DEMOGRAPHIC DIVIDEND AND LABOUR FORCE TRANSFORMATIONS IN ASIA: THE CASE OF THE REPUBLIC OF KOREA

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The demographic transition in the Republic of Korea has been extremely rapid. It will turn one of the youngest populations in the Organization for Economic Cooperation and Development (OECD) into one of the oldest by the middle of the twenty-first century (OECD, 2002), unless policy intervention and demographic behavioural change significantly alter the present course.

In less than half a century, the fertility and mortality regimes in the Republic of Korea have changed from the typical developing-country pattern to one characteristic of developed countries. The demographic transition began immediately after the Korean War in the early 1950s, when fertility rates were still very high. Official records indicate that the size of the baby-boom cohort born during the 1950s was around 8 million. This baby-boom generation and its offspring "echo generation" have a powerful "population momentum" that will largely shape the demography of the Korean population through the mid-twenty first century and beyond. The story of Korea's rapidly declining fertility followed by rapid population ageing revolves around the members of the baby-boom cohort – their demographics, culture, attitudes, behaviour as adults, and ultimately, their retirement from the labour force.

As the large baby-boom generation enters old age and life expectancy continues to increase, the age structure of the Korean population will change radically in the coming decades. Soon, the Republic of Korea will be facing the issues of a rapidly ageing population and decreasing labour force that are typical of developed countries. The "demographic dividend" that has benefited the Korean economy is expected to turn into a "demographic debt", as the baby-boom cohort claims its credit back from younger generations. This changeover from demographic dividend to debt raises serious issues of intergenerational equity with respect to economic growth and welfare distribution. During the first part of the twenty-first century, pension and health costs of retirees from the baby-boom generation will exert an unsustainable pressure on the social security system and the economy in general, at a time when the labour force will be relatively small.

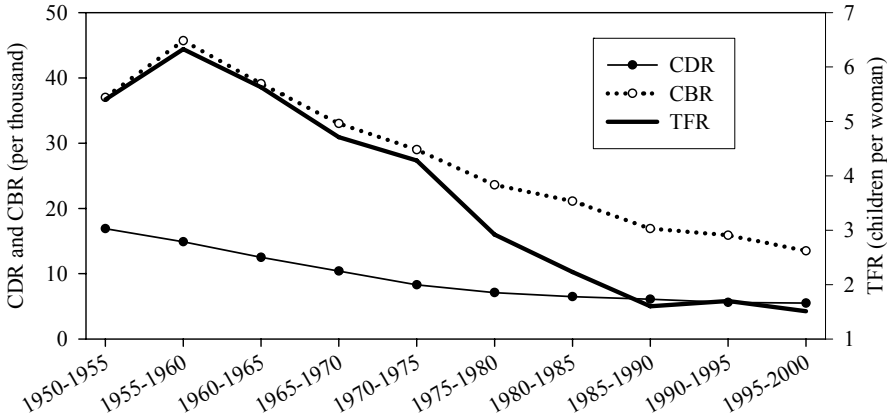
The present paper describes the major patterns of the past demographic transition in Korea and discusses the future trends of the Korean population. In particular, it examines how and to what extent the Korean economy benefited from the demographic dividend generated by the demographic transition and evaluates the assumptions regarding future fertility rates in the population projections of the Korea National Statistical Office (KNSO) and the United Nations Population Division. In addition, the paper addresses some policy initiatives that might mitigate the possible adverse repercussions of population ageing in order to keep Korea's economic growth and development on a sustainable path.

A. DEMOGRAPHIC TRANSITION IN THE REPUBLIC OF KOREA, 1950-2000

Demographic transition in Korea has been characterized by a rapid decline in fertility and a consistent and more gradual decrease in mortality. Figure 1 shows trends in crude birth (CBR) and death rates and total fertility rate (TFR) over the period 1950-2000. The CBR peaked at about 45 per thousand in 1955-1960 and decreased to 14 in 1995-2000. By the 1950s, improvement in public health and hygiene had already lowered the crude death rate (CDR) from about 35 per thousand in 1910 to about 17 per thousand in 1950-1955, and had increased life expectancy at birth from about 23 years in 1905-1910 to about 50 years in 1950-1955 (T.H. Kim, 2004). The CDR decreased further to 6 per thousand in 1995-2000. Following the implementation of an aggressive Government campaign for family planning, the TFR

declined dramatically, from 5.0-6.0 children per woman during the 1950s and 1960s to 1.7 in the mid-1980s.[1] This decrease of more than 3 children per woman in a period of about 2 decades has rarely been matched in world demographic history (Kwon, 1997). The fertility rate continued to fall into the 1990s and recently hit a record low of 1.2 in 2002 and 2003.

Figure 1. Crude death rate (CDR), crude birth rate (CBR) and total fertility rate (TFR), Republic of Korea, 1950-2000

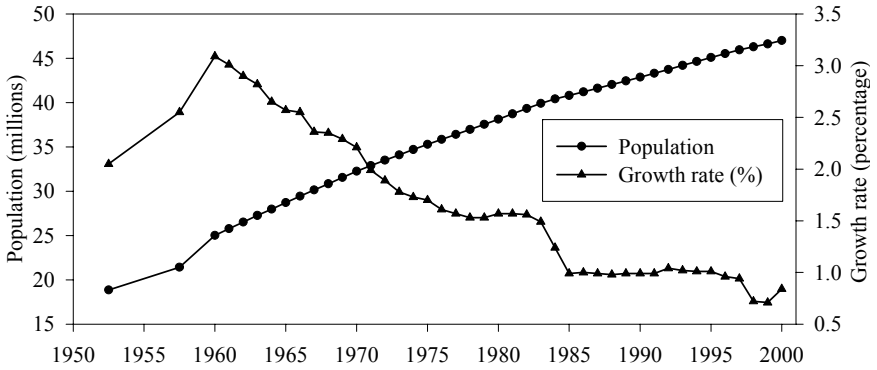


Source: United Nations (2005).

In half a century, the Korean population increased by a factor of 2.5 from about 19 million in 1950 to 47 million in 2000. The population growth rate peaked at 3.1 per cent per year in 1960 and then declined rapidly, reaching 1.0 per cent in the mid-1980s (figure 2). Until the mid-1970s, Korea's fertility pattern was similar to the average in the less developed regions. Thereafter, Korea's TFR swiftly converged to the level observed in the more developed regions (figure 3). The consistent decline of TFR results from the overlapping of childbearing patterns in different cohorts. For women born in 1950, the completed fertility rate was 2.9 children per woman. The 1970 cohort was the first to attain significantly below-replacement fertility, with 1.7 children per woman. The completed fertility rates of the 1970 through 1985 cohorts are of particular importance, as they will determine the TFR of the early twenty-first century in Korea. Based on observed and projected data, the completed fertility rates of the 1975, 1980 and 1985 cohorts will be about 1.5, 1.4 and 1.3 respectively, which implies the prevalence of well below-replacement fertility levels throughout the period 2000-2025 (table 1).

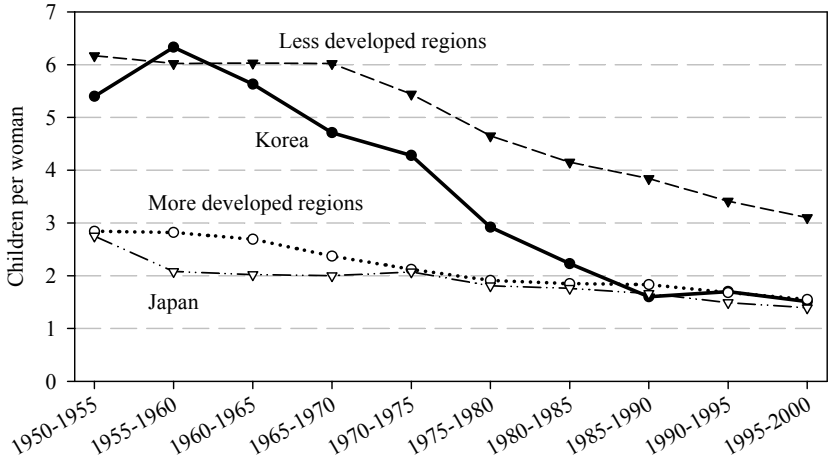
The demographic transition in Korea took place in the midst of rapid economic development and the transformation of the socio-economic system from a rural agrarian to an urban industrialized society (Doo-Sub Kim, 2004). The steep and consistent decline in fertility during 1950-1985 can be viewed as an outcome of socio-economic change at the macro-level, operating through choices made at the household (micro) level. The convergence of Korea's TFR to that of more developed countries after the mid-1980s may have been dictated by parents' rational choice based on the cost-benefit calculation of bearing and rearing children and parents' aspirations for upgrading the standard of living at the micro-level (Doo-Sub Kim, 2004). Parents began investing in the quality rather than the quantity of their children. Investment in children as human capital can be understood as a rational choice given the high returns to education made possible by Korea's growing economy and modernizing society (Becker, Murphy and Tamura, 1990).

Figure 2. Population size and growth rate, Republic of Korea, 1950-2000



Source: Korea National Statistical Office (http://kosis.nso.go.kr); United Nations (2005) for 1950 and 1955.
NOTE: Earliest two points refer respectively to the periods 1950-1955 and 1955-1960.

Figure 3. Total fertility rate in Japan, Republic of Korea and development regions, 1950-2000



Source: United Nations (2005).

TABLE 1: COHORT COMPLETED FERTILITY RATES IN REPUBLIC OF KOREA

Cohort	*Prime childbirth period (Age 25-40)*	*Completed fertility rate*
1950	1975-1990	2.87
1955	1980-1995	2.27
1960	1985-2000	2.08
1965	1990-2005	1.98
1970	1995-2010	1.70
1975	2000-2015	1.49
1980	2005-2020	1.39
1985	2010-2025	1.32

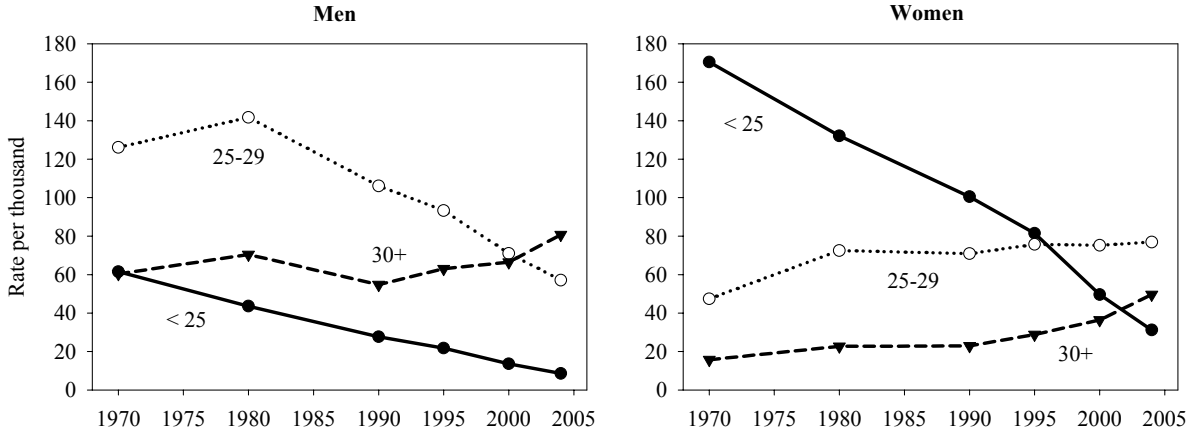
Source: KNSO (2003).

The changing fertility regime has been realized both through an increasing proportion of young men and women in their 20s remaining unmarried and through lower marital fertility. For instance, figure 4 shows a conspicuous decline in marriage rates among women aged up to 25 and men aged up to 30 during the period 1970-2004. In contrast, but to a lesser extent, marriage rates of men and women aged 30 and over have gradually been increasing over that period. As shown in table 2, the average age at first marriage has consistently increased over recent decades. In 1972, it was 22.6 years for women and 26.7 for men. As of 2004, it had increased to 27.5 years for women and 30.6 for men. Delayed marriage means a shortened period for women to bear children. Thus, unless age-specific marital fertility rises, the total fertility rate is expected to decline.

In fact, some social surveys indicate that the young generation may not be giving up marriage for good but just delaying it for their work careers (Byun, 2004). The discrimination against married women that is characteristic of the traditional male-dominated corporate culture in Korea has been a major barrier so far to the extension of female labour force participation. The current trend of delayed marriage among young women reflects their behavioural adaptation to this situation in the job market.

Although the trend towards later marriage might have a negative effect on future fertility levels, it could also have a positive effect on the Korean labour force and economic growth, by increasing the workforce's proportion of highly educated women who can remain attached to their careers for a longer period. On the other hand, getting married late does not necessarily mean a reduced number of children. The young generation might catch up since, even with marriage occurring so late, most couples would be physically able to have several children if they chose.

Figure 4. Age-specific marriage rates by sex, Republic of Korea, 1970-2004



Source: KNSO (2003).

TABLE 2: AVERAGE AGE AT FIRST MARRIAGE BY SEX IN REPUBLIC OF KOREA, 1972-2004

	1972	*1975*	*1981*	*1985*	*1990*	*1995*	*2000*	*2003*	*2004*
Male	26.7	26.8	26.4	27.0	27.8	28.4	29.3	30.1	30.6
Female	22.6	22.8	23.2	24.1	24.8	25.4	26.5	27.3	27.5

Source: KNSO (2003).

B. DEMOGRAPHIC DIVIDEND AND ECONOMIC GROWTH

The "demographic dividend" refers to the opportunity for economic growth brought about by the increasing proportion of the working-age population during the demographic transition. According to Bloom, Canning and Sevilla (2002), while population growth has a negative effect on per capita income (other things being equal), this effect is counteracted by the positive effect of the growth of the economically active population. They argue that the demographic dividend was essential to East Asia's "economic miracle". Mason (2001) presents a counter-argument by proposing a reverse causal mechanism. Rapid economic development and the accompanying social change (modernization, urbanization, and changes in behaviour), might have induced or facilitated demographic transition. However, when the two processes (economic development and demographic change) take place almost simultaneously in a relatively short period of time, it may be futile to try to apportion the causal flows precisely.

Leaving aside the issue of the cause of the initial economic and demographic changes, once change began, the demographic transition and economic growth in Korea epitomize the "demographic dividend" as described by Bloom, Canning and Sevilla (2002). In Korea's demographic transition, mortality decline preceded the fertility decline. The lag between the two generated a "bulge" in the number of births and population growth, the baby-boom generation. The baby-boomers grew up to form a large and young labour force, which contributed to an unprecedented economic growth. Bloom, Canning and Sevilla estimated that the dividend could explain one-third of the region's economic growth. Rapid socio-economic modernization and development led to rapid changes in the generation's fertility behaviour, which led to a rapid decrease in fertility levels. In turn, the decline in fertility reinforced the economic growth by lowering the dependency and welfare burden and allowing for higher investment in human capital.

However, as stressed by Bloom, Canning and Sevilla (2002), the demographic dividend is not automatic. If timely policy initiatives are not adopted and correctly applied, the opportunity could be missed. Conversely, if a sound policy environment is put in place, then the population dividend will be delivered through enhanced labour supply, savings and human capital. The following sections illustrate how the Republic of Korea benefited from the demographic dividend.

Population growth and labour force

Over the second half of the twentieth century the Korean population increased at an average rate of 1.8 per cent per year, from about 19 million in 1950 to 47 million in 2000 (table 3). During the first phase of the demographic transition (1950-1975), the average growth rate of the population (2.5 per cent per year) was significantly higher than the 1.1 per cent observed during the second phase of the transition (1975-2000). The proportion of the population in the working ages (15-64 years) remained relatively stable at around 55 per cent during the initial phase of the transition but started increasing in the mid-1970s to reach more than 70 per cent in 2000 (table 3). This outcome resulted not only from the large baby-boom cohort born at the onset of the fertility transition (1950-1960) but also from the relatively large number of the baby-boomers' descendents, the "echo cohort"; that is, the large number of baby-boomers led to a temporary resurgence of births even though fertility rates had already started declining by the time the baby-boomers reached the reproductive ages.

The total dependency ratio was relatively high between 1950 and 1975, due to the high youth dependency ratio resulting from the high levels of fertility. At that time, the old-age dependency ratio was low. Until the mid-1980s, those aged 65 or over made up less than 4 per cent of the population. Starting in the mid-1970s, however, the total dependency ratio declined rapidly—to reach a level below that of the more developed countries by the mid-1980s, when the Korean economy was entering a more mature stage

of economic development. At the same time, the median age of the Korean population, which had remained between 19 and 20 years from 1950 to 1975, jumped to about 22 years in 1980, 27 years in 1990 and 32 years in 2000 (table 3).

These changes in population size and age structure certainly contributed to economic growth by supplying a growing and young labour force to the economy. Demographic transition may also have contributed to economic growth by providing women an increased opportunity to participate in the labour market. Women became more likely to enter the workforce in great part because of the smaller number of children to take care of. According to national statistics, labour force participation of women of childbearing age has increased consistently. Especially impressive was the increase in the labour force participation rate of women aged 20-29, from below 45 per cent in 1980 to almost 65 per cent in 2004. Women still remain a promising source of the future labour force as younger cohorts become more educated, more inclined to participate, and more attached to their own work career through postponed marriage. Their increasing labour force participation is expected to add to labour supply, reinforcing the effect of the demographic dividend.

Population growth and savings rate

According to Bloom, Canning and Sevilla (2002), demographic transition also contributes to economic growth by increasing savings, which improves a country's prospects for investment and growth. The young and old consume more than they produce, whereas the working-age population tends to have both a higher level of economic output and a higher level of savings (Higgins, 1998). Improved health and longevity make saving easier and more attractive: a healthy population must plan far in advance if it is to maintain its standard of living through decades of retirement (Lee, Mason and Miller, 2000). Thus, as baby-boomers reach middle age (their 40s and 50s) national savings are expected to rise and contribute to capital accumulation, provided that savings are invested into productive activities.

Demographic transition and investment in human capital

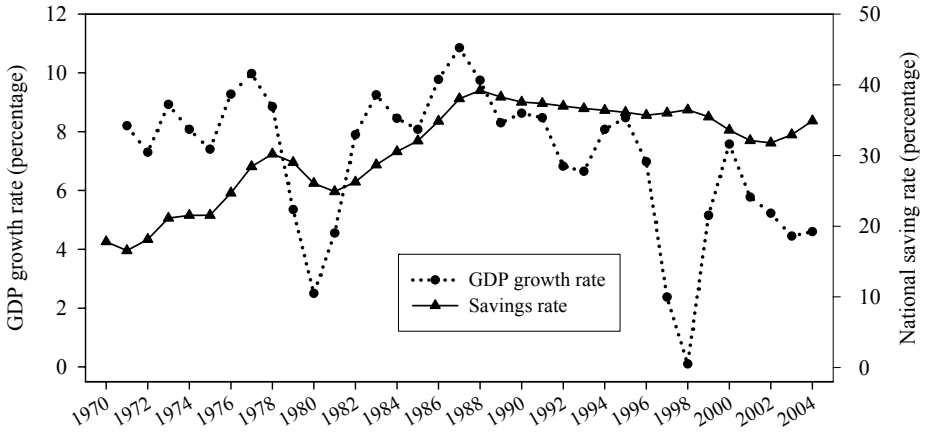
The demographic transition may have also a significant effect on investment in human capital. Decreased mortality and improved health cause parents to invest more in their children's human capital, as the wage premium for higher education increases and lower mortality means that the benefits last

TABLE 3: DEMOGRAPHIC CHANGES IN REPUBLIC OF KOREA, 1950-2000

Year	*Population (thousand)*	*Percentage 15-64*	*Population growth (percentage)*	*Median age (years)*	*Dependency ratio*
1950	18 859	55	2.6	19	81
1955	21 422	57	3.1	20	76
1960	25 003	55	2.6	19	83
1965	28 530	53	2.3	19	87
1970	31 922	54	2.0	19	83
1975	35 281	58	1.6	20	71
1980	38 124	62	1.4	22	61
1985	40 806	66	1.0	25	52
1990	42 869	69	1.0	27	45
1995	45 007	71	0.8	29	41
2000	46 779	72	0.4	32	40

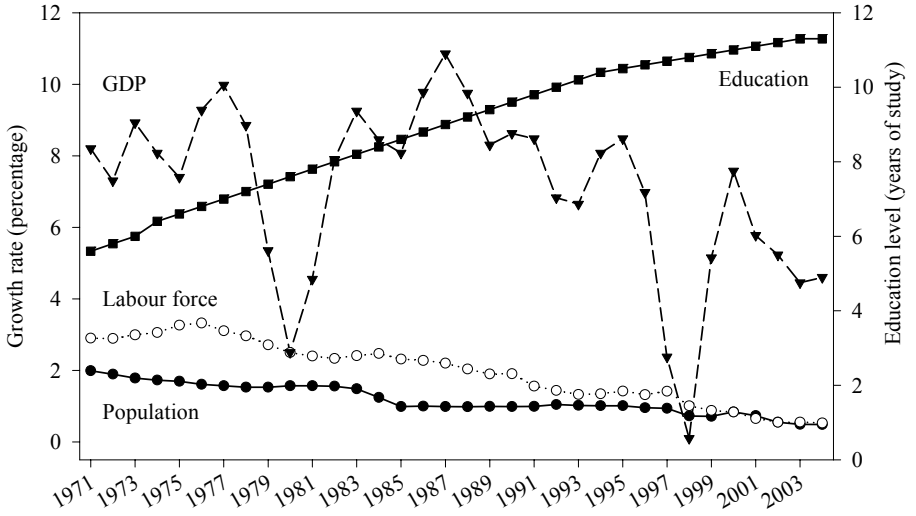
Source: Korea National Statistical Office (http://kosis.nso.go.kr); United Nations (2005).

Figure 5. National savings and Gross Domestic Product (GDP) growth rates, Republic of Korea, 1971-2004



Source: Korea National Statistical Office (http://kosis.nso.go.kr).
NOTE: Rates are 3-year moving averages.

Figure 6. Education level and population, labour force and GDP growth rates, Republic of Korea, 1971-2004



Source: Korea National Statistical Office (http://kosis.nso.go.kr).
NOTE: The GDP growth rates are 3-year moving averages.

longer. With fewer children, it becomes easier to devote more time and money to each child. As a result, the labour force becomes more productive, in turn promoting higher wages and better standard of living.

Figure 6 shows the trends in population, labour force and GDP growth rates along with the average educational level of the population. An examination of the long-term trend lines for these rates shows that the GDP growth rate moves in closer parallel with the growth rate of the labour force than with the total population. The trend in GDP growth lags that in growth of the labour force by about 10 years. The growth rate of the labour force peaked in 1977 at 3.3 per cent and then decreased, while the growth rate of

GDP peaked in 1987 at about 11.0 per cent and decreased thereafter. Particularly noteworthy is the parallel trend in the decreasing growth rates of the labour force and the GDP since the late 1980s.

From 1971 to 2003, the educational level of the population increased linearly from an average of less than 6 years of study to almost 12 years. According to Lee (1997), the miracle economic growth of Korea could be attributed to the rapid growth of human capital stock at least for the first 3 decades (1960s-1980s) of its economic development. Since the late 1980s, the economic growth rate has consistently fallen while the level of educational attainment has continued to increase. According to D.I. Kim (2004), while the supply of the college-educated labour force consistently rose over the past decades, its quality deteriorated after the start of the rapid yet unregulated expansion of college education. This implies a falling rate of return to investment in education due either to oversupply of highly educated labour or to declining quality of college education, as is documented in recent analyses of the Korean labour market (Lee and others, 2005). Thus, part of the falling rate of economic growth since the late 1980s may be explained by the deteriorating quality of the human capital among new entrants to the labour force as well as by the decreasing population growth rate.

In summary, the demographic changes in Korea have produced a demographic dividend, spurring economic growth during the second half of the twentieth century in the context of a favourable policy environment.[2] However, there remains the question of what will happen to the population and labour force in the coming decades of the twenty-first century. Even though fertility has already fallen to a level far below that needed for replacement of successive generations, the Korean population is projected to continue growing until 2020, when the baby-boom and its "echo generation" will have passed through their reproductive ages. After that, a period of negative growth is expected to begin. Thus, the population momentum created by the baby-boom cohort at the beginning of the demographic transition will last about 70 years, after which the Korean population is projected to grow older at full speed.

C. Korean population in the future: projections of the Korean National Statistical Office and the United Nations

The future of Korean population ageing, labour force, economic growth and the social welfare system depend critically on the course of fertility change. The critical question is whether fertility will stay at the current below-replacement level or will rise as many policy-makers and optimistic demographers expect. In early 2005, the United Nations Population Division issued the 2004 Revision of its estimates and projections of population. Also in 2005, the Korean National Statistical Office (KNSO) issued a revised version of its original 2001 population projections, which were based on the 2000 census. The reason for the 2005 revision was to reflect the radical drop in fertility rate since 2000. The following paragraphs compare the population projections and demographic assumptions adopted by KNSO (1996, 2001 and 2005) and by the United Nations (2005). The major demographic indicators and assumptions adopted in each population projection are summarized in table 4.

Because fertility rates are notoriously hard to predict (Bongaarts, 1998), there is significant variation in this variable across projections. In its original projection issued in 2001, KNSO pictured a very smooth and stable development of future fertility and assumed a TFR for 2005 of 1.37, which was expected to gradually increase to 1.40 by 2030 and to stay at that level until 2050. The observed TFR was 1.47 for 1998, 1.42 for 1999 and 1.47 for 2000, averaging 1.45 for the period 1998-2000. Thereafter, the TFR abruptly dropped to 1.30 in 2001, 1.17 in 2002 and 1.19 in 2003. The decline in TFR during 2001-2003 prompted KNSO to revise its 2001 decennial projection. The 2005 revision assumed a TFR of 1.19 for 2005, 1.28 for 2030 and 1.30 for 2050. On the other hand, the 2004 revision of the United Nations projection assumed a gradual increase in TFR from 1.21 in 2005 to 1.56 in 2030 and 1.77 in 2050, according to the medium variant (table 4). The United Nations also presented low- and high-fertility variants, which assumed that TFR after 2010 would be, respectively, one-half child below and one-half

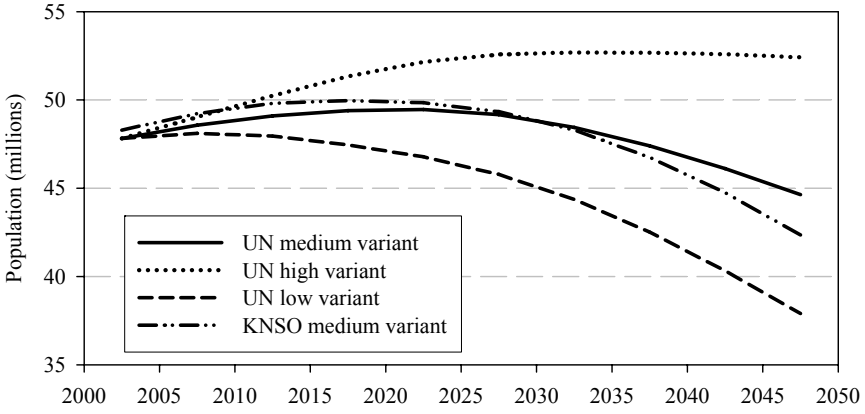
child above the levels assumed in the medium variant. Figure 7 presents the population projections from the 2005 KNSO revision (medium-fertility variant) and the 2004 United Nations revision (low-, medium- and high-fertility variants). According to the KNSO projection, the Korean population will grow to about 50 million by 2020 and then decrease to less than 43 million by 2050. This result is similar to the medium variant of the United Nations, which projects a slightly larger population of about 45 million for 2050. What is most striking, however, is the large difference in the total population resulting from the United Nations high- and low-fertility variants. While the high variant projects that the population will increase until 2030 and then reach a plateau at around 53 million, the low variant projects a long-term decline from the current 48 million to about 37 million by 2050. Thus, depending on the future course of fertility, the Korean population could follow completely different courses during the first half of the twenty-first century. Considering that past projections have generally over-estimated fertility rates, as was the case with Japan (Atoh, 2000), it may be that the future population will be more like that projected by the low variant than that by the high variant.

TABLE 4. DEMOGRAPHIC COMPONENTS OF POPULATION PROJECTIONS FOR THE REPUBLIC OF KOREA

		Korean National Statistical Office			*United Nations*
Variables	*Year*	*1996*	*2001*	*2005*	*2004*
Total population *(thousands)*	2005	47 275	48 461	48 294	47 817
	2030	52 744	50 296	49 329	49 161
	2050	-	44 337	42 348	44 629
Total fertility rate (*children per woman)*	2005	1.71	1.37	1.19	1.21
	2030	1.80	1.40	1.28	1.56
	2050	-	1.40	1.30	1.77
Life expectancy (Male, Female) *(years)*	2005	(72.3, 79.7)	(74.4, 81.2)	(74.8, 81.5)	(74.0, 81.0)
	2030	(75.4, 82.5)	(78.4, 84.8)	(79.2, 85.2)	(78.4, 86.4)
	2050	-	(80.0, 86.2)	(80.7, 86.6)	(80.8, 88.5)

Source: Korean National Statistical Office (http://kosis.nso.go.kr); United Nations (2005).

Figure 7. United Nations (UN) and Korean National Statistical Office (KNSO) population projections, Republic of Korea, 2000-2050



Source: Korea National Statistical Office (http://kosis.nso.go.kr); United Nations (2005).

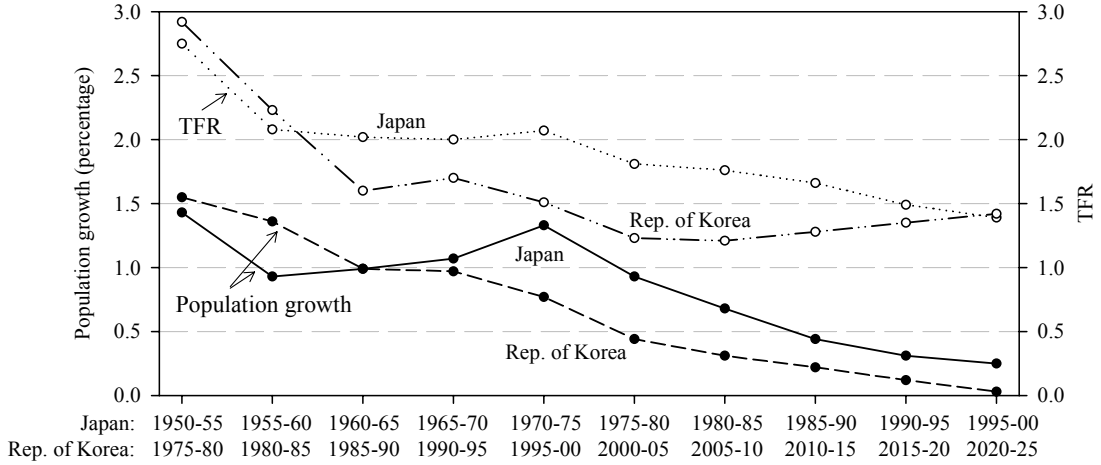
Given the lack of information on which to base predictions about future fertility in Korea, it is useful to consider the experience of other countries that went through the demographic transition earlier. In this regard, Japan would be the best reference as both countries belong to the same Asian culture of family formation and values concerning children. Japan has also been a forerunner of modern demographic transition among the East Asian countries. In fact, demographic changes in Japan and Korea during 1950-2000 have been remarkably similar in their pattern and pace with about a quarter-century time lag (table 5 and figure 8). The trend lines for Korea are below those for Japan in figure 8, because of the swiftness of Korean fertility decline during the 1970s and 1980s, from 2.92 to 1.60. Other than that, the long-term trend in both total fertility and population growth rates are approximately parallel for the two countries, except for the projected TFR in Korea. While in Japan, after reaching the below-replacement level the TFR gradually but consistently decreased to 1.39 in 1995-2000, in Korea the TFR is projected by the United Nations to increase to this same level by 2020-2025. Thus, the question is whether the steep

TABLE 5: FERTILITY AND POPULATION GROWTH TRENDS IN JAPAN AND REPUBLIC OF KOREA

Period (years)		*Total fertility rate (children per women)*		*Population growth (percentage)*	
Japan	Korea	Japan	Korea	Japan	Korea
1950-1955	1975-1980	2.75	2.92	1.4	1.6
1955-1960	1980-1985	2.08	2.23	0.9	1.4
1960-1965	1985-1990	2.02	1.60	1.0	1.0
1965-1970	1990-1995	2.00	1.70	1.1	1.0
1970-1975	1995-2000	2.07	1.51	1.3	0.8
1975-2080	2000-2005	1.81	1.23	0.9	0.4
1980-2085	2005-2010	1.76	1.21	0.7	0.3
1985-2090	2010-2015	1.66	1.28	0.4	0.2
1990-1995	2015-2020	1.49	1.35	0.3	0.1
1995-2000	2020-2025	1.39	1.42	0.3	0.0

Source: United Nations (2005).

Figure 8. Trends in total fertility rate (TFR) and population growth rate for Japan and the Republic of Korea in a time-lag framework



Source: United Nations (2005).

downward trend of Korean fertility will continue into the first decade of the twenty-first century following the Japanese trend observed between 1970 and 2000 or will trend upward to converge to the level of Japan for the reference time point.

D. Population ageing and future labour force

Ageing of the labour force

Korea is likely to experience one of the fastest demographic transitions from an "ageing" to an "aged" society. As a consequence, its work force is also expected to undergo an intense transition. Korea has already entered the stage of an ageing society as of 1999, with more than 7 per cent of its population aged 65 or over. In 2019, Korea is expected to become an aged society with over 14 per cent of its population aged 65 or over, which is projected to rise further to 20 per cent by 2026 (KNSO, 2001). This pace of transition is extraordinary compared to the past experience of Western societies. For example, France took 115 years to move from 7 to 14 per cent aged 65 or over, while the United States took 75 years (table 6). Among the industrialized countries, Japan has experienced the fastest transition to an aged society. However, Korea is expected to surpass Japan.

Korea will also experience a rapid increase in the old-age dependency ratio, from below 40 people in dependent ages (under age 15 and 65 years or over) per hundred working-age people (ages 15-64) in 2000 to about 82 dependent-age people per hundred of working age in 2050 (table 7). As has occurred in many other countries, the dependency ratio is shifting from a predominance of young- to old-age dependency as the demographic transition proceeds (Mirkin and Weinberger, 2000).

As the median age of the population rises from 32 years in 2000 to a projected 43 years in 2020 and 54 years in 2050 (table 7), the labour force will also get older. For instance, the proportion of workers aged 50 and over among the total labour force is projected to increase from about 25 per cent in 2000 to more than 50 per cent by 2050 (Phang, 2004). As observed from the past experience of advanced countries, increasing old-age dependency and ageing of the labour force usually happen hand in hand, which might exacerbate the negative effects on the economy and society.

Labour force participation at older ages

The future size of the labour force will depend not only on demographic change but also on age-specific participation rates. The trend in participation rates at higher ages will be particularly important given that the older age groups will be growing significantly in both relative and absolute size (OECD, 2002). Currently, the participation rates of those aged 25-49 years in Korea are lower than the average rates for the European Union (EU) and the OECD countries, particularly among women. Conversely, the participation rates of men and specially women aged 50-64 years are higher in Korea than in the OECD and EU member-countries, although they are significantly lower than in Japan (table 8).

Thus, older persons in Korea tend to remain in the labour market in higher proportions than do those in Western industrialized countries, which makes the Korean pattern resemble that of Japan more than that of EU or OECD member countries. This, in turn, implies a possibility that the future pattern of labour force participation and withdrawal of the Korean older population might differ from that of advanced Western societies, which exhibit a secular trend of early voluntary withdrawal from the labour force (Jacobs, Kohli and Rein, 1991).

TABLE 6: TRANSITIONS FROM AGING TO AGED SOCIETY IN SELECTED COUNTRIES

Country	*Year in which proportion of population aged 65 or over reaches*			*Time (years) for proportion to increase from*	
	7 per cent	*14 per cent*	*20 per cent*	*7 to 14 per cent*	*14 to 20 per cent*
Republic of Korea	2000	2019	2026	19	7
Japan	1970	1994	2006	24	12
Spain	1942	2013	2028	71	15
Germany	1932	1972	2012	40	40
United Kingdom	1929	1976	2021	47	45
Italy	1927	1988	2007	61	19
France	1864	1979	2020	115	41

Source: Korean National Statistical Office: News Release on Population Projections, 2001.

TABLE 7: DEPENDENCY RATIOS AND MEDIAN AGE OF POPULATION IN THE REPUBLIC OF KOREA, 2000-2050

Year	*Dependency ratios*			*Median age (years)*
	Total	*Youth* [a]	*Old age* [b]	
2000	40	29	10	32
2010	39	24	15	38
2020	41	20	21	43
2030	55	19	36	48
2040	71	20	52	51
2050	82	19	63	54

Source: Korean National Statistical Office: News Release on Population Projections, 2001.
[a] (population aged 0-14)x100 / population aged 15-64.
[b] (population aged 65+)x100 / population aged 15-64.

TABLE 8: LABOUR FORCE PARTICIPATION RATES BY AGE AND SEX IN SELECTED COUNTRIES, 2000
(percentage)

	Male		*Female*		*Total*	
Countries	*25-49*	*50-64*	*25-49*	*50-64*	*25-49*	*50-64*
Republic of Korea	92.4	78.0	58.2	50.7	75.5	64.3
Japan	97.2	89.1	66.1	56.8	81.8	72.6
European Union[a]	94.0	66.1	73.9	42.3	84.0	54.0
USA	92.4	75.6	77.3	61.0	84.7	68.0
OECD[a]	93.7	72.8	69.0	48.4	81.3	60.3

Source: OECD, Labour statistics (http://www.oecd.org/statsportal).
[a]Average.

The high participation rate of the older population in Korea may be attributable, in part, to the sizeable self-employed sector, including 40 per cent in agriculture, which is the largest among the OECD

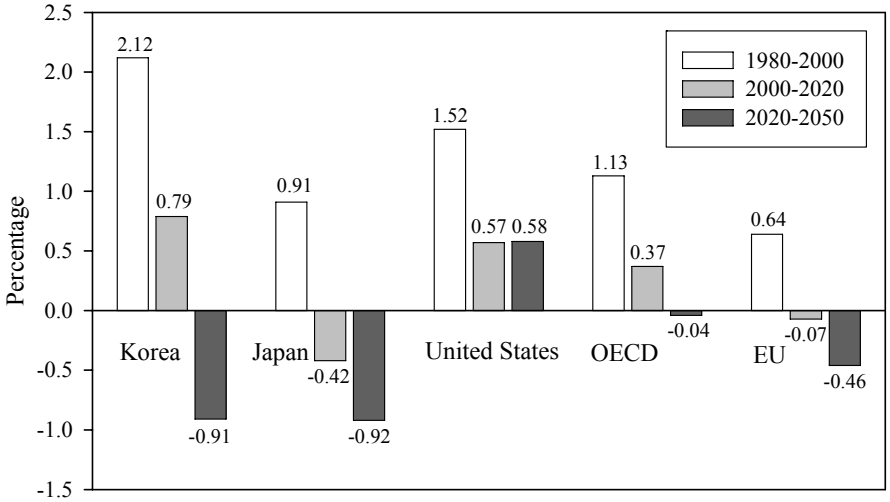
member-countries. Among workers aged 55-64, about 60 per cent are classified as self-employed. Among those aged 65 or over, 77 per cent of men and 76 per cent of women are self-employed. Since the self-employed tend to work longer than wage workers, this partially explains the relatively high rate of labour force participation of older Koreans. The relatively high participation rate of the older population can help alleviate the negative effect of decreasing labour force on economic growth in the coming decades. Thus, one of the most important and challenging policy initiatives is to create quality employment opportunities for older persons so that they can remain active in the labour market at least until normal retirement age. To achieve this, the quality of employment and working conditions of older workers need to be improved.

Future labour force projections

In a recent study, D. I. Kim (2004) simulated the growth rate of the future labour force according to six fertility scenarios. The scenarios varied from one of "very low" fertility, in which a TFR of 1.0 would be reached by 2050, to one of "very high" fertility, in which a TFR of 2.1 would be reached by 2050. The results indicate that the total labour force would grow to 24.8 million by 2019, and then start decreasing to approximately 19 to 17 million in 2050, depending on the target fertility level assumed.

Figure 9 presents an international comparison of the changes in labour force growth between 1980 and 2050 under the assumption of constant participation rates at the 2000 levels. Although labour force growth will be more rapid in Korea than in most other OECD member countries between 2000 and 2020, the slowdown compared with the growth in the previous period (1980-2000) will be especially marked in Korea. Japan and the EU may already be experiencing a decline in the absolute size of their labour forces. Over the period 2020-2050, the growth of the labour force in Korea will reverse and, along with Japan, Korea will experience one of the steepest falls in the size of the labour force.

Figure 9: Annual average labour force growth in selected periods between 1980 and 2050, for selected countries and groups of countries



Sources: KNSO (2005); OECD (2002).

NOTE: The projections of labour force growth over the period 2000-2050 assume that participation rates by sex and 5-year age group remain constant at their 2000 levels.

OECD = members of the Organization for the Economic Cooperation and Development.

EU = members of the European Union.

In general, however, labour force projections in Korea do not properly take into account the changes in participation rates that are expected in the course of population ageing. For instance, social security programmes, especially those related to retirement pensions, tend to affect the labour force participation of older persons, while higher educational levels and smaller numbers of children could increase the participation rates of women. From a policy perspective, it is thus important to consider the possible effects of future labour force participation rates. In this respect, it worth noting the projections for the next half century of the Korean labour force made by OECD (2002) based on alternative assumptions about age-specific participation rates. But this simulation is also limited as no fertility variation is taken into account.

In general, the OECD projections are slightly less pessimistic about the future labour force growth than most studies in this area. According to its "maximum participation" scenario, the labour force in Korea is projected to reach 24 million in 2050, whereas it does not exceed 20 million in any scenario of any other study. In all studies, however, Korea's labour force is projected to grow at slower rates until 2020 and then to start shrinking.

E. THE IMPACT OF AGEING POPULATION ON ECONOMIC GROWTH

The Korean economy enjoyed a high growth rate of about 7 per cent on average during the last two decades. This rapid economic growth was mainly due to the size and quality of labour and capital accumulation rather than to increasing growth in total productivity (Hahn and others, 2002). The considerable drop in the economic growth rate from 8.3 per cent during the 1980s to 6.0 per cent during the 1990s, which was mainly due to the decreasing growth rate of the working population, is indicative of the potentially detrimental effects of rapid population ageing on economic growth in the coming decades.

There is still more debate than consensus among researchers regarding the effect of population ageing on economic growth. According to the pessimistic view, upheld by the majority of scholars (Bloom, Canning and Sevilla, 2002; Borsch-Supan, 2000; OECD, 1998; World Bank, 1994), population ageing driven by low fertility and longer life expectancy has negative effects on economic growth through a set of inter-related mechanisms: (i) decreasing labour input due to low population growth and ageing; (ii) decreasing savings rate and capital accumulation due to an increasing dependency ratio and the cost of prolonged care of the aged; (iii) decreasing investment into human capital of the young generation due to increasing social welfare costs; and (iv) increasing foreign debt due to falling interest rates.

In contrast, some scholars point to the possibility of positive effects of low population growth and population ageing on economic growth, such as development of labour-saving technology and increased investment in human capital. The latter is posited to compensate for the decline in economic growth arising from the quantitative decrease in labour input. Scarth (2002), for example, asserts that population ageing could lead to productivity growth by motivating increased investment in human capital as labour becomes a relatively scarce factor of production. In a cross-national comparative study using panel data, Cutler and others (1990) concluded that decreasing labour force growth results in increasing labour productivity.

Thus, one of the fundamental measures to counteract adverse effects of an ageing population and shrinking labour force will be improving the productivity of the labour force. If consistent growth in labour productivity and increasing labour force participation among women can be achieved in coming decades, then the negative effect of population ageing could be mitigated (Phang and others, 2004; Cho, 2000).

The question is whether it is feasible to raise labour productivity to a level capable of compensating for the decreasing labour force, particularly after 2020. The prospect is rather discouraging. Long-term

projections in Korea usually predict labour productivity growth at around 0.2-0.4 per cent (Choi and others, 2003; Dae-Il Kim, 2004), a much lower level relative to the average 2.0-4.0 per cent during the last thirty years. According to Dae-Il Kim (2004), underlying the decline in future labour productivity is the changing population age structure and the decreasing quality of higher education.

In another study, Dong-Suk Kim (2004) simulated future economic growth (measured by the real GDP growth rate) using different assumptions about future fertility changes and total factor productivity. His projection is based on a Cobb-Douglas production function and takes into account long-term changes in savings and capital stock, an index of human capital and the size of the work force. Table 9 shows the predicted contribution of different factors to the economic growth rate based on the particular assumption that total fertility rate will recover to 1.4 and that total factor productivity will grow by 2 per cent annually. Overall, Korea's economic growth rate is expected to remain around 5 per cent during the first two decades of this century, and then decrease to 3.5 per cent during the 2020s, 2.2 per cent during the 2030s and 1.5 per cent during the 2040s.

In a similar vein, H. H. Lee (2001) has predicted that population ageing in Korea will result in a substantial decrease in future economic growth due to a lower savings rate and slower-to-negative labour force growth. He projects that the economic growth rate will fall from 8.8 per cent in 2000 to 4.1 per cent in 2010, 3.1 per cent in 2020, 2.2 per cent in 2030, 1.3 per cent in 2040, and 1.0 per cent in 2050.

F. POPULATION AGEING AND INCREASING COST OF OLD-AGE INCOME SECURITY

The projected demographic transition to an aged society will have serious economic and social impacts. Among other things, it will create a severe strain on public finances. Health care and other social assistance expenditures are expected to rise significantly with the increasing number of older persons. However, the main component of the rise in public spending will be the increasing expenditure for old-age pensions. In 2000, public expenditure on old-age pensions in Korea was 2 per cent of GDP, the lowest among OECD countries, but between 2000 and 2050 Korea is expected to experience the greatest increase in pension expenditures (figure 10). The National Pension System in Korea is projected to accumulate a huge amount of hidden liability as it matures, which will be transferred to the next generation of workers. This extra burden on the future workforce will also have a negative effect on the national economy during the next few decades.

In the Korean context of rapid population ageing and increasing costs of supporting the older population, the pension system is particularly important because of the scarcity of complementary programmes for old-age income security. For instance, Korea's National Basic Livelihood Protection Programme is intended to provide social assistance to ensure a minimum income, but its coverage is limited. Employed workers can receive, as they leave the firm, a retirement allowance equivalent to one month's salary for each year of service. However, this programme covers under 40 per cent of workers and, in general, the lump sum tends to be spent over the working life rather than being preserved until retirement age, because the work career of most Korean workers is characterized by multiple and relatively short-term jobs.

The rise in taxes and social security contributions that will be required to finance the increasing public expenditures associated with population ageing may give rise to intergenerational inequities and tensions. Much of this extra burden of taxation will fall on the working-age population who, at the same time, will lose political power in terms of votes to the growing number of older people. This may make it difficult for Korea to carry out the necessary adjustments to cope with an ageing society (OECD, 2002).

TABLE 9: ECONOMIC GROWTH RATE DISAGGREGGATED INTO SELECTED CONTRIBUTING FACTORS, REPUBLIC OF KOREA, 2000-2050

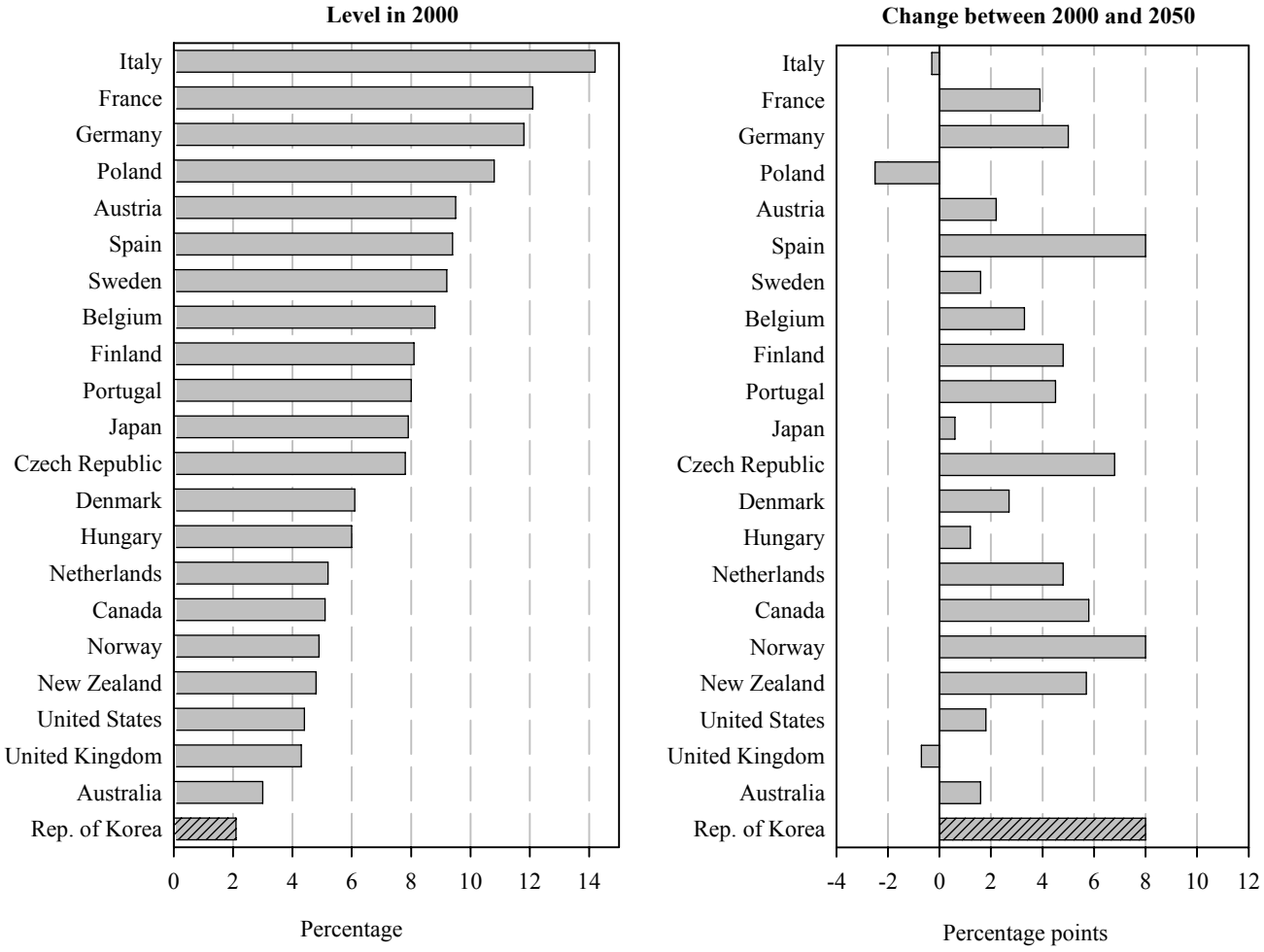
Period	*Growth rate* [a] *(percentage)*	*Contributing factors*			
		Work force [b]	*Human capital*	*Capital stock*	*Total factor productivity*
2000-2010	5.1	0.7	0.8	1.7	2.0
2010-2020	4.8	0.3	0.6	1.9	2.0
2020-2030	3.5	-0.4	0.5	1.4	2.0
2030-2040	2.2	-0.9	0.3	0.8	2.0
2040-2050	1.5	-1.0	0.1	0.4	2.0

Source: Kim, Dong-Suk (2004).

[a] Measured by real GDP growth rate.

[b] Total fertility rate is assumed to increase to 1.4 by 2050.

Figure 10. Public old-age pension expenditures (as percentage of GDP) in OECD countries, 2000-2050



Source: OECD (2001).

G. SOME POLICY CONSIDERATIONS

"More Children" policy

As previously discussed, fertility is the most critical demographic variable in determining future population and economic growth in Korea. The size and composition of the population and labour force, the status of the economy and future social well-being all depend on future fertility trends. It is thus understandable that the Government has implemented a pronatalist "More Children" policy, which has introduced new, or reinforced existing, "work-and-family-friendly" measures for working women (MOHW, 2004) and has started providing married couples with direct financial support in the form of tax breaks or cash allowances for each additional child. Underlying this policy initiative is a recognition of the high cost of rearing and educating children and the difficulty that married women with children confront in trying to combine work and family—the barriers being both institutional and cultural.

The current generation of young women seems already to have decided to pursue their work careers even if this entails delaying marriage and family formation. With effective means for controlling fertility readily available, couples can easily limit the number of children they have. On the other hand, in the Asian culture of family and kinship, remaining childless is still an unpopular option; one or two children is considered to be ideal. At the same time, with a still-ingrained preference for a son, Korean couples have successfully pursued parity-specific sex control for their additional children. The sex ratio for the third child was almost 180 boys per hundred girls in 1995 and 144 in 2000, whereas the ratios for the first and second child were 105 and 107, respectively (KNSO, 2003).

There are few who believe that the Government's pronatalist campaign based on direct financial incentives will by itself have a sizeable impact on the demographic behaviour of the young generation. Rather, more fundamental reforms should be pursued on a long-term basis to lower the cost of rearing and educating children, to make more work opportunities available to married women with children, and to build up a social-institutional system free of gender discrimination. Sleebos (2003), on examining the effect of the pronatalist policies of many European countries, concluded that, while these policies are often very costly, they tend to fall short of affecting fertility behaviour to a significant degree. It may therefore be advisable for the Government of the Republic of Korea to invest more in the quality than in the quantity of children and the future labour force.

Immigration policy

Another important policy for dealing with an ageing population and shortage of workers is to increase the working population through immigration (Visco, 2001). Most immigrant workers are relatively young, and immigrants often have higher fertility than that of the residents, so that immigration could also contribute to increasing fertility. Nevertheless, immigration cannot solve the problem of an ageing population and low population growth (Tapinos, 2000; United Nations, 2000, Choi and others, 2003). Apart from difficult issues of social integration and border control, the number of immigrants needed to compensate for the prospective decline in labour force would be huge, and the flow would need to be sustained in order to have a lasting effect on the age structure: immigrant workers get old too.

Labour market and employment policy

The size of the Korean labour force in the future will depend not only on fertility but also on participation rates. In particular, the participation of older persons and women could be greatly influenced by institutional settings and policy initiatives. Even though labour force growth will turn negative after 2020 in all of the OECD scenarios, the magnitude of the decline will be lower if there is a general rise in participation rates. For instance, under the baseline scenario, labour force growth over the period 2000-

2020 is projected to average 0.8 per cent per year, down from 2.1 per cent per year during the two previous decades. If participation rates for the older population were to decline—in response, for example, to public pensions becoming more extensively available—then, all else constant, annual labour force growth over the period 2000-2020 would be even lower at only 0.5 per cent. Under the maximum scenario, the increase in labour force would be 1.4 per cent per year (OECD, 2002).

Policy should therefore aim to encourage participation and employment for the older work force (OECD, 2002). Up to now, participation rates of the older population, especially males, have been high in Korea. However, with limited employment opportunities in the formal sector and with the involuntary early retirement currently practiced in Korean firms, it might become increasingly difficult for older persons to find employment in the future. Rapid technological change and the demand for increased skills that will characterize the future labour market also could exacerbate the employment problem of older workers. Therefore, on the demand side, employment contracts including mandatory early retirement policies should be changed gradually to adjust to the ageing of population and of the labour force. On the supply side, workers' initiative and choice should be directed toward lowering the cost of long-duration employment contracts, such as seniority wage and retirement allowance, so that long tenure (normal retirement) with a productivity-based wage system could gradually replace a system of short tenure (early retirement) and high wages (Phang, 2004).

Women's labour force participation has been low in Korea relative to other advanced countries (see table 8), in particular for young women with higher education. In fact, women could be the most valuable resource for Korea's future labour force. In this respect, the Government should strengthen its policy to assure that entry to the labour market following school-leaving, and re-entry to the labour market after childbearing, can be achieved at low transition costs. In addition, Korean labour market institutions and practices need to be reformed to enable working women to harmonize work and family and to enhance the development of their work careers.

H. FINAL REMARKS

The Korean economy and society have benefited from the demographic transition that produced a relatively young population and growing labour force during the second half of the twentieth century. The result was rapid and consistent economic growth and social development. The baby-boom generation born in the early stage of the demographic transition conferred a demographic dividend that helped drive the nation's "miracle" economic development.

Social structural changes at the macro-level that accompany rapid economic development often induce radical changes in individuals' demographic behaviour. In Korea, there have been rapid changes in marriage and childbearing among the generations that followed the first baby-boom cohort. Recent cohorts are marrying much later and bearing fewer children. At the same time, the baby-boom generation that carried out the work of Korean economic development is getting older. These ongoing demographic changes are leading to a rapidly ageing population. Korea's population and labour force are expected to continue growing during the first two decades of this century although at a much slower rate than before. By 2020, however, the large baby-boom cohort will be almost completely retired from the labour force and its smaller group of descendents will make up the core of the workforce.

In order to confront the social and economic challenges of an older population and an older labour force, it is advisable that the Government of the Republic of Korea pursue a wide range of policy reforms in a consistent and efficient manner. In particular, reforms should centre on labour market institutions and the social welfare system so that the Korean economy can continue on a path of sustainable growth. Currently, the labour market in Korea remains in a stagnant state under the long shadow of the economic crisis that affected several Asian countries in the late 1990s. As a consequence, employment opportunities

for older persons as well as for youth have been curtailed due to the structural-adjustment and lean-management policies practised in many large organizations and firms. Thus, the Government of the Republic of Korea faces the need to redouble its effort to prepare for an older society while still recovering from the current economic recession. Yet the task should not be deferred. To quote Denton and Spencer (2003): "The 'problems' of an aging population, or 'challenges' if one prefers, are not going to go away in a few years, to be replaced by others. They will be with us for a long time. Short-term 'solutions' should be suspect. Think long."

NOTES

[1] Before 1950, the total fertility rate in Korea was 6.4 in 1925-1930; 6.1 in 1930-1935; 6.2 in 1935-1940; 6.1 in 1940-1945; and 6.0 in 1945-1950.

[2] The policy environment was fundamental for the realization of the demographic dividend by increasing flexibility in the labour market to allow the expansion of the labour force, creating adequate saving mechanisms and providing good health and high-quality education.

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