

THE DEMOGRAPHIC TRANSITION IN THE KOREAN PENINSULA, 1910-1990: SOUTH AND NORTH KOREA COMPARED*

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Based on the analysis of the demographic trends in the Korean Peninsula since 1910, this study identifies the five demographic stages of the transition. Of interest are the questions of why and how South and North Korea have passed through the demographic transition. Key forces behind the fertility trends in South Korea including the urban-industrial expansion, and the family planning program are stressed. In North Korea, the fertility transition has been a product of the government's population control policies rather than the couple's motivation to reduce family size. In this study, the interactions of fertility with mortality and migration are analyzed. It appears that mortality did not play a major role in the decline of fertility, and that, in South Korea, people responded to the population pressure by migrating, delaying marriage, and having abortions, and then, only when these options were exhausted, marital fertility sharply declined.

INTRODUCTION

After the liberation of the country from the Japanese colonial rule in 1945, the Korean peninsula was divided into two parts. The partition of the Korean peninsula in 1945 has provided a 'controlled experiment' in the social sciences over a period exceeding four decades. Since the partition, both Koreas have pursued their respective strategies for socioeconomic development. South Korea adopted the capitalist market economy, while North Korea pursued the state-controlled socialist economy. And there has been virtually no contact or communication between private citizens in the two Koreas since the end of the Korean War in 1953.

However, the results of this 'controlled experiment' imply that there are substantial similarities between the two Koreas as far as the population structure and the pattern of the demographic transition are concerned. South Korea has recently completed the full pattern of the demographic transition, and is currently stabilized with low levels of fertility and

*An earlier version of this paper was presented at the International Conference on Transformation in the Korean Peninsula toward the 21st Century: Peace, Unity and Progress, which was held at Michigan State University, July 7-11, 1993.

mortality. In North Korea, the fertility transition started later than the South's. But as the level of fertility has continued to decline until the mid-1980s, the rate of population growth in North Korea has become moderate recently. There have been no major differences in the level of mortality between the two Koreas.

Despite an enormous amount of research regarding the declines of fertility and mortality in South Korea, there have been only a few studies covering the entire transition. Mainly due to the lack of hard information, the nature and theoretical basis of the demographic transition in the North have not yet been sufficiently explored (Kwon 1988; Park 1991; Eberstadt and Banister 1990; Cheong 1993). We do not have satisfactory explanations of the mechanism and socioeconomic determinants of the demographic transition in the Korean Peninsula. Nor is it clear what causal mechanisms operated in the relationship among the components of population growth.

This study attempts to analyze the demographic transition in the Korean Peninsula since 1910. In this paper, the demographic transition is divided into five stages according to levels of fertility, mortality and migration. The main objective is to compare and to analyze demographic trends in South and North Korea. This study also aims to develop explanations for why and how South and North Korea passed through the fertility transition. To provide means for wider empirical generalization, major factors which influenced the components of population growth are explored. An analysis of the interrelationship between mortality and fertility in the process of the transition is provided. Attention is also focused on whether migration can be incorporated into the demographic transition.

RECENT POPULATION PROFILES OF SOUTH AND NORTH KOREA

According to the 1990 Census, the population of South Korea was estimated as 43.4 million. According to the newly available North Korean data, the estimated population for midyear 1990 was around 21.4 million (Eberstadt and Banister 1990). Age pyramids for South and North Korean populations in 1990 are compared in Figure 1.

Despite the marked differences between the two Koreas over the past four decades, as Figure 1 shows, the shapes of their age and sex compositions are fairly similar. It is indicated that both populations are approaching the later phases of the transition from high levels of fertility and mortality to low ones. The proportion of the South Korean population declines as age goes down from 15-20. By contrast, for North Korean population under 15 years of age, the higher proportions are observed as age goes down. This slight

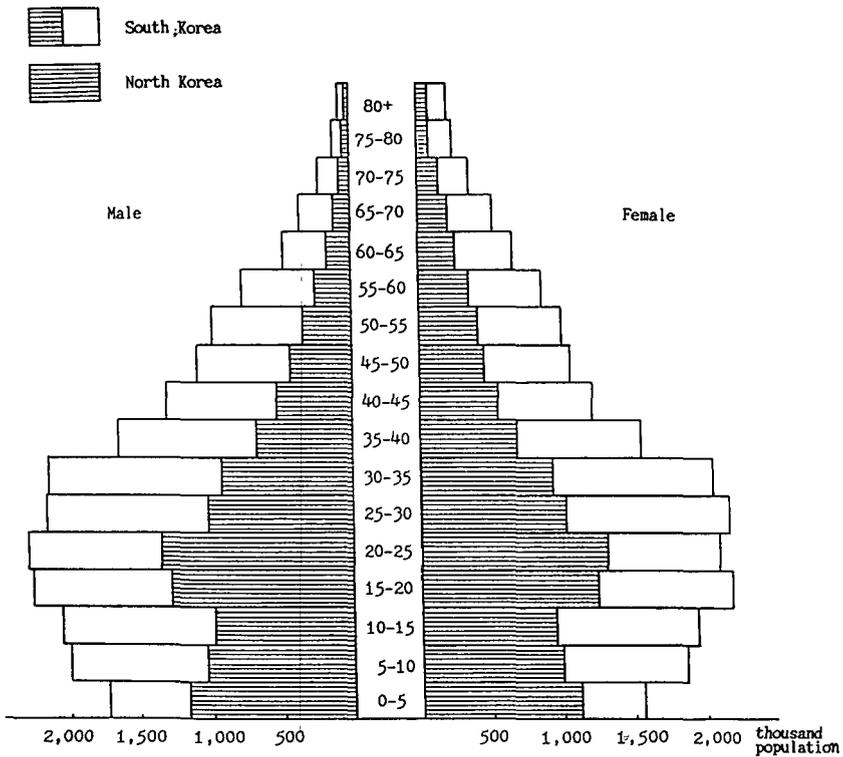


FIGURE 1. AGE PYRAMIDS FOR SOUTH AND NORTH KOREA, 1990

differential in the age composition reflects South Korea's decline of fertility started 5-10 years earlier than North Korea's, and that the pace of the decline was more drastic in the South.

Table 1 highlights the similarities and differences in the recent demographic situations of the two Koreas. One of the obvious differences between the two populations is that the sex ratio of the North Korean population was 97.5, over three points lower than the one in the South. The difference is mainly due to relatively lower sex ratios for age group 40 and over of the North Korean population, which may be partly explained by higher male casualties in the North than in the South during the Korean War. To a substantial degree, it could also be accounted by the fact that the refugees from North Korea to South Korea during the war were highly male selective.

Table 1 shows that the population of South Korea is somewhat older than the one in the North. The median ages of the South and North Korean

TABLE 1. COMPARATIVE DEMOGRAPHIC INDICATORS FOR SOUTH AND NORTH KOREA, 1990

Indicators	South Korea	North Korea
Population (millions)	43.4	21.4
Area (1,000 sq. km.)	99.3	122.8
Population Density (persons/sq. km.)	437.0	174.0
Sex Ratio	100.7	97.5
Median Age of Population	27.4	23.4
Expectation of Life at Birth (Both Sexes)	71.3	69.0
Dependency Ratio	44.2	49.5
Crude Birth Rate (/1,000)	15.6	24.1
Total Fertility Rate	1.6	2.5
Crude Death Rate (/1,000)	5.8	5.6
Rate of Natural Increase (/1,000)	9.8	18.5
Net International Migration Rate (/1,000)	-0.5	0.0
Population Growth Rate (/1,000)	9.3	18.5

Source: Eberstadt and Banister (1990, p.192); 1990 *Population and Housing Census Report*, South Korea.

populations in 1990 were 27.4 and 23.4, respectively. The expectations of life at birth for both sexes were 71.3 in the South, and 69.0 in the North. However, it is found that the dependency ratio was higher in the North: around 49.5 percent, versus the South's 44.2 percent. This reversal is mainly attributed to the different proportions of population under age 15 in North and South Korea: 29.4 percent in the former; four points lower in the latter.

It is clear from Table 1 that the level of fertility in South Korea is significantly lower than that of North Korea. In 1990, the crude birth rate in the South was estimated at 15.6 per thousand, and 24.1 in the North. The difference in the level of fertility is also reflected in the total fertility rate. South Korea's total fertility rate was apparently below replacement in 1990: about 1.6 children per woman. In North Korea, the total fertility rate was above replacement and estimated as 2.5 children per woman in 1990. On the other hand, there were no substantial differences in the levels of mortality between the two Koreas. Only slight differences in the level of the crude death rates are observed in Table 1.

The natural increase rates in South and North Korea in 1990 were estimated as 9.8 and 18.5, respectively. Table 1 discloses that the net international migration rates are almost negligible in both Koreas. Thus the annual growth rate of population in South Korea was estimated as 9.3 per thousand in 1990, as low as those of developed countries. By contrast, North Korea's population growth rate was estimated as 18.5 per thousand, almost exactly twice as high as South Korea's.

GROWTH AND TRANSITION OF THE KOREAN POPULATION

Population Growth in Prepartition Korea

The first Korean census in the modern sense was undertaken in 1925. The census populations, the annual rates of population growth, and the corresponding figures estimated for 1910-1925 are presented in Table 2. In this paper, the demographic transition is divided into five stages according to levels of fertility, mortality and migration.

From the perspective of the demographic transition, the population of Korea was in *the traditional stage* until 1910. Korea was then a typical agrarian society, and characterized by high fertility and mortality levels, resulting in almost negligible population growth. The level of fertility was high and stable, and mortality fluctuated mainly by epidemics, famine and war. Some emigration was reported, but its magnitude was inconsequential. At the end of this stage, in 1910, the population in the Korean Peninsula was estimated as 17.4 million (Table 2).

After the annexation of Korea by Japan in 1910, the Korean population entered *the early transitional stage* (1910-1945). Mortality started to decline in the early colonial years with the introduction of preventive care and effective medical institutions.¹ By contrast, due to improving health conditions and medical facilities, the crude birth rate increased substantially until the early 1920s, although the trend was reversed for the remaining period of this stage (Table 3 and Figure 2).

As a result, the Korean population grew at an increasingly rapid rate throughout the colonial period with an exception for the intercensal period 1935-1940 (Table 2). The exception is mainly due to the heavy emigration across the border. The annual rates of natural increase remained at the high level of over 20 per thousand during 1930-1944. The population increased to 25.1 million in 1944.

In *the early transitional stage*, the size and growth of population became a function of international migrants along with births and deaths. It is clear in Table 2 that the international migration rate exerted a strong effect on shaping the trend of the total increase rate during the entire colonial period.

¹The experience of western countries indicates that mortality decline is closely related to socioeconomic development. In prepartition Korea, however, mortality declines appear not to be much related to the economic development or the rising standard of living of the population. Industrial development in the colonial days was based on the exploitation of Korean labor and was achieved at the expense of deteriorating living conditions of the Korean population. Therefore, it did not contribute greatly to the reduction of mortality.

TABLE 2. POPULATION GROWTH IN THE KOREAN PENINSULA, 1910-1990

Year	Population (in 1,000)		Annual Rate (/1,000) of					
			Natural Increase		International Migration		Total Increase	
Prepartition Korea								
1910	17,427*		4.0		-1.4		2.6	
1915	17,656*		7.0		-2.3		4.7	
1920	18,072*		12.0		-1.8		10.2	
1925	19,020		18.7		-4.3		14.4	
1930	20,438		20.2		-3.6		16.6	
1935	22,208		20.6		-8.9		11.7	
1940	23,547		20.2		-2.2		18.0	
1944	25,120							
	South	North	South	North	South	North	South	North
1945	16,136*	9,135*	18.9	-	41.9	-	60.8	13.0
1949	20,167	9,622						
	19,904#		7.9	-	6.6	-	14.5	-9.9
1955	21,502	9,069*	28.7	-	-0.1	-	28.6	30.6
1960	24,989	10,568	26.6	27.8	-0.1	1.0	26.5	28.8
1966	29,160	12,565*	19.0	33.8	-0.2	0.1	18.8	33.9
1970	31,435	14,388*	20.2	27.2	-0.6	0.0	19.6	27.2
1975	34,679	16,480*	15.9	17.6	-1.0	0.0	14.9	17.6
1980	37,407	17,999*	16.4	17.1	-0.9	0.0	15.5	17.1
1985	40,420	19,602*	14.9	17.7	-0.7	0.0	14.2	17.7
1990	43,390	21,412*						

Notes: 1) *Estimated; #For 1955 boundary.

2) Figures for North Korean population are the estimated mid-year population. Other population figures are from the census results.

Sources: Kwon *et al.* (1975, p. 7); Kim (1992, p. 47); Eberstadt and Banister (1990, pp. 52, 69, 149, 175-76); 1990 *Population and Housing Census Report, South Korea*.

TABLE 3. ESTIMATED RATES OF FERTILITY AND MORTALITY IN THE KOREAN PENINSULA, 1910-1990

Period	Crude Birth Rate (/1,000)	Total Fertility Rate	Crude Death Rate (/1,000)			
----- Prepartition Korea -----						
1910-1915	38	-	34			
1915-1920	40	-	32			
1920-1925	42	-	30			
1925-1930	45	6.2	26			
1930-1935	44	6.1	24			
1935-1940	44	6.2	23			
1940-1945	42	6.1	23			
	South	North	South	North	South	North
1945-1950	42.0	41.0	6.0	-	23.0	21.0
1950-1955	40.0	36.0	5.6	-	33.0	19.0
1955-1960	44.7	37.3	6.3	-	16.1	15.3
1960-1965	41.7	41.7	6.0	-	14.9	14.6
1965-1970	32.0	44.6	4.6	6.4	12.8	11.2
1970-1975	29.8	35.5	4.2	5.4	10.0	8.3
1975-1980	23.9	24.2	3.0	3.3	6.7	6.3
1980-1985	22.5	23.0	2.3	2.8	6.4	5.8
1985-1990	16.0	23.3	1.7	2.5	6.0	5.6

Note: Due to the differences in the data sources, the problem of internal consistency between Tables 2 and 3 can be raised.

Sources: Kwon *et al.* (1975, pp.12, 23); Kim (1992, p. 52); Eberstadt and Banister (1990, pp. 69, 111, 175-76, 192).

Mainly due to the rapid rate of natural increase and Japanese colonial policies, economic situations in rural areas had deteriorated abruptly since the 1920s. The immediate result was a large exodus of farmers out of rural areas. At the beginning, farmers in the northern region (Ham-Kyoung Province) moved to southern Manchuria and Far Eastern Siberia in search of virgin land. After 1930, however, the majority of emigrants to Manchuria were farmers who originated from the southern region, especially Kyoung-Sang Province (Kwon and Kim 1990). Another destination for a large segment of emigrants was Japan since the early 1920s. Table 2 shows that the magnitude of emigration peaked at an annual rate of -8.9 per thousand during 1935-1940. As the Second World War became severe in the early 1940s, a substantial portion of the international migrants consisted of drafted soldiers and workers mobilized for the war.

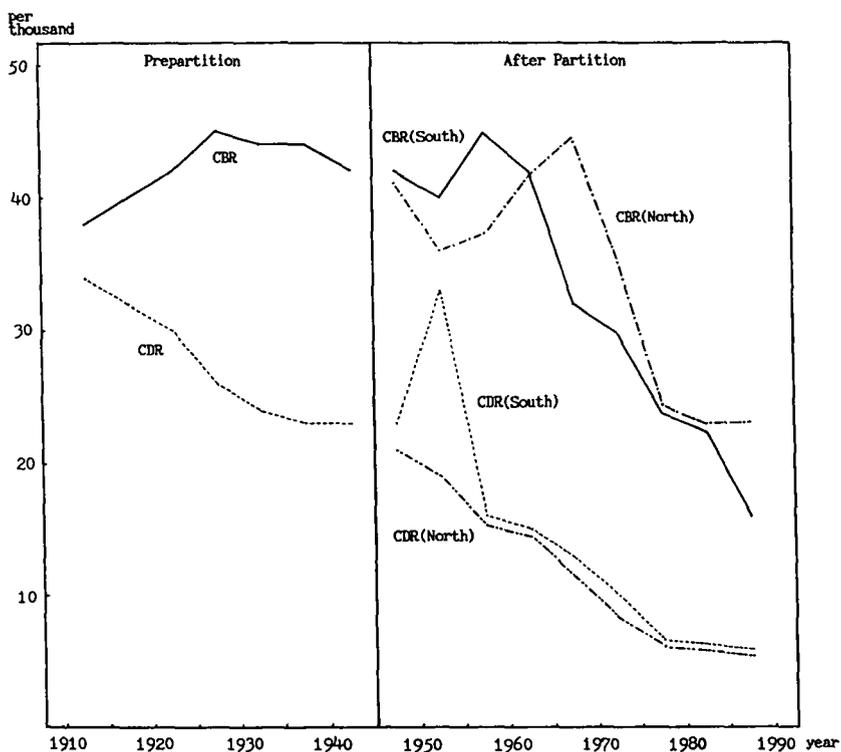


FIGURE 2. ESTIMATED CRUDE BIRTH RATES AND CRUDE DEATH RATES IN THE KOREAN PENINSULA, 1910-1990

Internally, the massive exodus of farmers also stimulated urbanward migration in this *early transitional stage*. A large segment of the population from the rural areas moved to urban areas in the Peninsula, and resulted in a rapid rate of urbanization.

Demographic Transition in South Korea²

The population of South Korea at the time of liberation in 1945 is estimated as 16.1 million (Table 2). Due to the apparent uniqueness in the pattern of the demographic evolution, the next stage is called *the chaotic stage* (1945-1960). Despite political turmoil, social unrest, and immense destruction to the economy, the population of South Korea increased

²For more detailed analysis of and discussions on the demographic transition in South Korea, see Kim (1992).

drastically during this stage. It is largely due to the massive influx of repatriation from overseas after the liberation and refugee migration from the North to the South during the war. The net gain of population in South Korea due to migration during 1945-1955 was estimated as 2.8 million (Kwon *et al.* 1975). The annual rate of population growth reached 60.8 per thousand during 1945-1949. The population continued to increase rapidly after the late 1950s, and peaked at an annual growth rate of 28.6 per thousand during 1955-1960.

The mortality situation was quite unusual in *the chaotic stage*. Direct and indirect casualties during the Korean War were extremely heavy: the total number of deaths reached 1.29 million (Shin 1992). The crude death rate was estimated at about 33 per thousand for 1950-1955 (Table 3). However, due to antibiotics and other new medicines introduced during the Korean War by the United Nations Forces, South Korea experienced a marked decline in mortality, especially infant and child mortality, after the war. The crude death rate declined to 16.1 per thousand population during 1955-1960, revealing a 51.2 percent reduction from the crude death rate of 1950-1955 (Table 3).

In *the chaotic stage*, fertility remained at a relatively high level despite socioeconomic and political disturbances. The crude birth rates were 42 and 40 per thousand for 1945-1950 and 1950-1955, respectively (Table 3). Separation of many couples, postponement of marriage, and a marked increase in the proportion of widowed women should have lowered the level of fertility to some degree during the Korean War years. However, as is plain in Figure 2, no drastic decline of fertility is observed during this period.

Korea witnessed a post-war baby boom after the end of the war. Birth rates continued to rise during the second half of the 1950s and the early 1960s. Despite the economic insecurity of the period, many couples did have births which they had postponed during the war. Figure 2 clearly shows that fertility actually went up before it started to decline. The level of crude birth rates during this period was equivalent to or even higher than the level observed for the period of 1925-1945 (Figure 2 and Table 3). This is also reflected in the total fertility rate. The estimated total fertility rate was 5.6 during 1950-1955, and it increased to 6.3 during 1955-1960.

It is interesting to note that birth rates rose before people could adjust their reproductive behavior to meet the new condition of low mortality. This also leads to conjecture that there might be a threshold level of population pressure below which major fertility decline is not easily triggered.

The year 1960 marked an important turning point in the demographic transition of South Korea. The population of South Korea entered *the late*

transitional stage (1960-1985). Very rapid and drastic reduction in fertility and continued decline of mortality took place during 1960-1985. As a result, a rapid decline in the rate of population growth was recorded in this stage. The annual rate of population growth for 1980-1985 was 15.5 per thousand, showing a reduction of 11 points from that of the intercensal period 1960-1966 (Table 2).

Since the government adopted population control policies in 1962, the family planning program has become an integral part of various government development plans in South Korea. The government's adoption of population control policies along with the socioeconomic development undoubtedly caused a very significant decline of fertility in the *late transitional stage*. The crude birth rate for 1960-1965 was estimated as 41.7 per thousand and the total fertility rate reached 6.0. The corresponding figures declined to 22.5 and 2.3 for 1980-1985 (Table 3).

Mortality also showed a substantial decline in the *late transitional stage*, although the pace of decline has been modest since the late 1970s (Figure 2). It can be regarded as an outcome of the expansion of health and medical services, both of which began to improve in the early 1960s along with socioeconomic development.

International migration became negligible after the Korean War. A slight increase in emigration was observed after 1970, but the number of emigrants was estimated at only 30-40 thousand every year. In Table 2, we see that the annual rates of international migration did not exceed -1.0 per thousand in the *late transitional stage* (1960-1985). Thus, the population of South Korea can be regarded as almost "closed" after 1960.

There is little doubt that the year 1985 marked another important turning point in the history of South Korean demography. The population of South Korea entered the *re-stabilized stage*, and has been approaching a stationary population even with negative growth potential in the offing. Table 2 shows that the annual growth rate was 14.2 per thousand for 1985-1990, revealing a 50.3 percent reduction from the growth rate of 1955-1960. Under the current age structure, after the year 2020, the South Korean population is likely to experience a decrease in the absolute number.

The trends of the crude birth rates and the total fertility rates indicate a continuing decline of fertility levels in the *re-stabilized stage*. Fertility is now believed to be under the replacement level in South Korea. The crude birth rate and the total fertility rate were estimated at 15.6 and 1.6, respectively, in 1990 (Table 1).

Although the pace was not so marked, the crude death rate continued to decline in the *re-stabilized stage*, and became stable at a low level. The modest

reduction in the crude death rate can be attributed to the changing age structure of the population. The crude death rate was estimated at 5.8 per thousand in 1990 (Table 1). The government's adoption of a national medical insurance system and the widening accessibility of medical facilities are expected to lead to a further substantial decline of mortality in South Korea.

Finally, international migration of the population of South Korea has been almost negligible in the *re-stabilized stage*. The South Korean population remained "closed".

Demographic Transition in North Korea

At the time of liberation and partition of the country in 1945, about 9.1 million people are estimated to have resided in North Korea. This is about 56.6 percent of South Korea's 1945 population. The pace of population growth in North Korea was not so marked after the partition. To a large degree, it speaks to the political and socioeconomic disturbances. The annual rate of population growth was 13.0 per thousand during 1945-1949 (Table 2).

If we assume a large number of repatriates returned to North Korea from Manchuria and Japan in the immediate post-liberation period, then the level of fertility in North Korea during this period is believed to be much lower than the one in the South (Figure 2). The total number of repatriated to North Korea has never been known, although it is presumed to be substantially smaller than that to the South (Kwon *et al.* 1975, pp. 33-34).

During the Korean War, the population of North Korea has experienced a decline in the absolute number. North Korea's 1955 population fell to 9.1 million, revealing a reduction of 553 thousand population from that of the year 1949. The decrease is attributed to the sharp drop of fertility, the heavy casualties, and the massive refugee migration from North to South Korea during the war.

According to Eberstadt and Banister's estimation (1990), the crude death rates in North Korea continued to decline during 1950-1955, and remained at a relatively low level. While South Korea's crude death rate rose remarkably to 33 during this period, North Korea's crude death rate fell to 19, even lower than that for the previous period 1945-1950 (Table 3). However, it should be interpreted as a distortion due to enumeration errors and poor quality of the data. In view of the age and sex composition of the current population in North Korea, the level of mortality is believed to have been high during the war period.

The population of North Korea experienced a very drastic increase during 1955-1970. The annual growth rate was estimated as 33.9 for the period 1966-1970. Considering that the net gain through overseas migration was no longer noticeable during this period, it can be recorded as the highest growth rate in the course of the demographic transition. Table 3 and Figure 2 show that the crude birth rate in North Korea had risen continuously since the end of the war, and reached 44.6 during 1966-1970. By contrast, a continuous drop in the level of mortality was observed during this period. The crude death rate recorded 11.2 during 1966-1970.

Unfortunately, we do not have hard information available on international migration up to the late 1950s in North Korea. According to the estimates from Eberstadt and Banister (1990), the large population movement across the border almost ceased after the beginning of the 1960s. Table 2 discloses a net gain of population due to international migration in the 1960s, but the magnitude appears to be insignificantly small. International migration has no longer played a significant role in shaping the size and growth of the North Korean population.

In the previous section on the demographic transition in South Korea, the fifteen year period 1945-1960 was named as *the chaotic stage*. Following an abnormal and irregular pattern of population growth during the post-liberation and the Korean War years, the levels of fertility and population growth remained high in North Korea up to the end of the 1960s. It is reasonable, therefore, to set up the twenty-five year period of 1945-1970 as *the chaotic stage* in North Korea's demographic transition.

The year 1970 marked an important turning point of sharp decline in the rates of fertility and population growth. The population of North Korea entered *the late transitional stage* after 1970. As is shown in Table 2, the rate of population growth, estimated as 33.9 during 1966-1970, dropped to 17.1 during 1980-1985. The crude birth rate and the total fertility rate, reported as 44.6 and 6.4, during 1965-1970, also fell considerably to the level of 23.0 and 2.8, respectively, during 1980-1985 (Table 3).

However, the declines were interrupted in the mid-1980s, and the crude birth rate and the rate of population growth tended to rise slightly afterwards. In view of the continued reduction in the total fertility rate in the late 1980s, these interruptions and the slight reversals are likely to have been caused by the age structure of the North Korean population. As the post-war baby boom generation, born in the late 1950s and the 1960s, began childbearing in the mid-1980s, the crude birth rate and the rate of population growth were weighted up.

The level of mortality gradually declined in *the late transitional stage*. The

TABLE 4. DEMOGRAPHIC TRANSITION AND THE RELATED FACTORS IN THE KOREAN PENINSULA

Stage	Period	Population Growth	Fertility	Mortality	International Migration
PREPARTITION KOREA					
<i>The traditional stage</i>	-1910	Very low and stable increase	High	High with fluctuation	Negligible
<i>The early transitional stage</i>	1910-1945	Rapid increase	High	High/Rapid decline began	Massive emigration to Manchuria and Japan
SOUTH KOREA					
<i>The chaotic stage</i>	1945-1960	Rapid increase except the period 1949-1955	High	Medium but high mortality during 1949-1955	Massive influx from Manchuria and Japan/Refugees from N. Korea during the war
<i>The late transitional stage</i>	1960-1985	Continued decline in growth rate	Rapid decline	Decline continued	Slight increase in emigration after 1970
<i>The re-stabilized stage</i>	1985-	Approaching stationary stage with negative growth potential	Under replacement level	Further substantial decline	Similar to the 1970s
NORTH KOREA					
<i>The chaotic stage</i>	1945-1970	Rapid increase except the period 1949-1955	High	Medium but high mortality presumed during 1949-1955	Influx from Manchuria and Japan/Refugees to S. Korea during the war
<i>The late transitional stage</i>	1970-	Decline in growth rate until mid-1980s but decline interrupted afterwards	Rapid decline until mid-1980s but decline interrupted afterwards	Decline continued	Negligible

crude death rate was estimated as 5.6 during 1985-1990. The level of mortality is currently quite low and stabilized in North Korea. Although it is affected by the age and sex composition of a population, the crude death rate in North Korea has been at a slightly lower level than the one in the South during the last half a century (Table 3 and Figure 2).

So far, we have tried to examine the nature and characteristics of the demographic transition in both Koreas as well as in prepartition Korea. The demographic transition in the Korean Peninsula started in the early 1910s. It is generally agreed that South Korea has completed the full pattern of the demographic transition. South Korea is currently stabilized with low levels of fertility and mortality, approaching a stationary stage. North Korea has yet to enter *the re-stabilized stage*. Fertility in North Korea started the major decline about ten years later than in the South, and has yet to fall further. However, what is striking is the parallel progress in the demographic transitions in South and North Korea. Despite the marked differences between the two Koreas, many facets of the transition appear to have been surprisingly comparable. The main discussions on each stage in the course of the transition are summarized in Table 4.

CAUSAL MECHANISMS OF THE FERTILITY TRANSITION

Determinants of Fertility Decline in South Korea

While the demographic transition theory has been widely accepted as a generalized description of the evolutionary process, many researchers have raised questions as to its explanatory and predictive value. It is argued that the theory does not provide a basis for pertinent deductions and predictions of future demographic development (UN 1973, pp. 60). To prove general validity of the theory, what is needed is a satisfactory framework and knowledge of lower levels. The crucial factor for reformulation appears to be the explanation of fertility transition and especially of the onset of fertility decline.

The proposed explanation of the fertility transition in this study stems from the threshold hypothesis and Davis' (1963) theory of demographic change and response. The basic arguments are that fertility decline is triggered when one or more associated conditions reach certain threshold values, and that people under heavy population pressure tend to use every demographic means possible to maximize their new opportunities.

During the early period of modernization (1910-1945), declining death rates and sustained birth rates resulted in a rapid natural increase. This increase occurred in the context of urban-industrial expansion under

Japanese colonial rule. The immediate rural demographic response was out-migration. The pace of urbanization was very rapid during this period. The annual urban growth rate was estimated as 129.4 per thousand during 1935-1940. Labor surplus in the rural areas also induced international migration. As mentioned above, Koreans responded to the population pressure by migrating to Manchuria and Japan.

It is important to note that Koreans used out-migration as their main response in *the early transitional stage* (1910-1945). Out-migration, both internal and international, was preferred to marital fertility control, which requires a re-definition of traditional sex and marital roles. Early marriage continued to prevail, and fertility remained at a high level in this stage (Kwon *et al.* 1975; Kim 1987b).

Despite political and socioeconomic turmoil, fertility continued to be stable at a high level in *the chaotic stage* (1945-1960) in South Korea. Figure 2 discloses a mild downward pattern of the crude birth rate during 1945-1955, but the trend was reversed by the post-war baby boom in the late 1950s. It was not until the early 1960s that the socioeconomic conditions appeared to have matured sufficiently for the onset of fertility transition in South Korea.

Substantial marital fertility declines occurred in the early 1960s, approximately one-half century after the initiation of the mortality reduction. The initial fertility decline was a joint product of the favorable socioeconomic conditions and the national family planning programs. South Korea had already achieved relatively low levels of infant mortality and relatively high levels of education in the early 1960s. Income, female labor force participation rates, and all the other development indicators rose steadily throughout the fertility transition and the subsequent period.

It is generally argued that the shift from a regime of "natural fertility" to one of "controlled fertility" can be made when the following three prerequisites are met: first, fertility must be within the calculus of parental choice; second, reduced fertility must be seen as advantageous; and finally, effective techniques of contraception must be widely available at minimized costs (Coale 1974; Jones 1990). It is also argued that fear of relative deprivation, rather than the threat of famine or absolute deprivation, is a subjective stimulus to limiting fertility (Davis 1963).

In South Korea, the rising standard of living resulted in a major fertility decline by raising expectations of upward mobility and creating fears of social slippage. With rapid urbanization, a larger proportion of the population was exposed to the modern industrial environment, and the high child costs associated with it provoked low fertility oriented norms, values and attitudes. In other words, socioeconomic conditions in the early

1960s became favorable for the shifts in social or administrative pressures bearing on fertility-related attitudes and behaviors.

As far as the demographic responses are concerned, emigration outlets were no longer available after the end of the Korean War. Celibacy has never been culturally supported. Fertility control, therefore, seems to have been the only alternative for South Koreans in the 1960s. In fact, South Koreans were fairly ready to accept and practice contraception. Even before the launch of the national family planning programs, induced abortion was widespread in urban areas, and women's age at marriage continued to rise (Kwon and Kim 1990).

It can be argued that diffusion of contraception, rising age at marriage, and the increase in induced abortion are three major factors of the fertility transition in South Korea (Kim 1988). Contraceptives became available in South Korea in the early 1960s mainly through the family planning programs. However, during the first half of the 1960s, contraception was mainly practiced by the women in the late reproductive ages, who already had enough children and enough sons (Kwon 1981, pp. 28-29). Contraception, therefore, contributed relatively little to fertility decline during the first half of the 1960s. However, the diffusion of contraception has been most responsible for the changes in the level of fertility since 1965 (Kim 1992).

Rising age at marriage and increasing number of induced abortions are found to be the most important factors of fertility decline during the early 1960s. Age of women at marriage has risen continuously, and contributed to the decline of the crude birth rate and the total fertility rate. The mean age of women at first marriage was 22.9 in 1966 indicating an increase of 6.3 years since 1925 (Kim 1987b). The relative importance of age at marriage and induced abortion has substantially reduced since the second half of the 1960s.

Determinants of Fertility Decline in North Korea

North Korean authorities have been extremely reluctant to release demographic data to the outside world since its founding, and especially since 1963. It is therefore very difficult to explore in depth, socioeconomic background and the causal mechanism of the fertility transition in North Korea. As an alternative, the government's stand and efforts which might have affected the fertility level and the transition are reviewed in this section, although the population policy has never been publicly pronounced in North Korea. Table 5 summarizes the nature and changing trends of the

TABLE 5. CHANGES IN THE POPULATION POLICIES OF NORTH KOREA

Period	Pop. Policy	Remarks
1960-1965	Pronatal	Public recognition of highly reproductive mother Increase in rationed food and subsidies for twins and triplets
1965-1970	Unarticulated or Neutral	
1970-1975	Antinatal but Inactive	Inactive introduction of family planning
1975-1980	Antinatal and Active	Three children recommended (Propaganda campaign through personal contacts rather than mass media) Reduction of rationed food for the fourth and higher parity children Diffusion of traditional methods of contraception and IUDs Raise woman's age at marriage to 22 (for college graduates, to 26)
1980-	Antinatal Reinforced	One or two children recommended Reduction of rationed food for the fourth and higher parity children Vigorous diffusion of IUDs Wide spread of induced abortion

Source: Unpublished documents from the National Unification Board, South Korea.

population policies of North Korea since 1960.

Fertility in North Korea dropped to a substantially lower level than in South Korea during the war. It is also estimated that the pace of recovery after the war was much slower in the North (Figure 2). According to the monitoring reports, the North Korean government had encouraged high fertility and large family size for political and economic reasons up to the mid-1960s. However, the government stance became antinatalist in the early 1970s and abandoned the previous population doctrine, after the level of fertility reached a record high in the late 1960s (Table 3 and Figure 2).

What is most interesting is that the levels of fertility in South and North Korea immediately before the transition were equivalent to each other, and that the levels are equivalent to or even higher than the level observed in *the early transitional stage* (1910-1945). This implies that the threshold hypothesis of the onset of fertility decline can be applied to the fertility transitions in both Koreas.

The population policies in North Korea appeared to be inactive in the early 1970s. The concept of family planning was introduced but no specific program had been launched during this period. In the second half of 1970s, however, the government adopted more specific and active fertility control

policies. It was recommended to limit the number of children to three per family. The propaganda campaign was conducted mainly through personal contacts utilizing health clinic staffs, medical personnel, and women's organization leaders rather than mass media. It is reported that, to discourage high fertility, rationed food was reduced for the fourth and higher parity children, and that traditional methods of contraception and intrauterine devices were widely distributed during this period. One of the important components of fertility control policies in North Korea was delayed marriage, especially for woman. Woman's legal age at first marriage was reported to be raised to 22. And for the college graduate, it was raised to 26.

In the early 1980s, the antinatal nature of population policies was reinforced and government interventions have been strengthened since then. The target number of children per family was switched to one or two. Intrauterine devices became widely available and have been used by the vast majority of couples practicing family planning (Eberstadt and Banister 1990). It is also reported that induced abortion has become widespread since the beginning of the 1980s.

There is no doubt that antinatalist population policies since the early 1970s have contributed to the drastic decline of fertility in *the late transitional stage* in North Korea. The decline of fertility in North Korea was interrupted in the mid-1980s as the post-war baby boom generation began childbearing. Since the mid-1980s, the level of fertility has remained substantially higher in North Korea than in the South (Table 3 and Figure 2). It is presumed that some obstacles to low fertility have prevailed in North Korea despite strong fertility control policies.

Due to the lack of hard information, it is very difficult to identify what these obstacles are. As an alternative way to obtain insights into the causal mechanism of the transition and the obstacles involved, the main differences in the transition process between the two Koreas are analyzed in this study.

First of all, it is believed that the timing of onset of the fertility decline in North Korea did not coincide with the maturity of socioeconomic conditions. It may have been difficult in the North under the Communist rule to provide a subjective stimulus to limiting fertility by raising expectations of upward mobility or creating fears of relative deprivation. While the fertility transition in South Korea was a joint product of the favorable socioeconomic conditions and the national family planning programs, the transition in North Korea seems to have been mainly expedited by the latter.

Secondly, as a result of rapid urbanization since the 1960s, a vast majority of the South Korean population had been exposed to the modern industrial environment, which, in turn, facilitated the formulation and acceptance of low fertility oriented norms, values and attitudes. By contrast, the North Korean government has strictly controlled population movements, and is not likely to have taken advantage of such effects. In South Korea, the timing of rapid urbanization coincided with the marked decline in the level of fertility (Kwon *et al.* 1975; Kim 1987a, 1992). However, these two variables appear not to be correlated with each other in the course of the transition in North Korea. The level of fertility in North Korea rose despite rapid urbanization up to the end of 1960s. It is also clear that the pace of urbanization in North Korea became much slower when the transition of fertility started in the early 1970s.

It is believed that high fertility oriented values or other traditional cultural factors are currently prevailing in both Koreas. For example, pronatalist pressures show up as a need for children for old-age security and a desire for sons. However, in South Korea, motivations for small families arose and spread widely over the course of rapid industrialization and urbanization after the early 1960s (Kim 1987a). In addition, various means of contraception have been provided efficiently through family planning programs. By contrast, North Korea has not been so successful in formulating motivations for low fertility at the individual level despite strong fertility control policies. The point is that if couples do not see a clear advantage to limiting family size, they are not likely to do so.

Interrelationship among Mortality, Migration and Fertility

One of the major controversies about demographic transition theory is whether the decline in mortality preceded the decline in fertility, and whether any causal relationship exists between the two declines. Based on the equilibrium model, it has been argued that mortality declined first, followed by the reduced fertility. By contrast, several empirical studies note that the decline in mortality does not always precede the decline in fertility (Coale 1974; Ware 1972; Goldscheider 1971).

It is clear in Figure 2 that mortality declined before fertility started to decline in the Korean Peninsula. However, fertility increased during 1910-1925, probably due to improved health conditions, when mortality was declining. A similar pattern is found in South Korea during the late 1950s, and in North Korea during 1955-1970.

In both South and North Korea, it is difficult to produce such an example

that a prior improvement in mortality or infant mortality was a major factor obliging parents to restrict their fertility within marriage. The interconnection between mortality and fertility seems to be tenuous and spurious. If there is a connection between declines of mortality and fertility, it is likely to be an indirect one.

In the original formulation of demographic transitional theory, migration was not considered as an integral part of the population change process. Migration was rather treated as an exogenous variable along with industrialization and urbanization.

Davis (1963) introduced migration into his theory of demographic change and response as an important determinant of demographic transition. It is argued that people, when faced with persistent population pressure, tend to use any possible demographic means to maximize their economic opportunities, or at least to maintain their standard of living and aspirations. The main responses are celibacy, delayed marriage, contraceptive use, abortion and internal or international migration. Among the responses, migration is considered to be a more efficient and a more rapid response.

Migration can be a substitute for other demographic responses. That is, migration works as a short-term safety valve relieving population pressure and reducing fertility (Goldscheider 1981). When migrants are removed from the traditional milieu of the agricultural population, their urban exposure and adaptation tend to reduce fertility. Migrants are more prone or receptive to change processes, and in the process of moving, are likely to accept low-fertility oriented norms and attitudes and realignment of social ties. Migration also results in the decline of kin dominance over economic resources and affects the role and status of women, which would create the conditions necessary for fertility reduction.

Friedlander (1969) examined the interaction between migration and fertility change in the process of the demographic transition using English and Swedish data, and concluded that timing and rate of fertility decline are negatively correlated with migration opportunities. Mosher (1980a, 1980b) reached the same conclusion from his research on Puerto Rico and Sweden.

In prepartition Korea, massive emigration of farmers to Manchuria and Japan retarded the onset of fertility transition. If emigration outlets had not been available, the Korean population might have been forced to reduce its natural increase through delaying marriage, abortions, and/or marital fertility controls.

Along with a large exodus of Korean farmers to Manchuria and Japan, rural-urban migration progressed substantially during the colonial period.

During 1925-1944, the urban population (excluding Japanese and foreigners) increased from 3.2 to 11.7 percent of the total population and the number of cities grew from 12 to 21. By transferring a large segment of the population out of rural areas, rural-urban migration in prepartition Korea reduced population pressure considerably and retarded the initiation of fertility reduction (Kwon *et al.* 1975; Cho *et al.* 1982).

Since the Korean War, both Koreas have transformed rapidly from agricultural societies to ones in which the majority of the population lives in urban areas. It is interesting to find a negative pattern in the South between population growth rate and urban growth rate for about twenty years following the Korean War. Particularly noteworthy is that, in South Korea, the rate of urbanization slowed down during the baby boom period around 1960 (Kim 1987a; Kwon 1990).

However, in North Korea under Communist rule, permission to change residence must be granted by the government, whose regional planning priorities may include strategic dispersion of the population (Eberstadt and Banister 1992). It is assumed, therefore, that the impact of internal migration on the pace of the fertility transition has been kept relatively minimal in the North. In fact, no significant correlation has been found in North Korea between the pace of urbanization and the decline of fertility.

In sum, the role of migration in the course of the demographic transition during the years before partition and in South Korea can be considered as a substitute process in the short-run and as part of multiphasic responses in the long-run in the areas under the heavy pressure of population growth. However, the complexity of the migration process does not easily allow the generalization of migration on fertility change.

SUMMARY AND CONCLUDING REMARKS

The main objective of this study has been the comparison and analysis of demographic phenomena such as population growth, and the trends of fertility and mortality in South and North Korea as well as in prepartition Korea. Attention was also given to the explanations of the causal mechanism and socioeconomic determinants of the demographic transition. The analysis examined, in the societal context, why and how Koreans passed through the demographic transition. However, because of the relative lack of hard information about North Korea, the analysis gives more attention to the South Korean experience.

Specific features and the pattern of the demographic transition differ substantially according to the initial levels of fertility, mortality and

migration and socioeconomic conditions of each society. The demographic transition in the Korean Peninsula did not follow the general pattern which has been observed for a long time in most western countries. While the transition took 150-200 years in most western countries, Koreans have passed through almost the full pattern of the demographic transition during the last 70-80 years. In the middle of this century, Koreans experienced an apparent uniqueness in the pattern of the demographic evolution due to a series of political events such as the liberation from the Japanese colonial rule, the partition of the country (1945), and the Korean War (1950-1953).

It is clear, however, that Korea experienced all stages of the demographic transition in this century. The death rates began to drop in the 1910s, and continued to decline with a noticeable exception of high mortality during the Korean War years. Departure from the traditional fertility pattern started between 1910 and 1920. But the birth rates did not undergo a sustained drop until almost 50 years later. Since the early 1960s in South Korea, fertility has dropped drastically to the point where birth rates are currently below replacement. North Korea's fertility transition started later in the early 1970s, and has yet to fall below the level of replacement. Currently, the death rates are very low in the two Koreas. There are no substantial differences in death rates between South and North Korea.

Socioeconomic change in South Korea in the early 1960s resulted in the use of contraception, induced abortion, and the rise in age at marriage. When the fertility transition began in the early 1960s, South Korea had already achieved a relatively low level of infant mortality. Socioeconomic changes in South Korea, especially urban-industrial expansion, have altered the costs and benefits of children in ways that have been well described by many microeconomists. Along with these developments, the transformation of family structure to the nuclear family and the westernization of attitudes have altered perceptions about women's roles and loosened traditional controls on young women.

In this context, the family planning program has played an important reinforcing role. Undoubtedly, fertility in South Korea underwent a drastic decline unprecedented in other countries. It can also be stressed that South Korea has experienced a relatively uniform decline irrespective of socioeconomic status and regions, although a discrepancy in the effect of the family planning programs between urban and rural areas is observed.

The decline of fertility in North Korea since the early 1970s has been scarcely less drastic. North Korea's fertility transition has been guided mainly by the fertility control policies which have been vigorous in raising age at first marriage and providing contraceptives. It is difficult to find

evidence that the transition was stimulated or accelerated by the couple's desire to reduce their family size in the course of socioeconomic development. Fertility decline in North Korea was interrupted as the post-war baby boom generation began childbearing in the mid-1980s.

The interactions of fertility with mortality and migration in the process of the transition are also analyzed in this study. It is clear that, in the Korean Peninsula, the decline in mortality preceded the decline in fertility. However, it is difficult to produce an example of direct causal relationship between the two declines. The mortality reduction seems to have exercised little direct impact on the changes in the level of fertility. If there has been a connection between mortality and fertility, it is likely to be a tenuous, spurious or indirect one.

The impact of migration on fertility varies greatly according to the type of migration and the sociodemographic context within which migration occurs. In *the early transitional stage* (1910-1945), population pressure on land intensified due to the decline of mortality. Population growth was checked to a considerable extent by international migration and, therefore, the initiation of substantial reduction in fertility was retarded. After the Korean War, in both Koreas, international migration became almost negligible in magnitude, and has not played a significant role in governing the growth rate of the population.

The internal urbanward migration in prepartition Korea is believed to have reduced population pressure in rural areas considerably and retarded the onset of fertility decline. In North Korea after the partition, its impact on the decline of fertility was not noticeable although the pace of urbanization was rapid until the late 1960s. However, there is little doubt that, in South Korea, massive rural-urban migration in the late transitional stage (1960-1985) set up the conditions for fertility reduction and has expedited the pace of the transition.

In sum, it can be concluded that South Koreans reacted in ways that were consistent with Davis' theory of demographic change and response. They responded to population growth by migrating, by delaying marriage, by having abortions, and then, only when these options were exhausted, did marital fertility sharply decline. But the same explanation can hardly be applied to the North Korean population.

This study has identified certain underlying forces making for lower fertility. South Korea is now approaching a stationary stage. Negative growth potential is even projected after the year 2020. Fertility in North Korea has yet to fall further. However, the likelihood and degree of further decline in fertility is a matter of some controversy.

As a concluding remark, it can be stated that there are no general and universal rules for patterns in the demographic transition to lower fertility. There has been a great degree of evolutionary pluralism and dissimilarities as well as similarities in the determinants and paths of the demographic transition. However, in view of the marked differences between South and North Korea's polities, what is most striking about the population structure and the pattern of the transition are not the differences, but the similarities.

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