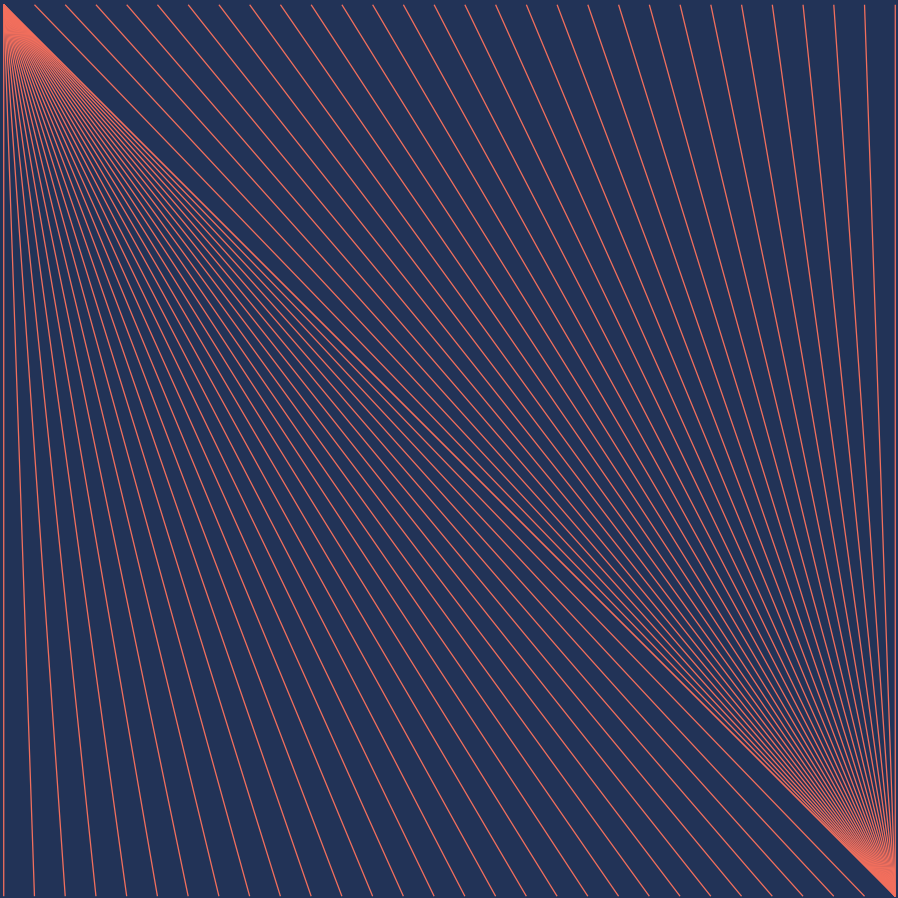


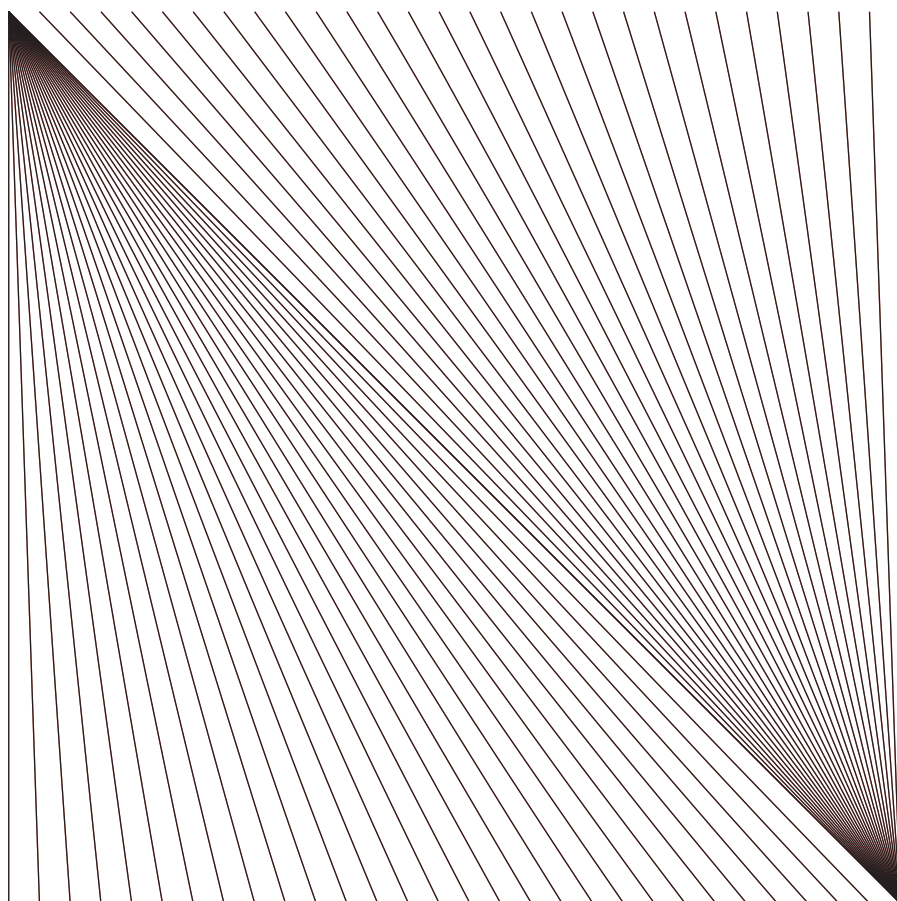
North Korea's Income-Population Puzzle

Jea Hwan Hong
Suk-Jin Kim



North Korea's Income-Population Puzzle

Jea Hwan Hong
Suk-Jin Kim



North Korea's Income-Population Puzzle

Printed	August 2021
Published	August 2021
Published by	Korea Institute for National Unification (KINU)
Publisher	Yu-hwan Koh, President
Editor	Yeowon Lim, Research Associate
Registration number	No.2-2361 (April 23, 1997)
Address	217 Banpo-daero(Banpo-dong), Seocho-gu, Seoul 06578, Korea
Telephone	(82-2) 2023-8208
Fax	(82-2) 2023-8298
Homepage	http://www.kinu.or.kr
Design	Seilfocus (82-2) 2275-6894
Print	Seilfocus (82-2) 2275-6894
ISBN	979-11-6589-045-2 93340 : Not for sale

Copyright © Korea Institute for National Unification, 2021

All KINU publications are available for purchase at all major bookstores in Korea.

Also available at the Government Printing Office Sales Center

Store (82-2) 734-6818; Office (82-2) 394-0337

North Korea's Income-Population Puzzle

This English translation is an abbreviated and edited version of Chapter 5 and some sections of Chapter 2 and 4 of Jea Hwan Hong et al., *Demographic Change in North Korea: Trends, Determinants, and Prospects* (Seoul: Korea Institute for National Unification, 2020). The analysis, comments, and opinions presented in this paper are those of the authors and do not necessarily represent the views of the Korea Institute for National Unification.

CONTENTS

⋮

1. Introduction	1
2. Data	5
3. Demographic Transition in North Korea	9
4. Factors Affecting Mortality	17
A. Economic Growth	19
B. Improvement in Public Health	26
5. Factors Affecting Fertility	31
A. Contraception and Abortion	34
B. North Korea's Military Service, Labor Policies, and Late Marriage Culture	40
C. North Korean Policies on Women, Education, and Labor, and the Preference for Fewer Children	43
6. Conclusion	49

1

Introduction

While North Korea is generally considered a low income country, its demographic trends and population structure seem to be rather similar to those of upper-middle income countries. Although most countries go through the typical demographic transition stages from “high death-high birth” to “low death-high birth,” and then to “low death-low birth” over a long period, North Korea has experienced a much more abrupt transition. As a result, North Korea had become an aging society by 2004 with more than 7% of the population being 65 or older, and it is predicted to become an aging society with more than 14% of the population being 65 or older by 2033.¹⁾ Compared to other low income countries that are predicted to become aging societies around 2060, North Korea is aging much more quickly.

Why are North Korea’s demographics exhibiting such an anomalous trend compared to other low income countries? The question is all the more salient considering that North Korea is the only low income country exhibiting such a trend. However, previous literature on North Korean demographics remains silent on the uniqueness of the North Korean case vis-à-vis universal trends.²⁾ In addition, North Korea shows other unique aspects not only in demographic changes but also in various dimensions so it is difficult to understand this phenomenon simply from a viewpoint of income level. Hence, this study seeks to expand our understanding of North Korean society by explicating its

¹⁾ Ji Young Choi, “An Analysis of Demographic Structural Change in North Korea and Its Implications,” *North Korean Studies Review*, vol. 20, no. 2 (2016), p. 13 (in Korean).

²⁾ For previous studies on North Korean demographics, see Hong et al., *Demographic Change in North Korea: Trends, Determinants, and Prospects*, pp. 29~33 and 145~146 (in Korean).

income-population puzzle.

This study specifically focuses on two perspectives. First, it approaches demographic change in North Korea from a long-term perspective considering that demographic change in general occurs in lengthy durations. Second, it seeks to understand the unique and universal features of demographic changes in North Korea in an integrated way, by undertaking a cross-country comparison.

2

Data

Generally, social science research values official national statistics as the most basic and important data. Hence, it is the norm to use the official demographic statistics published by the government when studying a country's population. However, official statistics from North Korea are very limited and inappropriate for a long-term comparative research. There are various alternative estimates published by external institutions, and this study uses the estimates included in the United Nation's 2019 World Population Prospects ("UN data" from here on).³⁾

The biggest advantage of using the UN data is that it is based on the most comprehensive and recently updated raw data. The UN data was compiled by utilizing the results from the North Korean censuses and surveys conducted since the 1990s, allowing a more reliable interpretation of the demographic trends in North Korea. Also, the data suits well with cross-country comparison; it provides the same demographic indicators for more than 200 countries around the world. The multiplicity of indicators is also an important reason for using the UN data. The UN data provides various indicators: total population, population growth rate, crude death and birth rate, total fertility rate, dependency ratio, and so on, allowing multifaceted analyses on the demographic trends and population structure. Finally, the UN data provides one of the lengthiest time series data available; it includes not only the data from 1950 up to the present but also the data on future prospects.

³⁾ UN, Department of Economic and Social Affairs, Population Division, World Population Prospects 2019, Online Edition, Rev. 1. (Accessed February 18, 2020)

Still, the UN data on North Korea's population is not without its limitations. Its pre-1990s data was derived from various post-1990s raw data, so it is increasingly less reliable as it goes back to the past period. For instance, the numbers of total population in the 1950s of the UN data are too much different from those often announced by the North Korean government and other studies. Compared to the indicators on South Korea from both the colonial period and the 1950s, the UN data shows clear signs of underestimation on both the crude death and birth rates in North Korea before the early 1960s.⁴⁾ Hence, in this study the use of the UN data is limited to those from 1965 and onwards, which are similar to other alternative estimates and North Korean official data.

⁴⁾ For more details, see Hong et al., *Demographic Change in North Korea: Trends, Determinants, and Prospects*, pp. 51~58 (in Korean).

3

Demographic Transition in North Korea

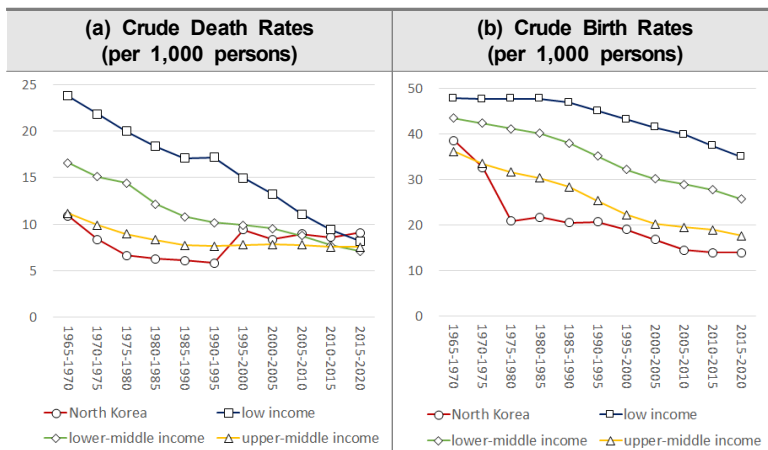
Generally, demographic changes can be understood as the transition from a traditional “high death-high birth” to a modern “low death-low birth” stage. The change takes place through four stages. In the first stage, both death and birth rates are high, and the population size remains fairly constant. In the second stage, death rates, especially infant mortality rate, decline while birth rates remain high; the result is rapid population growth. In the third stage, birth rates begin to fall slowing down the population growth. In the final stage, both birth and death rates remain low stabilizing the population.

Countries generally follow this standard trend, and so did North Korea throughout the 20th Century. However, North Korea exhibited uniqueness in terms of the range and speed of demographic change.

<Figure III-1> compares the crude birth and death rates in North Korea and developing country groups by income level. According to the World Bank’s country classifications by income level, North Korea is considered a low income country. However, its demographic trends have been much more similar to those of the upper-middle income group; its crude birth rate declined sharply in the 1970s and remains lower than the average of upper-middle income countries. While most low income countries are going through the second stage or just entering the third stage, North Korea had entered the fourth stage by the early 2000s. Considering the general correlation between income levels and stages of demographic transition, the North Korean situation is a striking anomaly.⁵⁾

⁵⁾ S. Amer Ahmed, Marcio Cruz, Bryce Quillin, and Philip Schellekens, “Demographic Change and Development: A Global Typology,” Policy Research Working Paper

Figure III-1 Crude Birth and Death Rates in North Korea and Developing Countries



Source: UN, Department of Economic and Social Affairs, Population Division, World Population Prospects 2019, Online Edition, Rev. 1.

<<https://population.un.org/wpp/Download/Standard/Population/>> (Accessed February 18, 2020)

Notes: 1) The figure shows the crude birth and death rates in North Korea, 30 low income countries, 47 lower-middle income countries, and 54 upper-middle income countries. The values for each income group are averages of those of the countries concerned. 2) Data on North Korea is excluded from the average for low income group.

North Korea's uniqueness is also evident in the new global typology of demographic change. A recent research from the World Bank classified countries into four distinct categories: Pre-dividend, Early-dividend, Late-dividend, and Post-dividend, based on the concept of demographic dividends.⁶⁾ Of all the low-income countries, North Korea was found to be the only

7893, World Bank (2016), p. 13.

⁶⁾ Demographic dividend is the economic growth potential that can result from shifts in a population's age structure. The first dividend may be realized thanks to the increase in the proportion of working age population (15~64) through the early stages. The second dividend arises because there is scope for economies to potentially save and invest more in both physical and human capital in the later stages of transition.

‘Late-dividend’ country.⁷⁾

Why does North Korea exhibit such dissonance between income level and demographic change? In other words, why does it present the income-population puzzle? Before delving into the puzzle, we must first question whether we underestimate economic recovery North Korea has experienced since the so called ‘Arduous March’ in the mid-to-late 1990s and whether it is the main source of the income-population puzzle.

North Korean real GDP per capita in 2019 rose just by 4.7% from 1998 when the North Korean economy was the worst, according to the calculation by dividing the Bank of Korea’s North Korean GDP estimates by the UN population data. Even in 2016 when the North Korean economy was at its peak, it was only 14.3% higher than in 1998 and about the same as that in 1995. In other words, according to the Bank of Korea’s estimates, North Korea’s income level has stagnated for two decades since the Arduous March.

However, this does not match most other data we come across elsewhere. For instance, according to the surveys sponsored by UN agencies, North Korean living standards have recovered substantially since the early 2000s and may even have risen above other low income countries. The nutritional status of North Korean children has been shown to have improved up until 2017, when it may even be better than the average of lower-middle income countries.⁸⁾ Also, in a comparative study on household wealth, North Korea’s

⁷⁾ S. Amer Ahmed, Marcio Cruz, Bryce Quillin, and Philip Schellekens, “Demographic Change and Development: A Global Typology,” p. 36.

⁸⁾ See Jea Hwan Hong, Suk-Jin Kim, and Eun Mee Jeong, *North Korean People’s Lives and Cooperation Plan* (Seoul: Korea Institute for National Unification, 2018), p. 73 (in Korean).

wealth index in 2017 appears to be higher than those of most low income countries and near at the median level of lower-middle income countries.⁹⁾ Although these results may be somewhat overstated considering the lower reliability of household surveys in North Korea, they suggest that North Korea today may not be one of the poorest among the poor countries in the world. Also, some studies suggest that the Bank of Korea's estimates have somewhat underestimated North Korea's growth rates since the early-to-mid 2000s by excluding a rising informal sector and underestimating the increase in coal production.¹⁰⁾ As such, North Korea's economic recovery is likely to have been more positive than suggested by the Bank of Korea's estimates.

Still, alternative estimates do not necessarily point to a substantially higher real GDP per capita. Most experts believe North Korea has not escaped from low income status especially because the recovery of the state-run manufacturing sector seems to have been sluggish. In other words, while North Korea's income level may be somewhat higher than it is commonly thought, the correction of the result is not likely to solve the income-population puzzle. North Korea's unique demographic trends should be

⁹⁾ See Suk-Jin Kim and Jea Hwan Hong, *North Korean Living Standards in a Comparative Perspective* (Seoul: Korea Institute for National Unification, 2019), p. 16 (in Korean).

¹⁰⁾ Jea Hwan Hong, *North Korean Economy in the Kim Jong-un Regime* (Seoul: KINU, 2017), pp. 26~29 (in Korean); Un Cheol Yang and Hyoungsoo Zang, "Evaluating the Bank of Korea's Estimation of North Korean Economic Growth," *Sejong Policy Studies*, vol. 21 (2017), pp. 17~18 (in Korean); Byung-Yeon Kim, "North Korean Economy under the Kim Jong-un Regime," in *North Korea Today II*, ed. Young-kwan Yoon (Seoul: Neulpoom Plus, 2019), pp. 90~97 (in Korean); Suk-Jin Kim, "Recent Research on the North Korean Economy: A Review Essay," *Journal of Peace and Unification Studies*, vol. 11, no. 1 (2019), pp. 41~44 (in Korean).

understood as a result of the interactions of various factors under its particular historical context. In sections 4 and 5, we will explore the sources of the income-population dissonance in North Korea by examining the determinants of mortality and fertility.

4

Factors Affecting Mortality

Globally, economic growth and improved healthcare have contributed significantly to the decline in death rates, especially in the infant mortality rate of the 20th Century. First, modern economic growth has led to the increase in income and food supply, driving the improvements in living standards, especially in nutrition. In addition, improved healthcare systems, the development of vaccines, and new methods of treatment have dramatically decreased the number of epidemic deaths.

Compared to other low income countries, North Korea exhibits unique trends on such factors. Here, we discuss what these trends are and how they relate to the income-population puzzle.

A. Economic Growth

1) Income Level

As stated above, North Korea today is commonly classified as a low income country. However, North Korea once enjoyed its heyday when its economic performance was relatively good and its income level much higher. It achieved rapid growth by sharply increasing the inputs of labor and capital in the early days, but failed to improve productivity continuously, which led to growth slowdown later.¹¹⁾ Its early growth was attributed to the socialist regime's resource mobilization strategy. As a result, North Korea's development level seems to have been near at the global median until the 1970s.

In global comparison of income and growth, the real income per capita data (in terms of purchasing power parity) provided by the Maddison Historical Statistics (MHS) is widely used. In this

¹¹⁾ See Suk-Jin Kim, "Economic Growth and Crisis in North Korea: Past Performances and Future Prospects," Ph.D. dissertation in Economics, Seoul National University, 2002, pp. 146~173 (in Korean).

study, we also compare the long-term income trajectories in North Korea and other countries, using the data of 145 countries included in the 2018 edition of MHS. But, as for North Korea we refer to a different data series derived from recent studies on the North Korean economy because the 2018 edition of the MHS is judged to have significantly underestimated North Korea's past income levels.¹²⁾

MHS suggests that North Korea's 1955 income per capita was around half (51.5%) of South Korea's. However, considering various information, the income per capita for the two countries right after the Korean War should be similar.¹³⁾ Hence, this study assumes that North Korea's income per capita in 1955 was the same as South Korea's offered in the MHS. It also refers to Cho and Kim (2020) for annual growth rates from 1956 to 1989¹⁴⁾ and to Kim (2017) from 1990 to 2013 to calculate the annual income per capita.¹⁵⁾

¹²⁾ MHS Data is from the Groningen Growth Development Centre Website, <<http://www.rug.nl/ggdc/historicaldevelopment/maddison>>. This study refers to all countries whose data is available from 1960 to 2010. The 2020 edition of the Madison Statistics has removed all North Korean data before 1990 and only contains data for the post-1990 period.

¹³⁾ Suk-Jin Kim, "Economic Growth and Crisis in North Korea: Past Performances and Future Prospects," p. 57 (in Korean).

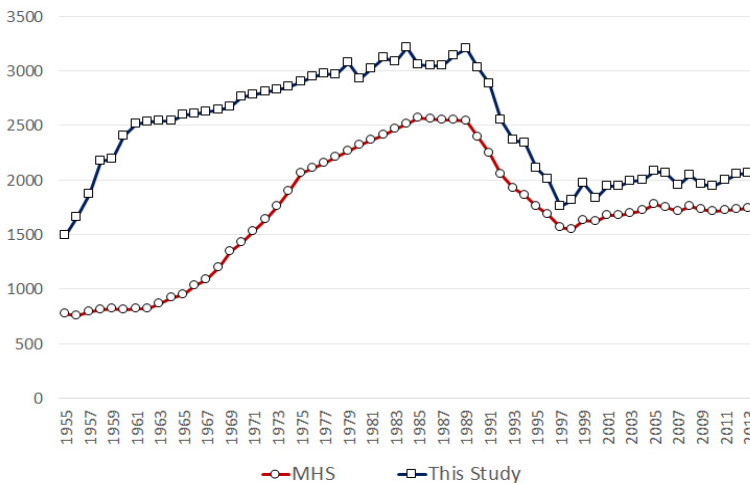
¹⁴⁾ Taehyoung Cho and Minjung Kim, "Estimating Long-term Economic Growth in North Korea, 1956-1989," *BOK Economic Analysis*, no. 2020-17 (Bank of Korea, July 2020), pp. 1~61 (in Korean). The estimates of this new study are not much different from those of previous studies. See also Byung-Yeon Kim, Suk Jin Kim, and Keun Lee, "Assessing the Economic Performance of North Korea, 1954-1989: Estimates and Growth Accounting Analysis," *Journal of Comparative Economics*, vol. 35, no. 3 (2007), pp. 564~582; Suk-Jin Kim, "Economic Growth and Crisis in North Korea: Past Performances and Future Prospects," pp. 20~41.

¹⁵⁾ Byung-Yeon Kim, *Unveiling the North Korean Economy: Collapse and Transition* (New York: Cambridge University Press, 2017), pp. 74~78 (in Korean). Kim's estimates for 1990~2013 are not much different from those of the Bank of Korea.

<Figure IV-1> shows the calculated estimates for real income per capita of North Korea based on the purchasing power parity for the year 2011 along with MHS's estimates. Some features of the figures are worth mentioning. First, according to this study's estimates, North Korea's income per capita has increased quickly in the 1950s, slowed down from the 1960s to 1980s, tumbled in the 1990s, and only recovered slightly even after the 2000s. Second, North Korea's income level seems to have been much higher over the whole period compared to the MHS estimates. Third, while the estimates of this study show a dramatic increase in the 1950s and a slowdown in the 1960s, the MHS estimates illustrate a dramatic increase from the mid-1960s to the mid-1970s. As described in detail in Cho and Kim (2020), the trend shown in this study is likely a better representation of the North Korean economy.

Figure IV-1 North Korea's Income Per Capita, 1955-2013

(Unit: 2011 \$, PPP)



Source: MHS data is from the Groningen Growth Development Centre website.

<<http://www.rug.nl/ggdc/historicaldevelopment/maddison>> (Accessed April 24, 2020).

For this study's data, see the description in the text.

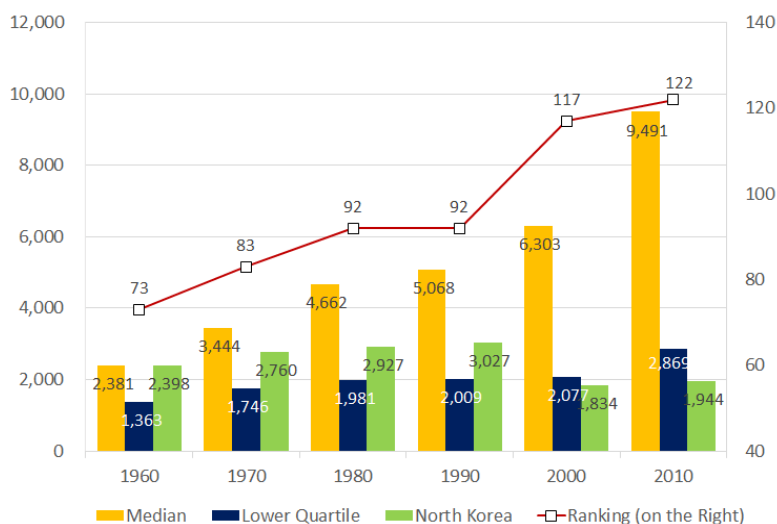
<Figure IV-2> represents the relative position of North Korean income level in the world from 1960 to 2010. North Korea was ranked 117th in 2000 and 122nd in 2010 out of 146 countries. While North Korea's economic recovery since the early 2000s seems to be somewhat underestimated as stated in section 3, even after correcting the possible error, the fact that North Korea these days remains in low-income status does not change.¹⁶⁾ On the other hand, looking at the period before 1990, North Korea's rankings had continued to be much higher than in the 2000s; it was ranked 73rd in 1960, 83rd in 1970, and 92nd in 1980. Its income per capita seems to have been not much different from the global median until the early 1970s, and much higher than the lower quartile until the early 1990s.

In summary, North Korea can be said to have been at least a lower-middle income status until the early 1990s when its economy began to fall into the severe crisis. As such, its much higher income compared to traditional societies may have led to the rapid decline in death rates fostering demographic transition. The higher income may also have led to the lower birth rates. Generally, societies with a higher income have a lower number of children per household and higher spending on education per child. In other words, such societies choose the quality over the quantity of children, lowering the birth rates.

¹⁶⁾ As stated in Suk Jin Kim, "Recent Research on the North Korean Economy: A Review Essay" (2019), even when North Korea's post-2005 annual growth rates were about 2 percentage points higher than the Bank of Korea's estimates, North Korea's ranking in 2010 was 119th, marking only a three-step increase.

Figure IV-2 Comparison of Per Capita Income: North Korea and 145 Countries

(Unit: 2011 US\$ (PPP), rank order)



Source: The Groningen Growth Development Centre website.

<<http://www.rug.nl/ggdc/historicaldevelopment/maddison>> (Accessed Apr 24, 2020).

North Korean data is this study's estimates in <Figure IV-1>.

Note: For more details, see the description in the text.

2) Food Supply

Food supply is one of the most basic factors affecting demographic changes. As societies go through the second to the third stage of demographic transition, food supply must increase to feed rapidly growing population.

Since North Korea pursued food self-sufficiency, most of its food supply was self-produced, and imports were limited. Though there is no reliable official data, the best estimates available can help you roughly understand the long-term trends of crop production. North Korea appears to have succeeded in significantly

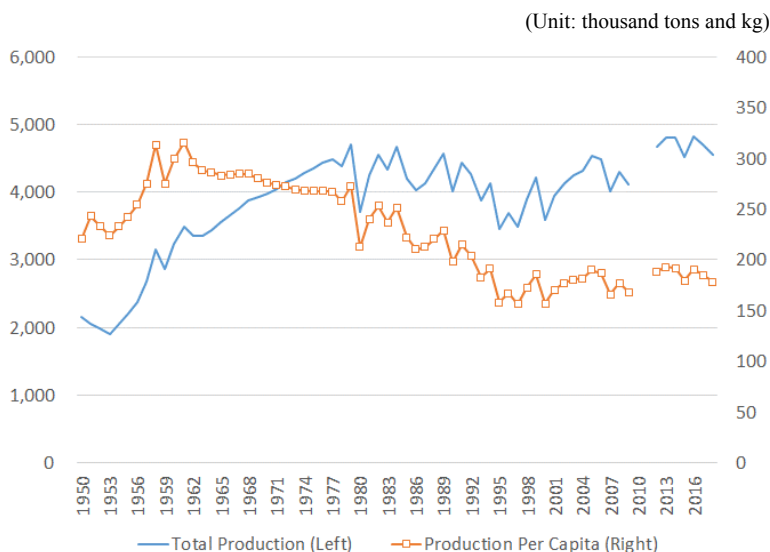
increasing its crop production from the early 1950s to the mid-1970s as shown in <Figure IV-3>, which is based on the estimates from its official sources from 1950 to 1960 and from a South Korean government agency from 1961 to 2018. Until the 1970s, the crop production increased rapidly, while the increase in population led to a drop in per capita production after the early 1960s. As the drop was not significant until the mid-1970s, North Korea was able to cope with the growing population.

However, the situation has dramatically changed since the late 1970s. Crop production per capita has fallen sharply as total production has stagnated or decreased. Therefore, North Korea has increasingly depended on external sources of food (i.e. imports and foreign aid), and the volatile inflow has severely influenced the food situation.¹⁷⁾ Crop production has somewhat recovered since the 2000s, but population growth has stalled the crop production per capita.¹⁸⁾ In short, the food situation in the 1960s and the 1970s was much better than today, so it was possible to feed the growing population. In a similar vein, the worsening situation since the mid-1970s has likely pressured the North Korean authorities to pursue population control policies.

¹⁷⁾ This study focuses on the general trends in demographic change and related food supply, excluding the specifics of the inflow of food resources. It also excludes the discussion on the production of other edible agricultural and marine products. For more details, see Sung Wook Nam, "Grain Shortage and Population Trends in North Korea, 1961~1998," *Studies on Modern North Korea*, vol. 2, no.1 (1999), pp. 219~272 (in Korean); Suk Lee, "Food Production, Ration, Trade, and Consumption in the DPRK in the 1980s: the Origin of the Food Crisis," *Studies on Modern North Korea*, vol. 7, no. 1 (2004), pp. 41~86 (in Korean).

¹⁸⁾ Considering that production of some crops and other food items in private plots not recorded in the statistics has increased since the late 1990s, it seems that the actual food situation has improved, and it is much better than the crop production per capita figures suggest.

Figure IV-3 Crop Production Estimates (milled equivalents) in North Korea, 1950~2018



Source: The crop production data from 1950 to 1960 is estimates from North Korean official sources, see Suk-Jin Kim, “Economic Growth and Crisis in North Korea: Past Performances and Future Prospects,” pp. 30~32 and p. 322; for the data from 1961 to 1997, see Statistics Korea, *Fifty Years of Socioeconomic Change in Korea* (Statistics Korea, 1998), p. 311 and for the data from 1998 to 2018, see Statistics Korea, North Korea Statistics Portal <<http://kosis.kr/bukhan>> (Accessed Sept 16, 2020). Total population data from 1950 to 1964, see Statistics Korea, *Fifty Years of Socioeconomic Change in Korea*, p. 295 and the data from 1965 to 2018 is from the UN data.

Notes: (1) The crop production data is milled equivalent estimates. (2) The data after 1961 is estimates from Rural Development Administration of South Korean government (the data from 2010 to 2011 is missing).

Given this radical reversal of its economic trends, North Korea’s income-population puzzle might be much simpler than initially estimated. Significant decline in income and food supply following the economic crisis of the 1990s seems to be an important cause. At a closer look, however, questions still remain. For instance, the child mortality and total fertility rates in North Korea in the 1970s

were much lower than those in countries with similar income level. This implies that the puzzle cannot be explained simply by the fact that North Korea enjoyed a relatively higher income in the past.

B. Improvement in Public Health

1) Adopting a Socialist Healthcare System

The current socialist healthcare system in North Korea is a wreck. Officially, the North Korean government claims to offer free health services. However, in reality, patients have paid some out-of-pocket expenses. The free healthcare system, however, was in effect and operating before the economic crisis. The system seems to have offered fairly good health services compared to the income level of the time, contributing to the rapid demographic transition.

Past socialist regimes offered free health services along with free education and housing.¹⁹⁾ All medical workers were employed by the state, and hospitals and other medical facilities were all state-owned. North Korea's healthcare system, too, has these socialist traits. North Korea introduced a free healthcare system in 1946, expanding the eligibility to include almost all citizens by 1958.

While the adoption of the system is important in and of itself, its effectiveness is also crucial. While the lack of data limits accurate evaluation, North Korea's healthcare system seems to have worked to a certain extent prior to the crisis according to the testimonies of many defectors. North Korea assigned doctors to

¹⁹⁾ Jong Hwa Byun, Inhwa Park, Mi Kyoung Seo, and Man Cheol Kim, *Comparative Study on the Healthcare Institutions of South and North Korea* (Seoul: Korea Institute for Health and Social Affairs, 1993), p. 9 (in Korean).

regions that were divided into zones, in which they provided medical services, such as treatment, disinfection, vaccination, and check-up to residents, and offered much strengthened preventive care, which operated properly up until the 1980s. As a result, North Koreans were able to enjoy relatively good services, and this has likely lowered the death rate very rapidly and accelerated demographic changes.

2) *Early Introduction of Modern Medical Technology*

The demographic transition in South Korea has also been very rapid compared to countries at similar development level. In this sense, solving North Korea's income-population puzzle requires a review of the historical context and cultural features that the two Koreas share. Of these, the early introduction of modern medical technology deserves a special attention.

<Figure IV-4> shows crude death rates in the two Koreas from the 1920s. It is noteworthy that similar downward trends appeared in both countries until the 1990s.²⁰⁾ A few studies set the 1920s as the starting point of the mortality decline in Korea. But they have limitations in that they only examine the trends since the 1910s.²¹⁾ A study that used existing family trees to examine a broader range of time claimed that the decline began in the late 19th century.²²⁾

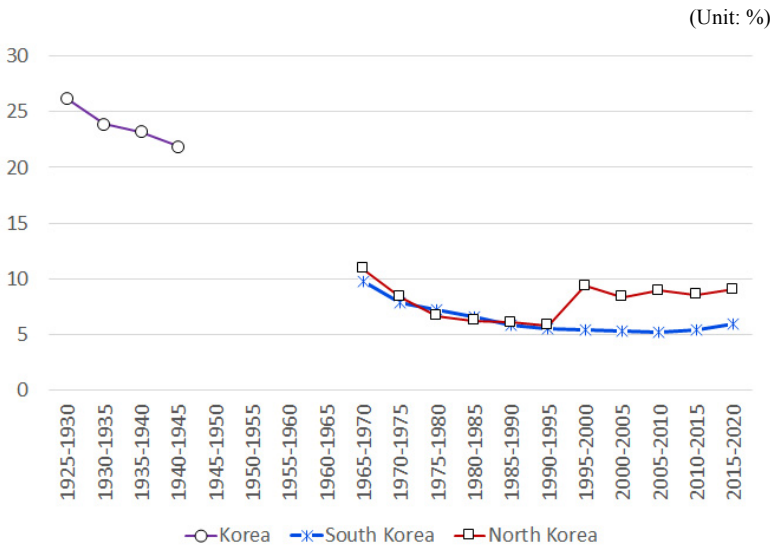
²⁰⁾ It shows data from 1925 because censuses have taken place every 5 years after this period, providing sufficient reliability.

²¹⁾ Tu-sop Kim, "Demographic Change in the Korean Peninsula 1910-1990: Comparing South and North Korea," *The Korean Journal of Unification Affairs*, vol. 5, no. 4 (1993), p. 208 (in Korean); Tae Hwan Kwon and Tu-sop Kim, *Understanding Demographics* (Seoul: Seoul National University Press, 2002), p. 249 (in Korean).

²²⁾ Hui Jin Park and Myeong Su Cha, "Demographic Trends in Late Dynastic and

It argued that the introduction of vaccines, other modern medicines, and hygiene after the opening of ports had led to fewer deaths.²³⁾

Figure IV-4 Crude Death Rates in South and North Korea



Source: Pre-1945 data is from Nak Nyeon Kim et al., *Long Range Statistics on South Korea I*, p. 93. Post-1950 data is from UN, Department of Economic and Social Affairs, Population Division, *World Population Prospects 2019*, Online Edition, Rev. 1. <<https://population.un.org/wpp/Download/Standard/Population>> (Accessed Feb 18, 2020)

These studies suggest the demographic transition in Korea (before the division) began much earlier than in other developing countries whose mortality decline is known to have begun generally around the 1930s and 1940s.²⁴⁾ The disparity means that

Colonial Korea: Evidence from Two Genealogies,” *Review of Economic History*, vol. 35 (2003), pp. 16~18 (in Korean).

²³⁾ Ibid., p. 18.

²⁴⁾ David S. Reher, “The Demographic Transition Revisited as a Global Process,”

Korea adopted modern medical technology earlier and/or used it more effectively compared to other countries.

It is also important that the adoption led to the decline in birth rates as well as in death rates. It is because lower infant mortality leads to lower birth rates. Demographers argue parents give birth to children considering the desired number of surviving children, so fewer infant deaths result in fewer births.

Population, Space, and Place, vol. 10, no. 1 (January/February 2004), p. 23.

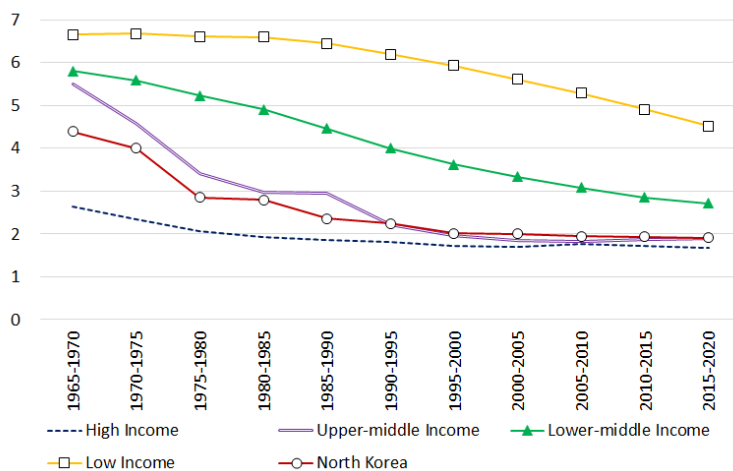
5

Factors Affecting Fertility

Solving North Korea's income-population puzzle requires examining the factors affecting fertility as well as mortality. As seen in <Figure III-1-(b)>, the crude birth rate in North Korea fell much earlier than in other developing countries, and this has led to a rapid demographic change. To understand why the rate fell, we need to look at another important indicator: "total fertility rate." Total fertility rate refers to "the average number of children that would be born to a woman over her lifetime." <Figure V-1> shows that North Korea's total fertility rate was much lower than those of other developing countries from early on, and it declined further in the 1970s and 1980s, stabilizing at the level of upper-middle and high income countries by the 1990s.

Figure V-1 Total Fertility Rates in North Korea and Country Groups

(Unit: persons)



Source: UN, Department of Economic and Social Affairs, Population Division, World Population Prospects 2019, Online Edition, Rev. 1.

<<https://population.un.org/wpp/Download/Standard/Population>> (Accessed Feb 18, 2020).

Why did the total fertility rate in North Korea fall earlier and faster than in other developing countries? As with death rates, birth rates are strongly influenced by social and economic developments. Once developments (i.e. better education and health, higher income, women's empowerment, urbanization, cultural modernization, etc.) take place, social norms and values change, increasing the proportion of late marriage and non-marriage as well as the likelihood of having fewer children and maintaining a nuclear family. Consequently, individual's motivation for contraception and abortion increases along with changing social attitudes towards the use of these means.

Population policies also lead to declining birth rates. Population policies carried out by governments shift social norms towards having fewer children and foster the dissemination of modern contraceptive methods, helping to prevent unwanted pregnancies. Allowing abortion was another path taken by many countries resulting in decline of birth rates although it is not usually a component of formal policies.

How did such factors affect North Korea's fertility? The factors can be classified into two categories: technical means of controlling childbirth and socioeconomic factors.

A. Contraception and Abortion

Throughout the 1970s and 1980s, population control policies such as public campaigns, dissemination of modern contraceptive methods, promotion of late marriages, and allowing abortions, encouraged people to have fewer children in North Korea. The most important of these was probably the use of modern contraceptive

methods followed by the tolerance towards abortion.

1) *Contraception*

With socioeconomic development and family planning campaigns that foster new norms and values, women, and couples more broadly, desire fewer children, increasing their reliance on contraception or abortion.

Contraception is one of the most important means for having fewer children. Effective contraception is also essential in that it reduces the need for abortion, a much more burdensome way. Therefore, the spread of modern contraceptive methods allowing more effective birth control has been the centerpiece of population policies across developing countries since the 1970s.

According to testimonies of officials and defectors, North Korea began to disseminate modern contraceptive methods as national policies and social norms shifted from encouraging to controlling births in the 1970s. According to Director Sun-won Hong at North Korea's Demographic Research Institute, "the government has set up maternal counseling centers in obstetric hospitals, providing intrauterine devices (IUD), condoms and oral contraceptive pills for free."²⁵⁾ Also, according to female defectors, the IUD insertion procedure has been performed widely in obstetric hospitals since the mid-1970s.²⁶⁾ However, women often had to buy imported

²⁵⁾ Ho-Il Moon, "North Korean Population: Policies and Prospects," *KDI Review of the North Korean Economy*, vol. 5 (May 2002), p. 70 (in Korean).

²⁶⁾ Young-Sun Kim, "Reproduction Policy and Gender Culture Politics in North Korea in the 1960s and 1970s," *Women and History*, vol. 21 (2014), pp. 200~203 (in Korean).

IUDs made in China from local markets called *Jangmadang* and brought them to the hospitals. This suggests that although the government encouraged contraception and provided related services, it was basically a personal choice.²⁷⁾

According to reproductive health surveys sponsored by the United Nations Population Fund (UNFPA) since the early 1990s, the contraceptive use in North Korea was already more prevalent in the early 1990s than in most developing countries.²⁸⁾ Considering this, its contraceptive prevalence is likely to have also been relatively high in the 1970s and 1980s.

North Korea's contraceptive prevalence has risen even further since the early 1990s. North Korea's population policy officially shifted back to encouraging childbirths during the 1990s, but the government seems to have been passive in pursuing a new policy. Considering the totalitarian nature of its socialist system, North Korea would have succeeded in reducing the contraceptive use if it really wanted to. However, the contraceptive use continued to rise, showing that the government did not strongly infringe on personal choices over childbirths.

One of the critical issues with North Korea's contraceptive use is that the portion of IUD use has been overwhelmingly high. IUD use is the most out-of-date method with adverse side effects such as pain and infection, and thus is usually avoided in developed countries. Though IUDs are widely used in other developing countries like China and Vietnam, their prevalence is usually much

²⁷⁾ Ibid., pp. 200–203.

²⁸⁾ United Nations, Department of Economic and Social Affairs, Population Division, World Contraceptive Use 2020 Database, <<https://www.un.org/en/development/desa/population/publications/dataset/contraception/wcu2020.asp>> (Accessed July 15, 2020).

lower than in North Korea. The high IUD dependence also suggests that the burden of contraception is almost entirely on women, which is an undesirable situation that needs to be corrected.

2) *Abortion*

According to previous studies on North Korea's population policies, abortion was legalized in 1983 in an effort to control population growth, and then banned again in 1993 due to the policy shift to encouraging childbirths.²⁹⁾ However, according to Director Hong's testimony, abortion was already allowed to a limited extent in 1973, as its social demand increased.³⁰⁾ Ae-ran Lee, a North Korean defector and researcher, also testified that abortion was generally allowed in the early 1970s.³¹⁾ These

²⁹⁾ Sam-Sik Lee, Na-Mi Hwang, Sang-Young Lee, and In-Cheol Shin, *Population Prospects and Policies from the Perspective of Inter-Korean Integration* (Seoul: Korea Institute for Health and Social Affairs, 2005), pp. 133~134 (in Korean); Sam-Sik Lee, Su-Jeong Son, Hwa-Jong Baek, and Nam-Hoon Cho, *Demographic Change in South and North Korea and Population Policy Tasks in Case of Unification* (Seoul: Korea Institute for Health and Social Affairs, 1999), p. 61 (in Korean); Sam-Sik Lee, "Demographic Change in North Korea and Policy Implications for Health and Welfare," *Health and Welfare Forum*, vol. 132 (2007), p. 38 (in Korean); Tu-sop Kim, Min-ja Choi, Kwang-Hee Jeon, Sam-Sik Lee, and Hyoung-Seok Kim, *Demographics and Population Census in North Korea* (Daejeon: Statistics Korea, 2011), pp. 253~255 (in Korean); Na-Mi Hwang, Sam-Sik Lee, and Sang-Young Lee, *The Status of Health, Childbirth, and Child Rearing of North Korean People* (Seoul: Korea Institute for Health and Social Affairs, 2012), p. 35; Keong-Suk Park, *North Korean Society and its Refracted Modernity: Population, State, and the Lives of the People* (Seoul: Seoul National University Press, 2013), pp. 125~130 (in Korean).

³⁰⁾ Ho-Il Moon, "North Korean Population: Policies and Prospects," *KDI Review of the North Korean Economy*, vol. 5 (May 2002), pp. 70~71 (in Korean).

³¹⁾ Ae-Ran Lee, "North Korea's Pronatalist Policies and Illegal Abortions: Women

testimonies indicate that policies on abortion seem to have become generous during the 1970s as social values and norms shifted towards preferring fewer children. Also, according to many female defectors, abortion surgeries have taken place covertly across hospitals and at the homes of doctors or pregnant women even after the government's stance has shifted in the 1990s.³²⁾ This shows how the ban on abortion has not been enforced strictly.

Then, how frequently did abortions take place in North Korea? According to the 2002 Reproductive Health Survey and the 2014 Socio-economic, Demographic and Health Survey funded by the UNFPA, the proportion of women undertaking abortion in North Korea seems to have been much lower than the global average. This may have been partly due to the anti-abortion policy enforced since the mid-1990s, but more would have to do with late marriages, infrequent sexual intercourse, and widespread contraceptive use. The findings may also underestimate the abortion rate as there exists a possibility that North Korean women may not have replied honestly to the surveys. While lacking sufficient sample size and representativeness, one survey on defector women implies that North Korea's abortion rate may be much higher than what the two official surveys illustrate, but still lower than the global average.³³⁾

as Reproductive Tools, Women's Rights Abuse, and Illegal Abortion in North Korea," *North Korea Monthly*, vol. 7 (2008), pp. 165~167 (in Korean).

³²⁾ Na-Mi Hwang, Sam-Sik Lee, and Sang-Young Lee, *The Status of Health, Childbirth and Child Rearing of North Korean People* (Seoul: Korea Institute for Health and Social Affairs, 2012), p. 35 (in Korean); Heeyoung Shin et al., *White Paper on North Korean Healthcare: 2019 Edition* (Seoul: Korea Foundation for International Healthcare, 2019), p. 67 and 105 (in Korean).

³³⁾ Joanna Hosaniak, *Status of Women's Rights in the Context of Socioeconomic Changes in the DPRK* (Seoul: Citizen's Alliance for North Korean Human Rights, 2013), p. 35.

As with the case of contraception, North Korea's abortion practices are problematic. The most commonplace method is a surgery commonly called 'curettage,' which is an outdated and less safe method. Moreover, after abortion was banned in the mid-1990s, abortion surgeries have often taken place at unsafe or less safe places like homes of doctors or patients, threatening the lives of women.

In summary, in the 1970s and 80s North Korea carried out population control policies (family-planning campaigns and dissemination of modern contraceptive methods) that the international community recommended to developing countries, and also tolerated abortions, which seemed to have contributed to lower birth rates. While North Korea shifted its population policies to encouraging childbirths in the mid-1990s, these policies seem to have not been enforced strongly and the social norms on contraception and abortion remained. Also, North Korea did not pursue heavy-handed policies that severely infringe upon women's rights like China's one child policy or socialist Romania's anti-abortion policy.

In conclusion, while North Korea has been a socialist country with strong government power, it has carried out relatively reasonable and moderate population policies, not deviating much from common practices in developing countries. This implies that North Korea's early and rapid fall in birth rates cannot be explained simply by its population policies. In the next section, we discuss socioeconomic context which, together with policies, has contributed to fewer childbirths.

B. North Korea's Military Service, Labor Policies, and Late Marriage Culture

Other basic, sometimes more important factors that determine birth rates are the social preferences, norms, and values on childbirth, marriage, and family. Such cultural factors are historically constituted by the regional, religious, and economic conditions and change along with socioeconomic developments. However, they sometimes can change abruptly through social policies implemented by the government.

1) Age of First Childbirth and Marriage

A woman's age at which she gives her first childbirth affects birth rates. The younger the mother, the more children she is expected to have over the course of her life. While the North Korean data is unavailable, various information points to the conclusion that the average age at first birth in North Korea has been one of the highest among developing countries.

One important factor in determining a woman's age at first childbirth is the age of marriage or cohabitation. The earlier a woman gets married or lives together with a man, the younger her age of giving first birth. The 2008 census data on North Korean women's first marriages shows a long-term, steadily increasing trend as exhibited in <Table V-1>. The data shows that women in their 80s (born in the 1920s) got married usually in their teens or at the latest in their early 20s. However, women in their 70s (born in the 1930s) married more often in their 20s and those in their 50s (born in the 1950s) later than that. In North Korea the trend of

later marriages began already in the 1950s and had stabilized by the 1970s.

Table V-1 Age at First Marriage among Married Women in North Korea (2008 Census)

(Unit: %)

Age in 2008	Age at First Marriage				
	Under 20	21-24	25-29	30-34	34
30-39	1.2	37.5	54.5	6.3	0.5
40-49	1.4	45.3	49.9	2.9	0.6
50-59	3.2	43.0	51.8	1.8	0.2
60-69	10.7	60.3	27.8	1.0	0.2
70-79	33.7	54.2	11.1	0.8	0.2
Over 80	64.9	30.6	3.9	0.4	0.1

Data: Central Bureau of Statistics, DPRK, DPR Korea 2008 Population Census: National Report (Pyongyang: Central Bureau of Statistics, DPRK, 2009), pp. 60~61

2) Military Service System and Women's Economic Activities

One factor that led to the late marriage culture was North Korea's military service system. According to Helen-Louise Hunter, a former CIA North Korea Analyst, "the main reason for late marriages has been the requirement for all young men to serve in the army until they are twenty-eight."³⁴⁾ North Korean men usually serve in the military for a long time. They are known to have served around 5 to 10 years from their late teens to mid or late-20s. North Korea introduced mandatory military service system in the late 1950s, and the duration at the time was 5 years. Since then, the service duration has extended to around 7 to 9

³⁴⁾ Helen-Louise Hunter, *Kim Il-song's North Korea* (Westport, Connecticut: Praeger, 1999), p. 100.

years in the late 1970s and to around 10 years since 1983 (it became 13 years from 1997 to 2002 and returned to 10 to 11 years since then).³⁵⁾ Although not all men had to serve in the military, and the actual ratio of service may have been much lower than what the policies stated, the military service system seems to be an important factor that established the late marriage culture.

Another contributor to the culture was the need to mobilize female labor force. At the 6th Congress of the League of Socialist Working Youth of Korea (June 1971), the government encouraged men to get married over the age of 30 and women over the age of 27 chiefly because of the need to mobilize young female labor force.

After losing a sizable male population due to the Korean War, North Korea has put a lot of efforts into mobilizing female labor force in various economic areas. As a result, women accounted for about half of the entire labor force in the 1970s.³⁶⁾ Nevertheless, the government appeared to have the need to mobilize more young women by postponing marriages and childbirths to later stages in life. To avoid the double pressure from work and childrearing, women also had the motivation for late marriages. Overall, such national and personal needs coincided to result in a culture of late marriage.

North Korea's late marriage trend has only intensified since then. The 2008 population census and the 2014 "Socioeconomic,

³⁵⁾ Jaehong Koh, "Changes and Prospects of the Military Service Period in North Korea," INSS Strategy Report 21 (Seoul: Institute for National Security Strategy, 2018), pp. 1~21 (in Korean).

³⁶⁾ Young-Ja Park, "The Policy of Women Labor in North Korea (1953-1980's): Focus on the Making of Laborer and the Sexual Rank," *North Korean Studies Review*, vol. 8, no. 2 (2004), pp. 137~161 (in Korean).

Demographic and Health Survey” show that most women settle down between 25 and 29 and men between 30 and 34 in North Korea. This is much later than in other developing countries. The late marriage culture since the 1990s is not just because of the government policies. Since the economic crisis, many women have to bear the heavier burden of meeting the livelihood needs of their families,³⁷⁾ and so they become reluctant to get married.³⁸⁾ In other words, the late marriage culture since the 1990s also stemmed from failures in the socialist economic system and the consequent socioeconomic environment.

C. North Korean Policies on Women, Education, and Labor, and the Preference for Fewer Children

1) General Factors Affecting Fertility Preference

What influences birth rates more than the age of marriage and childbirth is fertility preference. The main reason why total fertility rates are falling in most countries is a decline of women’s desired number of children, showing a shift in social norms. In the analytical framework of economics, fertility preference depends on the costs and benefits of having children. Here, costs and benefits include

³⁷⁾ Andrei Lankov and Seok-hyang Kim, “North Korean Market Vendors: The Rise of Grassroots Capitalists in a Post-Stalinist Society,” *Pacific Affairs*, vol. 81, no. 1 (2008), pp. 53~72; Young-Ja Park, *North Korean Women: 70-Years of Genesis and Twists* (Seoul: LPBooks, 2017), pp. 523~582 (in Korean).

³⁸⁾ Miryang Yoon, “The Status and Role of North Korean Women,” in *Women and Family in North Korea*, ed. The Korean Association of North Korean Studies (Seoul: Kyungin Publishers, 2006), p. 110. Another defector testified that “women have to feed everyone in the family [...] so it is better to stay single.” Park (2017), p. 576 (in Korean).

not only economic and financial but also psychological and cultural aspects. Hence, fertility preferences change gradually in line with both economic and social developments.

Behind the norm shift toward having fewer children lies an important social phenomenon: the empowerment of women.³⁹⁾ As women's education level and economic participation rate increase, the number of children desired by women tends to decline.⁴⁰⁾ Also, the more women have a better education, the greater their ability to control childbirths through contraception or abortion, giving them greater choice to have fewer children.

2) Education, Economic Participation, and Fertility Preference among North Korean Women

What would be the ideal number of children for North Koreans today? According to the 2014 "Socioeconomic, Demographic, and Health Survey," they prefer having a little less than 2 children, which is much lower compared not only to Sub-Saharan African countries but also to other Asian developing countries.

Fertility preference usually has a close correlation with the level of socioeconomic development, but North Koreans' preference of having fewer children has outpaced its development, maintaining a

³⁹⁾ Ushma D. Upadhyay et al., "Women's Empowerment and Fertility: A Review of the Literature," *Social Science and Medicine*, vol. 115 (2014), pp. 111~120; David Canning, Sangeeta Raja, and Abdo S. Yazbeck, eds., *Africa's Demographic Transition: Dividend or Disaster?* (Washington, DC: World Bank, 2015), pp. 77~90.

⁴⁰⁾ For a comprehensive overview of the literature on theories and findings regarding how women's level of education and economic activities help reduce the birth rate, see Max Roser, "Fertility Rate," Paper published online at OurWorldinData.org (First published in 2014, and revised in 2017), <<https://ourworldindata.org/fertility-rate>> (Accessed September 1, 2020).

stable downward trend even during the long-term stagnation. Such an anomaly seems to have come from a significantly higher level of female education and economic participation led by the exceptional education and labor mobilization policies of the socialist regime.

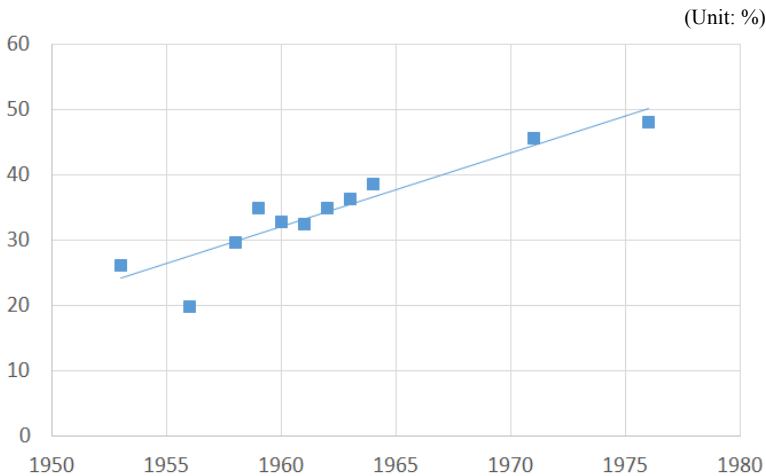
From a relatively early period, women in North Korea received far more education than women in other developing countries. North Korea introduced a compulsory education system in the 1950s and has made a lot of effort to expand public education since then.⁴¹⁾ On the other hand, not many developing countries pursued compulsory education policies before the 1980s; even the few that tried failed to maintain the policies. North Korea already provided secondary education regardless of gender in the 1960s, leading to a high ratio of women with secondary education. As a result, when educated women began to get married in the 1970s, they preferred to have fewer children and the birth rate declined.

Meanwhile, North Korea also encouraged women's economic participation from an early stage as stated above. As a result, women's economic participation has become commonplace since the 1970s. In addition, urbanization and industrialization are needed for women's empowerment and lower fertility preference, because many women still tend to have a lot of children despite their active economic participation in traditional rural communities of developing countries. In other words, women should be able to

⁴¹⁾ For details on the education policies, see Yong-Hyun Park, "Chapter 3. Educational Institutions and Administration," in *Education in North Korea*, ed. Hyung-chan Kim (Seoul: Eulyoo Publishing, 1990), pp. 115~130 (in Korean); Moosuk Min and Jae-Hee Ahn, *On Female Education in North Korea* (Seoul: Korean Women's Development Institute, 2001), pp. 13~24 (in Korean); Jin-Sook Kim, "School System and Educational Reform of the 12-Year Mandatory Education in North Korea," *KDI Review of the North Korean Economy*, vol. 6 (June 2016), pp. 3~16 (in Korean).

have modern jobs in the industrial and service sector of the urban economy to have fewer children.

Figure V-2 Proportion of Female Workers and Office Clerks in North Korea



Source: North Korea Central Yearbook, Rodong Sinmun, and Collection of Writings of Kim Il-sung. Recited from Young Ja Park, “The Policy of Women Labor in North Korea (1953-1980’s): Focus on the Making of Laborer and the Sexual Rank,” pp. 143-144.

<Figure V-2> shows that the proportion of women in the employment of industrial and service sector in North Korea boosted from 20~30% in the 1950s to almost 50% by the 1970s, demonstrating that women’s participation in the modern urban economy had reached a sufficient level. In other words, the trend since the 1970s of having fewer children was, in large part, due to the socialist modernization and labor mobilization policies.⁴²⁾

⁴²⁾ The Soviet Union and the Eastern Bloc also experienced a similar increase in the level of education for women and a decline in birth rates thanks to their socialist economic and education policies. See Jerzy Berent, “Causes of Fertility Decline in Eastern Europe and the Soviet Union II: Economic and Social

Meanwhile, the continuing preference of having fewer children since the 1990s stems from a different economic environment. After the economic crisis, women more often became responsible for their families' livelihood needs, considering childbirth to be a bigger burden. In summary, whereas its socialist institutions and policies (gender, education, and labor policies) led women to favor fewer children in the past, institutional and policy failure led women to continue to have such a preference in North Korea today.

Factors," *Population Studies*, vol. 24, no. 2 (1970), pp. 247~292.

6

Conclusion

This paper focuses on the uniqueness of demographic changes in North Korea, which may be called “the income–population puzzle,” and explores the sources of the puzzle. The analysis shows that the exceptionally rapid demographic transition—an early drop in death rates followed by an early and rapid decline in birth rates—in North Korea originates from the combination of the government’s policies and its unique socioeconomic factors.

The economic growth and increasing food production during the early stages of its socialist development, along with policies on public health, brought an early drop in death rates. Also, the social norms that favor late marriage and fewer children led by its socialist gender, education, labor policies, and the military service system brought an early and rapid decline in birth rates. The dissemination of modern contraceptive methods and the tolerant policies on abortion also contributed to lowering the birth rates.

Such a conclusion does not fit well with the commonly held belief that North Korea is a totally failed state. The perspective that North Korea is a socioeconomically fragile country may be too narrow and uni-dimensional. Although North Korea indeed suffers from various social and economic problems, more comprehensive and balanced approaches are needed to fully understand the country.

Meanwhile, we should not overlook the lack of respect for women’s freedom, health, and rights in North Korea’s population and social policies. These policies passed most of the responsibilities and burden of contraception and abortion to women. Furthermore, the methods of contraception and abortion were often unsafe and prone to adverse side effects. North Korean women’s freedom and rights were limited by being mobilized for economic and social participation. Also women were forced into playing the traditional female role in the social structure that discriminates against them.

For decades, such problems have not been resolved. Women's responsibilities and burden have only increased since the crisis in the 1990s. Many North Korean women have paved new paths toward survival and recovery through hard work, but they have been still pressured to get married, have children, and take care of their families at the same time.

Will North Korea's policies affecting childbirth and family culture change in the future? While the tasks are very heavy, there are glimpses of hope. First, North Korea has public health and education infrastructure and professionals based on its socialist ideology. Hence, they can improve public services using existing resources. Second, the South Korean government and civil society are very interested in improving health and human rights of North Korean people and are willing to cooperate and provide support. Third, North Korea has accepted the assistance of international organizations, especially of UN agencies for improving the quality of people's lives since the crisis. Equipped with experience and effective programs, the international community is willing to provide much larger assistance if North Korea agrees to receive it.

Therefore, if North Korea pursues social and economic development by undertaking reforms and opening up its economy, women will be able to alleviate their burden, have children in a better environment, and lead a more stable family life. Of course, there are many obstacles in the process to reform and opening-up of North Korea, inter-Korean cooperation, and international cooperation. The South Korean government, along with its civil society and the international community, should continue to help North Korea along the way.

North Korea's Income-Population Puzzle

