

## **North Korea: A Statistical Glimpse into a Closed Society**

**Nicholas Eberstadt\***

From the standpoint of statistical data, North Korea—formally, the Democratic People's Republic of Korea (DPRK)—remains a modern-day hermit kingdom. Although all centrally planned Leninist states have made a point of controlling and limiting the data they release to the outside world, North Korea's controls have been far stricter over the past generation than those of virtually any other Communist country. Since the early 1960s, even such seemingly mundane tidbits as national population totals have been routinely and carefully suppressed.

In 1989, however, Pyongyang broke a quarter century of silence by providing the United Nations Population Fund (UNFPA) some details about demographic and social trends within the country. These data were released as a condition for UNFPA technical assistance with the DPRK's first-ever population census, prospectively scheduled for 1992. Though limited in scope and attended by certain ambiguities, these figures nevertheless provide a basis for reconstructing certain important trends in this largely uncharted society.

---

\* I wish to thank Dr. Judith Banister of the US Bureau of the Census for her helpful comments. Andrea Miles assisted with many of the tables and figures in this paper. Special thanks is due to Mr. Jonathan Tombes who has been of great help throughout this project.

This paper will review some of these findings, particularly as they pertain to North Korea's population and labor force.

## Background

UNFPA officials were informed that North Korea's demographic data are compiled principally through its household registration system, which is administered conjointly by the Ministry of Public Security (MPS) and the Central Statistics Bureau (CSB). (Certain series, such as reported trends in vital rates, appear to be prepared separately.) North Korea's population and employment data are meant to reflect the situation at year's end, rather than mid-year or for the year as a whole, as is customary elsewhere.

After North Korea's long statistical blackout, questions might arise about the accuracy of the data newly released. Analysis of the figures and series reveal a number of shortcomings (infant mortality, for example, appears to be seriously underestimated) and various peculiarities of presentation (such as the removal of the military population from the total national count after 1970). On the whole, however, the figures appear to be reported as collected, without any obvious alterations. The problems with North Korea's demographic data appear to be similar to those observed in non-Communist, less developed countries.<sup>1</sup> Our analysis of the data concluded that the released data were not invented or falsified.

Three items divulged have been of particular importance in reconstructing North Korea's demographic trends. The first are reported population totals for men and women for selected years in the post-partition period. The second is an age-sex structure for the country's civilian population for year-end 1986. The third is a series of reported vital rates for various years since the

---

1 For further discussion, see Nicholas Eberstadt and Judith Banister, *The Population of North Korea* (Berkeley, CA: Institute of East Asian Studies, Korean Monograph Series; 1992), pp. 8-12.

Korean War. Meager though these data would appear to the demographer accustomed to working with complete census returns, they are adequate for conducting a reconstruction of basic trends from 1960 to 1987, and for projections beyond.

### **Reconstructing Population Trends from Available Data**

As demographers will immediately appreciate, reconstruction of North Korean population dynamics from available data cannot proceed until one clears a hurdle—and an imposing one at that. Pyongyang has to date divulged just one age-sex structure for the country's population; without another for some earlier date it would be impossible to produce constrained estimates or projections. It was therefore incumbent upon us to create a hypothetical, but reasonably reliable, population structure for a base year.

In theory, this could have been an onerous and frustrating task; in practice, it proved to be surprisingly manageable. We ended up creating three alternative base populations, each of which incorporated somewhat different assumptions about fertility, mortality, and population composition. Despite their differences, all of the models produced results that matched most available official data rather well. But there are some inconsistencies and problems in the reported statistics. By allowing our various models to deviate from the reported data in slightly different ways, we were in effect able to test the sensitivity of our modeling procedures to the assumptions underlying them.

Though all three models produced results generally consistent with one another, what we called Model 1 produced results that conformed most closely to the available North Korean demographic data. The analysis in this paper is based upon reconstructions and projections relying upon that particular model.

Model 1 presented a hypothetical population structure for the DPRK for 1960, based upon South Korea's 1960 census. Our working hypothesis in this model was that historic Korean pat-

terns of fertility and mortality, and the impact of such crises as partition and the Korean War, would be reflected in the age-sex structures of both the North and the South.

For females, we simply applied an adjusted 1960 South Korean female age structure (smoothed to take "heaping" and age misreporting into account) to the reported 1960 female population total for North Korea. Preparation of the male age structure was more complex. Male losses during the Korean War period, whether by death or emigration, were apparently much greater in the North than the South; whereas the reported 1960 sex ratio for South Korea was 101, it was only 94 for North Korea.

We assumed these wartime losses were drawn exclusively from the cohort aged 20 and older as of 1960: that is to say, men 13 years of age or older at the time of the Korean War's 1953 armistice. We could then create a hypothetical base population for North Korean males under 20 years of age in 1960 on the basis of corresponding female cohorts previously estimated and the age-specific sex ratios derived from a United Nations "Far Eastern" model stable population. The male population aged 20 and older was obtained as a residual: total reported male population for 1960 minus total estimated male population under 20 for the same year. That residual was distributed among North Korea's adult cohorts in accordance with the patterns of the South Korean 1960 census.

Since no life tables are available for North Korea, Model 1 used UN Far Eastern model life tables in estimating mortality trends between 1960 and 1987. These worked well until the late 1970s, when there was no longer a sufficient differential between male and female infant mortality in the life tables to reproduce faithfully North Korea's reported childhood age-sex structure of 1986. We retained the Far Eastern mortality pattern, but slightly modified its infant mortality structure.

Fertility levels for Model 1 were estimated from the reported crude birth rates and the 1986 population structure at ages 16 and below. No age-specific fertility rates have been reported for

North Korea, so we assumed that South Korean patterns for similar levels of fertility were applicable.

In general, North Korea has been enough of a closed population since the end of the Korean War that it is reasonable to assume zero net international migration. In Model 1 we assume no net migration for most years. But in the late 1950s and early 1960s, over 80,000 ethnic Koreans were repatriated from Japan to North Korea. Since we were unable to obtain data on the age-sex structure of this migrant group, we simply assumed that half the returnees were male and half female, and that the age structure for immigrants conformed to that of the base population by sex.

**Table 1**  
**North Korea, Estimated Total Population Size and Growth,**  
**1960–1990 (Population in thousands)**

Year	Total pop.	Males	Females	pop. sex ratio	pop. growth (per 1,000)
1960	10,568	5,094	5,475	93.0	27
1965	12,172	5,894	6,278	93.9	31
1970	14,388	7,012	7,376	95.1	36
1975	16,480	8,070	8,410	95.9	19
1980	17,999	8,838	9,161	96.5	18
1985	19,602	9,650	9,952	97.0	17
1990	21,412	10,568	10,844	97.5	19

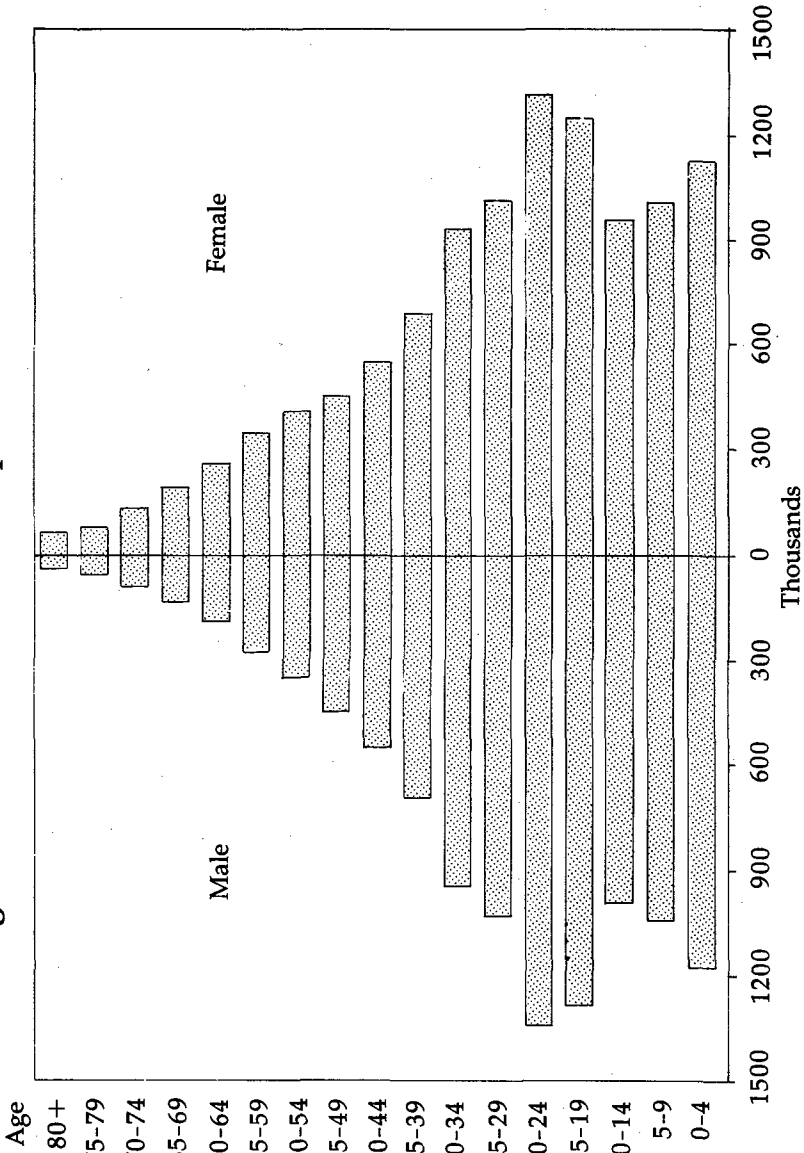
Note: This table includes the military population. Population totals refer to midyear. Sex ratio is the number of males per hundred females in the total population.

Source: Model 1, computer population reconstruction produced at the Center for International Research, U.S. Bureau of the Census, derived from official DPRK data. Nicholas Eberstadt received permission from officials of the Central Statistics Bureau to cite the statistics in this table, Pyongyang, 25 May 1990.

### **Total Population**

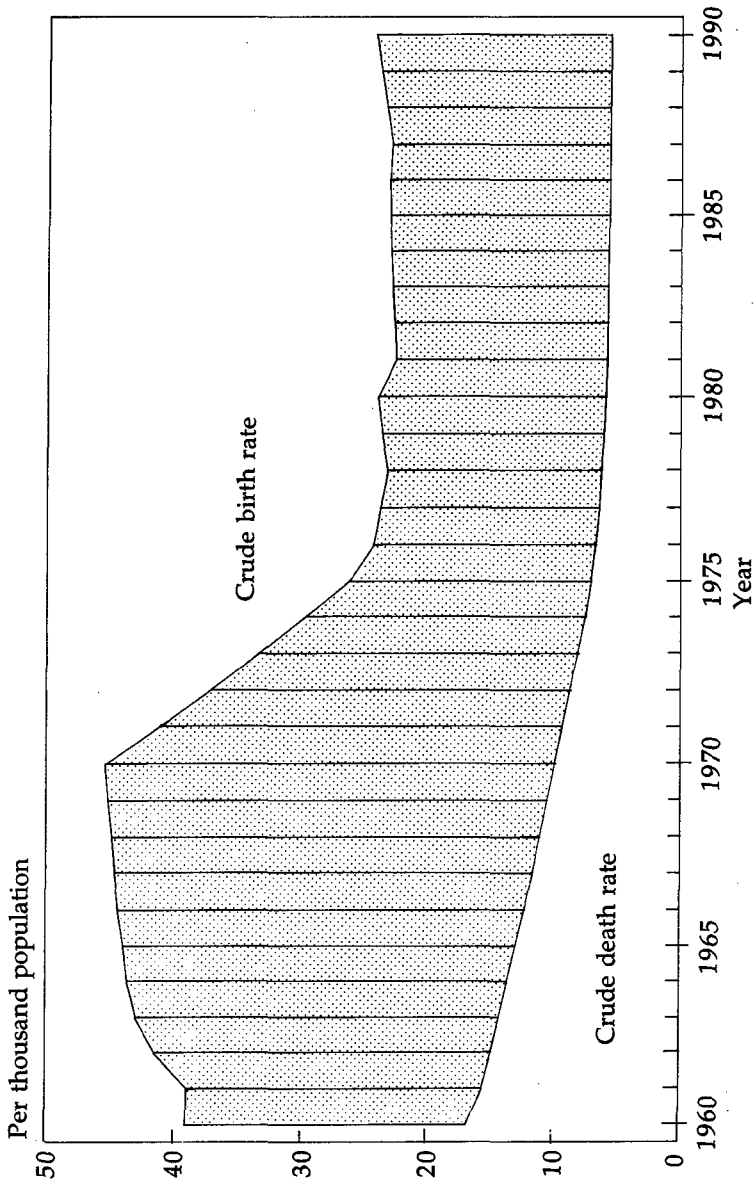
North Korea's midyear 1990 population is estimated at 21.4 million persons (Table 1), about half the corresponding total for

Figure 1. North Korea 1990 Population Structure



Source : Eberstadt and Banister, 1992

**Figure 2. North Korea, Estimated Vital Rates, 1960-1990**



Source : Eberstadt and Banister, 1992

South Korea. The DPRK's sex ratio, or number of males per 100 females in the population, is estimated at 97.5. This would be roughly four points lower than for the South, where the ratio is reportedly 101.6. The difference is significant, and speaks to the continuing impact of the Korean War on North Korea's population structure. As already mentioned, male losses—through both combat and emigration—were more substantial for the DPRK than for the Republic of Korea. Nevertheless, a demographic recovery has long been underway; since 1960, the country's sex ratio has increased by an estimated four and a half points.

### **Age-Sex Structure**

North Korea's estimated midyear 1990 age-sex structure is depicted in Figure 1. Like other societies in the later phases of the so-called demographic transition, North Korea's age-structure has progressed from "pyramid" to "Christmas tree." North Korea's "tree," of course, has been clipped unevenly at the top, largely by the Korean War. Its branches extend furthest for the cohort born in the late 1960s; subsequent cohorts are all smaller. This indentation reflects a radical shift in the country's vital trends since 1970.

### **Vital Rates**

Estimated and projected vital rates for North Korea for the years 1960 to 1990 are presented in Figure 2. The upper line represents North Korea's crude birth rate (births per 1000); the bottom line represents the crude death rate (deaths per 1000); the darkened area between them represents the contemporaneous "rate of natural increase."

North Korea's estimated crude death rate fell dramatically between 1960 and 1980, from almost 17 per thousand to under 6 per thousand. Since then, a further drop in the crude death rate has taken place, but only a marginal one. Birth rates, for their part, appear to have risen during the 1960s, perhaps reaching a



peak of over 45 per thousand in 1970. During the 1970s, they are estimated to have dropped radically; that decade is thought to have witnessed virtually a 50 percent decline in the crude birth rate. During the 1980s, North Korea's birth rate is estimated to have dipped slightly, and then to have risen slightly. Our projections for 1990 suggest a crude birth rate almost exactly the same as for 1980, at about 24 per thousand.

The DPRK's rate of natural increase appears to have been fairly high in 1960; we estimate a rate of about 22 per thousand a year. With rising birth rates and falling death rates, the tempo subsequently accelerated, until it topped 35 per thousand a year in 1970. Thereafter it fell sharply. Between 1970 and 1976, by our estimates, it came down from over 35 per thousand to under 18 per thousand. Since then, North Korea's population growth rate seems to have held relatively constant, fluctuating between about 17 and 19 per thousand.

The abrupt and dramatic decline in North Korean birth rates estimated for the early 1970s begs the question of policy interventions. At much the same time the People's Republic of China experienced a similar drop in its birth rates, partly due to the pressure of a forceful and comprehensive antinatalist campaign. North Korea has never announced an antinatal population policy. To the contrary: to the limited extent that the issue has been broached by international organizations and through academic exchanges, North Korean officials and researchers have implied that their government takes a neutral posture toward population growth, or may even positively wish to accelerate its increase.<sup>2</sup> But interviews with North Korean defectors paint a very different picture.<sup>3</sup> These consistently indicate that a strict antinatal policy went into effect in the early 1970s; and has been continued

---

2 For more details, see *ibid.*, pp. 69–72.

3 See, for example, National Unification Board, *A Survey of Heterogenization in North Korea* (Seoul: NUB, 1978), especially interviews with defectors #61–68. (in Korean).

since then. One representative of a quasi-official pro-DPRK group in Japan stated, in 1984, that North Korea was then implementing a "two-child norm;"<sup>4</sup> his comments, however, have not been subsequently corroborated. One may note, however, that North Korea would not be the first Communist country to enforce restrictive birth controls in almost total secrecy, if this in fact were what she were doing. China executed a quiet but muscular anti-natal drive in the early 1970s, even as Beijing was officially proclaiming the doctrinal concordance of population growth and socialism.<sup>5</sup>

### Fertility

Crude birth rates are a less than fully satisfactory measure of fertility, insofar as they are affected by a population's age-sex structure. More intuitively pleasing perhaps is the "total fertility rate" (TFR)—the number of children born per woman of child-bearing ages. Our estimates are for period-specific TFRs—which is to say, synthetic "snapshots" of fertility for women of all age groups in a given year.

According to our reconstruction, fertility was already fairly high in 1960, but it rose significantly thereafter. By 1970 North Korea's TFR may have been approaching seven children per woman—a level rather higher than was commonly known to preindustrial Asian societies, and in fact more consonant with the high-fertility regimens in the contemporary sub-Saharan. Between 1970 and 1975, by our estimates, North Korea's TFR dropped by over three children per woman. By 1980, the DPRK's total fertility rate was down to about three children per woman; by 1987—the last year for which we have hard data—it was

---

4 Author's interview with Choe Kwan Ik, International Department, General Federation of Korean Residents in Japan; Tokyo, 28 September 1984.

5 See, for example, Judith Banister, *China's Changing Population* (Stanford, CA: Stanford University Press, 1987), pp. 165–166.

about 2.5. (We have projected that rate forward to 1990; for later projections, we have arbitrarily assumed a gradual decline to 2.0 in the year 2010).

It is instructive to compare North and South Korean TFRs (see Table 2). In the early 1960s South Korean fertility levels may have been roughly similar to those in the North, or perhaps even somewhat higher. In the early 1960s, however, South Korea's TFR began what has been a steady decline; it dropped below replacement in the mid-1980s, and is currently thought to be lower than in such places as the United States or Canada. Though North Korea's fertility decline began later, and apparently has yet to hit the line of net replacement, it nevertheless seems to parallel the pattern in the South: in both regions, for example, TFRs have dropped by nearly two-thirds over the past twenty years.

**Table 2**  
**Total Fertility Rates, North and South Korea, 1966–1988**  
**(Children per woman)**

Year	North Korea	South Korea
1966	6.5	5.4
1971	6.3	4.7
1974	4.5	3.6
1976	3.5	3.2
1982	2.8	2.7
1985	2.6	2.1
1988	2.5	1.6

Note: Fertility estimates for South Korea are from a series of national surveys on fertility and family planning.

Source: H.S. Moon et al., "1985—Fertility and Family Health Survey," in 1985 *KIPH Research Abstract*, (Seoul: Korea Institute for Population and Health, 1985), p. 8; "Prevalence of Contraceptive Use and Fertility," *KIPH (Korea Institute for Population and Health) Bulletin*, No. 16, June 1989, p. 1.

## Life Expectancy

Just as the total fertility rate may be preferred to the crude birth rate for a measure of a population's childbearing, so life expectancy at birth may be seen to provide a less ambiguous measure of survival chances than the crude death rate.

Generally speaking, North Korea appears to have made considerable progress in mortality reduction over the past three decades. Our estimates and projections suggest that life expectancy at birth in North Korea may have risen by as much as 20 years between 1960 and 1990: from about 46 to about 66 for men, and from about 52 to about 72 for women. Our figures, however, suggest that improvements in life expectancy have slowed down markedly in recent years: whereas we reconstruct an increase in life expectancy of about ten years for the 1960s, our figure for the 1980s is about three years. In the late 1980s, North Korea's estimated life expectancy at birth would have been similar to projections for such places as Mexico or Mauritius.<sup>6</sup>

It would also be very close to the estimated life expectancy for the population of South Korea. Indeed, the similarity is striking (see Table 3). To be sure: mortality estimates for South Korea are more problematic than is generally appreciated.<sup>7</sup> On more than one occasion, these official estimates from Seoul seem to have been shaped by political pressures. For what they are worth, however, independently reconstructed estimates of life expectancy at birth for men and women seem to track amazingly well in divided Korea over a period of decades. The similarity is

---

6 See, for example, the most recent United Nations projections (1992 round) for the years 1985–1990 in United Nations, *World Population Prospects: the 1992 revision* (New York: UN Department of International Economic and Social Affairs, forthcoming).

7 As Choo Hakchung once put it, "The existing reality of the health data and information system in Korea is much more serious than a casual observer can imagine." "National Health Data and Information System," in Chong Kee Park, ed., *Human Resources and Social Development in Korea* (Seoul: Korea Development Institute, 1980), p. 170.



Recent reports about pervasive food shortage and other difficulties in North Korea<sup>8</sup> may seem to call our assessment about levels of life expectancy in North and South Korea into question. We should therefore emphasize that similar levels of life expectancy at birth could be consonant with markedly different patterns of public health or levels of economic productivity.

### Urbanization and Mobility

North Korea released a certain amount of data on urbanization and migration to the UNFPA. Definitions for "urban" and "rural" areas, unfortunately, were not provided. Subsequent discussion with population researchers and CSB officials in Pyongyang revealed that there is not, in fact, a single standard definition for these terms. At present, urban blocks or "dong" are generally defined as areas in which three thousand industrial "workers" are employed—but not always. The ad hoc nature of statistical classifications demonstrated in designations of urban and rural areas is well to keep in mind when examining other social and economic figures from the DPRK.

Whatever the problems with underlying definitions, North Korea appears to have undergone substantial urbanization since the end of the Korean War (see Table 4). Between 1953 and 1987, registration system figures indicate that North Korea's rural population increased by less than one million, while its urban population grew by over ten million. In 1953 less than one fifth of the DPRK's population was defined as urban; by 1987, almost three fifths of its civilian population was said to be urban.

---

8 See, among many other reports, O Tae Chin, "North Korea's Crisis, the Rice Has Run Out" (in Korean), *Wolgan Choson*, March 1991, translated in *United States Foreign Broadcast Information Service* (FBIS), EAS-91-063, 2 April 1991, pp. 33-38.

**Table 4**  
**North Korea, Civilian Population by Urban and Rural**  
**Residence, 1953–1987 (in thousands)**

Date, year-end	Urban	Rural	Percent urban	Tempo of urbanization
1953	1,503	6,988	17.7	
1956	2,714	6,645	29.0	21.4
1960	4,380	6,409	40.6	12.9
1965	5,894	6,514	47.5	5.6
1970	7,924	6,695	54.2	5.4
1975	9,064	6,922	56.7	2.0
1980	9,843	7,455	56.9	0.2
1982	10,362	7,412	58.3	2.9
1985	11,087	7,705	59.0	1.0
1986	11,265	7,795	59.1	0.4
1987	11,530	7,816	59.6	2.1

Note: The original table included the following note from the Central Statistics Bureau: "Urban/rural areas and populations are divided according to the administrative units regardless of the nature of people's life, food supply, or occupation. Cities also include some rural *ri*. In this table, 'urban' does not include the people living in the city's *ri*. These people are accounted as rural." The "tempo of urbanization" is the difference between the exponential growth rates of the urban and rural populations.

Source: Nicholas Eberstadt received permission from officials of the Central Statistics Bureau to cite the statistics in this table, Pyongyang, 25 May 1990.

Of the 11.5 million civilians said to be living in urban areas in 1987, about 7.7 million were reportedly living in 23 North Korean cities with populations of 89,000 or more. (Why figures were released for such a seemingly arbitrary grouping is unclear.) The size of these populations is depicted in Map 1. As may be seen, Pyongyang, the capital, is by far the DPRK's largest city; the second most populous, Hamhung, is reportedly less than a third as big. Pyongyang, on the other hand, accounts for a rather smaller proportion of urban, and total, population in the North than does Seoul in the South. Discussions with researchers and

officials in Pyongyang seemed to suggest that this difference spoke to deliberate policy decisions in the North—decisions that had been affected by both economic and security considerations.<sup>9</sup>

**Table 5**  
**Indicators of Urbanization in North and South Korea, 1935–1985**

Year	Percent urban		Period	Tempo of urbanization	
	North Korea	South Korea		North Korea	South Korea
1935	4.9	6.0	1935-44	9.8	9.1
1944	10.6	12.3			7.8
1949	NA	17.1	1944-53	6.1	
1953	17.7	NA	1949-55		7.1
				21.4	
1955	29.0 <sup>1</sup>	24.5	1953-55		
				12.9	3.5
1960	40.6	28.0	1955-60		
				5.6	4.5
1965	47.5	33.5 <sup>2</sup>	1960-65		
				5.4	8.1
1970	54.2	41.1	1965-70		
				2.0	5.9
1975	56.7	48.4	1970-75		
				0.2	7.1
1980	56.9	57.3	1975-80		
				1.7	6.9
1985	59.0	65.4	1980-85		

<sup>1</sup>1956 <sup>2</sup>1966

NA: not available

Notes: In the prepartition period, "urban areas" were defined as cities and towns with over 20,000 population within their administrative boundaries. Since partition, for South Korea, urban areas have been defined as administrative cities with an urban population of 50,000 or more. The definition of the urban population for North Korea is unknown. The tempo of urbanization is defined here as the annual percent growth in the urban population size minus the annual percent growth of the rural population.

Source: *The Population of North Korea*, p. 28.

9 Author's discussions in Pyongyang, 22 and 25 May, 1990.



Trends in urbanization for North and South Korea can be compared (see Table 5); one must remember, however, that many areas that would be typed as "rural" in the South (e.g., administrative cities with populations of under 50,000) might qualify as "urban" in the contemporary North. Even so, the contrasts are intriguing. Since 1970, the pace of urbanization in the North seems to have slowed to a crawl; in the South, it continues to be brisk.

**Table 6**  
**Domestic Migration: Annual Number of Changes in Residence**  
**as Reported Through Residential Registration Systems:**  
**North and South Korea, 1980–1987**

Year	North Korea		South Korea	
	Total (in thousands)	Percent of registered population	Total (in thousands)	Percent of registered population
1980	920	5.3	8,259	21.9
1982	927	5.2	8,616	22.1
1985	882	4.7	8,679	21.4
1986	997	5.2	8,660	21.3
1987	1,134	5.9	9,309	22.6

Note: Migration figures for North Korea refer to *ri*, administrative units with an average reported population in 1987 of 1,900, and *dong*, urban administrative units averaging 7,600 people. Migration figures for South Korea pertain to *gun* and *shi*, administrative units with an average reported population in 1987 of over 200,000.

Source: *The Population of North Korea*, p. 30.

North Korea has also released data on internal civilian migration: that is to say, on the number of persons who change their *dong* or *ri* permanent residence in the registration system from one year-end to the next. During the 1980s, about a million North Koreans registered such a move each year; that would amount to roughly five to six percent of the registered population in any given year (see Table 6). In the South, by contrast, between a fifth

and a quarter of the total population reported moving from their *gun* or *shi* in any given year. Since those administrative units are far larger than North Korea's *dong* and *ri*, these differences actually understate the difference in geographic mobility between the two populations.

One may discern an economic significance in these divergent urbanization trends and migration patterns. While North Korea's sharp slowdown in urbanization after 1970 might bespeak security concerns, it may also in part reflect economic difficulties. Moreover, to the extent that geographic mobility may play a role in the reallocation of human and other resources within the production process, North Korea's decidedly less flexible posture toward internal migration would not seem to be auspicious for the overall development of her economy.

**Table 7**  
**North Korea, Population Ages 16 and Over by Occupation,**  
**1986 and 1987 (in thousands)**

Year	1986			1987		
	Total	Male	Female	Total	Male	Female
State worker	6,830	2,990	3,840	7,135	3,134	4,001
Official	2,060	855	1,205	2,103	879	1,224
Farmer	3,141	1,305	1,836	3,167	1,312	1,855
Coop worker	110	41	69	112	42	70
Total	12,141	5,191	6,950	12,517	5,367	7,150

Note: "State worker" refers to people doing physical labor in state-owned industrial enterprises. "Official" refers to the officials in government agencies or other institutions. "Farmer" refers to those doing physical labor in cooperative agricultural units. "Coop worker" refers to those doing physical labor in cooperative industrial units. All civilians ages 16 and above are included in one of the above occupational categories, even if they are elderly, retired, disabled, etc. The military are excluded.

Source: Nicholas Eberstadt received permission from officials of the Central Statistics Bureau to cite the statistics in this table, Pyongyang, 25 May 1990.

### **Civilian Labor Force: Sectoral Distribution**

For the first time in twenty-five years, the DPRK has released figures on the size and sectoral distribution of its labor force (see Table 7). These must be used with caution, for they are peculiar in a variety of respects.

For one thing, they seem to impute virtually 100 percent labor force participation rates to the country's adult population—that is, to those aged sixteen and older. It looks as if all adults were assigned the same occupational grouping as their household head. Unfortunately, discussions with population researchers and CSB officials in Pyongyang did not resolve the uncertainties about the methodology behind this table, and one should not discount the possibility that it devolves from some more arbitrary and unexplained taxonomy. If the table does reflect the breakdown of the adult population according to the occupation of the household head, it probably provides a less than accurate representation of actual distributions in the registered civilian labor force, insofar as sectoral differentials by age, sex, and household size may be presumed to exist within this country.

A second problem concerns the nature of the population surveyed. The breakdown in Table 7 explicitly refers to the civilian population alone. While this might not pose major difficulties to an analysis of manpower for most societies, North Korea happens to have an enormous and apparently growing military force. The force is sufficiently large that one would presume it must engage in economic activity to help support itself. In fact, there are frequent reports in the DPRK's press of army units participating in agriculture, industrial production, construction and the like. This aspect of North Korean employment, however, necessarily goes unrecorded in the official data released to date.

A final problem is intrinsic to the socialist statistical system. The CSB, like other similar apparatuses, is principally concerned with measuring activity in the "people's economy"—the socialist sector. In all Communist countries, a considerable amount of

ingenuity and effort expresses itself through gray or black markets; recent visitor accounts describe a brisk if illicit underground economy in North Korea.<sup>10</sup> Whatever its share of gross domestic product may be, and whatever portion of total man-hours worked it may truly account for, it is completely undocumented in the figures the CSB has to date unveiled.

**Table 8**  
**Reported Classification of North Korean Population by**  
**Occupation, 1960-1987 (percent)**

Classification	1960	1963	1986	1987
Laborers (State workers)	38.3	40.1	56.3	57.0
Office workers	13.7	15.1	17.0	16.8
Farmers	44.4	42.8	25.9	25.3
Cooperative workers	3.3	1.9	0.9	0.9

Note: The 1964 source referred to "Composition of Inhabitants by Occupation." The military population was apparently included in the 1960s, but the 1986 and 1987 classification is for civilians only.

Source: 1960 and 1963 figures from *North Korean Central Yearbook 1964*, Joint Publications Research Service, No. 35, 218, 27 April 1966, pp. 197-98; 1986 and 1987 figures derived from Table 7.

These limitations notwithstanding, the new figures on civilian labor force do speak to the existing employment structure, and to trends over the past generation. By 1987 only about one quarter (see Table 8) of the North Korean adult population was classified as farmers. That same year, almost three-fifths of the adult population was classified as laborers—that is to say, employees in state enterprises, a category we might consider close to our designation for the "secondary" or industrial sector. About one-sixth were typed as office workers: performers of "non-productive labor" in the Marxist-Leninist taxonomy; in our own,

---

10 See, for example, Kim Tong-hyon, "Republic of Charcoal Trucks" (in Korean), *Wolgan Choson*, December 1990, translated in *FBIS-EAS91-056*, 22 March 1991, pp. 22-33.

perhaps something like "tertiary" or service-sector workers. A tiny fraction—less than one percent—were registered as workers in cooperative enterprises, a designation perhaps meant to capture the officially sanctioned semi-private enterprise sector.

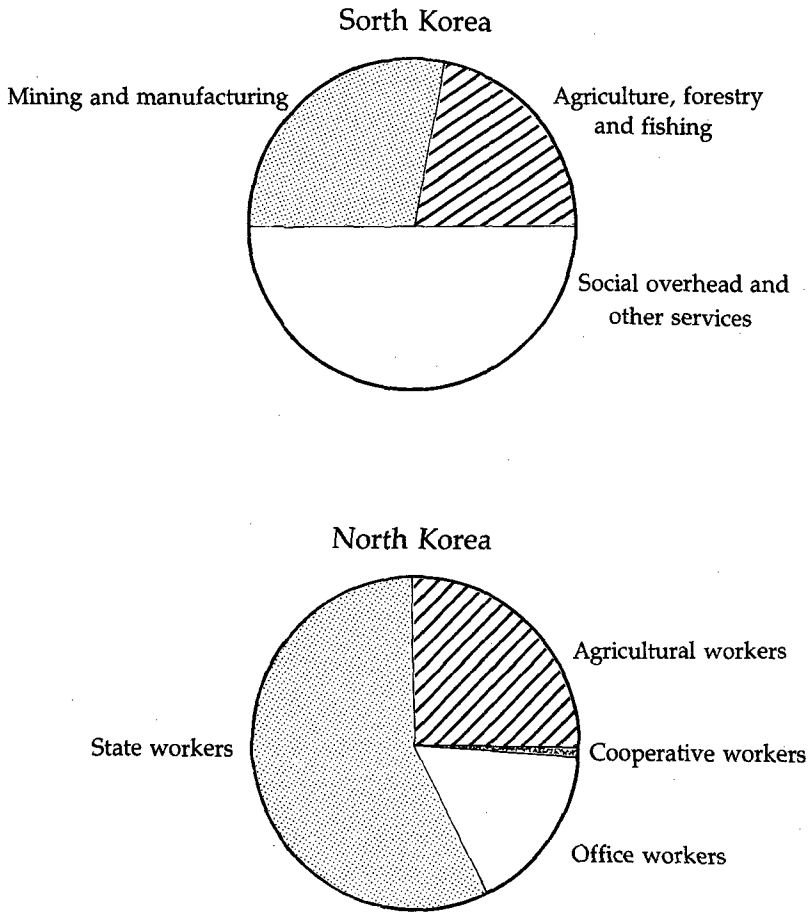
Figures on employment for the early 1960s and the late 1980s seem to have been compiled according to different methods, the earlier ones enumerating only actual paid employees, the latter including every adult in a given household. Irrespective of the distortions that may have been introduced by this change of technique, it is clear that a transition out of agriculture and into industry has proceeded over the past three decades. The share of "office workers" in the national economy, by contrast, is reported to have risen only slightly between 1963 and 1987, perhaps because official policy views this sphere a "non-productive" and thus a drain upon other sectors.

North Korea's reported occupational breakdown for 1987 can be compared with that of South Korea (see Figure 3). The comparison must be approached with caution, since the definitions for the sectors in question, and the procedures used to measure them, are so totally different. Moreover, South Korea's data on employment leaves much to be desired, as specialists in this area have long complained.<sup>11</sup> Yet the comparison remains illustrative. Figures from the two Koreas seem to suggest that agricultural activity accounts for roughly similar shares of the total workforce. In South Korea, however, the service sector appears to absorb over half the workforce, whereas in North Korea employment in state industries seems to be absolutely predominant. Figure 3 may provide a first, highly imprecise, glimpse of the sorts of sectoral adjustments workers in North Korea may expect to face if their country makes a transition to a market-oriented economy, or if their region is reunified with the rest of the peninsula on South Korean terms.

---

11 For one assessment, see David L. Lindauer, "Labor Market Behavior in the Republic of Korea," *World Bank Staff Working Papers* #641 (1984), pp. 71–76.

**Figure 3. Reported Occupations by Sector :  
North and South Korea, 1987 (percent)**



Sources : Table 28 ; and Social Indicators in Korea 1988, pp. 92, 105, 110

**Table 9**  
**North Korea, Males Not Reported, 1975-1987**  
**(in thousands)**

Date, Year-end	Reconstructed (Model 1)	Reported	Total males missing	Missing in ages 16-54
1975	8,147	7,433	714	NA
1980	8,918	8,009	909	NA
1982	9,234	8,194	1,040	NA
1985	9,737	8,607	1,130	NA
1986	9,912	8,710	1,202	1,201
1987	10,090	8,841	1,249	NA

NA: not available

Note: The reported totals are the civilian male population of North Korea. The missing males constitute our estimate of the size of the male military population of the DPRK.

Source: Model 1, reconstructed by the Center for International Research, US Bureau of the Census.

### **Military Manpower**

As already mentioned, North Korea's military absorbs an enormous amount of the country's able-bodied manpower. Until now estimates of North Korea's military forces were derived through Western intelligence, principally through "signals intelligence" and other technical means. North Korea's recently released data, however, provide an alternate basis for estimating the size of the country's armed forces. In brief, the procedure is to reconstruct an estimate for the total male population, and to subtract from this the reported total male civilian population.<sup>12</sup> (Until 1970, the CSB counted the country's entire population, but thereafter only civilians; this quirk permits us to estimate the size of the "missing male" cohort from 1975 to 1987). We assume that

---

12 For a fuller account, see Nicholas Eberstadt and Judith Banister, "Military Buildup in the DPRK: Some Indications from North Korean Data," *Asian Survey*, Vol. 31, #11, (1991).

this missing male contingent provides a minimum figure for North Korea's military population (see Table 9).

If these numbers roughly capture the dimensions of North Korea's military manpower commitment, the DPRK's armed forces would have accounted for over 6 percent of the country's estimated total population, over 12 percent of its estimated male population, and over 21 percent of its male population aged 16 and above as of 1987. If we assume that the soldiers in question are drawn overwhelmingly from the 16-28 cohort, they could have comprised as much as 42 percent of this grouping in 1987. (By way of rough comparison, South Korea's armed forces would have accounted for somewhat less than 11 percent of the corresponding cohort in 1985, on the assumption that 600,000 troops would have been drawn from its ranks.)<sup>13</sup>

The massive disposition of young male manpower into military channels necessarily constrains the mobilization of youths into the civilian labor force, and may complicate the upgrading of skills that is associated with the higher education system. These constraints may have a bearing not only on current economic performance, but also upon prospects for the future.

But as been mentioned already, it might be a mistake to treat North Korea's military manpower as a deadweight burden upon the national economy. The "juche" philosophy would certainly seem consonant with policies urging economic self-reliance upon the People's Army. In fact, some North Korean defectors have reportedly complained of the arduous non-military efforts to which they were seconded while under uniform.<sup>14</sup> And if the military is a priority sector in North Korea, as there is every reason to presume, assigning economic tasks to it may be an

---

13 Derived from Economic Planning Board, *Korea Statistical Yearbook 1989* (Seoul: National Bureau of Statistics, 1989), p. 44.

14 See, for example, Yu Yong-won, "North Korean Military Structure Viewed" (in Korean), *Wolgan Choson*, December 1990, translated in *FBIS*, EAS-91-073-S, 16 April 1991, esp. p. 6.



effective administrative means of seeing to it that special targets are achieved. Unfortunately, until more is known about North Korea's military economy, very little can be said about its economic operations with any certainty.

### Labor Force Participation Rates

In 1987 a North Korean publication stated that "today 8,950,000 all have a job and are engaged in creative labor."<sup>15</sup> If this figure is taken to represent North Korea's actual population of economically active individuals at year-end 1986, it is possible to compute labor force participation rates for the country, and to compare them with rates reported elsewhere (see Table 10).

Table 10 provides two estimates for labor force participation rates for North Korea: the first on the assumption that the aforementioned figure excludes military workers, and the second—arguably less likely—on the assumption that the military is already subsumed within that number. By any reckoning, however, North Korea appears to be a society with a high degree of labor mobilization. Labor force participation rates in North Korea might well be higher than in such command-planning societies as the Soviet Union of the late 1970s or the Warsaw Pact states of the 1970s and the 1980s. (North Korea's rates might be slightly lower than those reported for China or Vietnam, but the latter two are predominantly rural agricultural societies, and their figures on labor force enrollment are correspondingly more ambiguous.)

By these indications, North Korea's labor force participation rate would be higher than for any of the Asian so-called newly industrializing countries—perhaps considerably so. A difference of almost twenty points, for example, might separate North and

---

15 Pang Hwan Ju, *Korean Review* (Pyongyang: Foreign Languages Publishing House, 1987), p. 78.

**Table 10**  
**Estimated Labor Force Participation Rates for North Korea and**  
**Selected Other Countries (Percent)**

Country or group	Total	Male	Female
<b>Communist states</b>			
USSR (1979; 20+)	73.3	82.8	65.8
Bulgaria (1985; 20+)	69.9	75.3	64.7
Czechoslovakia (1980)	67.8	75.5	60.8
GDR (1981)	67.5	76.2	60.0
Hungary (1980)	60.5	71.9	50.2
Poland (1978)	67.3	76.6	58.7
Romania (1977)	67.1	74.9	59.6
Yugoslavia (1981; 20+)	62.1	79.8	45.8
PRC (1982)	78.7	86.5	70.6
Vietnam (1989)	77.3	81.6	73.6
Cuba (1981)	53.4	72.8	33.8
<b>Asian NIC's</b>			
Hong Kong (1986)	66.4	80.9	51.2
ROC (1989)	60.1	74.8	45.4
ROK (1980)	56.5	75.1	39.5
Singapore (1980)	63.2	81.5	44.3
<b>Developed Market Economies</b>			
FRG (1988)	56.5	71.8	42.7
Japan (1985)	63.6	80.3	47.7
Sweden (1985; 20+)	64.9	70.6	59.5
USA (1980; 16+)	62.0	75.1	49.9
<b>North Korea:</b>			
Excluding military (1986/87; 16+)	73.7	NA	NA
Including military (1986/87; 16+)	67.8	NA	NA

NA: not available

**Note:** All non-North Korea figures come from census data, except for FRG and ROC, which come from labor force surveys. Unless otherwise indicated, labor force participation rate is for economically active population 15 years of age and older as a percentage of the total cohort. North Korean estimates based upon stated official figure for employment, plus reconstruction of population structure and military population. It is not clear if the reported employed population of North Korea includes the military or refers to civilians only, so we have calculated it both ways.

Source: For North Korea: Nicholas Eberstadt and Judith Banister, *The Population of North Korea* (Berkeley, CA: Institute of East Asian Studies, 1992); For Vietnam: Judith Banister, *Vietnam: Population Dynamics and Prospects* (Washington, DC: U.S. Bureau of the Census, Center for International Research, June 1991); For ROC: ROC Directorate-General of Budget, Accounting and Statistics, *Statistical Yearbook of the Republic of China 1990* (ROC: Executive Yuan, 1990), p. 57; For all other countries: *International Labor Office, Yearbook of Labour Statistics* (Geneva: ILO), various issues.

South Korea. North Korea's labor force participation rates also look to be much higher than those reported for some of the world's leading "developed market economies."

North Korea's labor force has not always been so thoroughly mobilized. Data for the year-end 1963, for example, suggest an estimated labor force participation rate for those fifteen and older of about 55 percent. By way of comparison, the labor force participation rate for those fourteen and older reported for South Korea in 1967 was also about 55 percent.<sup>16</sup> The subsequent divergence of North and South Korean patterns underscores the degree to which the DPRK has relied upon an "extensive" growth strategy, and probably indicates the "success" of the long-enunciated drive to include North Korean women in the formal workforce.

North Korea's high estimated rates of labor force participation would seem to compound the difficulties that might be expected in a transition to a market-oriented economy, or in reunification on South Korean terms. It seems likely that many of the persons presently counted as "creative laborers" are in reality marginal employees, or persons who (for reasons of age or infirmity) should not be expected to pursue paid compensation. North Korea, unfortunately, will not bequeath such persons a pension-funding mechanism, much less the means to endow it. If North

---

16 *The Population of North Korea*, p. 82; *Economic Planning Board, Social Indicators in Korea 1985* (Seoul: National Bureau of Statistics, 1985), p. 118.

Korean employment patterns were to conform roughly to those reported in the present-day South, over a fourth of those persons in the civilian labor force in the late 1980s would no longer be receiving wages or salaries. (If the armed forces were added to this civilian population count, the fraction would be even greater—closer to 30 percent.) A shift to a market-oriented economy, at least in the short run, would probably mean that many people would have to shift jobs—but that substantially more people would be leaving their previous employ than would ultimately enter new positions. One may appreciate the possible social consequences of such a transition.

### **Prospective Growth of the Working-Age Population**

How will North Korea's working-age population (ages 16–64) grow in the future—say, to the year 2010? Unlike so many questions about the future of the North Korean labor force, this one can be answered with a minimum of conjecture. Our reconstructions of the country's population for year-end 1986, after all, provide us with a stream of prospective entrants up to the year 2001; barring catastrophe, changes in survival schedules can have only a minimal impact on projected totals. Working-age aggregates will depend thereafter on fertility trends for the years 1987–1995, matters still in large measure unknowable. Even if our projections for fertility for these years are far off the mark, however, they will only slightly affect our projections for total working-age population for 2010, since that cohort stands to compose only a small fraction of the country's adults.

Estimates and projections for North Korea's working age population may be seen in Table 11. As of midyear 1990, by our estimates, about 13.9 million adults fell within the 16–64 cohort. Of them, over half were under 30, and nearly 5 percent were 16 years of age. By 2010, under our projections, the working-age population will have grown by almost two-fifths, to about 19.2 million. Its composition, however, will be very different. Less

than a third of this grouping is projected to be comprised of persons aged 16-29, and less than 3 percent would be 16 years of age. If our fertility projections are too high, as some might argue, North Korea's future population will be even grayer than these figures would suggest.

**Table 11**  
**North Korea, Estimated and Projected Population in Labor**  
**Force Ages, 1986-2010 (in thousands)**

Age group	1986	1990	1995	2000	2005	2010
16	585	470	387	415	469	526
16-29	6,273	6,804	6,706	6,054	5,747	6,351
30-64	5,995	7,086	8,474	10,327	11,928	12,821
16-64	12,268	13,890	15,180	16,381	17,675	19,172

Source: Model 1 reconstructed and projected at the Center for International Research, US Bureau of the Census.

Because North Korea's fertility rate has yet to fall below the replacement level, working-age population will continue to grow throughout the foreseeable future. By our estimates and projections, it will increase at a rate of roughly 1.7 percent a year during the 1990s, and by about 1.6 percent annually in the decade thereafter. The younger portion of this cohort (16-29), however, will be smaller in the year 2000 than it was in 1990, and will almost certainly be smaller in 2010 than it was in 1990 as well.

Like many aspects of population change, the prospective trends in working-age population growth have economic implications. The greying of the North Korean population may be expected to make the transition to a market economy somewhat more difficult. This is because lower fertility rates make for lower replacement rates within the working-age population. Though older workers tend to be more productive in any given cross-section of the labor force, younger persons may tend to be more flexible. In any event, it is typically at younger ages that persons absorb the education and develop the attitudes that affect pro-

ductivity in later life—not the reverse. Although retraining and resocializing North Korea's adult population would surely offer some opportunities for improvements in labor productivity under a future order, wholesale replacement of the previous labor force by one with nothing to "unlearn" might contribute even more. The impending decline in the younger cohort within North Korea's working-age population means that this process of replacement will be slower than it would have been at earlier junctures in DPRK history.

### Concluding Observations

To the extent that this paper has attempted to peer into the future, it has commented upon potential or impending economic difficulties that may be divined from the newly released data on North Korea. These are genuine enough, but to focus upon them alone might risk painting an inadequate picture of possibilities for the future. South Korea's post-partition experience, for example, attests to the flexibility the local population could demonstrate in responding to new economic opportunities—even among cohorts that had entered middle age or later life at the time that the "economic environment" had begun its dramatic change.

Labor market responses in the DPRK cannot be measured with data available, but relieving some of the existing distortions imposed under the current regimen would surely be expected to contribute to productivity improvements. North Korea's ratio of wages and salary to GDP, for example, may be one of the very lowest in the world today; personal consumption as a proportion of national income looks to be abnormally low, even for a communist state.<sup>17</sup> Under these circumstances, even such modest

---

17 This phenomenon, moreover, may not be new for the DPRK. One recent study has estimated that consumption accounted for an astonishingly low 35 percent of North Korean GDP (on an "adjusted factor cost" basis) for the year 1959; the comparable estimate for the USSR for 1955 was 59 percent! Fujio Goto, *Estimates of the North Korean Gross Domestic Product 1956–1959* (Kyoto: Kyoto Sangyo

changes as the introduction of "inducement goods," or the advent of rationing by means of the currency system, might be expected to have significant and dynamic consequences for labor productivity.

Aphorisms notwithstanding, demography is not destiny—at least not for the individuals in question. It is instead the human factors—some of them unquantifiable—that tend to shape performance, and even events. At the moment, however, all too little is known about the qualities, capabilities, and motivations of the individuals within the DPRK who are necessarily examined by demography only in the aggregate.