

## Population and Labor Force in North Korea: Trends and Implications

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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--every--population census, prospectively scheduled for January 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.

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

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## I. 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 midyear or for the year as a whole, as is customary elsewhere.

After North Korea's long statistical black-out, 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 or 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 alteration. 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 yearend 1986. The third in a series of reported vital rates for various years since the Korean War. (These data are presented in the Appendix, as Tables A-1, A-2 and A-3). 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.

## II. Population Trends

### 1. Total Population

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

1) For more details, see Nicholas Eberstadt and Judith Banister, *The Population of North Korea* (Berkeley, CA: Institute of East Asian Studies, Korean Monograph Series; forthcoming).

## 2. Age-Sex Structure

North Korea's estimated midyear 1990 age-sex structure is depicted in Figure 1. (The data framing this picture may be seen in the Appendix, in Table B-1). Like other societies in the later phases of the so-called demographic transition, North Korea's agestructure 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.

## 3. Vital Rates

Estimated and projected vital rates for North Korea for the years 1960 to 1990 are

presented in Figure 2. (The data for this figure may be seen in the Appendix, in Table C-1). 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

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

Year	Total population	Males	Females	Population sex ratio	Population growth (percent)
1960	10,568	5,094	5,475	93.0	2.7
1965	12,172	5,894	6,278	93.9	3.1
1970	14,388	7,012	7,376	95.1	3.6
1976	16,480	8,070	8,410	95.9	1.9
1980	17,999	8,838	9,161	96.5	1.8
1985	19,602	9,650	9,952	97.0	1.7
1990	21,412	10,568	10,844	97.5	1.9

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, May 25, 1990.

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.

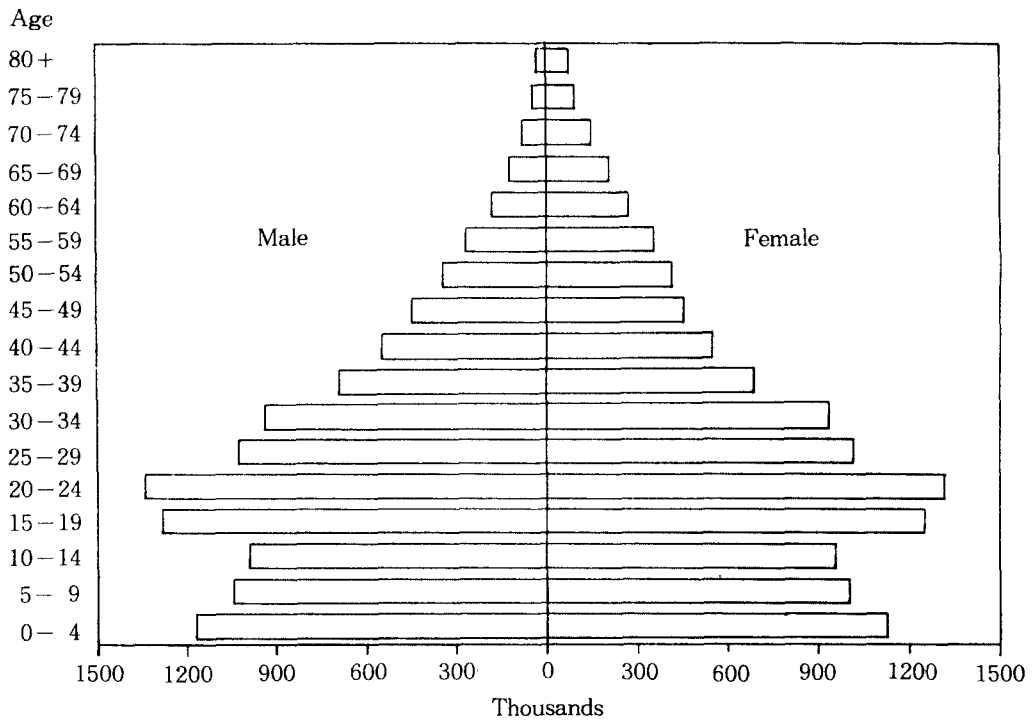
The DPRK's rate of natural increase appears to have been fairly high in 1960; we estimate a rate of about 2.2 percent a year. With rising birth rates and falling death rates, the tempo subsequently accelerated, until it topped 3.5 percent a year in 1970. Thereafter it fell sharply. Between 1970 and 1976, by our estimates, it came down from over 3.5 percent to under 1.8 percent. Since then, North Korea's population growth rate seems to have held

relatively constant, fluctuating between about 1.7 percent and 1.9 percent.

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 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



Figure 1. North Korea 1990 Population Structure (1990 mid-year)



Source : Teble B-1

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 since then.

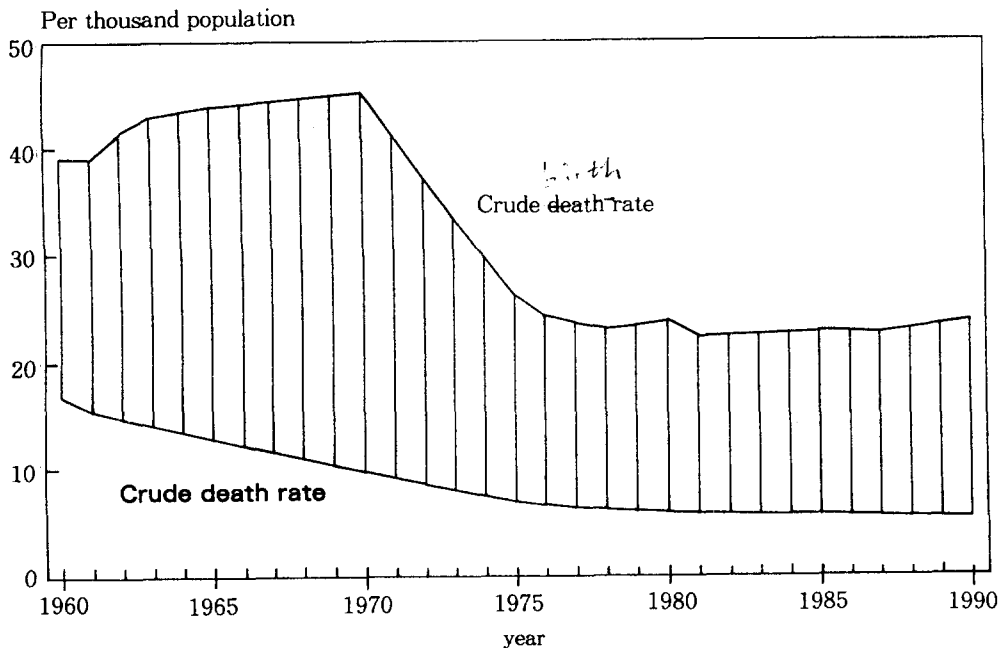
One representative of a quasi-official pro-DPRK group in Japan stated, in 1984, that North Korea was then implementing a "two-child norm"<sup>4)</sup>; his comments, however, have not been subsequently corroborated. One may note, however, that North Korea would not be

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>

#### 4. Fertility

Crude birth rates are a less than fully satisfactory measure of fertility, insofar as they are affected by a population's age-sex struc-

Figure 2. North Korea, Estimated Vital Rates, 1960–1990



Source : Table C-1

2) For more details, see *Ibid*

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

4) Author's interview with Choe Kwan IK, International Department, GFKRAJ; Tokyo, September 28, 1984.

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

ture. More intuitively pleasing perhaps is the "total fertility rate" -- (TFR) the number of children born per woman of childbearing 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. (A more detailed presentation may be found in the Appendix, in Table C-2).

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 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 notional surveys on fertility and family planning.

Sources: For North Korea, Table C-2. For South Korea, 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.

## 5. 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. Detailed estimates and projections of trends in life expectancy at birth for men and women between 1960 and 1990 may be seen in the Appendix, in Table C-2.

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 perhaps all the more surprising in view of the almost complete separation of the two population, and the well-known differences in their "development strategies".

A generation of research into the economics of "human capital" has illuminated the connection between health and productivity. The relationship is general; it is in no sense mechanistic or tight. Similar levels of mortality do not necessarily imply equal levels of productivity for the populations in question. Indeed, similar levels of mortality do not even necessarily suggest similar overall patterns in health. The modern world is familiar with populations characterized by low levels of mortality, yet high incidences of morbidity: Sri Lanka is one that comes to mind immediately.

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

6) See, for example, the most recent United Nations projections (1990 round) for the years 1985-1990 in United Nations, *World Population Prospects 1990* (New York: UN Department of International Economic and Social Affairs, 1991).

7) As Choo, Hak Chung 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

8) See, among many other reports, *US Foreign Broadcast Information Service (FBIS), EAS-91-028, February 11, 1991, p. 26.*

of public health or levels of economic productivity.

## 6. 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.

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 collection 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 consideration.<sup>9)</sup>

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.

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 yearend to the next. During the 1980s, about a million North Koreans registered such a move each year; that would amount to roughly 5-6 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

<sup>9)</sup> Author's discussions in Pyongyang, May 22 and 25, 1990.



**Table 3. Estimated Expectation of Life at Birth for North Korea, South Korea, and Prepartition Korea. 1940–1986**

Year	North Korea			South Korea		
	Both Sexes	Male	Female	Both sexes	Male	Female
1940–1945 (Prepartition)	43.4	42.0	44.8	43.4	42.0	44.8
1955–1960	NA	NA	NA	49.6	46.9	52.5
1960	49.0	46.0	52.1	NA	NA	NA
1960–1965	51.9	48.9	55.0	50.7	48.1	53.5
1970–1975	61.3	58.2	64.6	NA	NA	NA
1978–1979	65.4	62.1	68.4	NA	62.7	69.1
1980	65.7	62.7	69.0	64.9	61.2	68.8
1985	67.4	64.1	70.4	NA	64.9	71.3

NA = Not available

Note: Estimates for prepartition Korea are for the country as a whole. For North Korea, the life expectancy estimates given for 1960–1965 are our 1963 estimates; for 1970–1975, our 1973 estimates; and for 1978–1979, our 1979 estimates.

Sources: For North Korea: Table C–2. For South Korea: Kwon Tai Hwan, *Demography of Korea: Population Change and Its Components 1925–1966* (Seoul: Seoul National University Press, 1977), in South Korea (Seoul: Korea Institute of Population and Health, 1983), pp. 121–123 (in Korean); Republic of Korea, Ministry of Health and Social Affairs, *Yearbook of Health and Social Statistics 1986* (Seoul: MHSA, 1986), p. 7.

**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

Notes: 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, ‘Rurban’ 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 population.

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

Table 5. Urbanization in North and South Korea, 1935 – 1985

Year	North Korea percent urban	Tempo of urbanization	South Korea percent urban	Tempo of urbanization
1935	4.9		6.0	
1944	10.6	9.8	12.3	9.1
1949	NA	6.1	17.1	7.8
1953	17.7		NA	7.1
1955	29.0(1956)	21.4	24.5	
1960	40.6	12.9	28.0	3.5
1965	47.5	5.6	33.5 (1966)	4.5
1970	54.2	5.4	41.1	8.1
1975	56.7	2.0	48.4	5.9
1980	56.9	0.2	57.3	7.1
1985	59.0	1.7	65.4	6.9

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. For South Korea, urban areas are 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 the annual percent growth in the urban population size minus the annual percent growth of the rural population.

Sources: Dae Young Kim and John E. Sloboda, "Migration and Korean Development," in Robert Repetto et al., *Economic Development, Population Policy, and Demographic Transition in the Republic of Korea* (Cambridge, MA: Harvard University Press, 1981), p. 40; *Migration, Urbanization and Development in the Republic of Korea*, (Bangkok: ESCAP, 1980), p. 16; *Social Indicators in Korea 1987*, p. 60; *Korea. Statistical Yearbook 1988*, p. 40. North Korean data from Table 4. See also Nicholas Eberstadt and Judith Banister, *The Population of North Korea* (Berkeley, CA: Institute of East Asian Studies, forthcoming).

Table 6. Annual Domestic Migration as Reported through Residential Registration System: 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

Notes: 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.

Sources: For North Korea, Nicholas Eberstadt received permission from officials of the DPRK Central Statistics Bureau to cite these data, *Pyongyang*, May 25, 1990. For South Korea, derived from *Korea Statistical Yearbook 1988*, p. 61.

reported moving from thier “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.

### III. Trends of Labor Force

#### 1. 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 16 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

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

	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

Notes: “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, May 25, 1990.

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 "grey" 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.

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

**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

Notes: 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.

Sources: 1960 and 1963 figures from North Korean Central Yearbook 1964, Joint Publications Research Service, No. 35, 218, derived from Table 7.

10) See, for example, the lengthy discussion in *Choson Wolgan*, December 1990.

“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, perhaps something like “tertiary” or service-sector workers. A tiny fraction—less than 1 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 be-

tween 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 leave 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

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



Sources : Table 8 : and Social Indicators in Korea 1988. pp. 92. 105. 110

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

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.

## 2. 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.<sup>12)</sup> 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. (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 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

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

Notes: 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.

Sources: Model 1, reconstructed by the Center for International Research, U.S. Bureau of the Census. Official data from Tables A - 1 and A - 2.

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

from the 16-28 ~~cohort~~ <sup>age group</sup>, 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 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.

### 3. 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 yearend 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

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

14) FBIS, EAS-91-112, April 16, 1991, P.11.

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
Communist states			
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	72.0	50.1
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)	52.3	71.5	32.8
Asian NIC's			
Hong Kong (1986)	66.4	80.9	51.2
ROC (1989)	60.1	74.8	45.4
ROK (1980)	54.8	70.5	39.5
Singapore (1980)	63.2	81.5	44.2
Developed Market Economies			
FRG (1988)	56.5	71.8	42.7
Japan (1985)	63.6	80.3	47.7
Sweden (1985)	64.9	70.6	59.5
USA (1980)	62.0	75.2	49.9
North Korea:			
Excluding military (1986/87; 16+)	73.7	NA	NA
Including military (1986/87; 16+)	67.8	NA	NA

NA = Not available

Notes: 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.

Sources: For North Korea: Nicholas Eberstadt and Judith Banister, *The Population of North Korea* (Berkeley, CA: Institute of East Asian Studies, forthcoming); For Vietnam: Judith Banister, *Vietnam: Population Dynamics and Prospects* (Washington, D.C.: 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.



force participation rate would be higher than for any of the Asian so-called “newly industrializing countries” -- perhaps considerable so. A difference of almost twenty points, for example, might separate North and 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 yearend 1963, for example, suggest an estimated labor force participation rate for those 15 and older of about 55 percent. By way of comparison, the labor force participation rate for those 14 and older reported for South Korean 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 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.

#### 4. 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 yearend 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

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

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. (More detailed projections are available in the Appendix, in table D-1). 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 "greyer" than these figures would suggest.

Because North Korea's fertility rate has yet to fall below replacement, 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 implication. 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 productivity 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

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, U.S. Bureau of the Census.

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 the DPRK’s history.

#### IV. 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 along 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 has 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;<sup>17)</sup> personal consumption as a proportion of national income looks to be abnormally low, even for a Communist state. Under these circumstances, even such modest 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.

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17) This phenomenon, more over, may not be new for the DPRK. Once recent study has estimated that consumption accounted for an astonishingly low 35 percent of North Korean GDP, on a factor cost basis, for the year 1959; the comparable estimate for the USSR for 1955 was 59 percent! Fugio Goto, *Estimates of the North Korean Gross Domestic Product 1956--1959*, (Kyoto: Kyoto Sengyo University Press, 1990), p. 48

Map 1. Leading Cities of North Korea, Comparative 1987 Population Sizes



Table A — 1. North Korea, Reported Total Population by sex, 1946 — 1987 (Population in thousands)

Date, Year-end	Total	Male	Male annual growth rate	Female	Female annual growth rate	Sex ratio
1946	9,257	4,629	1.08	4,628	1.49	100.0
1949	9,622	4,782	-4.58	4,840	-1.77	98.8
1953	8,491	3,982	3.88	4,509	2.67	88.3
1956	9,359	4,474	3.86	4,885	3.27	91.6
1960	10,789	5,222	3.00	5,567	2.60	93.8
1965	12,408	6,067	3.22	6,341	3.34	95.7
1970	14,619	7,127	0.84	7,492	2.65	95.1
1975	15,986	7,433	1.49	8,553	1.65	86.9
1980	17,298	8,009	1.14	9,289	1.54	86.2
1982	17,774	8,194	1.64	9,580	2.04	85.5
1985	18,792	8,607	1.19	10,185	1.61	84.5
1986	19,060	8,710	1.49	10,350	1.49	84.2
1987	19,346	8,841		10,505		84.2

Notes: Annual growth rates are in percent. Sex ratio is males per hundred females. Population totals after 1970 apparently exclude the military.

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

Table A — 2. North Korea, Reported Civilian Population by Age Group, Year — end 1986

Age	Total	Male	Female	Sex ratio
0 (Infants)	387,300	198,423	188,877	105.1
1 — 3	1,204,785	613,739	591,046	103.8
4 — 5	923,078	470,713	452,365	104.1
6 — 15	4,400,204	2,235,540	2,164,664	103.3
16	544,355	264,536	279,819	94.5
17 — 54	9,817,072	4,286,768	5,530,304	77.5
55 — 59	574,469	222,639	351,830	63.3
60 — 89	1,197,352	415,227	782,125	53.1
90 — 99	11,436	2,874	8,562	33.6
100 +	49	7	42	16.7
Total	19,060,100	8,710,466	10,349,634	84.2

Notes: According to notes from United Nations experts, "Age group classification in the table is in accordance with the criterion of DPRK's CSB according to their need for analysis. Age 1 — 3 is for figuring out preschool enrollment, 6 — 15 for compulsory education and age 16 is the age of finishing compulsory education and becoming eligible to receive the citizenship card and to have a job." Sex ratio is males per hundred females in each age group.

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

Table A—3. North Korea, Reported Crude Vital Rates and Infant Mortality, 1944—1986

Year	Crude birth rate	Crude death rate	Natural increase rate	Infant mortality rate
1944	31.3	20.8	10.5	204.0
1949	41.2	18.7	22.5	
1953	25.1	18.1	7.0	
1955	40.5	20.9	19.6	56.4
1956	31.0	17.6	13.4	
1959	39.3	12.0	27.3	
1960	38.5	10.5	28.0	37.0
1961	36.7	11.5	25.2	
1962	41.1	10.8	30.3	
1963	42.7	12.8	29.9	
1965	43.5	9.8	33.7	35.3
1970	44.7	7.0	37.7	22.7
1975	25.9	4.7	21.2	18.1
1980	21.8	4.5	17.3	14.2
1982	21.9	4.3	17.6	
1985	22.2	4.6	17.6	10.5
1986	22.9	5.0	17.9	9.8

Notes: Infant mortality rates are infant deaths per thousand live births. Crude birth, death, and natural increase rates are per thousand population as of midyear. In recent years, official crude birth and death rates were calculated with the civilian, not the total, population in the denominator. But if the births and deaths are those of the total population, which is probably the case, the denominator should be the total population including the military. Such a recalculation would make the birth and death rates based on registered vital events slightly lower than reported here.

Sources: Democratic People's Republic of Korea, Central Statistics Bureau, The Health Statistics of the Democratic People's Republic of Korea (Pyongyang: CSB); 1983 edition, p. 5; 1987 edition, pp. 5, 7; U.S. Joint Publications Research Service (JPRS), Translations from North Korea Central Yearbook; 1961 edition, p. 321 ; 1963 edition, p. 337; 1964 edition, p. 316.

Table B - 1. North Korea, 1990 Population Profile

Age group	Estimated midyear population			Sex ratio
	Both sexes	Male	Female	
Total	21,411,618	10,567,950	10,843,668	97.5
0	493,552	252,079	241,473	104.4
1-4	1,808,316	922,501	885,815	104.1
5-9	2,046,355	1,042,714	1,003,641	103.9
10-14	1,949,407	991,168	958,239	103.4
15-19	2,531,943	1,283,591	1,248,352	102.8
20-24	2,658,012	1,342,791	1,315,221	102.1
25-29	2,041,534	1,024,064	1,017,470	100.6
30-34	1,875,169	939,853	935,316	100.5
35-39	1,380,927	691,191	689,736	100.2
40-44	1,100,728	548,727	552,001	99.4
45-49	900,998	446,532	454,466	98.3
50-54	757,991	345,978	412,013	84.0
55-59	620,179	269,532	350,647	76.9
60-64	450,494	181,397	269,097	67.4
65-69	329,689	125,824	203,865	61.7
70-74	223,830	82,942	140,888	58.9
75-79	137,636	47,668	89,968	53.0
80+	104,858	29,398	75,460	39.0
0-3	1,865,960	952,299	913,661	104.2
4-5	862,949	439,987	422,962	104.0
0-5	2,728,909	1,392,286	1,336,623	104.2
6-15	3,996,276	2,033,125	1,963,151	103.6
16	469,646	238,215	231,431	102.9
16-29	6,803,934	3,433,497	3,370,437	101.9
16-64	13,890,420	6,856,707	7,033,713	97.5
17-26	5,191,462	2,623,183	2,568,279	102.1
17-54	12,350,101	6,167,563	6,182,538	99.8
15-49	12,489,311	6,276,749	6,212,562	101.0
60+	1,246,507	467,229	779,278	60.0
Total fertility rate: 2.5		Crude death rate : 5.6		
Total births: 516,276		Rate of natural increase: 18.6		
Crude birth rate: 24.1		Net international migration rate : 0		
Total deaths: 118,917		Population growth rate: 1.9		
		Both sexes	Male	Female
Expectation of life at birth:		69.0	65.6	72.0
Infant deaths:		15,894	9,019	6,875
Infant mortality rate:		31.3	34.7	27.8
Median age:		23.4	22.8	24.0

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

Tabel C—1. North Korea: Reconstructed Trends in, and Projections for, Population and Vital Rates, 1960–2010

Year	Midyear population	Expon. growth rate (%)	Calendar year data						
			Births	CBR	Deaths	CDR	Net international Migrants	Rate	Growth rate (%)
1960	10568165.	2.634	413631.	39.14	177318.	16.78	49000.	4.64	2.700
1961	10850221.	2.636	423107.	39.00	167308.	15.42	23000.	2.12	2.570
1962	11140074.	2.808	461985.	41.47	164080.	14.73	3000.	.27	2.701
1963	11457292.	2.969	492422.	42.98	161891.	14.13	3000.	.26	2.911
1964	11802545.	3.082	512953.	43.46	158978.	13.47	3000.	.25	3.025
1965	12171985.	3.182	534438.	43.91	155532.	12.78	3000.	.25	3.138
1966	12565486.	3.268	555044.	44.17	152947.	12.17	3000.	.24	3.224
1967	12982958.	3.344	576891.	44.43	150043.	11.56	3000.	.23	3.311
1968	13424476.	3.421	600039.	44.70	146851.	10.94	0.	.00	3.376
1969	13891669.	3.509	624581.	44.96	143384.	10.32	0.	.00	3.464
1970	14387821.	3.370	650744.	45.23	139638.	9.71	0.	.00	3.552
1971	14880990.	3.028	611717.	41.11	136484.	9.17	0.	.00	3.194
1972	15338408.	2.704	570900.	37.22	131299.	8.56	0.	.00	2.866
1973	15758824.	2.390	527033.	33.44	125801.	7.98	0.	.00	2.546
1974	16139977.	2.084	481169.	29.81	120096.	7.44	0.	.00	2.237
1975	16479865.	1.851	432989.	26.27	114285.	6.93	0.	.00	1.934
1976	16787716.	1.748	408213.	24.32	111216.	6.62	0.	.00	1.769
1977	17083749.	1.716	404264.	23.66	109194.	6.39	0.	.00	1.727
1978	17378365.	1.726	403967.	23.24	107803.	6.20	0.	.00	1.704
1979	17682020.	1.778	415967.	23.52	106822.	6.04	0.	.00	1.748
1980	17999265.	1.736	451535.	23.98	106189.	5.90	0.	.00	1.808
1981	18314415.	1.673	411931.	22.49	106976.	5.84	0.	.00	1.665
1982	18623324.	1.689	420545.	22.58	107681.	5.78	0.	.00	1.680
1983	18940581.	1.708	430621.	22.74	108972.	5.75	0.	.00	1.698
1984	19266833.	1.725	441184.	22.90	110327.	5.73	0.	.00	1.717
1985	19601990.	1.731	451153.	23.02	111695.	5.70	0.	.00	1.732
1986	19944189.	1.728	457941.	22.96	113002.	5.67	0.	.00	1.730
1987	20291804.	1.748	464562.	22.89	114271.	5.63	0.	.00	1.726



Tabel C-1, (Continued)

Year	Midyear population	Expon. growth rate (%)	Calendar year data						Growth rate (%)
			Births	CBR	Deaths	CDR	Net international Migrants	Rate	
1988	20649584.	1.790	480976.	23.29	115707.	5.60	0.	.00	1.769
1989	21022586.	1.834	498049.	23.69	117314.	5.58	0.	.00	1.811
1990	21411618.	1.865	516276.	24.11	118947.	5.56	0.	.00	1.856
1991	21814655.	1.874	529782.	24.29	121037.	5.55	0.	.00	1.874
1992	22227302.	1.865	539592.	24.28	123044.	5.54	0.	.00	1.874
1993	22645810.	1.841	545439.	24.09	124972.	5.52	0.	.00	1.857
1994	23066571.	1.804	547870.	23.75	126814.	5.50	0.	.00	1.825
1995	23486548.	1.762	547478.	23.31	128580.	5.47	0.	.00	1.784
1996	23904122.	1.712	546536.	22.86	130286.	5.45	0.	.00	1.741
1997	24317002.	1.649	541493.	22.27	131985.	5.43	0.	.00	1.684
1998	24721312.	1.575	532765.	21.55	133655.	5.41	0.	.00	1.614
1999	25113682.	1.493	520944.	20.74	135314.	5.39	0.	.00	1.536
2000	25491317.	1.407	506611.	19.87	136973	5.37	0.	.00	1.450
2001	25852547.	1.323	492284.	19.04	139461.	5.39	0.	.00	1.365
2002	26196917.	1.244	477983.	18.25	142066.	5.42	0.	.00	1.282
2003	26524849.	1.172	464756.	17.52	144809.	5.46	0.	.00	1.206
2004	26837516.	1.108	453077.	16.88	147690.	5.50	0.	.00	1.138
2005	27136532.	1.054	443338.	16.34	150692.	5.55	0.	.00	1.078
2006	27424151.	1.009	436329.	15.91	153738.	5.61	0.	.00	1.030
2007	27702241.	.969	430531.	15.54	156942.	5.67	0.	.00	.988
2008	27971942.	.934	426129.	15.23	160314.	5.73	0.	.00	.950
2009	28234490.	.904	423121.	14.99	163841.	5.80	0.	.00	.918
2010	28491025.	.883	421275.	14.79	167486.	5.88	0.	.00	.891

Notes: Figures reflect computation process, and should not be construed to indicate actual limits of confidence.

Source: Reconstructed and projected at the Center for International Research, U.S. Bureau of the Census, from official DPRK data. Nicholas Eberstadt received permission from officials of Central Statistics Bureau to cite the statistics in this table, Pyongyang, May 25, 1990.

Table C-2. North Korea: Estimates and Projections of Mortality And Fertility, 1960-2010

Year	Expectation of life at birth			Infant mortality rate (per 1,000)			TFR
	Both Sexes	Male	Female	Both Sexes	Male	Female	
1960	48.97	45.99	52.08	95.0	106.6	82.7	5.3995
1961	49.93	46.92	53.03	91.1	102.2	79.5	5.3995
1962	50.91	47.89	54.00	87.3	97.7	76.4	5.8005
1963	51.92	48.89	55.00	83.5	93.2	73.3	6.0805
1964	52.97	49.92	56.03	79.6	88.6	70.1	6.2205
1965	54.04	50.98	57.09	75.7	84.1	67.0	6.3590
1966	55.00	51.92	58.05	72.1	80.0	63.7	6.4755
1967	55.99	52.89	59.04	68.4	76.0	60.5	6.5900
1968	57.01	53.89	60.06	64.7	71.9	57.2	6.7050
1969	58.06	54.92	61.11	61.0	67.8	53.9	6.8200
1970	59.14	55.98	62.19	57.3	63.7	50.6	6.9350
1971	59.91	56.71	62.97	54.8	61.1	48.2	6.3375
1972	60.70	57.47	63.77	52.3	58.6	45.7	5.7405
1973	61.50	58.24	64.59	49.8	56.0	43.2	5.1300
1974	62.32	59.04	65.43	47.2	53.4	40.7	4.5200
1975	63.17	59.85	66.29	44.7	50.9	38.3	3.9095
1976	63.71	60.39	66.80	43.7	49.4	37.6	3.5000
1977	64.25	60.94	67.33	42.6	48.0	37.0	3.3000
1978	64.81	61.51	67.86	41.6	46.6	36.4	3.1300
1979	65.38	62.08	68.41	40.5	45.1	35.7	3.0700
1980	65.96	62.66	68.97	39.5	43.7	35.1	3.0390
1981	66.25	62.95	69.25	38.7	42.8	34.4	2.8000
1982	66.54	63.24	69.54	37.9	41.9	33.6	2.7500
1983	66.83	63.53	69.83	37.1	41.0	32.9	2.7000
1984	67.13	63.82	70.13	36.2	40.1	32.2	2.6500
1985	67.43	64.12	70.42	35.4	39.2	31.5	2.6000
1986	67.74	64.42	70.72	34.6	38.3	30.7	2.5500
1987	68.04	64.72	71.03	33.8	37.4	30.0	2.5000
1988	68.35	65.02	71.33	33.0	36.5	29.3	2.5000
1989	68.66	65.33	71.64	32.2	35.6	28.5	2.5000
1990	68.98	65.64	71.96	31.3	34.7	27.8	2.5000
1991	69.24	65.90	72.22	30.4	33.7	26.9	2.4680
1992	69.50	66.16	72.48	29.5	32.8	26.1	2.4360
1993	69.76	66.42	72.75	28.6	31.8	25.3	2.4040
1994	70.03	66.69	73.02	27.7	30.8	24.4	2.3725
1995	70.30	66.96	73.29	26.8	29.8	23.6	2.3395
1996	70.57	67.23	73.57	25.9	28.9	22.7	2.3140
1997	70.85	67.50	73.85	25.0	27.9	21.9	2.2880
1998	71.13	67.78	74.13	24.1	26.9	21.1	2.2620
1999	71.41	68.07	74.42	23.1	25.9	20.2	2.2360
2000	71.69	68.36	74.71	22.2	24.9	19.4	2.2100
2001	71.89	68.56	74.92	21.7	24.4	18.9	2.1880
2002	72.09	68.76	75.12	21.2	23.8	18.4	2.1660
2003	72.28	68.96	75.33	20.6	23.2	17.9	2.1440
2004	72.49	69.17	75.54	20.1	22.6	17.4	2.1220
2005	72.69	69.38	75.75	19.6	22.0	17.0	2.0995
2006	72.90	69.59	75.97	19.0	21.4	16.5	2.0820
2007	73.10	69.81	76.19	18.5	20.9	16.0	2.0645
2008	73.32	70.02	76.41	17.9	20.3	15.5	2.0460
2009	73.53	70.24	76.63	17.4	19.7	15.0	2.0275
2010	73.75	70.46	76.86	16.9	19.1	14.5	2.0100

Notes: Figures reflect computation process, and should not be construed to indicate actual limits of confidence.

Source: Reconstructed and projected at the Center for International Research, U.S. Bureau of the Census, from official DPRK data. Nicholas Eberstadt received permission from officials of the Central Statistics Bureau to cite the statistics in this table, Pyongyang, May 25, 1990.

**Table D—1. North Korea, Detailed Estimates and Projections of Population in Labor Force Ages.  
1986—2010**

(In thousands)

Age group	1986	1990	1995	2000	2005	2010
15—19	2,766	2,532	1,944	2,036	2,279	2,589
20—24	2,184	2,658	2,521	1,936	2,029	2,271
25—29	1,906	2,042	2,643	2,507	1,926	2,019
30—34	1,479	1,875	2,027	2,625	2,492	1,915
35—39	1,161	1,381	1,857	2,009	2,604	2,472
40—54	954	1,101	1,361	1,833	1,985	2,574
45—49	808	901	1,076	1,333	1,798	1,950
50—54	682	758	869	1,041	1,293	1,747
55—59	518	620	716	825	992	1,237
60—64	393	450	568	661	765	926

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