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Research Report

North Korean statistics and research on the North Korean economy

Dialogue on the North Korea Economy, No. April 2021

Provided in Cooperation with:

Korea Development Institute (KDI), Sejong

Suggested Citation: Lee, Suk; Cho, Byungkoo (2021) : North Korean statistics and research on the North Korean economy, Dialogue on the North Korea Economy, No. April 2021, Korea Development Institute (KDI), Sejong

This Version is available at:

<https://hdl.handle.net/10419/234188>

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Dialogue on the North Korea Economy

April 2021



North Korean Statistics and
Research on the North Korean Economy

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Suk Lee

Dialogue on the North Korea Economy

North Korean Statistics and Research on the North Korean Economy

For researchers who study the North Korean economy, one of the most unknown and interesting areas is North Korean statistics. There are many questions such as: Do statistics on the North Korean economy even exist? If not, how do overseas researchers conduct their studies? and If so, can we trust them? What statistics are published by the South Korean government and other global institutions? The list goes on, but no one has come up with a conclusive answer.

This is why we chose North Korean statistics as the first topic of the new series. Numerous questions were dealt with on the topic and their significance for studies on the North Korean economy. We hope you find this article useful and informative.

Dialogue on the North Korea Economy

Date and Venue

KDI meeting room, Tuesday, April 28, 2020

Interviewer

Cho, Byungkoo (Senior Fellow at KDI)

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Interviewee

Lee, Suk (Senior Fellow at KDI)

KDI's *Dialogue on the North Korean Economy* is a monthly series that features interviews with the foremost experts on North Korea. The first publication was released in March 2021 in connection with the *KDI Review of the North Korean Economy*. Each edition tackles a different facet of the North Korean economy, and offers valuable insight into prominent issues and aspects.

The views and opinions expressed by the contributors are their own, and do not reflect the official views and position of KDI.

- KDI Review of the North Korean Economy Board of Editors



Availability of North Korean Statistics: Changes and Features by Period

Cho, Byungkoo Q.

Before we begin, I would like to thank Dr. Lee, Director of the KDI Office of North Korean Economic Studies, for his participation. To lead us off, let us examine the statistics from and research on North Korea. So, Dr. Lee, what are your thoughts on North Korean statistics? Contrary to the general opinion that there is no such thing, do they exist or are we, the outside world, simply unaware? Also, if they do exist, how has ‘availability’ changed over time?

Lee, Suk

First and foremost, it is an honor to be the first interviewee for the new Dialogue series. It is especially meaningful that you, Dr. Cho, my predecessor, are conducting this interview. Although I have talked about North Korean statistics on many occasions, I will dive deeper into the issue today, and offer more details.

To your first question about the existence of North Korean statistics, the most accurate answer would be “sometimes.” In other words, it is erratic and depends on the circumstances and point in time. To present a clearer picture, we need to divide by period. There are a total

of four phases: the first starts from Korea's liberalization from Japan in 1945 to 1960; the second is from 1961 to the end of the 1980s; the third from 1990 to 1995; and the last is from 1996 onwards.

Let's begin with the first phase. North Korea declared itself a socialist economy, and thus, adopted the principles of socialism for the economy, politics, and many other areas. Statistics were no exception, and were compiled and published based on the same fundamentals. The first aspect of

this phase is that statistics were regularly published in North Korea during this period. For example, in the appendix for the *Korean Central Yearbook*, a major official publication, you can find statistics on a wide range of areas including demographics and industrial output, among others. Although they are not detailed, nevertheless, they were a recurring feature. Later, the statistics were separately compiled and published under the title *DPRK Collection of Statistical Data on the Develop-*

Table 1 | Major Contents of the *DPRK Collection of Statistical Data on the Development of the People's Economy*

Classification	Main contents	No. of statistical charts
Overview	Natural conditions, administrative divisions, demographic composition of urban and rural areas, growth in gross social output value, growth in national budget and imports, price index, etc.	22
Industry	No. of state/cooperative factories and enterprises, growth in gross industrial output value, growth in gross industrial output value by sector, state/cooperative factories' production of major industrial goods, etc.	13
Agricultural economy	Land reform in northern republic, arable land size, sown land size, apple production by province, forestation, etc.	44
Transportation & postal services	Growth in transportation vehicles, growth in passenger travel by transportation method, workload of postal services, etc.	9
Basic construction	Government investments into basic construction, government investments into basic construction by sector, home construction, share of modular building construction, etc.	10
Labor	No. of employees, no. of employees/technicians/experts by economic sector, etc.	8
Goods distribution	No. of commercial networks of state/cooperative organizations, retail value of distributed goods, retail price indices, levels of distribution costs of commercial goods from state/cooperative organizations, etc.	15
External trade	Growth in total trade, composition of exports by item, composition of imports by item	3
Education, culture, public health	No. of schools by class, no. of colleges/universities by province, no. of movie theaters by province, total no. of publications and circulation, no. of public health institutes and medical doctors, etc.	32

Note: Lee, Suk, *North Korean Statistics: Availability and Reliability*, recited from Korea Institute for National Unification (2007).

Source: Central Bureau of Statistics of DPRK Central Planning Commission, *DPRK Collection of Statistical Data on the Development of the People's Economy*, Pyongyang: National Publishing Co. 1961.

ment of the People's Economy (1946-1960), both in Korean and English.¹

The second aspect is that statistics were a part of all official statements. Generally, a socialist state is governed not through law but through orders. These orders were called “cabinet decrees” in North Korea, and most included statistics. For instance, the cabinet decrees aimed at concentrating the buying and selling of cereals on the central authorities to sustain its food rationing system in the 1950s included regional crop statistics. This is only one example, and in fact, statistics were incorporated into other official documents such as the ‘People’s Economic Development Plan,’ North Korea’s first economic plan under the banner of socialism, and statements from high-level meetings, including the Supreme People’s Assembly.

The last aspect of this phase is the use of statistics by politicians. Kim Il-sung cited statistics when commenting on the economic sector such as agriculture and industry, as well as on other various issues such as population, and social groups. The practice of using statistics was adopted not only by the supreme leader but also by other senior officials, including cabinet ministers and the executive members of the Supreme People’s Assembly. More interestingly, economists as well as politicians cited various statistics when they wrote articles for economics magazines which do not exist anymore but at that time served as a channel to learn and promote ‘Marx-

ist-Leninist economics’ or ‘Soviet economics’

As you can see, although the period from 1945 to 1960 was certainly not bountiful, statistics on a wide-range of areas were regularly published in North Korea. And, these figures have enabled the outside world to, at least in part, conduct their research on the North Korean economy. In fact, Dr. Chung, Sang-hoon’s research in the 1970s used statistics that had been re-

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¹ This collection is the only one of its kind that has ever been published by the North Korean authorities. Publishing the collection shows that the North Korean authorities were confident in establishing and developing a socialist economy. The contents of the collection were almost the same as those in the annex of the *Korean Central Yearbook*. For more details, see Table 1.



leased up until the 1960s.²

As far as I know, the study was the first earnest attempt in the field.

Before we go any further, you say that statistics existed in North Korea until 1960, but are they the same as what we know them to be today?

Good question. The statistics produced in North Korea at that time were quintessentially socialist, so they vastly differ from our general understanding of statistics. This can be illustrated in many ways, but I will give you one example that will be easier to understand. Most statistics we see today are physical statistics. That is, if 1.28 million tons of steel were produced in

South Korea in 1961, then, 1,280,000 would be recorded as the steel output and the figure would be announced as the official statistic. A socialist economy, however, also uses other methods. The most typical is the index number. Say, 1950 is set as the base year and the amount of steel produced is 100, then the steel output for 1960 would be announced as 123. There is also the growth rate. For instance, a statement from a socialist state would say, “Steel production in 1957 grew 53% compared to 1950.” Of course, we could infer the physical statistics from both if the accurate physical statistics for the base year (1950) were available.

Unfortunately, in the case of North Korea, the physical statistics for the base year were rarely published. Also, the base years for the index numbers and growth rates frequently changed. For example, the base year for 1960 would be set at 1950, but that

² The work of Chung, Sang-hoon is not directly related to current studies on the North Korean economy. Also, there seems to be controversy over which was the first overseas study of the North Korean economy. But, the work is still meaningful in that it was one of the first attempts to study the North Korean economy as early as in the 1970s. (Chung, J-S., *The North Korean economy*, Stanford, Hoover Institution Press, 1974).

for 1961 would be set at 1955. So, although we have the statistics up until 1960, it is impossible for us to retrieve a complete time-series dataset. There are other serious issues like the fact that, in most cases, there are no physical statistics. As to why North Korea would use such methods, I would think it is because, on the one hand, it wants to show off its seemingly rapid economic growth both internally and externally, and on the other, to conceal the economic realities. Although, this phenomenon is not limited to North Korea and can be found in other past socialist economies, such as the Soviet Union.

Your insight into North Korean statistics, or rather socialist statistics, is very intriguing. Then, what about after 1960?

Although statistics were regularly published between 1945 and 1960, they disappeared from the *Korean Central Yearbook* in the early 1960s. They gradually stopped appearing in official documents after the Korean War, and then, all but disappeared by the end of the 1950s. From the early 1960s until the end-1980s, the authorities did not publish any statistics at all. This period is often called the ‘statistical blackout.’ The absence of statistics, of course, hindered research on the North Korean economy, and created the general perception that statistics do not exist in North Korea. However, from the perspective of us researchers, we were able to base our studies on three exceptions.

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From the early 1960s until the end-1980s, the authorities did not publish any statistics at all. This period is often called the ‘statistical blackout.’
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The first exception is the statistics compiled and published by the South Korean government. There was a demand for statistical data on the North Korean regime to conduct research and so, efforts were made on two fronts. Firstly, the Board of National Unification, the predecessor of the Ministry of Unification, began gathering and organizing quasi-statistics from North Korean media reports and other available sources. Let’s assume that in his 1975 New Year’s address, Kim Il-sung announced that “Last year, our people achieved a dazzling accomplishment in the battle to meet the harvest goal of 7 million

tons of grain.” Then, the Board presumes that North Korea’s grain production for 1974 was roughly 7 million tons. Of course, this is not statistics in the general sense of the word because we are unable to confirm whether the accurate figure is 6.99 million tons, 7.01 million tons, or 7.15 million tons. Regardless, taking into account that these figures do contain some statistical information, they were compiled under several categories such as gross macroeconomic output, industry, infrastructure, etc. The data were used by the Board in the 1990s to publish *Collection of North Korean Economic Statistics*.

For researchers of the North Kore-

an economy, these publications are a precious source of data for the blackout period. Apart from the Board, other relevant agencies in South Korea seem to have made similar efforts to systematically gather information related to North Korean statistics. With the belief that South Korea was in competition with the North in terms of regime, extensive efforts were made to evaluate North Korea’s economic capabilities. During this process, vast amounts of statistical data on the North were required, and so, pertinent actions were taken. So, from our point of view, these endeavors serve as valuable stepping stones in our studies.

Table 2 | Example of North Korean Statistics on Population Released in 1946-1994

(Unit: 1,000 persons)

Year	Total population	Population growth	Men		Women	
			Number	Share (%)	Number	Share (%)
1946	9,257	100	4,629	50.0	4,629	50.0
1949	9,622	104	4,782	49.7	4,840	50.3
1955.12.1	8,491	92	3,982	46.9	4,509	53.1
1956.9.1	9,359	101	4,474	47.8	4,885	52.2
1959.12.1	10,392	112	5,019	48.3	5,373	51.7
1960	10,789	117	5,222	48.4	5,567	51.6
1963.10.1	11,568	125	5,634	48.7	5,934	51.3
1975	16,400	-	-	-	-	-
1978	17,200 or less	-	-	-	-	-
1988	19,060	-	-	45.7	-	54.3
1989	20,000	-	9,140	45.7	10,860	54.3
1991	20,960	-	-	-	-	-
1994	21,514	-	-	-	-	-

Note: 1) DPRK *Collection of Statistical Data on the Development of the People’s Economy 1946-1960*, 1961, p.18.

2) *Korean Central Yearbook 1963, 1964*, p.314.

3) Figures were reversely calculated based on Kim Il-sung’s 1975 interview with Mainichi Shimbun of Japan on November 26, 1975: “More than half of the total population (8.2 million) are studying. ...”

4) Figures were reversely calculated based on Kim Il-sung’s remarks in 1976 for the 30th anniversary of the foundation of the regime on September 9, 1978, “8.6 million people, more than half of the total population. ...”

5) *Korean Central Yearbook 1989-1994*, annually.

6) Lee, Suk, *North Korean Statistics: Availability and Reliability*, recited from Korea Institute for National Unification (2007).

Source: The Board of National Unification, *Collection of North Korean Economic Statistics*, 1996, p.99.

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The second exception is trade statistics. Because by its nature trade is conducted between different entities, even if North Korea fails to release its statistics, we are able to obtain the figures by compiling data from its trade partners and doing reverse calculations. This method was used by researchers to understand the external trade of socialist states, and is still used today for underdeveloped countries with poor statistical infrastructure. For exam-

ple, from the 1980s to the 1990s, it was used by the Japan External Trade Organization (JETRO) to gather and produce statistics on North Korean trade. As part of its efforts to analyze Asian economies, the organization published *Economy and Trade Outlook of North Korea*.³

In addition to JETRO's publications, researchers have been able to use the trade statistics of international organizations such as the International Monetary Fund (IMF). Although North Korea is not a member, researchers can reproduce certain trade statistics of non-members by utilizing the IMF's Direction of Trade Statistics (DOTS). For example, Choi, Soo Young (1992) reproduced a systematic set of trade statistics on North Korea from 1945 to the 1980s by combining IMF data with official trade statistics from the Soviet Union and China.⁴ Studies such as this were just the start, and now, research based on North Korean statistics has become a favorite among outside experts.

The third exception is the statistics on public health and population. North Korea's state ration system has been under intense pressure since the mid-1980s. Although at the time, it was claimed that over 10 million tons of grain were produced, strangely, there were problems in food distribution. In consequence, North Korea urgently needed to review its own

3 The Japan External Trade Organization (JETRO), *Economy and Trade Outlook of North Korea*, each year. Most publications of this kind were published in the 1980s. Still, publications issued in the 1990s also contained various North Korean trade statistics for the 1980s that JETRO collected and compiled.

4 Choi, Soo Young, "Foreign Trade of North Korea 1946-1988", PhD Thesis, Northern University USA, 1992. Analyzing foreign trade of North Korea by using mirror statistics can be traced as far back as to the work of Chung, Sang-hoon mentioned above in this paper. But, the work of Choi, Soo Young (1992) appears to be the first attempt to reestablish trade statistics of North Korea in near complete, systematic form for the entire period of North Korean trade, for almost all trade partners, and using all available mirror statistics.

Table 3 | Population Statistics Submitted by the Central Bureau of Statistics to UNFPA in 1989
– Contents and Target Period

Classification	Content	Period
Population	Total population (civilians)	1946-1987
	No. of men/women, sex ratio	1946-1987
	Population by age group	1986
	Population by region (9 provinces, 4 special cities)	1987
	Urban and rural population	1953-1987
	Population of major cities (23 cities)	1980-1987
Birth/death	(Crude) birth and death rates	1944-1986
	Infant mortality rate	1944-1986
	No. of total births and deaths	1980-1987
	Cause of death (rate of deaths by cause)	1960-1986
Life expectancy	Life expectancy	1957-1986
Population composition by occupation	Population composition by occupation	1960-1987
	Population composition by occupation (gender)	1986-1987
Others	Population density by region (9 provinces, 4 special cities)	1987
	No. of total households, average household size	1980-1987
	Internal migration	1980-1987
	No. of marriages and divorces	1980-1987
	No. of registered students	1980-1987
	No. of university/college graduates	1988

Note: Lee, Suk, *North Korean Statistics: Availability and Reliability*, recited from Korea Institute for National Unification (2007).

Source: Extracted from N. Eberstadt and Judith Bannister, *The Population of North Korea* Berkeley: Korea Research Book, 1992.

statistics on the population. So, with outside help, North Korea began to seek the way of conducting its first ever population census from the end of the 1980s. That is to say, with the limitations of its civil registration system, which was designed to sup-

port food distribution and is equivalent to South Korea's resident registration system, exposed, the regime concluded that all related statistics needed an overhaul with help from outside.

To that end, a request was made to the

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United Nations Population Fund (UNFPA) for technical and financial assistance. The agency accepted and also called for South Korea's support which was given as promised, albeit indirectly. It goes without saying that the regime was obligated to hand over related materials, including those on civil registration, for the 1945-1987 period⁵ because UNFPA needed the official population and public health figures to conduct the census. This was the first time that North Korea had ever provided its official statistics in data format. Additionally, conferences were held to present the public health data on pregnancies, infants, births, etc. The information given during this time was more extensive, complete, and close to what is commonly accepted as time-series statistics than ever before, even to this day. Naturally, this enabled researchers to earnestly study the North Korean econo-

my. In fact, it is fair to say that the statistical data provided during this time serves as the basis for the outside world's research into North Korea's population.

You said that despite the fact that statistics were almost nonexistent in North Korea during the 1960s to the 1980s, researchers were able to use some exceptional sources to discover, collect and organize their data. But, although we have a saying in Korea that "If you do not have teeth, use your gums," it seems like a lot of hard work. Can you talk about what the conditions have been like since the 1990s, which are directly tied to the present day?

The situation surrounding North Ko-

⁵ Later, this data was made public by N. Eberstadt and Banister Judith in their publication, *The Population of North Korea*. Berkeley, Korea Research Book, 1992.

rea's statistics completely changed from 1990 to 1995. Most notably, the South Korean government and other public agencies began producing statistical estimates on the North Korean economy. The Soviet Union and other socialist states collapsed one by one from end-1980s to the early 1990s, and this gave rise to the common belief that North Korea would also fall. Under the circumstances, the South Korean government felt that it desperately needed to gain an accurate grasp of the economic conditions in North Korea. It was during this time that KDI's Office of North Korean Economic Studies was founded. The problem was, as I told you earlier, that we did not have any North Korean statistics. So, the government decided to bring the efforts of the Board of National Unification and other relevant agencies to the fore.

As a result, they began to officially produce their own statistical data on North Korea. For example, in 1990, the Bank of Korea (BOK) and others began producing estimates on North Korea's gross national income (GNI) growth rate, which is disseminated annually to this day.⁶ Other agencies followed suit in their respective fields. For trade, the Korea Trade-Investment Promotion Agency (KOTRA) began systematically collecting mirror data from North Korea's trade partners to produce statistics. And, the Rural Development Administration (RDA) and others began gathering data on grain production and supply, which is used to estimate North Korea's yearly grain production. Be-

sides, other agencies in South Korea also gather statistical data on North Korea in various fields. The figures are published by Statistics Korea through its annual Major Statistics Indicators of North Korea.

Thanks to these efforts from the early 1990s, both the quality and quantity of the statistics available to researchers have improved considerably. The various data that I mentioned take the lion's share of the information that is used by outside experts in their research on North Korea.

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⁶ To access the statistics, visit Data on the North Korean Economy at the BOK's website (<http://www.bok.or.kr/portal/main/contents.do?menuNo=200090>).



To sum up, the environment surrounding North Korean statistics started to change from the 1990s, not because North Korea broadened its statistical data, but because South Korea and the rest of the world began producing their own to better understand the North Korean economy. Is this correct?

Yes, it is. Before 1990, estimates produced outside were extremely rare, and the only available statistics on North Korea were those from within. Of course, there were

figures by the CIA, who gathers facts on not only North Korea but the rest of the world, and the Food and Agriculture Organization (FAO), a UN agency of which North Korea is a member. However, there were questions over reliability, and the figures were often accompanied by interesting footnotes, including those that stated outright that “These statistics are highly unreliable.” In this sense, it is fair to say that the statistical estimates on North Korea by the South Korean government and other relevant agencies that researchers often depend on today began in earnest in the 1990s.

Another source was the UN Statistics Division.⁷ This division compiles statistics on member states, and it began producing figures for North Korea in 1991 when both Koreas were simultaneously admitted to the UN. This marked another change from outside that occurred during 1992-1995. We saw yet another remarkable change in 1993-1995. North Korea’s first-ever population census was conducted in 1993, and released in 1995.⁸ It is reported that members of UNFPA provided financial and technical support on the ground, and that the North Korean authorities conducted a census for the entire population. The outcome of the census received substantial attention in that it was one of the most detailed and systematic sources of information on North Korea that had ever been made public until then.

⁷ UN Statistics Division(<https://unstats.un.org/home/>) provides various kinds of statistical data, including those on North Korea

⁸ North Korea conducted a population censuses in 1993 and in 2008. The results were made public by the DPRK Central Bureau of Statistics in “Tabulation on the Population Census of the Democratic People’s Republic of Korea (31 December 1993),” DPRK, 1995 and “DPR Korea 2008 Population Census National Report,” Pyongyang, DPR Korea, 2009.

So, what has changed since 1995? Why is that year considered another starting point when we discuss North Korean statistics?

It is because North Korean statistics underwent another fundamental change in 1995. During that year, North Korea began receiving food aid from the international community and was required to provide various kinds of statistical data, a norm for prospective recipients of humanitarian assistance. In 1994, North Korea announced its first death from starvation, and in 1995, it made the unprecedented move to request humanitarian food assistance from the International Red Cross (IRC). The IRC and World Food Programme (WFP) sent their members to the ground to launch small-scale food assistance programs at the end of 1995. Later, the scale of the programs was increased exponentially.

Obviously, in order to receive the aid, North Korea had to provide its statistics to the UN and other international organizations just as other recipients, and the size of data grew increasingly towards the end of the 1990s. The regime submitted data related to gross domestic product as well as those on agriculture, food, health, and population. Indeed, an environment was created in which if certain statistics were needed, the UN made active requests and the North accepted them to a certain extent.

The implementation of the humanitarian assistance programs served as another opportunity to create statistics. For example, in 1998, the North Korean authorities approved a national nutrition survey that was to be conducted on children by the

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European Union (EU), WFP, and FAO. Later, the survey was institutionalized into a regular program and still continues to this day. Additionally, statistics were produced to meet North Korea's own needs. For example, in partnership with UNFPA, North Korea hosted international seminars to restore its agricultural production capacity. During this process, various statistical data on North Korea's agricultural sector were produced.

Statistics were also compiled and published by international organizations through their own field surveys. Among others, the WFP and FAO, two UN agencies responsible for food and agricultural

Table 4 | Example of the Statistics Included in the Reports for the UN Since 2000 – Case of the DPRK (2002)

Classification	Content	Target Years
Major indicators	Total population, life expectancy, GNP, GNP per capita	1993, 1999, 2000
Population	Total population, population by region (9 provinces, 3 special cities), urban/rural population, no. of households	2000
Employment	Employment structure by industry and gender	1995, 1999
Birth & death	(Crude) birth rate, (crude) death rate, infant mortality rate	1990, 1993, 1996, 1998, 1999, 2000
Specialists, technicians	No. of specialists/technicians, no. of medical doctors	1993, 1995, 1998
Foreign debt & unemployment	Size of total foreign debt, unemployment, etc.	1999, 2001

Note: Lee, Suk, *North Korean Statistics: Availability and Reliability*, recited from Korea Institute for National Unification (2007).

Source: DPRK, extracted from the statistical annex of "Core Document Forming Part of The Reports of State Parties, United Nations Human Rights Instruments," July 16, 2002.

programs, sent their missions to North Korea on a yearly basis to survey grain production, consumption, and so on, which was then used to produce statistical data. Also their local offices began collecting data on market prices and other interesting topics, and occasionally published the outcomes.

Under these conditions, from the mid-1990s, statistical estimates on North Korea were not only being released from South Korea, but a wide array of detailed statistics started to pour out from overseas. A major example is the US Department of Agriculture's statistics on North Korea's grain, compiled because the North Korean market was considered to have the biggest potential in Asia. Also, it has become increasingly common for international organizations to produce their own estimates on North Korea in their respective fields.

As you can see, North Korean statistics have evolved significantly since 1995. From

that point, contact between North Korea and the rest of the world has increased substantially through humanitarian assistance programs. And consequently, the availability and scope of North Korean statistics have also dramatically improved. The official statistics North Korea provides to the outside world and statistics created by external entities have all seen increases

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Types and Features of North Korean Statistics that are Available

You have provided a very detailed explanation on the changes in the availability and environment of North Korean statistics from 1945 to the present. Can you now tell us about the kinds of statistics available today, and the main features and differences between them? I am also curious about what types are commonly used by researchers and why.

We currently have access to four different types of statistics. First, there are the official statistics that the North Korean authorities publish or provide to the outside world. Second, we have statistical estimates produced by governments and public institutions in South Korea and other parts of the world. The third and fourth are unconventional. The former, also known as specialized statistics type 1, includes data on trade, prices, and so on, and is extracted through means other than those used for the first and second, and the latter, also known as specialized statistics type 2, is extracted through electronic devices.⁹

Let's look at the first type. From a researcher's perspective, this type can be divided into four subtypes by their format and whether they are classified or not. By their format, official statistics are classi-



fied into 'small data' and 'big data.'¹⁰ 'Small data' refers to fragmented data that has extremely limited scope and is provided by North Korea in very small quantities depending on the occasion and purpose. For example, in 1997, North Korea provided the IMF fact finding mission team with its official GDP data for 1991-1996, then in 2002, it gave the UN its GDP data for 1998-2000, and thereafter, it gave UN agencies the same data for 2002-2004. In a case such as this, the data is all 'small data' because it is difficult for researchers to do any meaningful analysis due to the extremely limited quantity and scope.

⁹ Caution should be taken here because the classification is not an academic standard but adopted just for the convenience of this interview.

¹⁰ The terms, 'small data' and 'big data,' are not academic concepts nor buzzwords used by researchers. The terms were first heard during the interviewee's talk with Prof. Hazel Smith, a UK-based researcher who studies North Korea in 2016. She used the terms to talk about her experiences with North Korean statistics. They were used here just for convenience because they seem to effectively describe the features of North Korean statistics available overseas.

In fact, most of the official statistics provided by the regime since 1995 is small data. Of course, even small data can be developed into a relatively meaningful collection of data if they are accumulated consistently and systematically. In contrast, ‘big data’ refers to a set of data that is big enough in quantity for researchers to analyze a specific sector of the North Korean economy. Major examples include data included in the conclusion reports of the first and second population censuses carried out respectively in 1993 and 2008. Big data accounts for a relatively small percentage of the total. But as I said, it is possible to produce big data by gathering small data, and this is a part of what we do at the KDI Office of North Korean Economic Studies. One major achievement was the time-series data for the 1995-2018 period on food distribution in North Korea. That was completed based on sets of small data on monthly food distribution that the North Korean authorities presented to the FAO and WFP teams each time they visited since the mid-1990s.

The official statistics that the North Korean authorities published or provided to the outside world can also be divided into public data and private data. Most of the data we have talked about today are public data, freely available for everyone. Private data refers to data held by overseas institutions, which are not made public for whatever reason. The majority are what overseas organizations and institutions hold to conduct their analysis or what they have secured from North Korea through various channels but cannot publish for certain reasons. At present, no one knows ex-

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it is possible to produce big data by gathering small data, and this is a part of what we do at the KDI Office of North Korean Economic Studies.

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actly how much of this data exists. If these are all made public in time, we will see remarkable progress in terms of the research on the North Korean economy.

Your insights are very intriguing. It is also interesting that the KDI Office handles the job of converting small data into big data. Before explaining the other types of statistics, could you let us in on who is responsible for this job?

Table 5 | Example of Big Data Produced by Using Small Data – North Korea's Food Distribution

(Unit: 1 day, 1 person, gram)

Season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
95/96	-	452	452	452	452	452	250-300	250-300	250-300	200	200	200
96/97	200	450-500	450-500	100-200	100-200	100-200	100-200	100-200	100-200	0	0	0
97/98	0	400	400	300	200	100	0	0	0	0	0	100
98/99	100	350	340	225	240	175	175	175	175	360	360	360
99/00	320	300	300	300	250	200	200	150	150	0	0	200-250
00/01	250	215	215	215	215	215	215	215	215	-	-	-
01/02	300	300	300	300	300	300	300	250	350	300	300	360
02/03	300	300	300	300	300	300	300	250	250-350	380	380	380
03/04	300	300	300	300	300	300	300	300	250	300	250~350	350
04/05	200-250	200-250	200-250	250	250	250	250	200-250	200-250	200-250	200-250	250
05/06	500	500	500	500	500	500	500	500	500	500	500	500
06/07	500	500	500	500	500	500	500	500	500	500	500	300-400
07/08	300-400	350	350	350	350	350	350	250	150	150	150	150
08/09	300	330	350	350	350	350	323	310	300	350	350	350
09/10	350	355	395	395	400	400	400	370	370	370	355	355
10/11	360	370	400	400	400	400	380	190	150	200	200	200
11/12	355	365	375	395	395	395	400	395	380	335	310	310
12/13	390	400	400	400	400	400	400	400	390	390	320/350	310
13/14	390	400	400	400	420	420	420	410	-	-	-	-

Source: KDI database on North Korean statistics based on FAO/WFP, FAO/WFP Crop and Food Supply Assessment Mission to the Democratic People's Republic of Korea, Special Report, Various Years (Months) and other FAO/WFP fact finding mission reports.

Basically, all of our members, including myself, participate, but the researchers, in particular, play a major role. In addition to data conversion, our researchers are constantly busy with administrative work for the *KDI Review of the North Korean Economy* and other research activities. We are all indebted to them for their effort and hard work.

The second type of statistical data is the estimates produced by governments and

public institutions outside of North Korea. Major examples include the BOK's growth rate for North Korea's GNI, KOTRA's statistics on North Korean trade, and RDA's data on North Korea's grain production. These are all created by public institutions in South Korea. Public institutions engaged in such work elsewhere include the CIA and other US government agencies, and international organizations such as the UN. Some of the statistical estimates pro-

duced by these institutions are accessible via the portal site on North Korean statistics operated by Statistics Korea (<https://kosis.kr/bukhan/>). As has been the case of statistics produced in South Korea, the scope is also wide, ranging from population and macroeconomic indicators to specific industrial outputs and infrastructure.

Apart from the two types mentioned so far, there are two more types of North Korean statistics available, type 1 and type 2, and like I said before, they are unconventional. Type 1 refers to data extracted through methods that differ from those used for the first two types of statistics. North Korea's trade statistics and market prices fall into this category. Statistics on North Korean trade are not official because they are created by using mirror data from North Korea's trade partners and they are not estimates that derive from a fixed approach. They are merely

mirror statistics that have been rearranged to center around North Korea. Sources for such trade statistics include those from UN Comtrade, IMF DOT, and KOTRA. As for statistics on North Korean market prices, which are widely used by researchers at present, they are also unofficial and not estimated. They are produced by external institutions through surveys of local agents on the ground in North Korea. This kind of information gathering is actually used by Daily NK and Asia Press, online newspapers based in South Korea and Japan.

On the other hand, type 2 became available thanks to advanced technologies such as satellite equipment and emerging techniques such as googling. I am not sure whether it would be appropriate to go into more detail here. Just to give you a rough example, some researchers have recently shown interest in and actually used data



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on the degrees of night lights. The data, which is actually numbers showing the degrees of night lights captured by satellite, is used to assess the overall and regional economic status of North Korea. To sum up, when it comes to North Korean statistics, conventional data and new types of data coexist owing to the changes in North Korea’s statistics environment, and emerging technologies and equipment.

Issues of Reliability and Efforts to Improve It

It has been said that North Korean statistics have problems with reliability. What is your take on this? Could you explain how it became an issue in the first place? Do both the official statistics from the regime and the statistical estimates from outside have the same problem?

Unfortunately, my position on North Korean statistics is that you have to initially question any and all statistics that are related to North Korea. For economists in other areas this may sound somewhat bizarre, but as far as North Korean statistics are concerned, we must always keep this in mind. And I have valid reasons.

Regarding the official statistics provided by the North Korean authorities, there are at least three major issues related to reliability. First, reliability is an intrinsic problem of socialist economic statistics. Although this may sound overly simple, in a socialist economy, everyone has an incentive to lie, and thus, you should doubt the statistics because they are an ideal vehicle for such lies. As is widely known among economists who study socialist economies, a socialist economy is formed by the extensive and successional principal-agent relationship which stretches from the central planner at the top down to subgroups and producers at the bottom. At the core of this relationship is the asymmetry in authority and responsibility, and information asymmetry. Owing to these asymmetries,

reports from the bottom always tend to be an overestimation or underestimation of the facts rather than an accurate depiction.

This means that statistics from socialist economies always have an intrinsic reliability problem. Of course, market economies also have principal-agent relationships, and information asymmetry. But, because these economies are comprised of markets, the organizations and/or individuals responsible for the distorted information are eventually caught and punished. Thus, there is less risk of misreporting in the long run. In socialist economies without such mechanism, the probability of punishment is low and so, there are reliability issues.

Second, with North Korean statistics, there is a high probability of technical error. Let's take childbirth for example. When a child is born in North Korea, the hospital issues a birth certificate which the parents submit to the administrative chief of their community to get a seal. They then submit the certificate to the administrative office who issues a confirmation note which is handed in to the parents' place of work. In turn, the workplace relays this information to the public distribution agency who then cross-checks and confirms with the health institution (hospital) or the administrative office. When it is confirmed, the distribution agency enlists the newborn as a recipient of food rations for the workplace. As you may have noticed, one of the biggest incentives to report a birth in North Korea is to receive food. Then what about deaths? There is also an incentive not to report deaths because while the death remains unreported, the remaining family members continue

to receive food rations assigned to the deceased. When it comes to moving in, there is an incentive to report immediately, but for moving out, it is more beneficial to delay or distort the report. And, it is all for the same reason, food.

This structural feature of North Korean society suggests that its population statistics may be riddled with constant, systematic errors. It would be different if North Korea was fully digitalized or if regular census surveys were conducted so as to correct such errors. But, this is not the reality in North Korea. Past administrative systems were not digitalized at all, and statistics had to be calculated manually, which made cross-checking statistics across regions impossible. Thus, population statistics

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of a specific region had to be produced by adding or deducting the number of people who moved to or moved from the region. This was done once a year, and continued for more than 50 years. So, how can we trust the outcome? Statistics on the population serve as the very foundation for other types of statistics. In this sense, it is practical and reasonable to assume that North Korean statistics, even if all the entities engaged in the production are committed to enhancing reliability, contain a significant degree of technical error.

Lastly, although it has yet to be fully proven, there are those who suspect that the regime is manipulating its statistics. Of course, there are differing opinions on this issue, but the fact that doubt does exist over the veracity of North Korean statistics should be enough to make us believe

that trusting them is unwise. As I said earlier, it is safer to accept that North Korean statistics are unreliable before starting any discussion.

From what I hear, it seems essential that the reliability of the statistics provided by the North Korean authorities is verified. Then what about the other types of statistics? Should we also doubt the reliability of the statistical estimates issued by external sources such as trade statistics and market prices, and data created using mirror statistics and surveys?

Sadly, once again, it would be sensible to check the reliability of the statistics produced from outside North Korea. However, the problem with those statistics is slightly different. It is not about error, manipulation or technical flaw but about the inevitable limitations of statistics that are produced externally. For example, the BOK's estimates on North Korea's GNI are one of the most widely used statistics in relation to North Korea, not only in South Korea but around the world. Its reliability is also considered high. Some even jokingly say that even if North Korea has its own data on its GNI, the BOK's data is closer to the truth. This is because North Korea's statistical authority maintains a socialist system, and thus, is not capable of measuring the GNI as we in a market economy define it. Nevertheless, the BOK's data is not without its limitations. In fact, there is controversy over whether they ac-

Table 6 | Example of a Log in India's Statistical Report on its Imports from North Korea in 2008 with a 'High Probability of Error'

(Unit: US\$)

India's Imports from North Korea		Value of Imports
Total Imports from North Korea in 2008 in Customs Statistics (A)		109,319,401
Imports with a high probability of error (B)		
HS 300210	Immune serum and other products	2,967
HS 392490	Sanitary products and cosmetics	328
...
HS 851710	Telephones	769,899
HS900130	Contact lens	5,680
HS 900719	Movie cameras for 16mm or larger films	1,695
HS 901320	Laser devices	37,946
HS 902211	Lens for camera, projector, photo magnifier/ reducer	72,243
HS 846140	Gear cutters, gear grinders, gear finishing machine	53,745
HS 903140	Other optical devices	31,913
Total		28,837,455
(A) - (B)		80,481,946

Note: 1) Imports with a high probability of errors refer to imported goods that North Korea has never exported to its major export destinations such as South Korea, China, and Japan.

2) Recited from Lee, Suk et al., *Analysis and Reconfiguration of North Korean Trade Statistics 1990-2008*, Korea Development Institute, 2010.

Source: UN ComTrade Statistical Database(<http://comtrade.un.org/>).

curately capture the rapid growth in the North's market activities. If there is any merit to this, reliability will also become an issue for BOK statistics, not due to any statistical flaw, but because people will believe that they are unable to properly reflect certain parts of the North Korean economy.

Moreover, from 2010, there has been growing evidence that question the reliability of unconventional statistics. A common case is that significant errors have been found in the mirror statistics released

by North Korea's trade partners. In most instances, statistical errors were made because the Republic of Korea (South Korea) was mistaken for the Democratic People's Republic of Korea (North Korea)¹¹. For example, India and others have published statistical data showing that precision medical devices and ultra-large, high-tech electronics were imported from North Korea. This cannot possibly be true, and surely a mistake has been made between North and South. And, the problem is that

¹¹ For more details, refer to Lee, Suk et al., *Analysis and Reconfiguration of North Korean Trade Statistics 1990-2008*, Korea Development Institute, 2010; Lee, Suk, Lee, Jae-Ho, "Analysis of North Korean Trade Statistics: Verification of Availability and Reliability"; Koh, Il-Dong et al., *Analysis of the Trade Structure of North Korea and Implications for Inter-Korean Economic Cooperation*, Korea Development Institute, 2008.

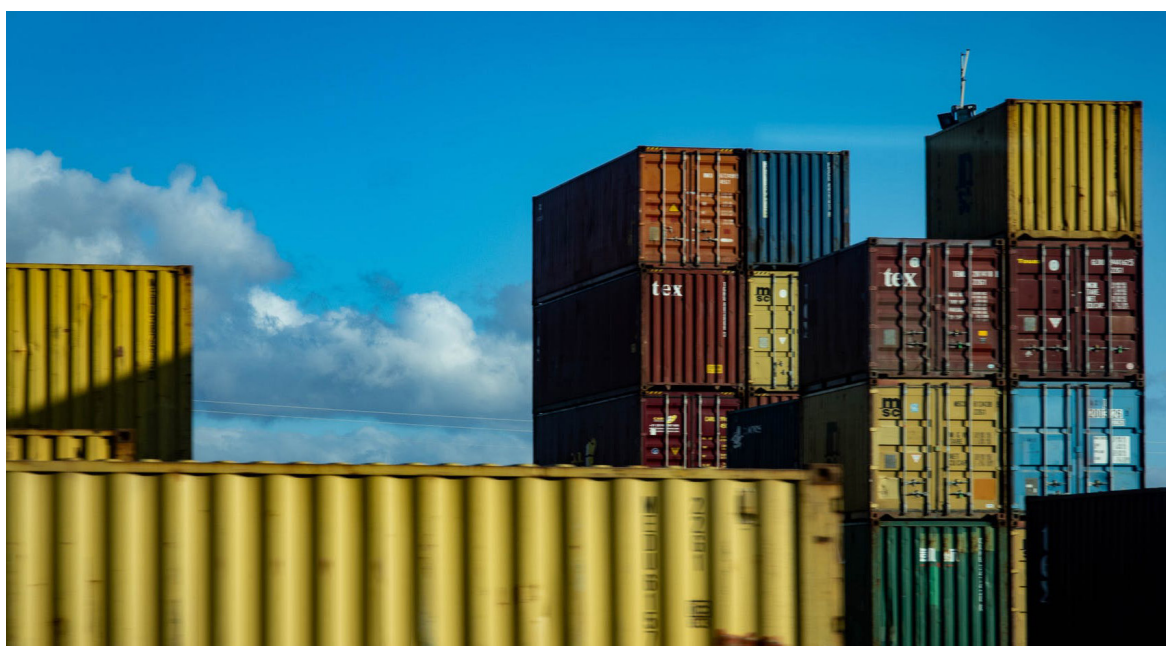
this is not a question of a few percent. Depending on the country and period, the percentage of error is in the tens. Under the circumstances, how are we to completely trust these figures?

Surprisingly, price data is no exception. Firstly, it is difficult to say whether the criteria for price in this type of data is appropriate. For example, does price refer to the transaction price, asking price, or average price? Maybe it is the starting price or median price? Also, price statistics are only considered consistent if the conditions of the gathering process, such as the environment, duration and timing, location, and the target, are constant. But this is neither the case for the price statistics from North Korea, nor do we have any information to verify the consistency. Therefore, it is difficult for us to recognize the reliability of North Korean price data, even if it was gathered by surveying local agents.

What is even more surprising is that the same goes for unconventional statistics

that are extracted through the use of electronic information such as that obtained via satellite. Obviously, because a sufficient amount of data has not been gathered and it is yet to be widely used, it would be inappropriate for me to go into detail here. That is, if I raise the issue of reliability in the early stages, it may thwart any efforts to develop this field.

If there is a problem with the statistics themselves, would this also not create a problem for the researchers who use them and their discussions? Why are they used despite such limitations? How is this justified? I know statistics are only a part of research, still I wonder, when the reliability of data is in question, what should serve as the foundation, and where should it be headed? Also, can you elaborate on what kinds of efforts researchers have made to tackle these problems?



I would like to take a roundabout approach to your question. Statistics has always been a sore subject, even for past studies on socialist economies such as those on the Soviet Union. As I said earlier, statistics from socialist economies are different, and there are many conditions that cause suspicion. Different opinions exist over the use of statistics from socialist economies, but I will skip repeating them and just present two hypotheticals.

Let's assume that factory A in Pyongyang has a tendency to continuously inflate its production figures in its reports. Then, the statistics produced based on its reports would be both inaccurate and unusable. My question here is, does factory A change its method of inflating its figures each time? The answer is sometimes. In addition to it being difficult to devise a new method each time, even if they do, it would not do any more to cover up the fact that the figures have been inflated. The same is true for if it didn't, that is, it wouldn't make it any more conspicuous. Thus, let's assume that factory A uses the same method. Then, although the statistics on factory A's production are unusable, the trends that can be drawn from them can be used. This suggests that while the reliability of North Korean statistics is dubious, the statistics are not entirely useless. If the assumption holds any truth for situations in North Korea, we have every reason to use these extracted trends, even if we cannot use the statistics as they are. Alec Nove, an expert on the former USSR, and his colleagues call this phenomenon the 'law of equal cheating.'

Now, let's put a twist to this assumption.

Factory A suddenly receives an order from the central planning authority in Pyongyang to transfer 10% of its production for 2020 to the nearby factory B for free. Then, would factory A inflate its production for 2020? Maybe. If it does, it would need to transfer more than what it is supposed to, and if it does not, lowering the figures is still tricky because it risks being reported on by factory B. Consequently, the amount factory A reports for 2020 will likely be much closer to the truth than before. This shows that even statistics that are produced by a source that habitually distorts figures can become more realistic and objective if certain conditions are met. In the case of factories A and B, such conditions were met due to conflicts of interest.

We can draw two implications from this case. Although all statistics from and on

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North Korea have a reliability issue, when they are available to researchers, firstly, efforts can be made to extract the valid parts, and secondly, efforts can be made to determine which statistics are relatively more reliable. If we continuously endeavor in this direction, we will be able to identify usable statistics for research. In fact, such efforts have been made in the past by many researchers in the UK and US doing research on the Soviet economy. All of this suggests to me that doing research without using statistics and using them without thoughtful consideration would be unwise either way.

You have provided us with a clear insight into the efforts that are being made to tackle the reliability issue of North Korean statistics. Before wrapping up, could you please tell us about any recent changes in research approaches? If there are any changes, what implications do they have for statistics and for research on the North Korean economy?

At present, the vast majority of researchers are extremely invested in making headway in the field of North Korean statistics, including all of us at the KDI Office of North Korean Economic Studies. In regards to this, one of the most notable changes is the move by researchers to organize the statistics themselves. There is a consensus on need to organize North Korean statistics among researchers at such South Korean state-run research institutes

as Korea Institute for Defense Analyses, Korea Rural Economic Institute, Korea Institute for International Economic Policy, Korea Institute for Industrial Economics and Trade, and Korea Institute for National Unification. Researchers at these institutes have conducted and plan to conduct joint research projects based on this shared understanding.

At the same time, they are keen to find ways to improve the quality of statistical

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 researchers and their
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data that may become regularly available. For this, individual researchers and their affiliated institutes have ramped up their efforts and investments into North Korean statistics-related projects, maintained relevant networks, and sought collaborations with pertinent government agencies. Also, government agencies that have an interest in North Korean statistics such as Statistics Korea and economy-related departments have actively promoted collaborations with researchers who study the North Korean economy.

Lastly, there is increasing interest in international cooperation in relation to North Korean statistics. Ironically, attention on the North Korean economy has become increasingly globalized since tougher sanctions were imposed in 2016. This is because countries want to see, on the one hand, if the sanctions are effective, and on the other, whether North Korea will open its economy once the sanctions have been lifted. However, the more this interest grows, the higher the demand will be for related statistics because, given the nature of the international community, partaking in technical discussions that are not supported by statistical data is a major faux pas. Noting this change in the international community, a significant number of researchers in South Korea have focused their attention on finding ways to upgrade the environment surrounding North Korean statistics through cooperation with the international community.

If all of these efforts bear fruit, I expect that the research environment will significantly improve in the near future.

Centering around South Korea, you have given us a glimpse into the diverse efforts that are being made by researchers to enhance the statistics environment in relation to North Korea. Indeed, I truly hope that these endeavors will not be in vain, and that the research environment improves. Thank you for your clear and detailed explanation about North Korean statistics and research on the North Korean economy.



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