming decades as persons born during the postwar baby boom begin to retire. Thus, funding the increased demand for health as well as caregiver services and providing income security for older persons will continue to loom as major, if not immediate challenges for public policy in countries in the region.

*Extract from: Journal of Population Research, Vol. 20, No. 1, 2003*

#### Acknowledgments

The opinions expressed in this paper are those of the author and do not necessarily reflect those of the United Nations.

#### Note

1 The cases of Hong Kong and Macao should also be mentioned: in both areas, fertility is well below the replacement level and the population is projected to age rapidly in the near future. Replacement migration projections for these areas have not been prepared, however. Both Hong Kong and Macao are Special Administrative Regions of China and will be fully integrated into the People's Republic of China by 2047 and 2049, respectively. Government and economic ties are close. Thus, migration from the People's Republic of China to those areas will increasingly take on the nature of internal migration.

#### References

- Asian Migration News. 2001a. Union for foreign workers. 16–30 April.
- Asian Migration News. 2001b. More Koreans in US. 16–31 March.
- Atoh, Makoto. 2001. The coming of a hyper-aged and depopulating society and population policies – the case of Japan. Pp. 9–1 to 9–14 in United Nations Expert Group Meeting on Population Responses to Population Ageing and Population Decline, New York, 16–18 October 2000. ESA/P/WP.168. New York: United Nations.
- Battistella, Graziano. 2001. Migration 2000 in Asia: a year in review. *Asian Migrant* 14(1): 5–20.
- Cho, Namhoon. 2001. Policy responses to population ageing and population decline in Korea. Pp. 11–1 to 11–13 in United Nations Expert Group Meeting on Population Responses to Population Ageing and Population Decline, New York, 16–18 October 2000. ESA/P/WP.168. New York: United Nations Population Division.
- Department of Statistics. 2001. Monthly Digest of Statistics, April 2001. Singapore: Ministry of Trade and Industry.
- Frejka, Tomas. 1973. *The Future of Population Growth: Alternative Paths to Equilibrium*. New York: John Wiley and Sons.
- Katsumata, Yukiko. 2001. The impact of population decline and population ageing in Japan from the perspectives of social and labour policy. Pp. 10–1 to 10–19 in United Nations Expert Group Meeting on Population Responses to Population Ageing and Population Decline, New York, 16–18 October 2000. ESA/P/WP.168. New York: United Nations Population Division.
- Kim, Ik Ki. 2001. Policy responses to low fertility and population ageing in Korea. Pp. 12–1 to 12–11 in United Nations Expert Group Meeting on Population Responses to Population Ageing and Population Decline, New York, 16–18 October 2000. ESA/P/WP.168. New York: United Nations Population Division.
- Leete, Richard and Iqbal Alam. 1999. Asia's demographic miracle: 50 years of unprecedented change. *Asia-Pacific Population Journal* 14(4): 9–20.
- Migration News. 2001. Japan. 8 (2 February).
- Republic of China, Directorate General of Budget, Accounting and Statistics, Executive Yuan. 2001. *Statistical Yearbook of the Republic of China, 2001*. Taipei.
- Stover, John and Sharon Kirmeyer. 1997. *DemProj Version 4, A Computer Program for Making Population Projections*. Washington DC: Futures Group International.
- United Nations. 1999. *World Population Prospects: The 1998 Revision*. Vol. I: Comprehensive Tables. ST/ESA/SER.A/177. New York.
- United Nations. 2001a. *World Population Prospects: The 2000 Revision*. Vol. I: Comprehensive Tables. ST/ESA/SER.A/198. New York.
- United Nations. 2001b. *World Population Prospects: The 2000 Revision*. Vol. II: Sex and Age. ST/ESA/SER.A/199. New York.
- United Nations. 2001c. *Replacement Migration: Is It a Solution to Declining and Ageing Populations?* ST/ESA/SER.A/206. New York.

## **THE SECOND DEMOGRAPHIC TRANSITION IN ASIA? COMPARATIVE ANALYSIS OF THE LOW FERTILITY SITUATION IN EAST AND SOUTH-EAST ASIAN COUNTRIES**

*Makoto Atoh with Vasantha Kandiah and Serguey Ivanov*

In this article, seven countries and areas in ESEA, that is Japan, Singapore, Hong Kong, (South) Korea, Thailand, China and Taiwan, which have different cultural background from the Western societies, will be examined with respect to trends in fertility, their demographic determinants, their social and economic background and their relation to the traditional family system, focusing on their comparison between the period of fertility transition and that of below-replacement fertility.

Please find the complete article at

[http://www.ipss.go.jp/webj-ad/WebJournal.files/population/2004\\_3/atohdoc2004mar.pdf](http://www.ipss.go.jp/webj-ad/WebJournal.files/population/2004_3/atohdoc2004mar.pdf)  
(September 2007)

## **LOW FERTILITY AND FAMILY POLICY IN JAPAN - IN AN INTERNATIONAL COMPARATIVE PERSPECTIVE**

*Makoto Atoh with Mayuko Akachi*

This paper came up from the efforts by the first cross-national analysis group to collect comparative time-series data on both demographic, social and economic factors and family policies. The aim of this paper is to analyze trends in fertility and its proximate determinants, their social and economic background and family policies in Japan in an internationally comparative perspective, clarify their similarities with and differences from other developed countries and derive, if possible, any possible recommendations for the Japanese government from these comparative analyses.

Please find the complete article at

<http://www.ier.hit-u.ac.jp/pie/Japanese/discussionpaper/dp2003/dp156/text.pdf>  
(September 2007)

## **UPCOMING CHANGES IN JAPANESE SOCIETY AND THE FUTURE SHAPE OF THE NATION: PORTRAIT OF DEPOPULATING SOCIETY - DIVERSIFYING VALUES AND A MORE MATURE PROSPERITY**

*Matsutani Akihiko*

This paper discusses—from a principally economic perspective—how conditions are likely to change in light of the population decline and the responses that might be required to ensure that these changes lead to prosperity. The author describes in three chapters the changes in corporate behaviour, the diversification in patterns of employment and finally a „new prosperity“ and the conditions necessary for its achievement.

Please find the complete article at

<http://www.iips.org/05upcomch/05shapenationMatsutani.pdf>  
(September 2007)