Perspectives of Taiwan's Population and the Potency of Alternative Policies

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Abstract

In this study, an effort is made to review past population policies and trends, suggest alternative hypotheses regarding the potency of policy, and estimate the effects of these policies on population trends in Taiwan. The overall objective is to provide information that will enable targets to be set for Taiwan's future population policies. Our review suggests that to avoid a sharp increase in dependency ratio, policy intervention is needed to at least pursue the population course suggested by the mid-high projection. The projection was made by Council of Economic Planning and Development, Executive Yuan, Republic of China. It involved an expectation that total fertility will rise to 1.3 by 2011 and to 1.6 by 2021. If we assume the expectation is accepted as policy goals of Taiwan's government and the policy to promote fertility will remain at its current level, we have no choice but to rely on policies to promote marriage. In this case, the policy targets are estimated as follows:

(1) The proportion married must increase by 0.43 percent in the period 2004 to 2011.
(2) The proportion married must further increase by 0.71 percent in the period 2011 to 2021.

Key Words: Fertility, Population policy, Population projection

Observers of demographic trends in Taiwan have been shocked to learn that Taiwan's fertility has remained at a level far below the replacement level of 2.1. The total fertility rate for general women (TFR) in Taiwan fell from 1.77 in 1997 to 1.46 in 1998. It then decreased from 1.56 in 1999 to 1.23 in 2003, with the exception of a slight rebound to 1.68 in 2000 because of the year of the dragon. Initially, some may have suspected that the low fertility was a temporary phenomenon caused by a high unemployment rate and economic recession. However, after 5 or 6 years of low fertility, others have started to wonder if it is a permanent phenomenon that reflects a new attitude toward marriage and family among young cohorts. If this is the case, policy intervention is essential to change attitudes so that they become more favorable toward marriage and fertility. It is therefore crucial to review the

availability, potency, and effectiveness of policy measures on fertility.

In this study, an effort is made to review past population policies and trends, suggest alternative hypotheses regarding the potency of policy, and estimate the effects of these policies on population trends in Taiwan. The overall objective is to provide information that will enable targets to be set for Taiwan's future population policies. This paper is organized as follows. Section One reviews Taiwan's past population policies. Section Two looks at the factors affecting low fertility. Section Three considers potential policy alternatives. Section Four examines the potency of policy and population trends, and Section Five closes with a discussion.

I. Taiwan's Past Population Policies

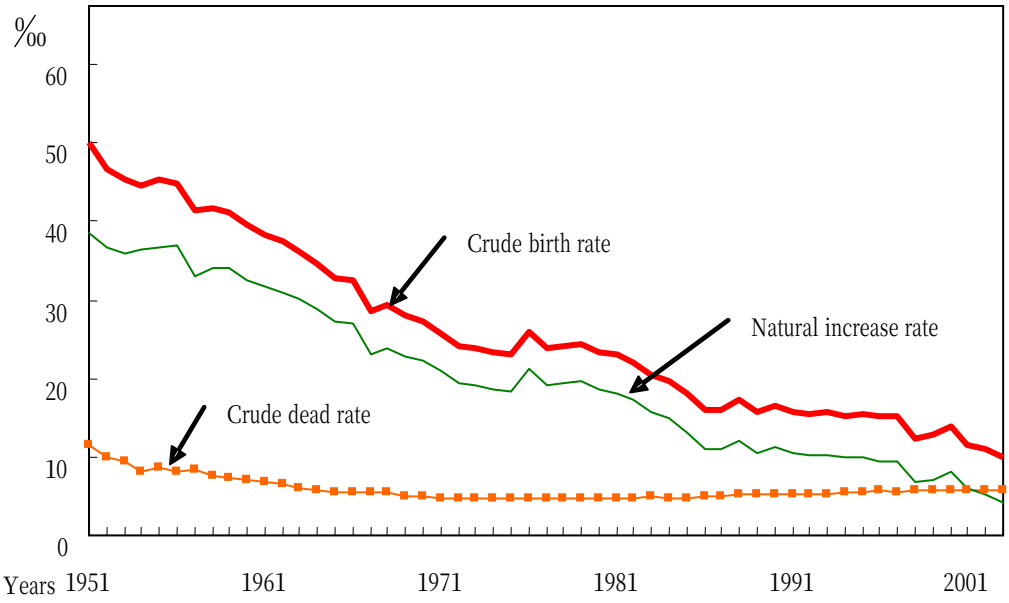
Since Taiwan was in the past well known for its successful family planning program, we might then question whether such success became the seed for the current low fertility. In addition, we might also question if there was anything we could learn from past experience to raise the current low level of fertility. To this end, a review of Taiwan's past population policy and its impact is therefore essential.

In 1964, an island-wide family planning program was launched to tackle the problem of rapid population increase and its consequent deterrent effect on economic development. At that time, Taiwan's crude birth rate and death rate were at opposite extremes. The former was as high as 34.54‰ and the latter as low as 5.74‰ (see Figure 1). These contrasting rates led to a high natural rate of population increase of 28.8‰, implying a doubling of the population in about 24 years. A 5-year project was thus launched in 1964, with a view to inserting about 600,000 so-called loops (IUDs). It was estimated that each loop insertion could prevent 0.5 births and that the natural rate of population increase could be lowered to 20‰ by 1973 (Chen, et al., 2003). A successful implementation of the project with 628,639 loops inserted in five years was followed by two single-year projects and a second 5-year project beginning in July 1971. Although the accumulated loop insertions achieved the 12-year target of 2,811,000 insertions, the natural rate of population increase was 21.24‰ in June 1976, a level slightly higher than the target rate of 20.00‰.

In fact, Taiwan's natural rate of population increase was 19.43‰ in 1973. It, however, rebounded to 21.24‰ in 1976 due to a sudden increase in births during the year of the dragon. Although Taiwan's family planning program was quite successful over the 1964-1976 period, a careful evaluation of its accomplishments in this regard reveals that the decrease in the birth rate was mainly attributable to the acceptance of loops by older women. On the contrary, the fertility of younger women increased rapidly. In order to bring the fertility further down, it was necessary to strengthen the education of young

women in relation to family planning, to lower the woman's ideal family size from 2.9 to 2.1, and to create a "perfect contraceptive society." The ways in which the program was promoted in the field as well as the workers' evaluation criteria were thus modified extensively. In addition to loops, other intra-uterine contraceptives, as well as sterilization, oral pills, and condoms, were also made available to married women. Some 400 field workers were employed and NT$3.7 billion dollars spent during the 1977-1980 period. As a result of these efforts, Taiwan's natural rate of population increase was expected to decline to 12.5‰ by 1989. In fact, Taiwan's natural rate of population increase was down to 10.58 ‰ by June 1990, indicating that Taiwan's family planning program had successfully accomplished its goal.

Figure 1. Taiwan's Crude Birth Rate, Crude Death Rate and Natural Increase Rate, 1951-2003



Source: Population projections from 2004 to 2051 for Taiwan, Republic of China (CEPD, 2004)

A "New Family Planning Program" was then proposed by the Ministry of Health in 1990 to replace the old family planning program. This new program focused on the following services:

1. The promotion of family planning education and the provision of services to youth.
2. The promotion of family planning

education and the provision of services to the disabled.

3. The promotion of family planning education and the provision of services to the mentally-impaired.

4. The promotion of family planning education and the provision of services in remote areas.

5. The provision of infertility prevention services.

6. The provision of services to marriageable, newly-wed, and post-partum women.

7. The provision of eugenic services to people as needed.

Along with the successful completion of a family planning program, two outcomes are expected. One is the completion of population transition and the other is population aging. From 1991 to 1997, Taiwan's crude birth rate fluctuated between 15.72‰ and 15.07‰, while the crude death rate ranged between 5.18‰ and 5.71‰. It is evident from these statistics that Taiwan's population has completed its transition from high birth and death rates to low birth and death rates. With the assistance of increased life expectancy, the completion of population transition has inevitably brought about an aging society. Taiwan's life expectancy at birth increased from 57.41 years in 1952 to 73.22 years in 2002 for males, and from 60.26 to 78.94 years for females over the same period (MOE, 2004). The simultaneous declines in the birth and death rates led to an increase in the proportion of aging population. The proportion of population aged 65 and above reached 7.09% by 1993 and just met the criteria for an aging society set by the World Health Organization.

What was unexpected from this successful family planning program was the continued decline in fertility. Taiwan's total fertility rate for general women continued to decline from 1.4 in 2001 to 1.2 in 2003. Following the launching of the "New Family Planning Program," there was a limited official effort to promote family planning. Family planning field workers were assigned to jobs other than family planning. No budget was specifically appropriated for family planning. What was left was a voluntary organization, the Planned Parenthood Association of Taiwan, that was put in charge of distributing contraceptives to married couples. We may then wonder why there was a continuation in fertility decline. Was it purely a hangover resulting from a successful family planning program? Was the slogan of "two kids is just right; one kid is no less" still prevailing among young cohorts? Or were there other reasons for the decline in fertility?

II. Factors Affecting Low Fertility

As births out of wedlock have been limited in Taiwan, the factors affecting low fertility may be broken down into two types: the fertility of married women and the proportion married. The past trends of these two factors are reviewed below in order to provide a guideline for policy planning.

1. Fertility of married women

In this regard, accumulated numbers of live births and ideal family size are selected to indicate the fertility of married women. A series of fertility surveys conducted by the Bureau of Health Promotion, Ministry of Health and its predecessors show that the fertility of married women has fallen slightly below the replacement level of 2.1. The numbers of live births for married women aged 20-39 steadily declined from 2.8 in 1981 to 1.9 in 2003 (see Table 1). Similarly, the ideal family size for the same age group declined from 2.8 children in 1981 to 2.0 in 2003.

Table 1. Accumulated Live Births, Ideal Family Size, Total Fertility Rate, Age at First Marriage, Age at First Birth, Parity Distribution and Proportion Married for Women in Taiwan in Selected Years

	Years			
	1981	**1991**	**2001**	**2003**
Accumulated live births [a]	2.8 (1980)	2.3 (1992)	2 (1998)	1.9 (2002)
Ideal family size [a]	2.8 (1980)	2.4 (1992)	2.4 (1998)	2 (2002)
Total fertility rate [b]	2.46	1.72	1.4	1.23
Age at first marriage[b]	24	26	26.4	27.2
Age at first birth[b]	23.2	24.9	26.2	26.2
Parity distribution[b]				
1st birth	37.5	42.2	49.8	51.3
2nd birth	31.4	36.5	35.3	36.6
3rd birth & above	31.1	21.3	14.9	12.1
Proportion married[b]				
	4.8	2.4	1.5	1.1
20-24	39.4	24.5	13.9	11.3
25-29	78.5	65.1	47	41.5
30-34	89.3	82.8	72	68.5
35-39	92.4	86.1	79.1	76.8

a : Source —— Fertility surveys conducted by Bureau of Health Promotion, Ministry of Health and its predecessors.

b : Source ——Taiwan-Fukien Demographic Fact Book, Ministry of Interior, June 2004.

Generally speaking, the ideal of "two-kids is just right" still prevails, but the total fertility rate for women in general has declined sharply from 2.46 in 1981 to 1.24 in 2003. The fertility rate for married women and the overall fertility rate for women in general did not decline at the same rate, suggesting that the fertility of married women was not the main factor accounting for the decline in the total fertility rate.

On the contrary, the trend in terms of the age at first marriage and the parity distribution reveal the reasons why the decline in fertility has continued. Table 1 shows that the age at first marriage for females increased from 24.0 in 1981 to 27.2 in 2003. The delay in marriage would inevitably shorten the fertility period. Therefore, there was a concomitant increase in average age at first birth, from 23.2 in 1981 to 26.2 in 2003.

The delay in marriage assisted by the decline in the ideal family size has led to a change in the parity distribution. The proportion of third and above births declined sharply from 31.1% in 1981 to 12.1% in 2003 (see Table 1). On the contrary, there was a drastic increase in the proportion of first births, from 37.5% in 1981 to 51.3% in 2003. However, a slight increase in second births from 31.4% in 1981 to 36.6% in 2003 was not enough to counteract the decline in third and above births.

2. Proportion married

Although a decline in the proportion of married females has been observed for every age group over the 1981-2003 period, the most drastic decline occurred in the 25-29 age group, where it declined from 78.5% in 1981 to 41.5% in 2003 (see Table 1). When the effect of the delay in marriage declined, the proportion married improved slightly for the next two age groups. Still, a sharp decline was carried over to these other two age groups. The proportion married in the 30-34 age group fell from 89.3% in 1981 to 68.5% in 2003. A corresponding decline from 92.4% in 1981 to 76.8% in 2002 occurred among the 35-39 age group.

In brief, there were three factors that accounted for Taiwan's decline in fertility — a decline in the ideal family size, a delay in marriage, and a decrease in the proportion married. The decline in the ideal family size was just 0.1 below the replacement level. Although the average age at first marriage increased to 27.2 in 2003, it did not pass the high fertility period (age 25-29). Therefore, neither of them constituted the major reason for the very low fertility. By contrast, the decline in the proportion married was the main culprit, since as many as 31.5% of the women who passed the high fertility period were not married and gave birth to no children, making the denominator representing the total fertility rate for women in general relatively large and the numerator small. This therefore explains why there was a sharp decline in the total fertility rate for women in general.

The relative importance of fertility decline and the decrease in the proportion of women married were confirmed by a recent survey

conducted by the Bureau of Health Promotion of the National Health Administration (BHP, 2004). In total, 2,546 persons aged 20-39 were interviewed by phone. Among them, 55.5% were married, and 45.5% unmarried. When those in the sample were asked about their ideal family size, 68.9% of them expressed a desire to have 2 children; 14.6%, 3 children; 2.3%, 4 children; and 10.9%, 1 or none. These results suggest that the average ideal family size remained greater than the replacement level. On the other hand, 61.5% of unmarried people in the sample wanted to get married; 16.0% did not; and 22.5% did not know, were not sure, or refused to answer. For unmarried females, the proportion wanting to get married was as low as 51.2%. In sum, a low willingness to get married should be a matter for concern.

Solutions toward the decline in fertility and marriage were also revealed by the survey. 51% of those in the sample had one child but did not want to have another. Based on a multiple-choice question, the major reasons for not wanting another child were insufficient economic ability (47.3%) and high educational costs for children (16.3%). The policy measures recommended in order to promote fertility included reforming the education system and lowering educational costs for children (40.3%), strengthening Taiwan's economy (23.5%), lowering crime rates (14.0%), improving the social welfare system (12.1%), and providing birth incentives (11.4%).

On the other hand, the survey also revealed ways of increasing the proportion of those married. Among females who were wanting to get married, no eligible partner was listed as the major reason for their not getting married. This was followed by insufficient economic ability. The order of these reasons was reversed for their male counterparts. Among those in the sample who did not want to get married, there were different reasons for not wanting to get married based on gender. The reasons offered by males were ranked as follows: insufficient economic ability (39.1%), enjoying being single (21.0%), no eligible partner (13.7%), and avoiding burdens (4.2%). For females, the order of the reasons was as follows: enjoying being single (26.7%), insufficient economic ability (16.2%), avoiding burdens (14.6%), and no eligible partner (7.3%). It seems that more education on marriage is needed for females.

III. Potential Policy Alternatives

To devise a good policy, it is important to compare our understanding of the factors giving rise to low fertility with measures being enforced or proposed to stop its further decline or even reverse it. In this section, potential policy alternatives are divided into two main types: policies to promote the fertility rate and policies to promote marriage.

1. Policies to promote the fertility rate

In order to make a better assessment of the usefulness of ongoing and proposed policies to

promote the fertility rate, the reasons for the low fertility should be reviewed first. The major reasons claimed for which a consensus was reached in a meeting organized by the Council of Economic Planning and Development (CEPD, 2004a) and a public hearing organized by the Ministry of Interior may be summarized as follows:

(1) Changes in population structure:
The postwar baby-boom cohort has completed their task of giving birth and has been replaced by young cohorts with a smaller population.

(2) Increased costs of rearing children:
Not only have the costs of baby care increased for double income families but also the costs of specialized training.

(3) Delay in marriage:
The increase in age at first marriage has shortened a woman's fertility period.

(4) Women's values have changed so that they favor freedom and leisure.
Better-educated women tend to remain single.

(5) Economic recession, high marriage costs, high housing costs, and high living costs have deterred young cohorts from getting married.

In response to the major reasons listed above, some programs have been enforced while others have been proposed by relevant government departments. These are listed below as a basis for a discussion on potential policies:

(1) Building a good day-care system to ease the burden of child rearing:
a. Using spare classrooms in primary schools as a day-care center or kindergarten. (Proposed)
b. Promoting after-school activities for the children of employed parents at school or in communities. (Proposed)
c. Improving information systems for baby-sitting and the training of baby sitters. (Enforced)
d. Executing the law on the "equality of both sexes." (Enforced)
e. Encouraging entrepreneurs to provide day-care services to employees. (Enforced)
f. Setting an upper limit for day-care expenses and subsidizing day-care costs. (Enforced)

(2) Implementing child-women health care policies
a. Subsidizing medical expenses for children aged 6 or less. (Enforced)
b. Providing preventive health care to children aged 0-6. (Enforced)
c. Setting up breast-feeding rooms in public and private offices. (Enforced)
d. Providing a good health care environment. (Proposed)

(3) Improving the fertility health care system
   a. Assisting infertile couples. Proposed)
   b. Improving the adoption system. (Proposed)
   c. Increasing infant survival rates. (Proposed)
   d. Saving some induced abortions for live births. (Proposed)

(4) Revising the taxation system to promote marriage and fertility
   a. Providing incentives for third births. (Proposed)
   b. Enabling adolescents to enjoy a tax discount similar to that for those aged 70 and above. (Proposed)
   c. Revising the tax rates for married couples. (Proposed)
   d. Giving tax penalties to the unmarried. (Proposed)

(5) Enhancing mass media campaigns
   a. Soliciting good campaign slogans. (Proposed)
   b. Encouraging the production of mass media programs on eugenics and fertility promotion. (Proposed)
   c. Providing teaching materials to kindergartens, nursery schools, and all levels of schools. (Proposed)

2. Policies to improve the proportion married

Again, the reasons for a low marriage rate are listed first:

(1) Years in school are increased to provide better economic opportunities.
(2) Women with better education are more economically independent.
(3) Young women have limited dating channels or else are opposed to arranged marriages.
(4) The social pressure to get married is less prevalent nowadays.
(5) Some women may even prefer to be single.

Feasible strategies to counteract the low marriage rate are proposed below:

(1) To promote social activities for marriageable youth organized by government organizations.
(2) To subsidize non-profit organizations that organize social activities for marriageable youth.
(3) To enhance mass media campaigns that encourage marriage.

IV. Potential Policies and Population Trends

Generally speaking, proposed policies tend to match the reasons for low fertility. In such cases, the problem that we have is potential policies because policies that are not driven by vibrant energy will remain on the starting blocks and become useless. Therefore, a review of potential policy alternatives has been presented first. The relationships between these potential policy alternatives and population trends are discussed as follows.

1. Potential policy alternatives

Since the strategies to promote fertility and marriage have been discussed over an extended period, here we attempt to make a subjective estimate of potential policy alternatives. At first, we feel that the potential for policies that focus on increased fertility has at most remained at its current level for the following reasons:

(1) As the government budget deficit increases rapidly and the setting up of a national pension system is listed as a top priority, the government cannot afford to run any costly new population programs. Programs designed to promote fertility by means of tax exemptions are estimated to be very costly. One study that utilized official regional-based data for the period 1990-96 indicated that a one thousand NT dollar increase in real value terms of the personal tax exemption resulted in an increase of only 1.2-1.4 births per thousand women (Huang, 2000). This policy, on the one hand, reduced the Taiwan government's real tax revenues by NT$12.448 billion—or 9.37 percent of the original total family income tax. On the other hand, it also resulted in an increase of 2,577.28 births in 1995, 7,853.39 births in 1996, and 6,400.48 births in 1997. In other words, the respective costs to the Taiwan government, in terms of lost tax revenue, were NT$48.3 million, NT$15.8 million, and NT$19.4 million for each additional birth during these three years.

(2) The Ministry of Finance tends to be against any tax exemption in view of the government budget deficit. It would thus be unlikely to approve programs either indirectly aimed at birth promotion (e.g., as based on Huang's study) or other direct programs (i.e. providing an incentive amounting to NT$30,000 for each third birth).

(3) The press has cited evidence of a strong negative response toward such an incentive for a third birth. Most people have felt that an incentive amounting to NT$30,000 is not attractive because the cost of child rearing is at least 10 times the amount they would receive as a result of the incentive. The imposition of a tax penalty for being single has not been favored either.

If we are unable to increase the effectiveness of policies aimed at promoting fertility, we have no other choice but to rely on policies aimed at promoting the marriage rate. We thus use the data on the total fertility rate for general women and the percentage of those currently married during the 1965-2003 period to estimate the effect of the marriage rate on the total fertility rate. The results of our simple least squares regression are shown below:

TFR = -17133 + 324.86 PR

(-4.13) (4.74)

t t

Adj. R^2 = 0.3671 F = 22.46 DF = 1/37 P < 0.001

Here TFR represents the total fertility rate per thousand women, and PR the percentage married. TFR lagged one year is taken as the dependent variable. Since we have assumed that potential policies in relation to fertility promotion would remain unchanged, no other factors have been included in the model except for the proportion married. In other words, the effects of other factors are reflected in the proportion of those married. The regression results indicate that a 1% increase in the proportion of those married could result in 0.342 births in terms of the total fertility rate, other things being equal. In the West, it has been found that an all-out social welfare policy may result in an increase of 0.1-0.2 births (Kamaras, et al., 1998, Blanchest & Ekert-Jaffe, 1994). Therefore, a 1% increase in the proportion married is about 1.5 times more effective than an all-out fertility promotion policy that Taiwan currently cannot afford. Moreover, we believe that the increase in the marriage rate will also increase the proportion that is satisfied with old age (Chen, 2001).

In the next section, we will use this estimated effect of the proportion married on TFR as a standard to gauge potential population trends and to set goals for future policy efforts.

2. Assumptions regarding population projections

Our discussion on Taiwan's future population trends is based on population projections made by the Council for Economic Planning and Development (CEPD, 2004b) using the cohort component method. To facilitate the discussion, the assumptions on which the population projections are based are briefly explained as follows:

(1) Base population:
The year-end population for 2003.

(2) Survival rate:
Life expectancy at birth for males will increase from 73.45 in 2004 to 78.32 in 2021 and to 79.18 in 2051. Life expectancy at birth for females will increase from 79.15 in 2021 to 85.23 in 2021 and to 86.09 in 2051.

(3) Migration:
There are about 3,000 male out-migrants in the age groups 5-14, 20-24, and 45-49. The number of female out-migrants amounts to about 1,000 for those aged 10-29, 45-49, and 65-69. The amount of in-migrants is estimated to be around 4,000 foreigners.

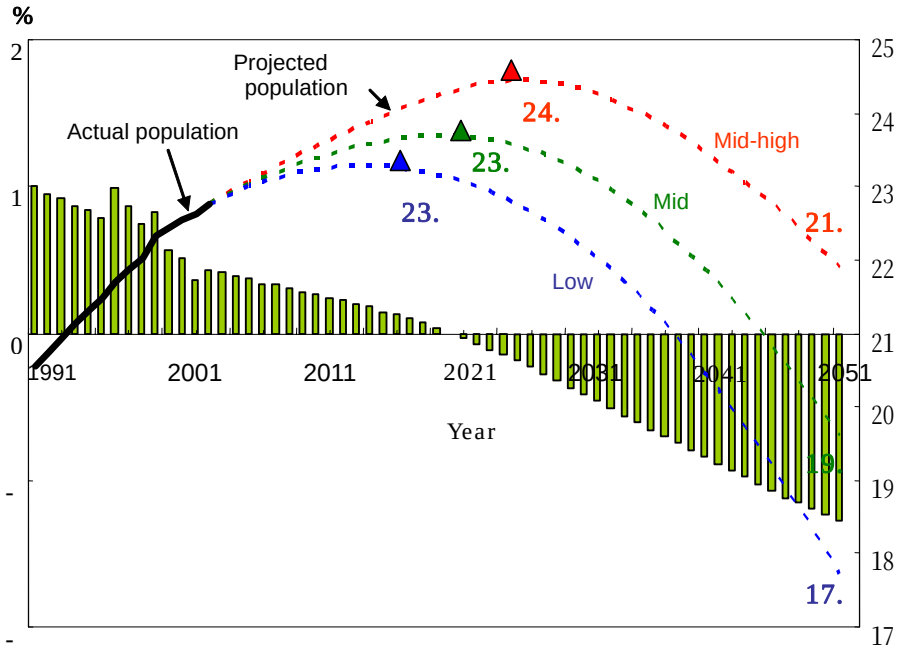
(4) Sex ratio at birth:
The sex ratio at birth will decrease from 109.6 in 2004 to 106 in 2021 and remain unchanged thereafter.

(5) Fertility:
Population projections made by the United Nations for the United States, France, the United Kingdom, Korea, Japan, Singapore, Italy, and Hong Kong (UN, 2002), as well as

Taiwan's current status, are reviewed in order to make an objective assessment regarding the fertility level. Then seven hypotheses on age-specific fertility rates and the total fertility rate are made and specified in Table 2.

The projection involving an expectation that the total fertility rate will rise to 1.37 by 2011 and to 1.6 by 2021 is referred to as a mid-high projection. Meanwhile, the projection which assumes that the total fertility rate will remain at 1.2 throughout the period 2004-2054 is referred to as a mid projection. Finally, the projection that begins with a total fertility rate of 1.192 in 2004 and declines to 1.065 in 2001 and to 0.9 in 2021 and thereafter is referred to as a low projection. In the following sections, we will focus our discussion on these three projections.

Figure 2. Total Population of Mid-high, Mid, and Low Projections for Taiwan



Source: Population projections from 2004 to 2051 for Taiwan, Republic of China (CEPD, 2004)

3. Alternative perspectives regarding Taiwan's population

The major characteristics of the population projections made by CEPD are listed below:

(1) Total population

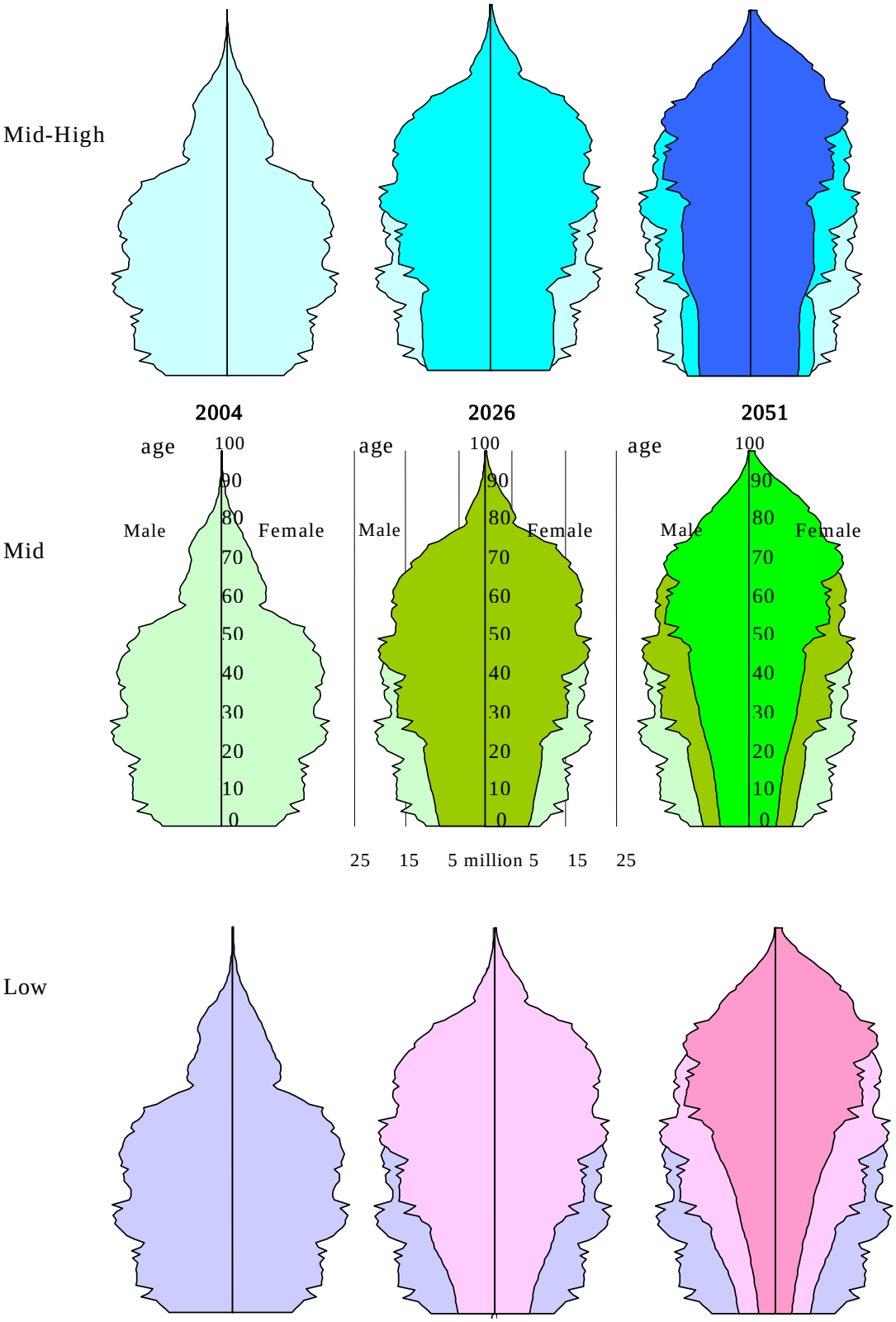
Figure 2 shows the total population trends for each of the mid-high, mid, and low projections. According to the mid-high projection, Taiwan's total population will reach a peak of 24.45 million in 2027, before

Table 2. Seven Hypotheses on Age-specific Fertility Rates

Year	Age-specific fertility rate							Total fertility rate
	15-19	20-24	25-29	30-34	35-39	40-44	40-49	
Replacement projection (TFR =2.1 in 2021)								
2004	0.012	0.058	0.117	0.057	0.011	0.001	0	**1.257**
2011	0.013	0.062	0.157	0.077	0.013	0.002	0	**1.591**
2021	0.014	0.057	0.223	0.109	0.017	0	0	**2.1**
2051	0.014	0.057	0.223	0.109	0.017	0	0	**2.1**
High projection (TFR =1.8 in 2021)								
2004	0.012	0.057	0.116	0.056	0.011	0.001	0	**1.242**
2011	0.012	0.057	0.144	0.070	0.012	0.002	0	**1.459**
2021	0.012	0.049	0.191	0.093	0.015	0	0	**1.8**
2051	0.012	0.049	0.191	0.093	0.015	0	0	**1.8**
Mid-high projection (TFR=1.6 in 2021)								
2004	0.012	0057	0.115	0.056	0.011	0.001	0	**1.231**
2011	0.012	0.053	0.135	0.066	0.012	0.001	0	**1.371**
2021	0.011	0.044	0.170	0.083	0.013	0	0	**1.6**
2051	0.011	0.044	0.170	0.083	0.013	0	0	**1.6**
Mid projection (TFR=1.215 in 2021)								
2004	0.011	0.052	0.092	0.069	0.020	0.003	0	**1.215**
2011	0.011	0.052	0.092	0.069	0.020	0.003	0	**1.215**
2021	0.011	0.052	0.092	0.069	0.020	0.003	0	**1.215**
2051	0.011	0.052	0.092	0.069	0.020	0.003	0	**1.215**
Mid-low projection (TFR=1.1 in 2021)								
2004	0.011	0.055	0.112	0.054	0.010	0.001	0	**1.203**
2011	0.010	0.045	0.114	0.056	0.010	0.001	0	**1.153**
2021	0.007	0.030	0.117	0.057	0.009	0	0	**1.1**
2051	0.007	0.030	0.117	0.057	0.009	0	0	**1.1**
Low projection (TFR=0.9 in 2021)								
2004	0.011	0.055	0.111	0.054	0.010	0.001	0	**1.192**
2011	0.009	0.041	0.105	0.051	0.009	0.001	0	**1.065**
2021	0.006	0.024	0.096	0.047	0.007	0	0	**0.9**
2051	0.006	0.024	0.096	0.047	0.007	0	0	**0.9**
Trend projection (TFR=0.7 in 2021)								
2004	0.011	0.054	0.109	0.053	0.010	0.001	0	**1.171**
2011	0.008	0.037	0.094	0.046	0.008	0.001	0	**0.954**
2021	0.005	0.020	0.078	0.038	0.006	0	0	**0.74**
2051	0.005	0.020	0.078	0.038	0.006	0	0	**0.74**

Source: Population projections from 2004 to 2051 for Taiwan, Republic of China (CEPD, 2004)

Figure 4. Pyramid of Mid-high, Mid, and Low Projections for Taiwan



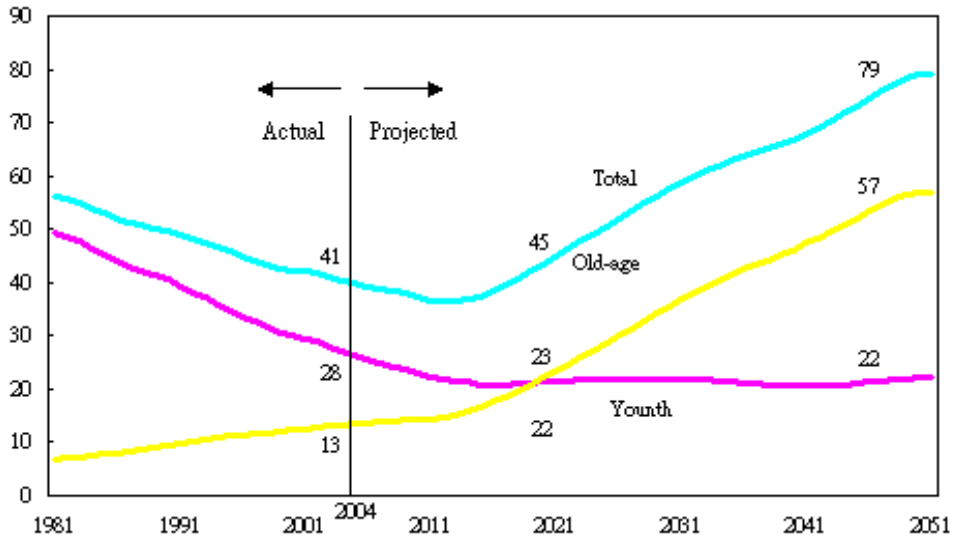
Source: Population projections from 2004 to 2051 for Taiwan, Republic of China (CEPD, 2004)

steadily declining to 21.89 million in 2051. Based on the mid projection, Taiwan's population will peak at 23.70 million by the year 2022, before continually declining to 19.59 million by the year 2051. According to the low projection, Taiwan's population will reach its maximum size of 23.28 million by the year 2016. It then will fall to 17.72 million in 2051.

(2) Number of births

What shocks government officials and the general public most of all is the decline in live births. Based on CEPD's mid-high projection, the number of live births will first increase from 226 thousand in 2003 to a peak of 240 thousand in 2021, and thereafter decline to 180 thousand in 2051 (see Figure 3). A consistent decline beginning in 2003, however, is observed for mid and low projections. The former will have only 100 thousand births in 2051, and the latter only 60 thousand births in 2051.

Figure 5. Changes of Dependency Ratio According to Mid-High Population Projection for Taiwan



Source: Population projections from 2004 to 2051 for Taiwan, Republic of China (CEPD, 2004)

(3) Population structure

The decline in live births will bring forth a drastic change in the population age structure. Figure 4 shows that the population pyramid will change from a lantern shape to a temple bell-shape, and

finally to an urn shape for all three projections, reflecting a rapid increase in the dependency ratio. The increase, however, is different from our past experience. It is a result of a decline in youth dependency and an increase in old-age dependency. By taking the mid-high projection as an example, the youth dependency ratio will decline from 27.1 percent in 2004 to 21.5 percent in 2021 and to 22.3 percent in 2051. On the contrary, the old-age dependency ratio will increase from 13.1 percent in 2004 to 23.4 percent in 2021 and to 56.8 percent in 2051 (see Figure 5). This type of increase implies a sharp increase in medical expenses, because health care for the aged will be very costly in the future.

V. Discussion

It is a surprise to us that even the mid-high projection will result in a rapid increase in the dependency ratio. To avoid a sharp increase in the dependency burden, policy intervention is needed to at least pursue the population course suggested by the mid-high projection. If this is the case, the fertility hypotheses specified in Table 2 will become our policy goals and can be sketched as follows:

(1) The total fertility rate must increase from 1.231 in 2004 to 1.371 in 2011.
(2) The total fertility rate must be further increased to 1.6 by 2021.
(3) The total fertility rate must remain at the level of 1.6 thereafter.

If we further assume that the policy to promote fertility will remain at its current level, we have no choice but to rely on policies to promote marriage. In this case, the policy targets are estimated by dividing the decline in TFR by the factor 0.342 and are listed as follows:

(1) The proportion married must increase by 0.43 percent in the period 2004 to 2011.
(2) The proportion married must further increase by 0.71 percent in the period 2011 to 2021.

The next question concerns how the goals can be accomplished. The introduction of foreign brides could be a measure to promote the marriage rate and birth rate. Between 1987 and 2004, 110.8 thousand foreign brides (mainly coming from South Asia) and 196.5 thousand Mainland Chinese brides applied for an entrance permit (MOI, 2005). These brides have become an important source of live births. For example, they contributed about one-eighth of the live births in 2003. They, however, have encountered many difficulties in daily life including language barriers, cultural differences, and working opportunities. They have experienced difficulty helping with their children's homework because of the language barrier. Their children have been stigmatized for having a foreign mother. The majorities (about 80%) of them are not qualified to apply for a work permit and are an extra burden to

their husbands who are overwhelmed by their lower social status. Therefore, the introduction of foreign brides is not a measure that should be recommended. It seems then that we had better rely on local women.

To effectively encourage local women to get married and give births, the initial step is to fully understand the reasons for their later marriage and less marriage. After a careful analysis of factors about values, institutions, and behaviors, Retherford et al. (2001) conclude that in Japan a key factor has been the near-complete erosion of the institution of arranged marriage, which has not been fully compensated by the emergence of voluntary associations and other social institutions where single men and women with similar interests can readily meet each other. A similar finding was also noted in Taiwan. According to the most recent survey stated above, we must help them find eligible partners. Obviously, this is a difficult task. If there is no successful experience that can be gleaned from to tackle it, we have no choice but to rely on the lessons learned from our past family planning program, a dynamic concept of "an interaction among goal-action-evaluation" (Chen, et al., 2003). This suggests that once policy goals are set, appropriate action programs based on experimental results must be designed and implemented with sufficient budget and personnel. A timely evaluation may provide us with a hint as to how to readjust our goal. The chain reactions among the targets, actions, and evaluation provide a program with a self-adjusting mechanism and ensure the success of a program if enough budget and personnel are provided. If this approach is acceptable, our immediate need is to conduct experiments to enhance the marriage proportion. A powerful field program with enough budget and personnel must follow.

In a powerful field program, field workers are assigned two tasks during home visiting based on the household register. One is to educate married women regarding having at least two births. The other is to encourage unmarried adults to participate in activities organized for the purpose of increasing contact with other unmarried adults. It is expected that the TFR will be increased through these two types of program.

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