Project Report:

Democratic People's Republic of Korea Economic Statistics Project
(April –December 2008)

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By

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List of Abbreviations

AMA	Analysis of Main Aggregate (database, by UN)
BOK	Bank of Korea
CIA	Central Intelligence Agency (of US)
CIC	Center for International Comparisons (University of Pennsylvania)
DPRK	Democratic People's Republic of Korea
ESDS	Economic and Social Data Services
ERINA	Economic Research Institute of Northeast Asia
EU	European Union
FAO	Food Agriculture Organization
GDP	Gross Domestic Products
GNI	Gross National Income
GTIS	Global Trade Information Service
IDB	International Data Base (US Census Bureau)
ITC	International Trade Center (UNCTAD/WTO)
KCS	Korea Customs Service
KDI School	Korea Development Institute School of Public Policy and Management
KIEP	Korea Institute for International Economic Policy
KINU	Korea Institute for National Unification
KITA	Korea International Trade Association
KOSIS	Korea Statistics Information Service (of NSO)
KOTRA	Korea Trade-Promotion Agency
IFI	International Financial Institution
IMF	International Monetary Fund
MDG	Millennium Development Goals (UN)
MOC	Ministry of Commerce (of China)
MOU	Ministry of Unification (of Korea)
NSO	National Statistical Office (of Korea)
OECD	Organization for Economic Cooperation and Development
PPP	Purchasing Power Parity
PWT	Penn World Table
ROK	Republic of Korea
SIPRI	Stockholm International Institute for Strategic Studies
TPI	Trade Performance Index
UNCTAD	United Nations Conference on Trade and Development
UNFPA	United Nations Population Fund
UNICP	United Nations International Comparisons Programme
UNICEF	United Nations Children's Fund
UNSD	United Nations Statistics Division
UNPD	United Nations Population Division
WDI	World Development Indicators (World Bank)
WHO	World Health Organization
WTO	World Trade Organization

Executive Summary

In May 2007, a small group of North Korea analysts organized the Democratic People's Republic of Korea (DPRK) Economic Forum at the US-Korea Institute of the School of Advanced International Studies, Johns Hopkins University. This group focused on the fact that North Korea analysts, academicians and policymakers share concerns about the availability and quality of DPRK statistics. They face constant challenges to the validity of their analysis, arguments and policymaking. Often, there is no common ground for productive and meaningful policy discussion on North Korea due to data and statistics problems.

While there is considerable interest in and need for more "reliable" North Korea statistics and data, there remains a dearth of literature on this particular topic, especially any studies based on a comprehensive review of existing and available North Korea statistics data. Analyses identifying, comparing and evaluating DPRK data made available by different entities are also extremely limited. In April 2008, the Korea Development Institute School of Public Policy and Management approved a project titled the "DPRK Economic Statistics Project (The Project)" to address these issues directly.

The Project aims at three principal contributions: (1) to conduct a comprehensive review of available DPRK statistics; (2) to help data users make sound judgments in their use and interpretation of available DPRK statistics; and (3) to provide resources and findings that can help build a common ground for productive policy discussions among North Korea analysts, policymakers, and interested parties.

The Project systematically reviewed over 200 data sources, encompassing different data categories and wide geographical areas. The Project conducted an overall assessment of the identified databases, using both supply-side and demand-side criteria, including data sources and estimation methodologies, the characteristics of the available data in terms of language and comprehensiveness, data presentation format and database functions, data update frequency, accessibility and institutionalization.

DPRK statistics data in the public domain proved to be more prevalent than expected. However, the key problems identified in available DPRK statistical data included limited primary sources, resulting in a "reverse pyramid structure" of available DPRK data. Another major problem is accessibility issues – both access to data and to the data's underlying methodology – due to language barriers as well as proprietary handling issues such as required fees.

The "reverse pyramid structure" of available DPRK statistics is comprised of three tiers. First-tier primary sources, including data supplied by North Korean authorities or North Korea's trading partners, are relatively scant. Second-tier "authoritative" secondary sources such as data released by South Korean governmental agencies and international organizations exist on top of the first tier, but are also limited in number, scope and sometimes in accessibility. Third-tier data is the most numerous and commonly

accessible, but the producers of this data tend to cite secondary sources in their databases without much attention to technical notes or methodologies. Also, if there are errors in the first tier, the same mistakes are circulated and perpetuated in other databases, as can be discerned from an examination of some trade mirror statistics.

Data accessibility issues limit the ability of researchers to gain a better understanding of certain datasets, methods and assumptions adopted, as well as the underlying objectives behind the datasets. There are some comprehensive and user-friendly databases in non-universal languages, which may be overlooked by English-speaking analysts. But accessibility restrictions including fees as well as institution-level rules and regulations, along with an unwillingness to share information in order to protect "exclusive contacts" with data providers in North Korea, represent a significant barrier to analytical research.

The Project revealed that different data categories require different approaches to data collection and technical analysis in order to overcome problems related to the reliability and usability of DPRK statistics. Demographic and microeconomic data provide critical building blocks or assumptions, which are in turn used to derive macroeconomic figures such as GNI per capita. Yet, major information gaps exist in these most basic data categories. DPRK demographic and population data remain questionable, given that all reporting entities, regardless of their different assumptions on mortality rates, rely on North Korea's first census conducted in 1993. Until the results of the second census conducted in 2008 are disclosed, we have no choice but to interpret DPRK demographic figures – and any data derived using such figures – with caution. Price data will also continue to be a challenge for data collection and analysis, requiring creative solutions for knowledge sharing such as the data depository system proposed in this Project.

Concerning macroeconomic data, the issues and debates surrounding North Korean GDP figures stem partially from common misinterpretation of the implicit objectives of certain datasets, as well as misunderstanding of fundamental differences in underlying assumptions and estimation methods, and inappropriate comparisons of data using non-comparable sources. Methods and general procedures used by "authoritative" secondary entities to estimate GDP, including the Bank of Korea (BOK), U.S. Central Intelligence Agency, the United Nations and the Center for International Comparisons at the University of Pennsylvania all appear logical, for the most part. But certain assumptions are not clearly explained and therefore their validity may be questionable. In particular, the BOK's unique perspective and implicit objectives reflected in its method to grasp the state of the North Korean economy using South Korean prices require careful consideration. Beyond that, comparisons of GNI data from non-comparable sources such as the Systems National Accounts-based GNI using Korean prices and purchasing power parity-based GNI using international prices also seem to cause numerous futile discussions and debates.

The Project's trade statistics analysis is intended to serve as a "user guide" to help data users understand the advantages and disadvantages of the available trade databases and to choose among them appropriately depending on the analytical purpose. Here, the central issue is not the lack of available data. There are quite a number of data sources available

to choose from (albeit almost all are mirror statistics). Instead, the questions are reliability and suitability. Therefore, the Project analyzed the various trade databases based on five conceivable utilities or analytical objectives: (1) to grasp North Korea's aggregate trade level; (2) to understand the historical trend of North Korea's overall trade and trade structure by country groups; (3) to obtain information on inter-Korean trade to be aggregated with the DPRK's external trade to come up with North Korea's "real" international trade level; (4) to learn about North Korea's trade with individual partner countries at the commodity level; and (5) to enable value-added analyses of North Korea's international trade, such as marketing strategies and competitiveness analyses.

In-depth discrepancy analysis revealed that wide gaps exist in the DPRK's aggregate trade figures among databases, mainly because of differences in the number of trading countries covered and the methods to adjust mirror statistics or drop partner trading countries. Based upon various statistical sources, one can observe an undeniable trend of increasing trade between North Korea and developing countries as a group over time. Given this trend, dropping small developing countries entirely from DPRK's trade database on the grounds of reliability may pose serious problems in interpreting accurately the aggregate level, historical trends and composition of trade by country or region. Aggregate trade data compiled by the UN and the IMF are likely to more closely reflect reality, given their more comprehensive coverage of trading partner countries.

The South Korean government faces unique legal restrictions and is therefore not likely to announce North Korea "international trade data" inclusive of inter-Korean commercial trade. As a result, North Korea analysts will need to continue the practice of aggregating the two statistics (North Korea's external trade and inter-Korean trade) as a necessary step to derive "real" international trade. But a simple aggregation, as currently practiced by many entities and analysts, should be interpreted cautiously as inter-Korean trade figures include considerable grant aid which registers as non-commercial trade.

The Project accessed a variety of bilateral and multilateral trade databases, enabling analysts to conduct in-depth commodity level analyses. It also encountered examples of highly sophisticated and readily available analytical tools embedded in some trade databases, deriving both static and dynamic aspects of trade performance and competitiveness. These databases can provide an insightful overview of North Korea's global status and level of participation in the world economy.

In sum, the fragile and unreliable "reverse pyramid structure" of available DPRK statistics needs to be altered so that more North Korean primary data sources become available and are shared to build a foundation for sound economic analysis and policymaking. Ultimately, the best way to address the fundamental issue of the lack of original sources and accessibility to DPRK statistics is to convince North Korea to become a more open society. However, amid challenging circumstances of limited accessibility to first-tier North Korean entities and primary data, the second-best way to improve the reverse pyramid structure of DPRK data is to develop a realistic and practical knowledge-sharing forum among the second-tier authoritative entities as well as informed analysts from concerned countries.

If second-tier entities and analysts can cooperate effectively, their collective role can be instrumental. First, they can collectively share a better understanding of the available DPRK data among authoritative entities. Second, they can help third-tier entities and the general public use DPRK data more wisely and avoid repeating or perpetuating common misinterpretations, or compounding mistakes made by first-and second-tier entities and analysts. Third, eventually, the second-tier entities will be in a better position, when such opportunities finally arise, to make a difference in solving the fundamental problem by assisting with capacity-building for first-tier North Korean entities, helping them to assemble and construct better statistical data and thereby rectifying the "reverse pyramid structure" of DPRK economic statistics.

The Project identified four characteristics for a new widely accessible database for effective knowledge sharing the construction of which could be explored beyond the current phase of the Project: (1) inclusion of comprehensive data along with user-friendly and simple but powerful analysis functions; (2) inclusion of data from multiple sources, along with methodologies for comparisons; (3) highlighting of rare and unique data; and (4) database sustainability through partnership with selected entities and the data depository system.

I.   Introduction[1]

A. Project Background and Objectives

In April 2008, the Korea Development Institute (KDI) School of Public Policy and Management approved a project titled the Democratic People's Republic of Korea (DPRK) Economic Statistics Project ("the Project"). The Project is administered by the US-Korea Institute at the Paul H. Nitze School of Advanced International Studies (SAIS), Johns Hopkins University in Washington, D.C. The Project is intended to directly address issues and concerns regarding the availability and quality of statistics that provide quantitative indicators of DPRK economic conditions. This report is a synthesis of research outputs produced over eight months in April-November 2008, and is primarily intended to inform KDI School officials and scholars and the members of the North Korea

The most fundamental yet controversial DPRK economic and social statistics include macroeconomic indicators such as Gross Domestic Products (GDP) and GDP per capita. In March 2008, for instance, the Yonhap News Agency[2] reported that former Minister of the Ministry of Unification Lee Jong-Seok criticized both the Bank of Korea (BOK) and the U.S. Central Intelligence Agency (CIA) for "over-estimating" North Korean GDP figures. The BOK announced that North Korea's nominal gross national income (GNI) was $25.6 billion in 2005, while the CIA's most recent two years of data set North Korea's Purchasing Power Parity (PPP)-based GDP at $40 billion. "If the BOK statistics are true," Lee argued that, "North Korea's per capita GNI represents two thirds of China's $1,736, and nearly double Vietnam's $616. Nobody would believe it if someone said North Korea is two times wealthier than Vietnam…"[3] Lee criticized the BOK's "wrong method" of employing South Korea's price and value-added rate information in calculating North Korea's GNI. The article reported further that *a method generally used by countries around the world* (emphasis by the author) brings North Korea's GNI down to $8.4 to 8.9 billion with a per-capita GNI at $368 to $389 based on the 2005 market exchange rate, concluding that such estimates would better reflect North Korea's economic reality.

Did the BOK really employ the "wrong method"? Is there a "right" method for estimating North Korea's economic indicators? Can we take any North Korea-related economic and social statistics at face value, and compare those with data from other sources? What is the "method generally used by countries around the world"?

The debate is a reminder that North Korea analysts, academics and policymakers face constant challenges in terms of the validity of their analyses, arguments and policymaking. Their arguments may be based on unreliable data sources, or supported by flimsy evidence. The debate also reflects that there is little common ground for productive and meaningful policy discussions on the North Korea economy due to data and statistics problems. Many still cannot agree on the most basic economic and social indicators for North Korea.

In addition to questions of fundamental accuracy, the divides among those who are most concerned about North Korea's economic issues in general -- and North Korea's economic and social statistics in particular -- also seem to stem from misinterpretation of implicit objectives of certain datasets, misunderstanding of fundamental differences in underlying assumptions and estimation methods, and inappropriate comparisons of data using non-comparable sources.

While there is considerable interest in and a dire need for "reliable" North Korea statistics and data, there remains a dearth of literature on this particular topic, especially based on any comprehensive review of the existing and available North Korea statistics data. Analyses identifying, comparing and evaluating DPRK data made available by different

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[2] Yonhap News Agency. "N. Korean economy overestimated says expert," *Yonhap News*. March 7, 2008. http://english.yonhapnews.co.kr/northkorea/2008/03/07/60/0401000000AEN20080307002000315F.HTML
[3] Ibid.

entities are also extremely limited. The Korea Development Institute has published comparative analyses of North Korea data sources, including research conducted by Koh and Oh (1996).[4] Among more recent works in this field, Lee (2007)[5] conducted a comprehensive study encompassing the historical background of the DPRK statistics and authorities, as well as in-depth comparative analyses of datasets by selected entities in the areas of GDP, trade, and population. The two editions of the *North Korea Development Report* (in English) issued thus far by the Korea Institute for International Economic Policy (KIEP) are accessible to both Korean and non-Korean readers.[6] Those reports compiled research and analysis exclusively focusing on North Korea's economic development, offering various datasets, but providing only limited comparative analyses and evaluations of the underlying data sources.

Building on these existing works, and against the backdrop of on-going debates surrounding DPRK statistics, this Project expands the scope of study and makes two major contributions:

- **The Project identifies the entities producing or estimating DPRK statistics and assesses their datasets and methods in a more comprehensive manner.** This exercise is valuable to find out what is available and what is not, and to understand how different entities identify, collect, analyze, and present DPRK data, as well as their rationale for the various estimation methods they have adopted. At the same time, this exercise indentifies issues to be addressed, in order to help data users make more sound judgments in their use and interpretation of available DPRK statistics, in terms of data quality and comparability. In the process, the Project has also identified and introduced some user-friendly databases that may have been under-utilized to date by the analytical community. The Project aims to present these findings and recommendations to selected entities that produce and estimate North Korean social and economic data.

- **The Project provides resources and conclusions that can facilitate the building of common ground for productive policy discussions among North Korea analysts, policymakers and interested parties.** Institutions and individual analysts need to cooperate toward effective but realistic knowledge-sharing amid challenging circumstances, with limited accessibility to North Korean primary data. This Project attempts to act as an example of cooperation among North Korea economic analysts from different countries and sub-disciplines, highlighting the issues encountered by various entities and individuals, particularly from South Korea and the United States.

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[4] Koh Il Dong and Oh Kang Su. (1999.6) "North Korea Economic Statistics: Current Status and Issues." *KDI Discussion Paper.* Seoul: Korea Development Institute. (In Korean)

[5] Lee, Suk. (2007) *DPRK Statistics: Usability and Reliability*. Seoul: Korea Institute of National Unification. (In Korean).

[6] Ahn, Choong Yong ed. (2003) *North Korea Development Report 2002/03.* Seoul: Korea Institute for International Economy.

B. Expected Output and Beneficiaries

The initial Project proposal approved by the KDI School in March 2008 summarized the Project's objectives, expected output and beneficiaries as follows:

The established objectives of the Project were three-fold:

- To analyze critically and systematically the reliability of available North Korean economic data, including data made available by the North Korean authorities and estimations conducted by other governments and international institutions outside North Korea, in order to better understand the situation of the DPRK economy;
- To classify available statistical data into user-friendly categories for effective knowledge-sharing, rigorous economic analyses and sound policymaking; and
- To clarify specific issues that should be addressed in interpreting statistics made available by North Korea in order to identify priorities for future efforts to improve the quality of economic statistics through discussions with North Korean authorities, when such opportunities arise.

Anticipated Project output included the following:

- A database of annotated statistics assembled from various sources and vetted by a technical review group;
- Technical analyses providing detailed assessments and commentary on specific sets of data; and
- Articles for publication.

Expected project beneficiaries were described as follows:

- The database is intended to provide a comprehensive picture of currently available North Korean economic data in a user-friendly manner.
- Technical analyses will be useful for analysts and a basis for discussions with North Korean authorities in the future.
- Articles for publication would aim to summarize main conclusions and lessons learned from the Project for analysts, policymakers and the general public.

C. Methodology

The Project was proposed to be implemented in three stages: (1) data identification and collection; (2) data assessment and classification; and (3) database construction and a final report. Each stage generated preliminary project output for discussion and input from North Korea economic experts, followed by further modifications of the output based on their recommendations. A systematic and methodical approach was adopted at

each stage, to generate the most effective output for achieving project objectives while also realizing cost-savings for the Project.

1. Data Identification and Collection (First Stage of the Project)

During the first stage of the Project (April – July 2008), the Project completed the following activities: (i) preliminary entity/data identification; (ii) discussions with North Korea analysts in the United States, in particular the members of the Project Steering Committee[7] and the DPRK Economic Forum at SAIS; (iii) desk work for data collection; and (iv) drafting of the output of the first stage of the Project. At the initial stage, the Project attempted to identify all known sources of DPRK statistics, to the extent possible, through a systematic and thorough search of entities both in North Korea and elsewhere that produce or estimate various economic and social indicators.

In order to be systematic and methodical in identifying data sources, the Project first looked at the SAIS library's on-line statistical resources.[8] Second, the Project reviewed useful links listed by major Korean entities as well as foreign and international organization websites.[9] For example, the Export-Import Bank of Korea has compiled a list of ROK institutions active in North Korea-related research and operations. Third, the Project referred to relevant North Korea resource guides such as *Tong-il Yeohaeng*.[10] In identifying databases, care was taken to identify a broad range of entities and types of economic data, with a wide and representative geographical coverage:

- Entities: North Korean entities, other governments, international organizations, non-governmental organizations (NGOs), think-tanks, universities and individual researchers (if applicable) were included.
- Types of economic data: Macroeconomic and financial statistics, social indicators and key sectors including agriculture and energy were emphasized.
- Geographical coverage: Not only entities in North Korea but also those in China, Japan, European Union (EU) countries, Russia, South Korea and the United States were covered to the extent possible.

Once data sources in different regions producing various North Korea economic data were identified, the Project sought preliminary input and advice concerning information gaps and priorities and criteria for data collection from Steering Committee members and members of the DPRK Economic Forum. Based on those suggestions, the Project pursued four broad data categories, namely, macroeconomic data, microeconomic data, trade data and social indicators, to help identify and clarify the issues surrounding DPRK statistics. Also, it was suggested that certain areas in which DPRK statistical data are

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[7] The Economic Forum/Steering Committee meetings were held five times in April, June, July, September and October 2008.

[8] Johns Hopkins University-SAIS Library website: http://www.sais-jhu.edu/library.

[9] The Export-Import Bank of Korea's useful link page on North Korea related information: http://www.koreaexim.go.kr/kr/sn/m03/s05.jsp.

[10] 전병길 (2007) 인터 넷으로떠나는통일 여행. 서울: 리더쉽코리아/한국리더쉽코학교.

already substantially available such as the energy sector, could be given a lower priority in terms of data collection and in-depth analysis While identifying statistical sources and data, each data source was characterized, to the extent possible, based on a set of preliminary criteria for categorization, in terms of the nature of the data (actual data vs. estimates), comprehensiveness (complete or incomplete), and frequency of announcement or publication (regular vs. irregular). Such preliminary characterization of the data facilitated the overall assessment of databases conducted in the second stage of the Project.

2. **Data Assessment and Classification (Second Stage of the Project)**

The second stage of the Project focused on general assessment and classification of the collected data. In order to make objective assessments concerning the reliability and background of specific data sets, the Project conducted field visits and interviews with both suppliers and users of North Korean economic statistics, to confirm methodologies and obtain information necessary for classification and assessment of reliability. Interviewees included expert users of North Korean economic statistics as well as the entities producing or estimating the statistics. During the course of the research and interviews, the Project identified which sources and datasets tend to be used most and why, while also looking at what is most lacking in the available sources, and therefore most needed in the future.

3. **Database Construction and Final Report (Third Stage of the Project)**

The third stage of the Project constituted database construction and final report writing. A datasheet in Excel format was prepared containing specific economic datasets (Appendix: Data Comparison). The final report contained the main technical analyses, detailed assessment and commentary. Some modifications were suggested at the mid-point of Project implementation in August 2008 to choose about 20 specific datasets as case studies for an in-depth evaluation in the final report. The final report, which contains a synthesis of the output of each stage of the Project, also serves as a basis for articles for publication. This report also explains the Project's major findings and lessons learned, by responding to the following questions, among others:

- What are the most important and most common issues identified in the available data and information that can prevent analysts and policymakers and others from understanding accurately the actual conditions of the North Korean economy, or hinder them in conducting meaningful economic analysis and deriving sound policy conclusions?
- What are the major issues regarding data provided by North Korean authorities and what remedial measures can be taken to overcome these constraints?
- Are there any potentially valuable statistical data sets identified during the course of the Project implementation, which have been under-utilized by analysts and policymakers?
- Did the Project final output (the database) reflect such findings and integrate under-utilized data sources in the database?

- What is the overall assessment of economic data in terms of availability, reliability, as well as needs for any particular data?
- What are the major gaps between the producers and users (supply and demand sides) of North Korean economic statistics?
- To what extent can the Project final output (the database) address the issues stated above, filling information gaps and satisfying the Project objectives?
- What are specific findings and recommendations regarding which entities covered could usefully serve as case studies?

Assessment workshops were organized to evaluate progress and define priorities and modalities for further activities. The Project was intended to be the first phase of activities that could be expanded into a second phase if the results were successful and additional funding could be mobilized, especially for the establishment of a more comprehensive databank with links to cooperating institutions, in order to fully achieve the Project objectives of knowledge sharing and dissemination. Thus, continuous cooperation -- updating, sharing and linking to related information, among organizations that provide and use data -- would comprise the main activity of the next Project phase, if the Project were continued and expanded.

PART ONE: OVERALL ASSESSMENT OF NORTH KOREA ECONOMIC STATISTICS

II.   Availability and Characteristics of DPRK Statistics and Data

While identifying statistical sources and data, the Project studied four distinct and separate categories: (i) socio-economic indicators; (ii) microeconomic data such as prices; (iii) macroeconomic data such as GDP and GNI per capita; and (iv) trade data. As noted above, the first stage of the Project derived criteria for categorization of databases. Such criteria included geographical coverage and comprehensiveness (time series or single-year data), language (available in English or only available in Korean), and the types of datasets. To the extent possible, the frequency of data updating (regular or irregular) was also confirmed.

A.   Geographical Coverage and Comprehensiveness

The Project covered and reviewed 162 entities drawing upon 221 data sources.   Many entities have multiple databases or publications. The Project counted them as separate data sources in most cases.

Table 1 shows the geographical coverage of the databases covered and reviewed, and the availability of DPRK statistics and the degree of comprehensiveness. "Comprehensive" data is defined as any sub-category of data that has contains statistics covering a period of over ten years, thereby enabling analysts to conduct meaningful time-series analyses.

In terms of geographical coverage, the Project covered entities from the Republic of Korea (ROK), the United States (US), European Union (EU) member states, Japan (J), China (C), Hong-Kong (HK), other Asia Pacific Countries (APAC) such as Australia and New Zealand, as well as international organizations (Global). These entities were further categorized into sub-groups, namely, government entities (G), private institutions (P), or NGOs. Entities covered include a large number of ROK government institutions (27), followed in number by global entities such as UN organizations (21), ROK NGOs (17), US private research institutes (16), and ROK private institutions (15). Looking at individual databases rather than the producing entities, North Korean economic statistics are available in many databases compiled by international organizations (41), followed by databases issued by the ROK government (37), ROK NGOs (21) and the US government (21).

During the course of identification and collection of data, the first obstacle encountered was access to North Korean official statistics. Some ROK entities' websites containing North Korean data nominally in the public domain were only accessible by Korean nationals, or by the designated staff members of these entities.

Out of 221 data sources covered, about 64% (141 databases) have North Korea-related economic and social statistics data; of 141 databases, about 40% (56 databases) have comprehensive data, while 56% (79) have only partial data.

Table 1: North Korea Statistics Data Availability and Comprehensiveness

	Number		DPRK Data (Y/N)			Among Yes		
	Entities	Databases	Yes	No	Not known	Compre hensive	Not Compre hensive	Not known
APAC-G	2	3	3	0	0	0	3	0
APAC-P	1	1	1	0	0	0	1	0
EU-G	9	9	4	4	1	1	2	1
EU-P	7	15	10	5	0	5	4	1
EU-NGO	1	1	1	0	0	0	0	1
Global	21	41	32	8	1	14	18	0
HK-NGO	1	1	0	1	0	0	0	0
J-G	4	4	2	2	0	2	0	0
J-P	8	11	4	3	4	3	2	0
NK-G	5	5	2	1	2	1	0	1
NK-NGO	1	1	0	1	0	0	0	0
PRC-G	7	9	4	3	2	3	1	0
PRC-P	2	2	2	0	0	0	2	0
ROK-G	27	37	24	9	4	14	10	0
ROK-NGO	17	21	8	13	0	0	9	0
ROK-P	15	17	11	4	2	2	5	3
US-G	13	21	17	4	0	4	13	0
US-NGO	4	5	5	0	0	0	5	0
US-P	17	17	11	6	0	7	4	0
Total	162	221	141	64	16	56	79	7
Share (%)	-	100%	64%	29%	7%	40%	56%	5%

B. Language, Accessibility and References

Table 2 shows that out of 141 databases identified as containing North Korean statistical data, 85 data sources or about 60% are available only in English while about 18% is available only in Korean. About 3.5% is available in languages other than English or Korean. The accessibility of DPRK statistics available only in English is considerably higher than that of sources available only in the Korean language. Three observations are noteworthy. Given the lack of primary sources, the same DPRK statistical information from a relatively limited number of sources in English is circulated and recycled among these databases. Second, there are some English databases that are under-utilized by South Korean analysts. Third, although the databases available only in Korean represent a relatively small proportion of the total, some still offer high usability. Such databases

are under-utilized by non-Korean analysts. For example, it is highly likely that the ROK National Statistical Office's Korea Statistics Information Service (KOSIS) database has been under-utilized by non-Korean analysts despite its comprehensiveness and user-friendly functions. The KOSIS offers, under its domestic statistics section, a tab called South-North Korea Economic and Social Indicators Comparison, containing 13 files of 86 comprehensive data categories for the period of 1965/70 to 2006.[11]

Table 2: North Korea Statistics Data Availability by Language

	Language						Accessibility	
	English only	**English and Korean**	**English and Other language**	**Korean only**	**Others only**	**Sub-total**	**Open**	**Restricted (of which proprietary)**
APAC-G	3	0	0	0	0	3	3	0
APAC-P	1	0	0	0	0	1	1	0
EU-G	1	0	2	0	1	4	4	0
EU-P	10	0	0	0	0	10	1	13 (1)
EU-NGO	0	0	1	0	0	1	0	0
Global	31	0	1	0	0	32	24	8 (2)
HK-NGO	0	0	0	0	0	0	0	0
J-G	0	0	2	0	0	2	2	0
J-P	0	0	2	0	3	5	3	2 (0)
NK-G	0	0	0	2	0	2	0	0
NK-NGO	0	0	0	0	0	0	0	0
PRC-G	0	0	4	0	0	4	2	2 (0)
PRC-P	1	0	0	0	1	2	0	0
ROK-G	6	3	1	15	0	25	0	5 (5)
ROK-NGO	1	6	0	2	0	9	0	0
ROK-P	0	3	0	6	0	9	0	1 (1)
US-G	17	0	0	0	0	17	0	0
US-NGO	5	0	0	0	0	5	0	0
US-P	9	0	2	0	0	10	2	4 (2)
Total	**85**	**12**	**15**	**25**	**5**	**141**	**105**	**35 (11)**
Share (%)	**59.9%**	**8.5%**	**10.6%**	**17.7%**	**3.5%**	**100%**	**75%**	**26%**

Aside from language barriers, other types of accessibility issues also became clear. So-called "proprietary" issues, defined here as obstacles to data access due to costs (fees), or other non-financial restrictions such as rules, regulations and procedures, are particularly relevant. For example, during the course of data identification and collection, it became clear that only South Korean nationals with national identification numbers can log in to become a member of certain ROK entities' websites. Also, even among South Korean

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[11] National Statistical Office: Korea Statistics Information Service (KOSIS): http://www.kosis.kr.

nationals, there are those who can and cannot gain access to North Korean data and statistics made available for the public domain. For instance, the website of the Korea Institute for National Unification (KINU) discloses the list of North Korea statistics announced and released by the North Korean authorities that have been submitted to international organizations. During field visits and interviews, KINU advised that the only way to access such data on their website is to physically visit the KINU office in Seoul.[12]

Perhaps most significantly, the Project also confirmed a "reverse pyramid" structure of data sources as determined by the references noted in the various databases. Some 22% of databases refer to primary sources, while 25% are considered to be authoritative entities reporting DPRK-related statistics. The remaining 50% are entities which merely cite and repeat data provided by the secondary authoritative sources. In other words, there are only a handful of institutions which rely on primary data sources provided by North Korean authorities (i.e., the United Nations), creating a fragile foundation for DPRK data and statistics sources. There is also a relatively limited number of frequently cited "authoritative sources" including the Bank of Korea (BOK), Korea Trade-Promotion Agency (KOTRA), and the United States Central Intelligence Agency (CIA). The majority of institutes that possess and disclose DPRK statistics on their websites or publications simply cite these authoritative sources, in most cases without adding their own analysis. It should also be noted that this "reverse pyramid" structure for DPRK

Figure 1: DPRK Statistics – Reverse Pyramid Structure of Data Sources
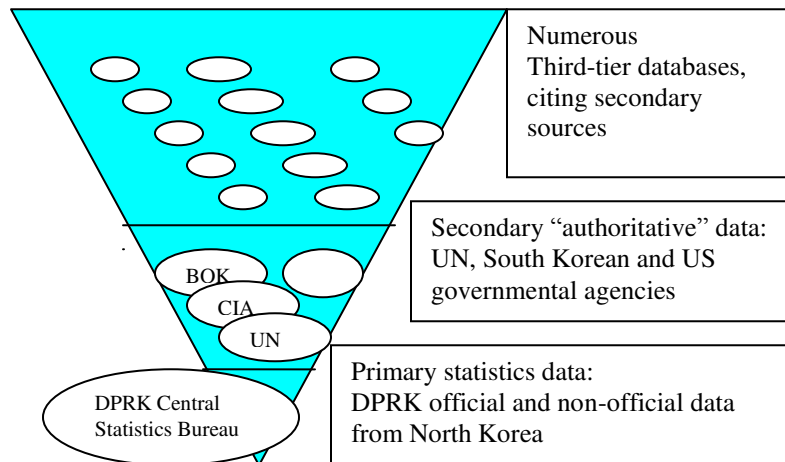
data sources does take into account those individuals and institutions which are known to possess DPRK statistics but use them only internally, or on a strictly proprietary basis. Most of these entities seem to be reluctant to share such data with others in part to protect exclusive relationships they may have established with data providers in North Korea.

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[12] Author's interviews with a ROK government official and a former KINU official. Seoul. August 2008. http://www.kinu.or.kr.

C.   Types of Datasets

Table 3 shows major findings regarding the characteristics of North Korea-related data, explained for each of the four data categories. There are distinct characteristics or features of the available North Korea data which become clearer when considered for each of the four types, namely, macroeconomic indicators, microeconomic indicators, social indicators and trade data. These differing characteristics imply that different approaches are necessary to conduct in-depth analysis on entities and their datasets in Part II. Also, there are implications for the operationalization of a data bank beyond the current phase of the Project. Each category of data could require a different method for data bank operationalization.

Table 3: Key Characteristics of Four Categories of North Korea Data

	Findings	Implications for needed follow-up
Macro-Data	* Many entities refer to a few sources and analyses (i.e., BOK, CIA, KOSIS) * Methodologies not transparently explained in the public domain	* In-depth comparative analyses among entities and methodologies * Interviews * Recommendations to data-producers
Micro-Data	* Lack of data and reliability issues * Major original sources are either from surveys conducted by international organizations and individuals (connected or contracted by outside organizations), or observations by entities/individuals in NK (i.e. foreign embassies in PY)	* Collection/compilation of micro data will continue to be a challenge * A data depository system as a model for compiling micro-data in the future
Trade Data	* Comprehensive data is available from multiple sources * Specialized entities providing data on a subscription basis. * Technical notes/methodologies, value-added analyses are more available, compared to other categories	* Comparative analyses among different sources (i.e., IMF DOT vs. KOTRA/KITA) * Recommendations to data-producers * Technical analysis (TA) can be a "user guide" for DPRK trade data users
Socio-econ data	* Specialized entities/agencies are cited as original sources (i.e., health indicators, TB rate) * Existing data is under-utilized	* Compilation of various data, categorization, and analytical focus need to be determined for the Project. * Link to macro-data analyses

Analyses of the databases covered indicate that for **macroeconomic data** such as GDP and GNI many institutes rely on only a few entities, namely the BOK and the CIA. This finding is not new; it confirms the already-known fact that those are the most frequently quoted sources. Why are they the most frequently cited? Aside from the BOK and CIA,

are there any other institutions that announce North Korea's macro data on a regular basis?

Regarding the first question, the frequent citation of the BOK and the CIA statistics can be attributed to the fact that both are governmental institutions which are believed to have direct access to DPRK data. In addition, their data is easily accessible through websites and publications, and the data has been regularly updated over the past decade or so. As a result, these two institutions are viewed as "authoritative" sources of North Korean economic statistics, especially in South Korea and the United States. The BOK and the CIA are almost exclusively relied upon as the original sources of North Korea GDP data. But until their underlying purposes, rationale and methodologies are better understood, gaps in the GDP data they publish will continue to be a source of contention The problem becomes even more complicated when third-tier entities cite GDP figures from the CIA and the BOK without much consideration to their comparability with other sources of GDP data for other different countries.

As regards the second question of whether other entities also announce or estimate North Korean GDP, information based on North Korean authorities' periodic but rather inconsistent announcements of data, particularly data from the 1990s, are available from some sources including the Ministry of Unification's North Korea Information Center.[13] The publication called *UN Data* also makes available North Korean GDP data through multiple channels, including the UN's Analysis of Main Aggregates (AMA) database. On the other hand, neither the World Bank nor the International Monetary Fund (IMF) includes North Korean macroeconomic data in most of their databases such as the World Development Indicators (WDI) online or the International Financial Statistics. This is mainly because North Korea is not yet a member country of these International Financial Institutions (IFIs). Most recently, the Center for International Comparisons at the University of Pennsylvania, in its latest Penn World Table (PWT6.2), has started to estimate North Korea's PPP-based GDP data starting in 1970 using various methods.

In sum, the circular nature of DPRK data is particularly noticeable in the case of macroeconomic data -- the "reverse pyramid" structure of economic data sources is especially prominent in the macroeconomic data category. Part II of this report directly addresses these issues, by conducting in-depth comparative analyses of some of the above-mentioned entities.

As expected, the top problem identified for **microeconomic data** is its overall absence. In addition, North Korean microeconomic data has serious problems with reliability even when it is available. Price data is fundamental to estimation of national accounts. Such data is especially important given that North Korea is in *de facto* transition – slowly, but clearly nonetheless – from a planned economy to a market economy. Within the limited microeconomic datasets that are available, a majority of data sources are surveys conducted by individual researchers, NGOs or foreign embassies in Pyongyang. These institutions often rely on individual (untrained) North Korean citizens to provide the

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[13] http://unibook.unikorea.go.kr/new2/

information. As a result, systematic collection and compilation of microeconomic data will continue to be a tremendous challenge.

Regarding **socio-economic data**, there are a number of specialized agencies producing unique and useful information related to health and social sectors. Such unique databases vary from ones produced by global entities such as the United Nations, the World Health Organization (WHO) and UNICEF (i.e., UN-Millennium Indicators Database offering DPRK historical data in the limited categories of socio-economic indicators) to specialized South Korean entities including the Korean National Tuberculosis Association and the Inter-Korean Summit Secretariat. The Inter-Korea Summit Secretariat provides statistics on inter-Korean dialogue sub-meetings by theme, such as politics, economy, culture and military. Due to the fragmented nature of socio-economic data, compilation of statistics from various sources and classification is a challenge that requires prioritization. Part II of this report will take up population and some health-related datasets for in-depth analysis.

The nature of issues revolving North Korea **trade data** and available trade databases is quite different from those of other data categories. Comprehensive databases of North Korea's external trade (for periods over 10 years) are available from multiple sources. The challenges faced by DPRK analysts in using and assessing trade data are therefore different. For example, why do the available trade databases show different aggregate figures that differ beyond what could be expected conceivable errors in data derived from mirror statistics? Which specific data sources should we use for which specific analytical purposes? What are major differences among the trade databases in terms of methodologies and classifications, as well as the entities' decisions in modifying reported official data when compiling mirror statistics?

Before addressing these specific technical issues in Part II of this report, the next section will make a more detailed overall assessment of the databases identified, in order to explain the logic behind choosing specific entities and datasets for more in-depth analysis.

III.   Overall Assessment of DPRK Databases

A. Overall Assessment: Criteria and Limitations

The second stage of the Project focused on general assessment and classification of identified or collected databases containing North Korean economic statistics. Assessment criteria were presented and discussed with the Steering Committee members as well as at an interim report seminar in Seoul in August 2008. In the end, the assessment criteria used in this study included both supply-side and demand-side criteria, as summarized in Table 4. Next, points were assigned depending on the degree to which each database performs according on each criterion, as shown in the table.

Table 4: Criteria for Data/Database Assessment

Criteria	3 Points	2 Points	1 Point
Data update frequency	Regular updating for a period over 5 years	Irregular updating or track record of updating over the past 3 years or so.	One time publication
Institutionalization	Specialized institutions, or divisions in charge of collection/analysis of DPRK data	Specialized personnel of organizations/institutions	Individual researchers
Sources	Primary sources of datasets (incl. rare, unique data, official trade customs data); secondary authoritative sources	Citing primary or secondary "authoritative institutions" w/ their own analyses/notes	Citing other institutions only, or no references indicated
Methodology	Solid methodology indicated/shared	Citing institutions, using solid methodology	No indication of methodology or unknown sources
Comprehensiveness of data	Over 10-year time series data	Data covering 2~9 years	Single-year figures
Data accessibility	Open to public through internet/publications	Purchase/subscription required, but available at university libraries	Proprietary data or difficult-to-obtain information (i.e., cost consideration)
Language	Available in English and other languages (i.e, Korean)	Available practically in one language (English).	Available only one non-universal language
Data presentation format/functions	Excellent: User-friendly formats/functions for data analyses (i.e., downloadable)	Good: Table formats	Not easy: Data and figures in text or figures only.

The supply-side factors included: (1) data update frequency; (2) institutionalization of staff members who collect and analyze North Korea economic statistics; and (3) sources of data and technical notes/explanations.   The demand-side criteria included: (1) reliability of methodology; (2) comprehensiveness of data; (3) data accessibility; (4) language of availability; and (5) data presentation format and functions (Table 4).

Each database was evaluated based on the above criteria, using a 3-point system.   The maximum possible point score that each database can earn is 24 points. This system of evaluation was not intended to rank the identified databases. Rather, the system was used to ensure that a logical methodology was in place for selecting entities or databases for more in-depth technical analyses as case studies. These criteria and point scores can also serve as decision-making guidelines, although not as definitive criteria, for the inclusion of specific entities or databases for inclusion in a larger-scale databank that might be constructed beyond the current phase of this Project.

B. Major Findings

Figure 2 shows the overall assessment of databases identified. In total, 121 entities were evaluated, of which 11 databases earned 24 points (a full score) or 23 points, followed by 16 databases with 22 points, 19 databases with 21 points, and 29 entities with 20 points. The weighted average point score is 19.6 points and the median point score is 20 points.

Figure 2: Overall Assessment of Databases Identified
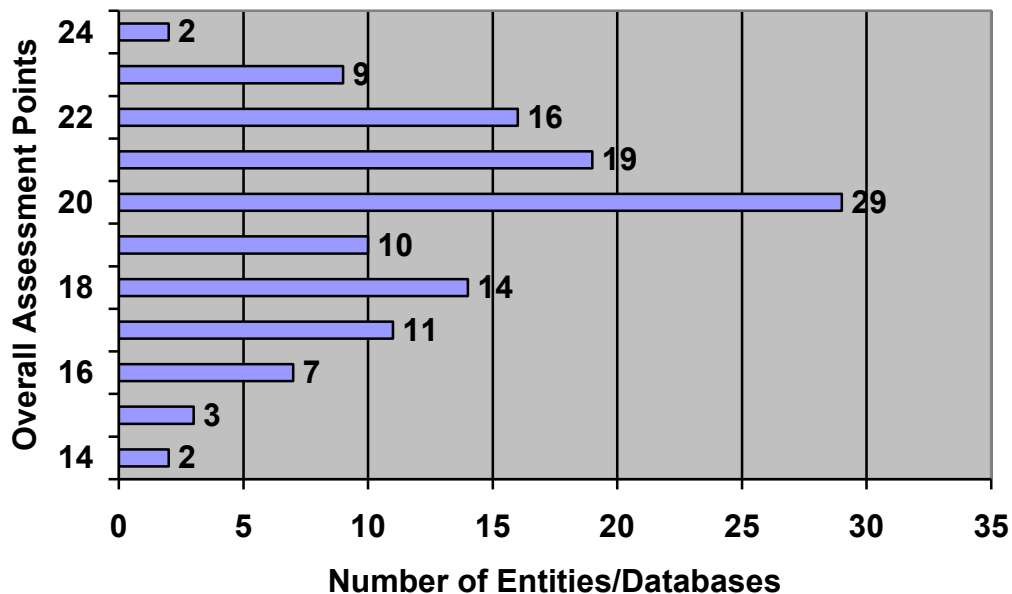
The entities producing the highest-rated databases have certain characteristics in common. Most of them are global entities, providing comprehensive trade data or economic and social indicators in their databases in the public domain, including UN Comtrade, OECD

databases, and UNCTAD trade databases. But national organizations such as the South Korean Ministry of Unification's website for inter-Korean trade and Japan's Ministry of Finance/Customs database also earned high overall points.

Table 5 shows a more detailed distribution of entities in terms of points assigned based on each assessment criterion. From this analysis, we can confirm many of the characteristics and issues of DPRK statistics that we have intuitively perceived.

Table 5: Distribution of Entities in terms of Assessment Points

Criteria	3 Points	2 Points	1 Point
Data update frequency	70 (57%)	38 (31%)	14 (11%)
Institutionalization	92 (75%)	29(24%)	1 (1%)
Sources	72 (59%)	48 (39%)	2 (2%)
Methodology	72 (59%)	47 (39%)	3 (2%)
Comprehensiveness of data	57 (47%)	49 (40%)	16 (13%)
Data accessibility	93 (76%)	24 (20%)	5 (4%)
Language	24 (20%)	76 (62%)	22 (18%)
Data presentation format/functions	36 (30%)	81 (66%)	5 (4%)

Update Frequency: The majority of databases assessed, accounting for 57%, are updated periodically, on a yearly basis or more frequently. However, the distribution skewed toward regular updating should be interpreted carefully. Most entities adopt necessary reviews and procedures as a matter of practice for all the countries concerned. But this does not necessarily mean that figures are updated for North Korea based on new or fresh data. Many of the UN databases covering population statistics, for instance, the UN Statistics Division (UNSD) or UN Population Division (UNPD), review North Korea's data and statistics on an annual basis, but not always based on receipt of new or necessary data. Many databases including UNSD and UNPD are assigned 3 points for conducting regular updating, but the reality is merely procedural, rather than reflecting the updating of actual data in a true sense. These issues are of course tied to the relative absence of primary source data.

Institutionalization: Institutionalization is also a difficult criterion that requires elaboration and careful interpretation. Many of the institutions operating large-scale multi-country databases are equipped with staff members who are in charge of not only North Korea but also other countries. Highest points (3) were assigned to those organizations even if their databases contain only limited datasets for North Korea, as long as they are likely to swiftly mobilize the necessary staff members to work on North Korean data when and if needed or available. For instance, North Korea is not yet a member country of IFIs such as the IMF and the World Bank. The Bank's World Development Indicators Online database, for instance, has not filled many of the data categories for North Korea due to the unavailability and questionable reliability of North

Korea statistics; out of over 800 data sub-categories contained in the World Development Online database, less than 200 datasets are present for North Korea. But the Bank is institutionally equipped to start providing necessary data once more reliable primary data, which passes the Bank's certain criteria and reliability tests, becomes available.

On the other hand, lower points were assigned to some data sources reviewed, if the North Korea data can be viewed as an individual rather than institutional asset, or if there is no institutional setup for data sharing. Field interviews revealed that some entities had staff members or North Korea experts create websites presenting rare and unique primary data. But the sites have not been updated after these particular staff members left the organizations.

Sources: A majority of entities/databases earned at least 2 points or above for this criterion, given that very few entities display North Korea data without citations or sources of data. In this overall evaluation, databases were categorized slightly differently from during the preliminary evaluation: those listing both primary sources and authoritative secondary sources earned 3 points. For instance, Good Friends earned 3 points for almost all of their survey reports disclosed on their website, as they use primary data sources or interviews, with value-added analyses or observations concerning the food situation or nutritional surveys. Many trade databases earned 3 points, as their source data such as partner countries' official trade/customs statistics can be interpreted as "primary" data even though they are mirror statistics. Examples include customs offices or trade authorities of partner countries, such as the China Customs and Japanese Ministry of Finance/Customs databases, global entities' databases such as UN Comtrade and IMF Direction of Trade, and private ventures such as the Global Trade Information Services (GTIS) that compiles trade data from foreign customs authorities.

If some research publications utilized primary data sources and conducted value-added reliability analyses, such works earned highest points. For instance, KOTRA, while using GTIS's database as well as overseas official customs data as its original sources, makes adjustments if there are questionable and inconsistent data. Similarly, reports compiled by the US Congressional Research Service received 3 points for the same reasons, identifying and verifying some major errors or inconsistencies in official trade statistics and adjusting figures accordingly. Such examples will be discussed in detail as part of this report's technical assessment of trade data (Box 4).

Methodology: About two-thirds of the databases assessed provided some technical notes and methodologies concerning how they obtained and estimated North Korea statistics. Most of them were global entities which disclosed general methods, methodological steps and procedures taken for data collection, verification or estimations. However, the most critically-needed information are the specific assumptions and methods applied to DPRK data, as it often does not fall into the same general categories as data from other countries. Some databases provide such crucial information (for example, the Center for International Comparisons - Penn World Table).

In most cases, however, North Korea-specific methodological information cannot be obtained in the public domain, requiring interviews and discussions with those organizations. It was a major challenge to ascertain the detailed methods or assumptions specifically applied to North Korea by most institutions contacted during the course of Project implementation. Specific questions were directed to relevant entities, but very few responded to such queries.

For instance, the UNCTAD *World Investment Report*, an annual publication as well as an interactive database, contains detailed information on its sources and methods for compiling and/or estimating FDI figures. But North Korea does not fall into any of the groups of countries for which conventional methods and procedures were applied. Further information was necessary for in-depth analysis. Despite these caveats, however, such databases earned 3 points due to their generally-solid technical methodologies and procedures disclosed, while revealing information gaps in their methodological steps specific to North Korea.

Comprehensiveness of data: More than one-third of the databases with DPRK statistics offer comprehensive datasets, defined as covering over ten years, as discussed in the previous section. Examples include the UN National Accounts Main Aggregate database, which contains extrapolated estimates to make datasets available from 1970, the IMF Direction of Trade database, and CIC's latest Penn World Table.

Data Accessibility: The Project consciously focused on investigating publicly available open sources as well as databases available at the SAIS online library network. As a result, databases that earned the highest score of 3 points accounted for three-fourths of databases evaluated.

There are some subscription-based databases that were not available at SAIS and earned low points due to cost factors, but were worth noting as valuable data sources nonetheless. For example, a US private venture, GTIS World Trade Atlas (WTA), was awarded only one point due to cost factors (subscription-based databases), but its utility as a trade database seems to be very high. GTIS has filled in a market niche by successfully serving not only US government organizations but also major entities in South Korea including KOTRA. GTIS's WTA will be included for further technical assessments in Part II of this report.

Aside from cost factors, other accessibility issues such as individual and institutional level constraints were taken into consideration in assessing data accessibility.   For instance, price data which is often gathered by individual researchers is neither easily nor fully accessible to a wider audience. Institutional level accessibility issues include some discriminatory rules and procedures applied to certain groups of people (i.e., Korean nationals vs. non-Koreans).

The Project's data accessibility assessment revealed another important issue. Due to the relative absence of DPRK primary data and constraints on accessibility to such data, data users tend to cite more easily accessible "authoritative" entities without paying

appropriate attention to their technical notes and methodologies. For instance, the CIA's *World Factbook* is widely used due to its openness. But sometimes the CIA's PPP-based GDP estimates have been misinterpreted or compared with data from non-comparable sources.

Language: Among the databases reviewed, about one out of five databases containing North Korea statistics is available in both Korean and English. Another one out of five is available only in non-universal languages, including Korean. The majority of databases are accessible only in English.

Language factors are critical in terms of usability. Highest points were awarded to bilingual databases taking into consideration both Korean and non-Korean speaking analysts' perspectives. However, this does not necessarily mean that there is lower usability or reliability for databases available only in English or in non-universal languages. To the contrary, we identified some databases that are sadly under-utilized due to language barriers (i.e., the South Korean KOSIS database), as briefly discussed in the previous section. The Project aimed to identify such databases as one of the Project's key objectives.

It is interesting to note that "bilingual" websites or publications do not necessarily present identical contents. Often, only parts of datasets or information are made available in English, if the producing entities are from non-English speaking countries. In other words, more datasets and user-friendly formats/functions tend to be made available in the producing entity's own language. The Chinese Ministry of Commerce, for instance, presents trade datasets on its websites in both Chinese and English. But the Chinese version is much more user-friendly in terms of datasets included and presentation. Deutsche Bundesbank's publication, although available only in German, offers DPRK exchange rates both in US dollar and Euro terms. While higher points were awarded to bilingual data sources, the Project attempted to select carefully databases for technical analyses in Part II.

Data Presentation and format: The majority of data sources covered earned 2 points, demonstrating good presentation of data in table formats with actual data points. One-third of the databases offered user-friendly database functions, including downloadable options and/or embedded value-added analyses in databases. The US Census Bureau's International Data Base (IDB), for example, has functions enabling analysts to derive population pyramid structures instantly. GTIS also has simple and powerful analytical tools embedded in its database, such as deriving unit costs of imports and exports. UNCTAD's *Handbooks of Statistics* offers pages indicating in a simple table format North Korea's historical trade structure by county groups or region, such as developed and developing countries.

Low points were assigned if relevant information such as technical notes or methodologies cannot be located easily, for example if methodologies are separately presented from dataset tables without any indication of where they can be accessed, causing confusion (the Bank of Korea database has this problem). Also, if some research

works, while relevant and significant, have only graphs or figures without offering specific figures, only one point was provided as it poses constraints on data gathering and analysis efforts, or integration of such data into a databank.

The Project set a general cut-off point at 20 points (the roughly weighted average or mean point score): databases with 20 points or more were in principle considered for further analysis. But the Project has taken into consideration not only overall points but also specific criteria for understanding the situation of available DPRK statistics and data. For example, some databases are extremely user-friendly, but may not earn highest points due to their proprietary nature. Conversely, some databases that earned high points (trade databases) while not necessarily satisfying a specific analytical purpose for this study were not included (for example, the official bilateral trade databases of New Zealand and Australia).

Summary: Preliminary and general assessments of available databases during the first and second stages of Project implementation provided the information needed to proceed with more in-depth technical assessment of selected datasets.

- For **macroeconomic data**, Part Two will focus on a few of the most frequently cited entities and their databases, including the BOK, the CIA and the UN, as well as possibly under-utilized databases such as CIC's Penn World Table.

- Selected **microeconomic data** (prices) and **socio-economic indicators** (population and health indicators) will be analyzed in the context of deriving macro data such as GNI per capita. One of the most frequently cited data sources for price data, Good Friends, will be introduced as a case study. Good Friends is generally open about sharing data compared to other institutions or individuals.

- Technical analysis for **trade data**, on the other hand, will focus on the introduction of different types of data sources including the IMF's *Direction of Trade* database, UN Comtrade, and data from the South Korean Ministry of Unification (MOU), Korea Trade-Investment Promotion Agency (KOTRA) and Korea International Trade Association (KITA), as well as the trade and customs authorities from Japan and China Also, there are specialized trade data sources, both proprietary and non-proprietary data, with value-added technical analysis already embedded in such databases. These include GTIS's World Trade Atlas and the UNCTAD/International Trade Center. One entire section of the report is devoted to trade data, which can also serve as a "user guide" of trade databases for specific analytical purposes.[14]

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[14] The author is indebted to William Newcomb for the concept of a "user guide" approach to conducting the Project's in-depth analysis of trade databases.

PART TWO: COMPARATIVE ASSESSMENT OF NORTH KOREA DATASETS – CASE STUDIES

Part Two of this report covers technical analyses and commentary on datasets compiled in Appendix (Data Comparison worksheet and supplementary data sheets), dividing it into two chapters. Chapter V specifically discusses population and other demographic related data, microeconomic data such as prices and exchange rates, and macroeconomic indicators such as GDP and GDP per capita. Chapter VI conducts in-depth analyses of selected trade databases.

IV.   Analysis of Major Economic and Social Indicators

A. Analytical Focus: Selected Entities, Indicators and Rationale

The section covers datasets encompassing three inter-related categories: demographic data, and selected microeconomic and macroeconomic data. But the main analytical focus is placed on macroeconomic data producers and their datasets due to the availability of technical notes necessary for conducting comparative analysis. Microeconomic data such as prices, as well as population data are treated as major variables directly influencing aggregate and per capita GDP.

The section focused on demographic data will compare official DPRK statistics with data from other entities including the US Census Bureau and the South Korean KOSIS. Datasets covered will be (1) population as a variable determining per capita indicators; (2) key factors influencing rate of increase, such as death rates and birth rates; and (3) selected Millennium Development Goal (MDG) indicators.

We will then touch briefly upon microeconomic data such as (4) prices and (5) exchange rates. The analysis in Part I revealed challenges in identifying and collecting microeconomic data, and it makes sense to review some representative entities' activities in data gathering, focusing on issues to be addressed. Such entities/databases include Good Friends, the Penn World Table, and the Deutsche Bundesbank.

As a logical extension, we will discuss GDP-related indicators next, keeping in mind that North Korea GDP statistics have often been estimated based on questionable population data and absent essential price data. A main analytical focus will be placed on (6) GDP/GNI; (7) per capita GDP/GNP; and (8) economic growth rates. As an extension, a look at (9) industrial structure and (10) the national budget and expenditure are included in an Appendix.[15]

GDP estimations by the BOK, the UN Statistics Division (UNSD), the US CIA, and CIC at the University of Pennsylvania will be presented and discussed. These entities were

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[15] As one of the potential reliability test tools, Lee introduced the method using the ratio of budget to GDP as a benchmark figure comparison. For instance, East European economies' level of budge/GDP ratio was 40-60%, which dropped down to 10% during transition period. Lee Suk (2007: 131).

selected based on the results of the overall assessment (Part I), as well as other factors including the level of information disclosure regarding methodology, supplemented by interviews to confirm their methods.

The period of analysis is focused on the 1990s and thereafter. The rationale for choosing this particular period is three-fold. First, North Korea became a United Nations member state in 1991, simultaneous with South Korea's entry to the UN. This required the DPRK to satisfy certain member state obligations to submit economic and social indicators to relevant UN agencies. Second, the 1990s saw dramatic economic turmoil in North Korea, affected by a "triple loss," namely, the loss of trading partners due to the collapse of the Socialist Bloc governments; the loss of the founding father Kim Il Sung; followed by an unprecedented famine. All these factors seriously affected the economic state of North Korea, resulting in huge gaps among its economic and social indicators announced or estimated by various entities. Third, the Bank of Korea took charge of North Korea GDP estimations for South Korea in 1991, following in the footsteps of the Ministry of Unification and the current National Intelligence Services. The CIA started to estimate PPP-based GDP in early 1990s as well.

B. Population and Health Indicators

There are huge gaps among the population figures reported by "authoritative" sources. **Figure 3** shows North Korea's population trend derived from five databases, namely, official DPRK statistics, South Korea's National Statistics Office (KOSIS database), UN data,[16] the World Bank's World Development Online database, and the U.S. Census Bureau[17]. The most distinct differences can be observed after 1996 with three divergent population growth paths. While the U.S. Census Bureau estimated that the DPRK's total population declined by more than 200,000 persons between 1996 and 1999, neither the DPRK nor ROK released statistics showing a similar declining trend for the same period.

Total population figures estimated by the UN and the World Bank based on the DPRK official statistics showed a continuous upward growth trend. According to the UN data, the DPRK's total population increased from 20 million in 1990 to 23.6 million in 2005, at an average growth rate of 0.98%. The World Bank's data shows a slightly different but similar increasing trend from 19.7 million in 1990 to 22.8 million in 2005, but at the same growth rate with the UN's estimation of 0.98%.

The ROK's KOSIS data showed that total population traced a similar increasing trend from 20.2 million in 1990 to 21.6 million in 1996, then shifted to a lower but still positive growth path thereafter, lower than those of the UN and the World Bank, to reach 23.08 million in 2007. The US Census Bureau's estimates, on the other hand, took a sharp declining trend for three years from 1996 (21.65 million) to 1999 (21.45 million), before exhibiting an increasing trend again to reach 23.11 million in 2007.

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[16] UN Data. http://data.un.org/Default.aspx (main page);
http://data.un.org/Data.aspx?d=POP&f=tableCode%3a1 (population).
[17] U.S. Census Bureau. International Data Base (IDB). http://www.census.gov/ipc/www/idb/ (main page). For methodology adopted by IDB, see http://www.census.gov/ipc/www/idb/faq.html.

Figure 3: DPRK Population Data by Entities
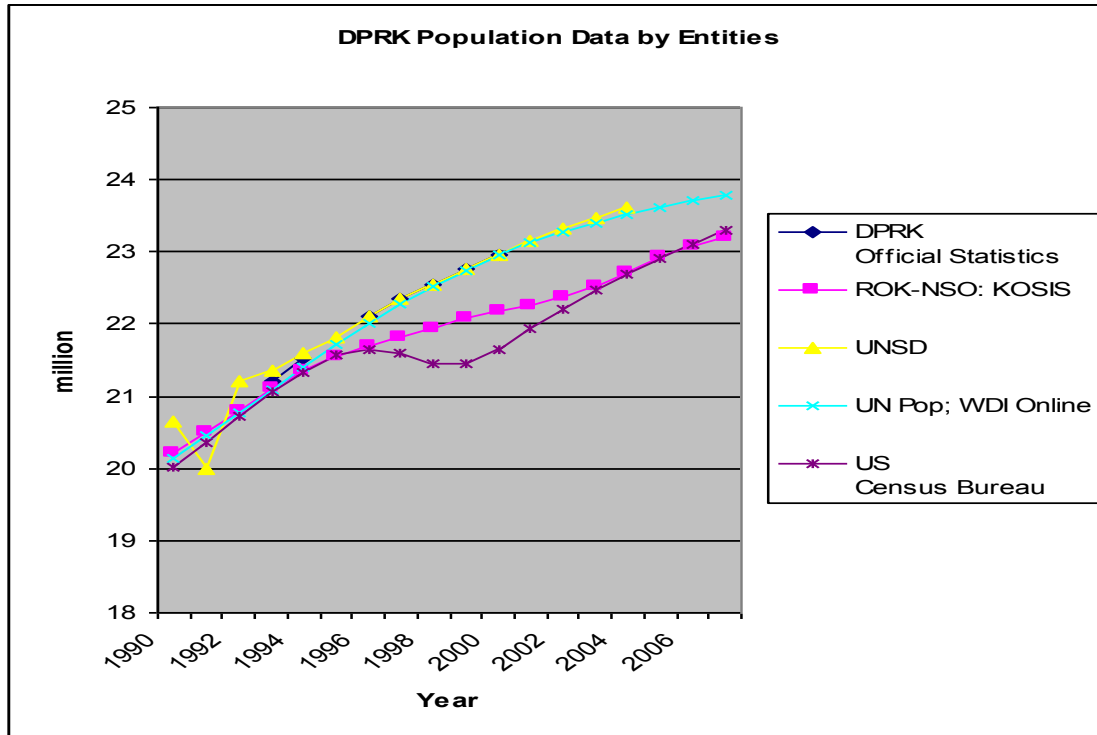
Source: Radio Press 2004 for DPRK; UN Data; World Development Online; US Census Bureau.

Let us look at the basic methodologies adopted by each entity, before exploring the cause of their divergent population estimates.

United Nations: The UN Statistics Division (UNSD) collects, compiles and disseminates official demographic statistics starting from 1948, and publishes the *UN Demographic Yearbook* every year. Data is in principle collected from national statistical authorities; in the case of North Korea, UNSD obtains such data from the DPRK Central Statistics Bureau, through the North Korean Permanent UN Mission in New York. Compiled data is recorded in UNSD's Demographic Statistics database, with additional technical information such as source years and reliability assessments. For instance, UNSD noted that the DPRK's total population figures for almost all the years were incomplete and of questionable reliability. The reason is obvious, because of the lack of conventional source data used by UNSD demographic and social statisticians to verify reported official statistics, that is, administrative records such as civil registration and population registers from North Korea.

UN Population Division: This database offers slightly different demographic figures in its *World Population Prospects* from the UNSD database. Both databases rely on, as an original source, the DPRK's first census conducted in 1993. But in the latest version of *World Population Prospects (2006),* total population figures are estimated using all the

available data on fertility, mortality and international migration trends between 1993 and 2005.[18] Then, total population figures up to 2050 are projected using 2005 as a base year. The underlying assumptions for projected demographic figures are the expected trends of fertility, mortality, international migration as well as AIDS illness scenarios. UNPD's *World Population Prospects* also serves as one of the major sources for demographic indicators compiled in the <u>*World Bank Development Indicators Online.*</u> Total population figures are midyear estimates for 1990-2004, and population projections are presented for 2020. The KOSIS database of South Korea's National Statistics Office also compiles DPRK population figures. The original sources cited in the KOSIS database include the National Intelligence Service and the DPRK's first census conducted in 1993.

<u>US Census Bureau:</u> The Bureau's International Data Base (IDB) covers various demographic indicators for 226 countries and areas, including North Korean population estimates (1960 to 2007) and projections (2008-2050). Demographic indicators covered in the IDB include, among others, birth rates, death rates and population growth rates, fertility rates, total population, population by age and sex, and contraceptive prevalence rates. The IDB has various embedded demographic analyses and query functions such as user-defined and predefined age groups and population pyramids.

Standard population estimation methods require fertility, mortality and net migration data. The gaps observed among the DPRK total population figures estimated by the above entities are mainly attributed to the differing interpretations of mortality rates, in particular during the 1990s when North Korea went through unprecedented economic and social crises. Following the disintegration of the Socialist Bloc starting in the late 1980s, the 1990s saw the virtual collapse of North Korea's economic system and food shortages. Due to the unprecedented famine, 600,000 to 3.5 million people are estimated to have lost their lives due to causes directly or indirectly related to the famine in the mid-1990s, depending on estimates reported by different analysts.[19]

The impact of the famine on estimated mortality rates measured or death rates during this period, are among the most critical determinant of divergent population figures. According to DPRK official statistics, crude death rates increased from 5.5 to 9.3 per 1,000 (1993-1998) while life expectancy rates declined from 72.7 to 66.8 (1993-1999)[20] According to ROK's NSO, North Korea's life expectancy rates (1993-1997) of men and women were much lower than the DPRK's official announcements, declining from 63.6 to 59.8 and from 69.3 to 64.5 (1993-1998), respectively. Infant mortality rates increased from 31 to 58 per 1,000 (1994-1996), according to the US Centers for Disease Control's estimates.

Assumptions regarding when the famine hit the country also remain debatable. Suk Lee (2005) argued that the famine hit the DPRK already in 1994 as opposed to 1995, the widely accepted year of the beginning of the famine as North Korea launched its

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[18] For detailed general assumptions underlying the results of the 2006 *Revision of World Population Prospects*, see UN Department of Economic and Social Affairs Population Division's website, http://www.un.org/esa/population/unpop.htm (World Population Prospects: The 2006 Revision Population Database).
[19] Cumings, Meredith-Woo (2002) & Haggard & Noland (2007).
[20] North Korean official statistics (Radio Press, (2004) *Kitachosen no Genkyo*).

international appeal for food aid. A sudden jump in the crude death rate, up to 6.8 deaths per thousand, occurred in 1994 following a declining trend (5.9 to 5.5) over the previous three years 1990-1993[21] Estimates by the U.S. Census Bureau indicate the rise in the death rate started even earlier, in 1993, up to 7.13 from the previous three years (5.6 to 5.4 in 1989-1992). In December 1995, two United Nations agencies, the Food and Agricultural Organization (FAO) and the World Food Programme (WFP) announced that 2.1 million DPRK children and 500,000 pregnant women were on the verge of starvation.[22] By 1998, it was reported that 60% of DPRK children were stunted and 50% were malnourished, according to a joint assessment by FAO/WFP based on eyewitness reports from refugees.[23]

Table 6 shows the mortality rates used by the two sources with the greatest gap in total populations, namely the US Census Bureau and the UN Population Division. They have differing assumptions for death rates during the famine period. Population data is a fundamental building block, but is among the most debated North Korean statistics.

Table 6: North Korea's Crude Death and Birth Rates (per 1,000 people) 1995-2007

Indicators	Entities	1995	1997	2000	2002	2007
Death Rate (crude)	USCB-IDB	12.2	21.4	7.6	6.8	7.1
	UNPD;WDI	7	8	9	9	10
Birth Rate (crude)	USCB-IDB	20	17	19	20	15
	UNPD;WDI	20	19	17	15	14

Source: United States Census Bureau. United Nations Population Division. World Bank.

Figure 4: US Census Bureau-IDB Population Pyramids for North Korea 1993~2007
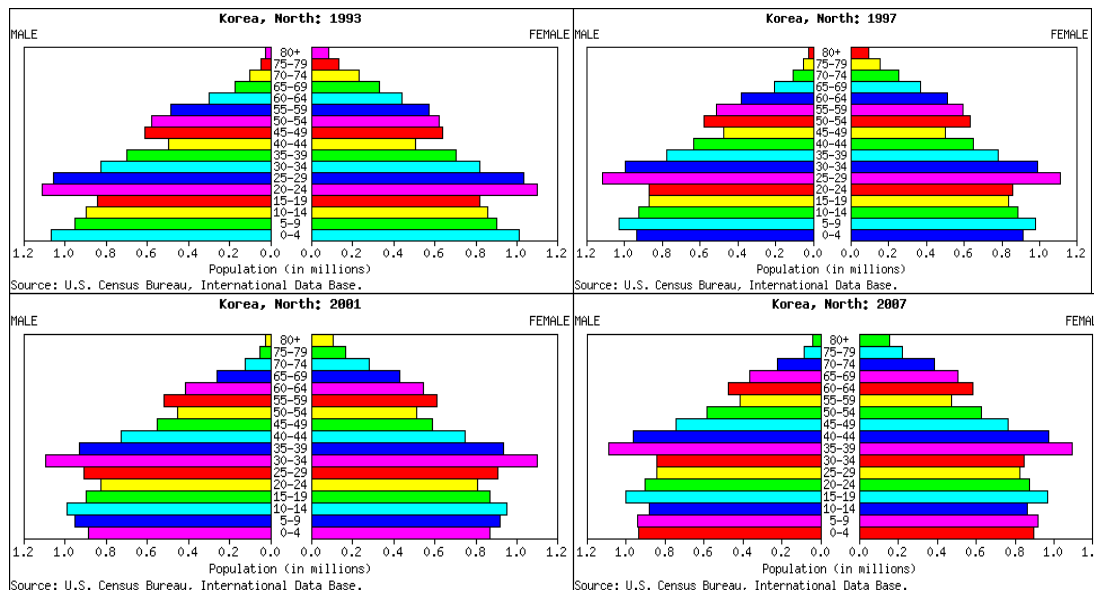
Source**: Source:** U.S. Census Bureau. *International Data Base*. <u>**http://www.census.gov/ipc/www/idb/pyramids.html**</u>

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[21] Ibid., Lee Suk (2005), 35.

[22] FAO/WFP. December 22, 1995.

[23] Lee Suk (2005) 13.

Figure 4 shows an example of output that can be derived from the IDB population database pyramid functions, choosing the years 1993, 1997, 2001, and 2007. It graphically shows changes in the younger generations, who were viewed as being among the most vulnerable to the famine. During the period of the onset of the famine (1993-1995), the population of age groups 0-14 showed a bell-bottom shape. For the following six years 1996-2001, the effects of the famine directly and indirectly hit the youngest cohort of North Korea's population (aged 0-4).

Contrary to North Korea's self-proclaimed status as a "strong and prosperous" country, North Korea's uniquely vulnerable population dynamics tell the grim picture of the current and future state of the country. **Table 7** shows North Korea's population dynamics compared to other country groups, based on the World Bank's *World Development Indicators*. The DPRK's average population growth rate for 1990-2004 was 0.9%, already equivalent to the average rate for upper middle income countries. For 2004-2020, it is projected to be 0.4%, equivalent to that of high income countries. Yet, poor quality of life in general is evident from the average crude death rate, which is as high as 11 per 1,000 people, equivalent to low income countries. Moreover, North Korea's birth rate has already dropped down to 16 per 1,000, the level of middle income countries. Given that these figures were derived from the World Development Indicators, which rely on UN data (meaning that they are most close to the DPRK official statistics), the data probably implies the most "optimistic" scenario of the current and future state of North Korea (unless a drastic change happens to improve the quality of life of North Korean people).

Table 7: **Population Dynamics: North Korea and the World**

	Average Population Growth Rate p.a. (%)		Crude death rate	Crude birth rate
	1990-2004	2004-2020	Per 1,000 people	Per 1,000 people
North Korea	**0.9**	**0.4**	**11**	**16**
Low Income	2.0	1.7	**11**	29
Middle Income	1.1	0.8	7	**16**
Lower MI	1.1	0.8	7	16
Upper MI	**0.9**	0.6	10	16
High Income	0.8	**0.4**	8	12
World	1.4	1.1	9	20

Source: The World Bank. (2006) *2006 World Development Indicators.*

In sum, North Korea's demographic and population data remain questionable, given that all authoritative reporting entities, regardless of some differences in assumptions, rely on North Korea's first census conducted more than 10 years ago in 1993. The absence of good data is complicated by the dramatic demographic changes that occurred due to the famine in the mid 1990s – concerning which there is no certain data. These questionable population figures compound the already complicated issues involved in constructing other basic economic and social indicators, especially when calculated on a per capita basis.

North Korea and the United Nations Population Fund (UNFPA) announced that a second nation-wide census survey would take place October 1-15, 2008.[24] It was reported that the DPRK would mobilize as many as 140,000 survey agents across the country, visiting households for half a month, with help from 10 international observers funded by the UNFPA. It is expected that more reliable and accurate demographic data and information may be available once the outcome of the second survey is released in 2009. Until then, we have no choice but to view any demographic data with caution.

C. Microeconomic Indicators - Prices and Exchange Rates

Microeconomic data such as prices and exchange rates are critically important variables determining other basic economic indicators such as GNI per capita in international dollar terms. As the findings of Part I revealed, North Korean microeconomic statistics such as price data are among the most challenging data categories for identification and collection from publicly available open data sources. Original sources of such data mainly come from North Korean defectors or interviews conducted by individual researchers travelling to North Korea. Data obtained through "North Korean contacts" developed individually over time in exchange for information or monetary compensation is rarely shared with others. Such data sources are almost without exception closed and exclusive in nature, therefore, used for internal analysis purposes. The author's interviews revealed that "special and exclusive contacts or routes" are commonplace in order to obtain price data or other relevant North Korea-related microeconomic information.

If publicly available, most price information is single-time data or pre-and post-July 2002 Economic Measures prices. Historically-presented price data sources are virtually non-existent in the public domain. As for market price data after the 2002 price reforms, one needs to assemble or construct such data historically from identified sources. Some entities also compile data by requiring staff members to review documents and find price data in news articles or newsletters. If published, such research works by individual researchers often contain single-time price data only, or show recent historical trends in a carefully suppressed format without data points.

Having said all that, however, there are a very few organizations that collect and compile periodical price data from North Korea <u>and</u> disclose such data to the public. Good Friends[25] is among the most frequently cited organizations when it comes to prices of

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[24] 2010 World Population and Housing Census Programme, *The Democratic People& Republic of Korea 2008 Census.*
http://unstats.un.org/unsd/demographic/sources/census/2010_PHC/North_Korea/North_Korea_more.htm; Yonhap News Agency. "North Korea Encourages Preparation for Census in October," *North Korea Newsletter No. 22* (September 25, 2008).

[25] Good Friends has two sister organizations, Join Together Society (JTS), an international relief agency for eradication of famine, disease and illiteracy, and Peace Foundation, a research institute. The information in this section was obtained through the author's interviews with Ven. Pomnyun Sunim, Chairman of the three organizations, with cooperation from Soonyoung Mi-Kim, Good Friends DC Representative, and other members of the two foundations.

consumer goods and daily necessities. Good Friends was established in 1996 with an organizational mandate to support North Korean refugees who had fled into China, mainly to its three northeastern provinces. As part of its activities, Good Friends has also conducted a series of survey interviews.[26] Since 2004, it has monitored the North Korean people's living conditions and human rights situation, and made public its findings through a newsletter titled *North Korea Today*.[27] Price data is frequently reported in the newsletter.

Good Friends currently monitors the prices of 80 items on a monthly basis, including food items and consumer products. They are grains (8), fish and meat (5), vegetables (3), seafood (2), cooking oil (2), seasoning (7), sugar and sweets (2), alcoholic drink (3), non-main food (1), detergents (4), heating fuel (2), oil (1), furniture (3), lighting (1), electrics (4), clothes (6) shoes (2) cigarettes (2), medicine (2), office supplies (4), communication (2), utilities (1), hair-dressing (3), entertainments (1), tax (3), and foreign currency exchange rates (2).   Price data is collected from eleven different cities and regions: Pyongyang, Pyongsung (South Pyongan Province), Sinuiju (North Pyongan), Sariwon (North Hwanghae), Haeju (South Hwanghae), Wonsan (Gangwon), Hamheung (South Hamgyong), Chongjin, Hoeryong, and Onsung (North Hamgyong), and Hyesan in (Ryanggang).   Located at the center of North Korea's western region, Pyongsung City is known to have a wholesale market providing products and goods to other markets around the nation, while Chongjin market is the main market in the eastern part of North Korea.

While many North Korea experts around the world tend to rely on Good Friends for price data, some analysts in the United States have candidly expressed the views that the data made publicly available by humanitarian NGOs such as Good Friends can be biased, and present the data selectively, to support its organizational mission. The methodology could also be statistically biased toward higher prices as the collection of data tends to be more concentrated during periods of acute food shortages.[28] Good Friends has engaged in activities to advocate to leaders in both the ROK and the United States that they help resolve North Korea's humanitarian disasters, thus improving basic human rights conditions, both political and economic, for the North Korean people, as well as for refugees and displaced persons in Asia and beyond.[29]

Asked to respond to these views, Good Friends provided a self-assessment on the reliability of its price data. The NGO considers its collected data to be reliable with roughly 80-90% accuracy. The rationale for this positive self-assessment was that its primary data comes from multiple but independent sources, including "those who work in

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[26] Ven. Pomnyun (1998). "The Food Crisis of North Korea 1,019 Witnessed by Food Refugees," (June. 21); "The Food Crisis of North Korea 770 Witnessed by Food Refugees" (May. 21); "Understanding and Responses of the North Koreans on the Social and Economic Condition of North."

[27] Monthly and weekly issues are available for 2004-2005 and 2006-2007, respectively. Currently, North Korea weekly newsletter is issued, but over the past five months starting in May 2008 when food situations worsened, Good Friends made available daily reports. http://www.goodfriends.or.kr/eng/ .

[28] Authors' interviews with researchers, both in public and private sectors, specializing in North Korea in the US. Also, Haggard and Noland (2008) explain possible statistical upward biases of reported prices from actual prices.

[29] Good Friends' official website. http://www.goodfriends.or.kr/eng/

markets and travel back and forth between North Korea and China, rather than from so-called geographically or institutionally connected networks of cooperators."

The author also asked questions about the reliability and neutrality of Good Friends data during interviews with research institutes in South Korea, including those often viewed as "conservative" South Korean think-tanks. These institutes gather price information independently through their own "special and exclusive" contacts. Comparing their own data with that of Good Friends, the institutes tentatively concluded that the data disclosed by Good Friends is almost identical to the primary source data collected through their own channels.

Appendix Tables show all the available monthly rice and corn price data for 2004-2008, provided by Good Friends. These Tables are intended to show only the data directly observed by Good Friends data-providers, and therefore no extrapolated estimates are included. However, the average figures are taken for particular months (i.e., March 2008), where Good Friends gathered and announced data in the beginning, middle and at the end of the month. Based on this data, it is clear that the prices of both rice and corn showed sharp increases starting in late 2007 and early 2008. The average price of rice from eleven cities increased at a compound monthly growth rate of 3.1% from 482 Won per kilo in June 2004 to 1,050 won (July 2007) and 1535 Won (April 2008), reaching the peak price of 2,815 won in May 2008. It declined to 2,264 won in September 2008, but that price still remained 4.7 times higher than the price observed in June 2004. Similarly, average corn prices increased at a compound monthly growth rate of 3.2% from 222 won per kilo in June 2004, up to 1,119 won in September 2008. The year 2008 saw continuous hikes in corn prices from 578 won in January, 773 won in March, to 1,263 won in April, reaching 1,494 won in June, followed by a decline in July. The average corn price in September 2008 was 5 times that of the observed price in June 2004.

A few observations are noteworthy, especially regarding changes in North Korean grain prices in late 2007 and most recent declines starting in May/June 2008. A recent study by Haggard and Noland (2008) shows that changes in North Korean grain prices (rice and corn, as well as corn/rice relative prices) have been influenced by nine domestic and international factors. Anticipated positive effects on prices included (i) private trade in grain and revival of the public distribution system (October 2005); (ii) floods in July 2006 and (iii) August 2007, counted as two events; (iv) North Korea's nuclear test and imposition of UN sanctions (October 2006); (v) imposition of restrictions on trading at the same time; (vi) Chinese export controls and (vii) North Korean restrictions on age of women traders in the market (December 2007); and (viii) tightened control on trading activity (April 2008). Sudden hikes in both rice and corn prices in late 2007 through early 2008 are likely to be influenced by the factors stated above. Although not included, the ROK presidential election and the anticipated change in the ROK administration may have also influenced North Korean price hikes in late 2007 through 2008.

Rice and corn prices[30] dropped immediately after reaching peaks of 2,815 won in May 2008 and 1,494 won in June 2008, respectively. As the above study noted, it is speculated that negative price changes were triggered by events such as the reported release of military stockpiles (rice) in May, as well as the announcement of US food aid (wheat and corn) and the actual shipment/arrival of that aid in June. These events must have increased the supply of rice and corn, thus pushing down rice and corn prices. It is interesting to note that the rate of increase of corn prices before early 2008 was relatively high compared to rice price increases. The relative per kilo price of rice over corn was consistently above 2 or even 3 from 2004 until February 2008, but the ratio dropped to around 1.8~1.9 for six months, before climbing again in September 2008.

Challenges faced by North Korea analysts in identifying and collecting price data naturally makes it difficult to grasp the state of the North Korean economy in terms of where it stands in its transition to a market economy. The share of products whose prices are determined by market or quasi-market functions can be a proxy measurement. The analysis in **Table 8** shows that North Korea's sudden price reforms in July 2002 led to market-driven price determination of virtually 80 to 90% of consumer products, especially those sold in general markets. The government allowed the existence and operation of general markets in June 2003 (10 June 2003, *Korea Central News Agency*). Given that it took China about 15 years to transition to the point where prices of over 90% of consumer goods and over 80% of industrial goods were determined by market forces, North Korea's drastic change in this regard is notable.

Table 8: Share of Products with Prices Determined by Market (%)

	North Korea		China			
	Year	Consumer	Year	Consumer	Agriculture	Industry
1st-2nd Year	**2002-03**	**de facto market prices**	**1978-79**	3.0	5.6	3.0
By 10th Year	**2012**	**?**	**1988**	38.3	53.8	--
By 15th Year	**2017**	**?**	**1993**	93.8	87.5	81.1

Source: Yang Moon-soo, "The General Market in North Korea: Aspects, Nature and Significance," *Vantage Point* Vol.28. No.9 (Seoul: Yonhap News Agency, September 2005). National Price Bureau of China, *Zhongguo wu jia nian jian.* [*China Price Yearbook*]. Various years.

Some scholars have also attempted to understand the North Korean economy from the perspective of contributions by the non-state sector to GDP. Lee and Yoon (2004) estimated that over 60% of North Korea's GDP was contributed by the non-state sector immediately after the introduction of the reform measures in July 2002. The drastic change is evident, compared to the fact that it took China over 20 years to reach that level.

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[30] The author is indebted to Bill Brown's presentation regarding rice and corn relative prices as a possible hunger indicator and the following discussions at the Economic Forum meeting on April 15, 2008.

Table 9: Estimates of Private Sector's Contribution to GDP

		China		DPRK	
		Private Sector 1/	**Non-state Sector 2/**		**Non-state Sector 3**
Pre-Reform Year 1	**1978**	-- 5%	-- 42%	**2000** **2002**	64% 62%
Year 12	**1990**	13%	51%	2014	?
Year 22	**2000**	33%	63%	2024	?

Note 1/ Private enterprises, share holding enterprises and other types of enterprises included.
Note 2/ Collectives are included to private sector enterprises defined above.
Note 3/ Based on social accounting matrices for DPRK constructed by Lee Young-Sun and Yoon Deok-ryong (2004). 21-24. According to Yoon, private economic activities (household and commodities) on an expenditure basis can be considered to be broad private sector activities.
Sources: *China Statistical Yearbook*; Asian Development Bank. *Draft PRC Private Sector Assessment* (Manila, 2001).

Exchange rates: There are a handful of institutions that disclose North Korea's foreign exchange rates in a comprehensive manner. The KOSIS, BOK, CIC's Penn World Table and Deutsche Bundesbank are worth mentioning (Appendix: Data Comparison). As with other economic and social indicators, South Korea's NSO and BOK present North Korean exchange rates, together with South Korea's exchange rates (1990-2006). Given the identical exchange rate figures by NSO and the Bank of Korea, the original sources are considered to be the same -- the Seoul Foreign Money Brokerage (for ROK won/US$ exchange rates) and the NIS for DPRK exchange rates.

CIC's PWT6.2 series also provides North Korea's won/US$ exchange rates from 1970 up to 2004, showing similar but slightly different figures compared to data from South Korea's NSO and BOK due to differences in original sources and estimation methods. For most of the countries in PWT6.2, exchange rates prior to 1960 are from UN Development Centre Sources. Data from 1960-1988 comes from UN and World Bank sources, usually the same as the IMF annual rates.[31][32] Deutsche Bundesbank's[33] monthly on-line publication, *Statistical Supplement 5 Exchange Rate Statistics* offers DPRK exchange rates on a monthly basis for both selling and buying in terms of U.S. dollars and the Euro, starting in October 1999.

Summary: In sum, price information is fundamental to derive other major indicators including conversion rates[34] and GDP estimates. Price data is also key to understanding the state of the North Korean economy, including the degree of marketization of the economy, and the share of the economy controlled by state plans or markets. To

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[31] Data Appendix for a Space-Time System of National Accounts: Penn World Table 6.1 (PWT6.1).
[32] World Bank, ICP 2003-2006 Handbook.
http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/ICPEXT/0,,contentMDK:20962711~menuPK:2666036~pagePK:60002244~piPK:62002388~theSitePK:270065,00.html
[33] Deutsche Bundesbank. *Statistical Supplement 5 Exchange Rate Statistics*, Various years 2000-2008.
http://www.bundesbank.de/statistik/statistik_veroeffentlichungen_beiheft5.en.php
[34] For some recent research on estimating conversion rates for South and North Koreas, see Rhee, Yeongseop, "Currency Conversion during the Period of Transition: The Case of North Korea," June 2008 (Revised October 2008). Presented at the Brookings Institution. November 14, 2008.

understand North Korea as an economy in transition (whether the government admits it or not) with supporting statistical data and evidence, will continue to be challenging, due to the lack of direct data as well as other obstacles stemming from the closed nature of North Korean society. Knowledge-sharing is probably most needed in this data category. Yet, this is a daunting task because of the proprietary nature of much of the price data that is available, and the relevant entities/individuals' reluctance to share such data with others. Some creative solutions will be necessary to build knowledge-sharing infrastructure in this area.

D. **Macroeconomic Indicators – GDP and GDP Per Capita**

Macroeconomic indicators, such as GDP, GDP per capita and GDP growth rates, are among the most controversial North Korean economic statistics. As discussed in the previous section, North Korea's GDP-related figures are the most frequently cited indicators in the various databases covered in this Project. Yet, in terms of their data source, the majority of databases/websites cite one of the following three entities: the BOK, the US CIA, and the United Nations. Those entities have become viewed as "authoritative data sources" because they announce GDP figures on an annual basis. In addition, their data is easily accessible and their methodology relatively thoughtful.

Some scholars point out the challenges and obstacles in evaluating the GDP figures estimated by different entities. In his study, Lee (2007) tentatively concluded that reliably comparing different entities' GNI datasets is not impossible. He adopted an alternative method to test the reliability of each dataset, that is, the estimation of conceivable maximum and minimum levels of North Korea's GDP. Lee ran regressions on GDP per capita, choosing 13 reasonably reliable real economy indicators as independent variables to reach a tentative conclusion that North Korea's estimated GNI should be within the range of $198 and $570 (Box 1).

Box 1: An Alternative Reliability Test on North Korea's GNI by Lee Suk (2007)

In his study, Lee conducted a regression analysis, using data from 277 countries for 2003, mainly health and nutrition related indicators that can be tied to data collected in North Korea by international donor organizations amid the food crisis and famine of the mid-1990s. These indicators are (1) electricity consumption; (2) energy consumption; (3) automobiles in use; (4) female life expectancy; (5) male life expectancy; (6) the under-five morality rate; (7) infant mortality rate; (8) oil consumption; (9) chronic malnutrition rate for children; (10) acute malnutrition rate; (11) cement production; (12) food calorie supply; and (13) protein supply. The equation follows:

Log Y = a + b1 logX, + b2 DS + b3 DU

Y=per capita GDP;
X = real economy indicators;
DS (dummy variable for socialist countries) = socialist economy dummy (socialist = 1, others = 0);
DU (dummy variable for underdeveloped countries) = developing countries (lower than $1,000 =1; the rest=0).

Based on the results of his regression analysis, Lee estimated the minimum and maximum reasonable levels for North Korea's per capita GDP to be $198 and $570, respectively. The results of the regressions were

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validated with R2 scores ranging from 0.72 to 0.87. Lee reached a tentative conclusion that the reliability of North Korea's official statistics and the UN data are high. But in terms of usability, he ranked the UN data as the highest.

Source: Lee Suk (2007). P.139.

While noting the challenges and obstacles in evaluating the reliability of GDP statistics by various entities, however, this section reviews the selected entities and their datasets, with an analytical focus on estimation methods, assumptions and rationale as well as the comparability of the datasets. This will help analysts to decide which specific datasets are most appropriate for their specific analytical purposes. Let us review the methodologies adopted by the selected entities, including the BOK and the CIA, and their rationale for using those methodologies.

The Bank of Korea:[35]

Since 1991, the BOK has estimated annually the "Gross Domestic Product of North Korea," using basic data on production quantities supplied by relevant institutions. Annual figures and relevant analyses are announced as "Report Materials" in June each year. In 2008, as usual, the BOK announced North Korea's latest GDP and other major statistics in a comparative format with South Korean figures.[36] From the 1980s through 1990, the Ministry of Unification led the South Korean government's work on estimating North Korea's GDP, following earlier work by the South Korean National Intelligence Service (then-Korea Central Intelligence Agency) in the 1960s and 1970s.[37]

Estimation Method: As in the estimation of South Korea's own national income, the BOK estimates North Korea's GDP by taking the **production** approach of the United Nations System of National Accounts (SNA).[38] The production method estimates GDP by tallying industry-by-industry value-added from the production side, rather than calculating expenditure or distribution of income. Using the production approach, one can calculate output by industry (or by commodity) first and then derive the value-added by deducting the value of the intermediate inputs used for production of the output.[39] In the process of estimating North Korean GDP via this method, the BOK uses South Korean prices, value-added ratios and exchange rates to convert into US dollars terms.

Rationale: What is the rationale for the BOK's estimation method and assumptions? The underlying objective of the BOK's official estimation of North Korean GDP seems to be to grasp North Korea's economic state *from the perspective of one Korea,* with the eventual unification of the two Koreas in mind. This unique perspective leads to the two

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[35] This section relies on the author's interviews with Bank of Korea officials, as well as supplementary interviews/meetings with other institutions including the World Bank and the existing research including Lee Suk (2007). Lee Suk selected the three entities, namely, BOK, UN and DPRK's official statistics for reliability test, as they offer time-series statistics.

[36] The Bank of Korea. "포도자료. 제목: 2007 년 복한경제성상률추정결과." June 18, 2008.

[37] Lee Suk (2007). P. 121.

[38] The Bank of Korea. Quarterly National Accounts in Korea: Manual –Concepts, Sources and Methods 2007. http://www.bok.or.kr/template/eng/default/public/index.jsp?tbl=tbl_FM0000000066_CA0000009788

[39] BOK, Quarterly National Accounts in Korea: Manual –Concepts, Sources and Methods 2007. PP. 29-32.

notable features of the BOK's methodology stated above: (1) use of the SNA method in estimating North Korea's GDP, since that is the same method as used in the estimation of South Korea's GDP; and (2) the key assumptions are based on South Korean indicators. Theoretically, the method and assumptions serve two purposes. The two Koreas can be compared, and when added together, they can be considered to be the economy of a "single country."

The BOK officials interviewed also cited practicality as a rationale for the use of South Korean prices, value-added ratios and exchange rates as "logical" assumptions. Given the paucity and unreliability of price and exchange rate data for North Korea, no matter how logically one may attempt to set one's assumptions, an estimated GDP figure will by nature be highly subjective, arbitrary and prone to errors. Some North Korea analysts defend the BOK position, as the central bank's DPRK GDP estimations are methodologically logical even if statistically (and consistently) "over-valued."[40]

Evaluation and issues to be addressed: There are some issues to be addressed in interpreting North Korean GDP figures derived using the BOK's methods and assumptions. First, although SNA-based GDP figures can be an effective tool to understand the state of an economy at a certain point in time, as well as over time, it is not suitable for use from an international comparative perspective. In other words, North Korean GDP figures derived through the BOK method can be comparable only with South Korea, but not to other economies. In reality, however, many analysts, journalists, and the public tend to compare North Korean GDP figures derived based on the BOK method and assumptions to other countries' data which are theoretically non-comparable.

BOK economists recognize these limitations. The BOK itself internally compiles and calculates an internationally-comparable North Korea GDP series based on purchasing power parity (PPP) assumptions. The BOK's internal exercise and interpretation do not diverge from those of external analysts, including those cited by former Unification Minister Lee (explained in the Introduction of this report). The BOK estimates that North Korea's per capita GDP levels, based on US exchange rates and PPP are $1,108 and $1,440, respectively. The PPP-based GDP level is lower than that of Vietnam and China, but equivalent to that of the least developed countries in Asia and Africa. (see Table 10).

Table 10. Purchasing Power Parity (PPP)-based GNI

	GDP: **Market Average Exchange Rate**		GDP: **PPP-Based**	
	(US dollars)	**Times x NK**	**(International dollars)**	**Times x NK**
North Korea	1,108	1.0	1,440	1.0

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[40] For details of the analyses of "advantages of the BOK methodology," see Lee Suk (2007) PP. 122-123.

Nepal	320	0.3	1,010	0.7
Vietnam	700	0.6	2,310	1.6
China	2,000	1.8	4,660	3.2
Kenya	580	0.5	1,470	1.0
South Korea	17,690	16.0	22,990	16.0

Sources: Bank of Korea. World Bank. World Development Indicators 2008. Used South Korea's market exchange rates and PPP rates.

In sum, the BOK methodology has its own underlying logic and objectives, that is, comparison and aggregation with the ROK's GDP for policymaking purposes. But it should be noted that GDP estimates based on ROK prices are misleading in trying to understand North Korea's stand-alone economic state, as well as to compare with other developing nations in the world.

Based on the authors' interviews with BOK officials, the BOK is fully aware of the above. The BOK in an internal document explicitly makes it clear that the BOK's calculated North Korea GDP is not comparable with other countries, except South Korea.[41] However, the BOK neither makes a public announcement of alternative internationally comparable GDP estimates, parallel to the SNA-based GDP using ROK prices, nor explains fully the presumed "underlying" objectives of the BOK's methodology and assumptions and its limitations.[42]

Another issue to be addressed about the BOK's GNI datasets concerns purely presentational matters. The fact that estimation methods cannot be located on the same webpage as the DPRK GDP tables seems to have caused some outside analysts to believe that the BOK has not disclosed its methodology. The BOK does disclose it, but separately from the GDP and GNI table figures. The BOK could easily resolve these unnecessary misunderstandings by sharing its methodology on the same page or simply linking to a paper explaining its methods and technical details (even if it is in Korean language). Another possible way of avoiding confusion is that the BOK could makes an announcement of two GDP figures based on different methods, the SNA and the PPP-based GNI, along with their underlying assumptions.

United Nations:[43]

Estimation Method: The United Nations Statistical Division (UNSD) estimates and announces North Korea's GDP and GDP per capita annually, with its data series

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[41] The author's interviews with BOK officials in Seoul (August 2008) and Washington, D.C. (September 2008).

[42] The author's interviews with BOK officials in Seoul (August 2008) and Washington, D.C. (September 2008).

[43] The analysis of this section is based on UN online publications such as UNSD. *Methodology for Data Estimation.* http://unstats.un.org/unsd/snaama/estimationProcess.asp. The author's interviews with UN officials (October 2008).

stretching from 1970 to 2006.[44] The Analysis of Main Aggregates (AMA) Database is compiled annually based on each nation's replies to the national accounts questionnaire of the UNSD, and supplemented with estimates based on official and unofficial data as well as proxy economic indicators from various sources. More specifically, the AMA contains official data for those countries that provide it, and UNSD estimates for all other cases (countries with no data, incomplete data or inconsistent and erroneous data)."[45] In general, the set of official statistics and proxy indicators for every data item in the AMA database consists of heterogeneous sub-series that often exhibit methodological differences. When merging these sub-series into a single time series, an attempt is made to remove all inconsistencies in methodology and coverage in order to obtain a complete time series beginning in 1970.[46]

In principle, the UNSD obtains GDP and GNI data in current prices from the DPRK Central Statistical Bureau, through the DPRK Permanent Mission to the United Nations. But the UNSD makes its own adjustments, including drawing on average growth rates calculated by the Bank of Korea, where possible.[47] Table 11 clearly shows that the BOK and UN have the same GDP per capita growth rates, although the actual GDP per capita figures are slightly different. While the BOK's growth rates are estimates of their own, the UN has adopted the BOK's growth rates as its assumption for estimating North Korea's GDP figures.

Table 11: GDP Per Capita Growth Rates: BOK vs. UN

	ROK Bank of Korea		UN Statistics Division	
	GNI Per Capita	**Growth Rate**	**GNI Per Capita**	**Growth Rate**
1971~75		-	**416~564**	10.4
1976~80		-	577~642	4.1
1981~84			656~745	3.7
1985~89			723~811	1.4
1990	1,142	-3.7	735	-3.7
1991	1,115	-3.5	663	-3.5
1992	1,013	-6	593	-6
1993	969	-4.2	503	-4.2
1994	992	-2.4	384	-2.1
1995	1,034	-4.1	222	-4.1
1996	989	-3.6	479	-3.6
1997	811	-6.3	462	-6.3
1998	573	-1.1	456	-1.1
1999	714	6.2	452	6.2
2000	757	1.3	462	1.3

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[44] http://unstats.un.org/unsd/cdb/cdb_source_xrxx.asp?source_code=4. UN Common Database is replaced by UN Data as of February 2008.

[45] United Nations Statistics Division. *Methodology for Data Estimation.*
http://unstats.un.org/unsd/snaama/estimationProcess.asp

[46] The author's interview with UN officials (October 2008).

[47] Ibid.

2001	706	3.7	476	3.7
2002	762	1.2	468	1.2
2003	818	1.8	471	1.8
2004	914	**2.2**	473	**0**
2005	1,056	**3.8**	517	**0.9**
2006	1,108	**-1.1**	509	**0.4**

Source: Bank of Korea; UN. *UN National Account Main Aggregate Database.*

As a matter of standard practice, the UNSD uses average annual market exchange rates as reported by the IMF in converting estimates expressed in national currency units into US dollars. As North Korea is not yet a member country of the IMF, therefore, the UN receives official exchange rates from the Permanent Mission, which is supplemented with the annual average of UN operational rates of exchange and reflects the most favorable legal exchange rate available to the UN.[48] These rates are used by the UN for daily official transactions including UN inter-office transactions in various countries, and are a good indication of the *de facto* rates used in the field.[49]

UNSD specifically notes the limited international comparability of their macroeconomic data due to their use of exchange rates which apply in practice only to external transactions and may not be relevant for the much larger portion of domestic GDP -- which is particularly true in the case of North Korea's closed economy.

Rationale: The rationale for the UN method is self-explanatory. They obtain original data from the North Korean authorities. They make some adjustments where necessary in order to maintain to the extent possible comparability for inter-temporal and time-series analyses.

Naturally, DPRK official statistics and the UN data are relatively close, especially in the latter half of the 1990s through 2006. In the first half of the 1990s, however, there were large discrepancies in figures between these two. While the author could not obtain more detailed information regarding the UN's downward adjustment of GNI per capita figures and assumptions, it is speculated that external and internal shocks, immediately after North Korea joined the United Nations, including the disintegration of the Socialist Bloc and the unprecedented famine that struck the nation starting in 1994 may have had an impact on the UN's decision to interpret and set assumptions differently. Despite discrepancies between the North Korean official statistics and the UN data, analysts point out that some assumptions such as industrial structure seem to be derived directly from official DPRK statistics.[50]

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[48] Ibid.

[49] United Nations Statistics Division. *Methodology for Data Estimation.*
http://unstats.un.org/unsd/snaama/estimationProcess.asp

[50] Lee Suk (2007) also speculated that certain assumptions were derived from the official statistics, pointing out that despite the differences in aggregate numbers of GDP per capita, industry structure were almost the same between the two datasets. P. 121.

Evaluation and Issues to be Addressed: The UN's perspective can be characterized by an emphasis on methodological rigor for the provision of complete time-series datasets starting from 1970. The UN has used original data provided by the DPRK authorities, but not taken at face value. For instance, the UN seems to have made downward adjustments especially during the early 1990s through the famine years.

The UN's GDP data for the DPRK is available starting from 1970 up to the present, the longest period of data available for conducting time-series and cross-sectional analyses with other nations, both member and non-member countries of the United Nations. The coverage of other member countries and the availability of the UN's time series data at reasonable cost make the UN database among the most accessible and reliable data sources for analysts.

US Central Intelligence Agency:

Among Western government institutions, the CIA is the most frequently cited data source for North Korea's GDP level and growth rate and other basic economic and social indicators.[51] Easy Internet-based accessibility of the CIA's *World Factbook* site and the international comparability of its PPP data are the primary reasons for the frequent use of CIA data, particularly by analysts in the United States. The *World Factbook* website, however, offers data only for the most recent year, not historical data; historical data must be obtained through its annual print versions. The CIA also specifically states that their data is not intended for time-series analysis due to methodological inconsistencies over time.

The CIA has compiled North Korean GDP data, based on purchasing power parity, since 1992. It also presented GDP estimates based on official exchange rates on its website for 2006 and 2007, but those figures were not included in publications. Since its first PPP-based estimate of North Korea GDP in 1992 at $22 billion, the CIA's estimates for North Korean GDP stayed roughly at the same level of $21-22 billion for the following ten years. The figures slightly increased in 2002 and 2003, up to $22.3 billion and $22.9 billion, after the adoption of the 2002 economic measures. The year 2004 saw a sudden jump up to $40 billion in North Korea's PPP-based GDP.

North Korea's official exchange rate (OER)-based GDP was reported as only $2.22 billion for 2006, but the figure jumped to $25.96 billion for 2007 on the online version of the *World Factbook.* The 2006 figure was listed on the website during the 2nd quarter of 2008, which was updated to the 2007 estimate of $26 billion. Neither the 2007 print version nor the 2008 print version present an OER-based GDP estimate.

The CIA's GDP per capita estimate for North Korea stood at $1,700 in 2007 on a purchasing power parity basis. That figure is much higher than comparable figures reported by other institutions including the Bank of Korea, the UNSD and North Korean

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[51] US Central Intelligence Agency. (2007) The World Factbook 2008. New York: Skyhorse Publishing. The latest version is also available at website: https://www.cia.gov/library/publications/the-world-factbook/index.html. On the website, the most recent update of country information is 6 November 2008.

official statistics. One of the key variables determining per capita indicators is population. The CIA uses U.S. Census Bureau figures as of the 1st of July for the same year. The U.S. Census Bureau has reported consistently smaller population figures than ROK government or DPRK official statistics. The smaller population as a denominator inevitably lead to slightly larger per capita figures for the CIA. But this can only be a minor contributing factor to the CIA's relatively high estimate of GDP per capita.

Estimation Methods:[52] The PPP method involves the use of standardized international dollar price weights, which are applied to the quantities of final goods and services produced in a given economy.[53] Most of the GDP estimates for developing countries are based on an extrapolation of PPP numbers published by the UN International Comparison Program (UNICP) and by Professors Robert Summers and Alan Heston of the University of Pennsylvania and their colleagues.[54]

In practice, however, there is little data to follow this approach in estimating North Korea's GDP. As stated in the *World Factbook* itself, "North Korea does not publish any reliable National Income Accounts data; the datum shown here is derived from purchasing power parity (PPP) GDP estimates for North Korea that were made by Angus Maddison in a study conducted for the OECD; his figure for 1999 was extrapolated to 2007 using estimated real growth rates for North Korea's GDP and an inflation factor based on the US GDP deflator; the result was rounded to the nearest $10 billion (2007 estimate)."[55]

Rationale: CIA states that its rationale for presenting two figures is tied to data usability for different purposes. The PPP-based GDP is defined as "value of all final goods and services produced within a nation in a given year as derived at purchasing power parity (PPP) exchange rates, the sum value of all goods and services produced in the country valued at prices prevailing in the United States." The PPP method's advantage is that it can be described as "probably the best available starting point for comparisons of economic strength and well-being between countries."

On the other hand, the rationale for presenting GDP based on OER methods is for the accurate understanding of internal economic composition, namely, for the purpose of calculating the share of items such as exports, imports, military expenditures, external debt, or the current account balance, relative to GDP, because the dollar values presented in *the Factbook* for these items have been converted at official exchange rates, not at PPP

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[52] CIA. *The World Factbook 2008*. North Korea section at https://www.cia.gov/library/publications/the-world-factbook/geos/kn.html.
[53] CIA. The World Factbook 2008. https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html#2001
[54] CIA. (2008). *CIA World Factbook: Notes and Definitions*. https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html#2195. Please also note that the Factbook reports that *The PPP-based GDP has been rebased using new PPP conversion rates, benchmarked to the year 2005, which were released on 17 December 2007 by the International Comparison Program (ICP). The 2005 PPP data replace previous estimates, many from studies dating to 1993 or earlier. The preliminary ICP report provides estimates of internationally comparable price levels and the relative purchasing power of currencies for 146 countries. The 2005 benchmark revises downward the size of the world economy in PPP terms from the previous estimates, and changes the relative sizes of many of the world's economies.*
[55] CIA. *The World Factbook*.

rates. These shares are the same as in local currency units. By presenting the two figures with technical notes and limitations, CIA seems to have directly addressed issues revolving the methodology of estimating DPRK's GDP.

Evaluation and Issues to be Addressed**:** Some limitations for each method should be noted. As for the CIA's PPP method, the general methodological procedures *per se* do not present issues. The biggest issue is that assumptions used as well as the fact that North Korea is not a conventional country calls into question whether this general methodology can be accurately applied. Assigning the US dollar value to all goods and services in the country regardless of whether these goods and services have a direct equivalent in the United States, and regardless of the quality of the goods and services, has obvious drawbacks. The special methodology adopted for North Korea will also make the CIA's PPP method less appropriate for comparability purposes with other countries, as well as for historical or time series studies.

The OER method, conversely, generally may not capture fully the value of domestic output, if exchange rate volatility is the norm.

The huge disparity in OER-based GDP and PPP-based GDP numbers released by the CIA in 2006 calls into question the reliability of the data, even if logical steps may have been followed to derive both GDP figures. The CIA notes that OER-based GDP figures in dollar terms are typically one-fourth to one-half the PPP estimate for developing countries with weak currencies. North Korea's OER-based GDP was one-twentieth of its PPP-based GDP in 2006. But the gap narrowed the one-half level in 2007. Intuitively, the discrepancy in 2006 is abnormally large. This change was unlikely to have been caused by the change in real output. The website version of the *CIA World Factbook* is updated periodically throughout the year. When this update was made, no clear explanations were presented.

Another issue to be addressed on CIA's PPP-based GDP data concerns limitations in usefulness for historical comparison. The *World Factbook* clearly states as follows: "the numbers for GDP and other economic data should not be chained together from successive volumes of the *Factbook* because of changes in the US dollar measuring rod, revisions of data by statistical agencies, use of new or different sources of information, and changes in national statistical methods and practices." [56] Yet, the reality is that many entities tend to cite CIA GDP figures, because of their easy accessibility in the public domain. Some institutions utilize and list CIA's data over time from the 1990s up to present, assuming that these figures can be historically consistent and comparable.[57]

That said, the CIA is the first entity which has presented in the public domain two distinct GDP figures based on different methods (PPP and OER-based GDP) with technical notes

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[56] https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html#2004

[57] For example, the National Bureau of Asian Research has an extremely user-friendly database for Asian countries' economic and social datasets from 1990. North Korea's GDP and GDP per capita data (CIA as original sources) can be retrieved from their website, which may lead some users to interpret them as historically comparable.

explaining the respective methodologies and their limitations. This should be viewed as a step forward toward creating a common ground for more productive discussions on the North Korean economy.

Penn World Table – University of Pennsylvania Center for International Comparisons:

The Center for International Comparisons (CIC) at the University of Pennsylvania was established in 1990 to continue intellectual endeavors in the area of national accounts, continuing traditions of research creating the System of National Accounts. This research, led by two Nobel Prize laureates, Simon Kuznets, an economist and University of Pennsylvania faculty from 1936 to 1954, and Richard Stone, an architect of the 1952 and 1984 SNAs, eventually led to the International Comparison Programme, the first-ever systematic multilateral set of purchasing power comparisons (Irving B Kravis).

The CIC's Penn World Table (PWT) provides purchasing power parity and national income accounts converted to international prices for 188 countries for the period stretching from 1950 to 2004. The latest version, PWT 6.2,[58] combines 2002 benchmark data for 30 OECD countries, updates figures for 138 other countries in PWT 6.1 and adds 20 additional countries, including North Korea. The base year was also moved from 1996 to 2000.

PWT is a user-friendly database, covering the general indicators included in Table 12 below, with a special focus on PPP-based GDP per capita. North Korea's GDP indicators as reflected on PWT6.2 are made available from PPP-based GDP and GDP per capita calculations based on different methodologies, including the Laspeyres method and Chain series, as well as Gross Domestic Income adjusted for terms of trade changes.

Table 12: PWT6.2 Indicators and North Korea Data (Selected Years)

	2003	2000	1990	1980	1970
Population (million)	22.466	21.648	20.019	17.114	13.912
Exchange Rate	146.3	2.144	2.176	2.569	2.569
Purchasing Power Parity over GDP	0.81	0.76	1.22	2.00	4.03
PPP GDP per capita	1526.6	1378.6	1487.9	557.7	112.4
Consumption Share of Cur. GDP %	73.9	74.5	80.1	66.5	68.8
Government Share of Cur. GDP %	24.2	23.6	17.2	16.1	14.8
Investment Share of Cur. GDP %	4.9	4.9	10.0	16.4	15.4
Price Level of GDP (US=100 in current prices)	0.55	35.28	56.24	77.80	156.67
Price Level of Consumption	0.55	34.55	51.01	65.95	128.27
Price Level of Government	0.36	23.49	33.41	43.36	95.30
Price Level of Investment	1.62	103.10	137.47	159.56	342.04

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[58] Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Productions, Income and Prices at the University of Pennsylvania, September 2006. A Query page of PWT6.2: http://pwt.econ.upenn.edu/php_site/pwt62/pwt62_form.php.

	2003	**2000**	**1990**	**1980**	**1970**
Openness in Current Prices	19.36	19.36	26.96	12.69	8.12
Ratio of GNP to GDP %	99.76	99.86	99.43	99.43	99.43
CGDP Relative to the United States	4.09	4.01	6.60	4.65	2.30
*PPP GDP per capita (2000 Constant Prices: Laspeyres:L)	1428.69	1378.95	1788.48	1011.84	410.79
*PPP GDP per capita (2000 Constant Prices: Chain series: CH)	1428.69	1378.95	1795.57	1022.41	415.08
*PPP GDP Chain per equivalent adult	1638.41	1589.57	2074.60	1237.04	515.63
*PPP GDP Chain per worker	2779.50	2688.54	3485.87	2134.03	874.23
*PPP Gross Domestic Income (RGDPL adjusted for Terms of Trade changes)	1428.69	1378.95	1788.48	1011.84	410.79
Openness in Constant Prices	19.36	19.36	29.77	15.20	9.72
Consumption Share of RGDPL	74.51	74.51	81.99	68.90	68.90
Government Share of RGDPL	23.58	23.58	16.91	16.15	16.15
Investment Share of RGDPL	4.89	4.89	9.23	13.80	13.80
Growth rate of GDP per capita (Constant Prices: Chain series)	0.58	-0.64	0.62	8.13	8.53 (1971)

Note: By PWT's definition, "real GDP per capita" means PPP-based GDP, not GDP in constant prices. In order to avoid confusion, this table does not use "real" to express PPP-based GDP.
Source: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Productions, Income and Prices at the University of Pennsylvania, September 2006.

Estimation Methods**:** As clearly shown in Table 8 above, the PWT is primarily concerned with the expenditure side of GDP. In general, the calculation of PPPs is undertaken in three stages: first, at the product level, then, at the product group level, where the relative prices are averaged to obtain un-weighted PPPs for the group. Finally, at the aggregation levels, the PPPs are weighted and averaged. The weights used in this last stage are the expenditures on the product groups. In this sense, the informed user needs to know what weights were used in the process of calculating.[59]

The PWT's methodology to derive PPPs depends on each country's data availability. In general, the following treatment is applied, depending on each country's data availability:

(1) actual price levels from the benchmark year (1996)
(2) predicted price levels from short-cut regression estimates (Box 2)
(3) extrapolated price levels from the previously available benchmark year (1985)

For special case countries, including centrally-planned economies such as North Korea and Cuba, separate treatment has been adopted to estimate PPPs.**[60]** Prior to the previous

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[59] CIC, *PWT6.1 Technical Documentation.* http://pwt.econ.upenn.edu/Documentation/Doc-tech.pdf (18 October 2002).
[60] Data Appendix for a Space-Time System of National Accounts: Penn World Table 6.1 (PWT6.1). Revised data 2/14/09. pp.8, 17, 19.

version of the PWT, North Korea was among those countries for which none of the above methods or combinations thereof were applied because they did not have a national account series for 1996. But it was included in PWT6.2, mainly using method (3). Since these countries are categorized into special cases, CIC qualifies the data as rough estimates at the GDP level.

Attempts were made to derive a real (PPP) GDP per capita estimate relative to the United States for 1985 and/or 1990 and/or 1996 for special case countries such as North Korea. North Korea's estimated population and GDP price (US=100) in 1985 were assumed to be 20.38 million and 14.3, respectively. These estimations were based on the work of Donald Roy[61] as well as CIA's *World Factbook* as original sources. PWT noted "the spirit of these additions is to stimulate work that may allow reasonable estimates for these countries to be developed in the near future." The latest version of PWT6.2 started to include North Korea data for the period of 1970-2003.

Box 2: Excerpt from PWT6.2. Short-Cut Estimates for Non-Benchmark Countries

Step 1: Generally, in order to derive PPPs for non-benchmark countries, PWT uses a method called "short-cut estimates." The method is to estimate, by running regressions, the price levels of non-benchmark countries that have national accounts series and at least one of the following three data sources: (i) the International Civil Service Commission (ICSC) published in the Monthly Bulletin of Statistics of the UNSO; (ii) the Employment Conditions abroad (EC); and (iii) the US State Department housing allowance. The first step is to run regression on a real per capita domestic absorption, by choosing the above three data sources as well as dummy variables (Sub-Saharan Africa and Central Asia).

Step 2:
Then, the price levels for consumption (C), investment (I) and government (G) will be derived by dividing the nominal (domestic currency) shares by the estimated real shares. The regressions of the real shares of C, I and G are run on the nominal shares and the real per capita DA. For example:

Real share C = a (*nom. Share C*) + b (*nom. Share I*) + c (*nom. Share G*) + d (*real DA*).

By applying the estimated coefficients (a, b, c, and d) to the non-benchmark countries, one can derive the price level of consumption as well as that of others:

Price level of Consumption = (nom share C)/(real share C) x (nom DA)/(real DA)

(**Source**: Penn World Table 6.2)

Evaluation and Issues to be Addressed**:** Table 13 below shows PPP-based GDP per capita based on different methodologies for eight countries including North Korea, and the size of the other countries' GDP, measured by assuming North Korea's GDP as 1. North Korea's PPP-based per capita GDP in constant prices (both Laspeyres and Chain series) was $1429, while China's GDP per equivalent adult and per worker GDP stood at $1638 and $2789, respectively. According to the CIC's analyses, North Korea's GDP level is equivalent to that of Nepal. Vietnam's GDP ranges between 1.7 to 1.9 times that of North Korea's, while China's is 3-3.5 times as large and South Korea's 12 times. Compared to African countries, North Korea's PPP-based GDP is slightly higher than Zambia and Kenya, and about the same level as Nigeria.

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[61] Roy, Donald (1990). "Real Product and Income in China, Cuba, North Korea and Vietnam," Development Policy Review. London: Sage. Vol. 8. 1990, pp.77-81.

Table 13: PWT6.2: PPP-based GDP Per Capita: North Korea and Selected Countries 2003

	Constant Prices: Laspeyres Series		Constant Prices: Chain Series		GDP Chain per equivalent adult		GDP Chain per worker		GDP income (adjusted for terms of trade change)	
	US$	times x NK	US$	times x NK	US$	times x NK	US$	times x NK	US$	times x NK
North Korea	1,429	1.0	1,429	1.0	1,638	1.0	2,780	1.0	1,429	1.0
Nepal	1,441	1.0	1,441	1.0	1,799	1.1	3,048	1.1	1,441	1.1
Vietnam	2,561	1.8	2,561	1.8	3,032	1.9	4,811	1.7	2,480	1.7
China	4,970	3.5	4,970	3.5	5,608	3.4	8,284	3.0	4,970	3.0
Zambia	946	0.7	946	0.7	1,230	0.8	2,236	0.8	998	0.8
Kenya	1,218	0.9	1,218	0.9	1,555	0.9	2,340	0.8	1,212	0.8
Nigeria	1,223	0.9	1,223	0.9	1,575	1.0	3,065	1.1	1,219	1.1
South Korea	17,595	12.3	17,597	12.3	19,496	11.9	33,784	12.2	17,047	12.2

Note: By PWT's definition, "real GDP per capita" means PPP-based GDP, not GDP in constant prices. In order to avoid confusion, this table does not use "real" to express PPP-based GDP.
Source: Alan Heston, Robert Summers and Bettina Aten, Pee World Table Version 6.2, Center for International Comparisons of Productions, Income and Prices at the University of Pennsylvania, September 2006.

Methodological rigor and development, backed by on-going academic research, are advantages of the CIC's work. The PWT's methodology for comparability is still being developed, and future versions may move in the direction of national accounts constant prices series, namely chaining or use stochastic methods of aggregation.[62] Challenges still remain, however, especially in terms of chaining across countries for comparisons.

The CIC also takes advantage of institutional relationships with a number of organizations, including the United Nations, the World Bank, and other universities, which is a strength in terms of generating overall methodological improvements and new areas for research over time in the future. For instance, there are some differences between the PPP methodologies by the World Bank and Penn World Tables (Box 3). Also, CIC's sister organization, the International Comparisons of Output and Productivity Center at the University of Groningen,[63] while not providing North Korea's data yet, is mainly concerned with the production side of GDP. Collaboration will mean another new area for comparing prices between North Korea's GDP from the expenditure and production sides. Methodological improvements and developments cannot be possible without effective knowledge-sharing among the concerned parties.

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[62] CIC. Penn World Table Introduction. http://pwt.econ.upenn.edu/aboutpwt2.html
[63] The University of Groningen's website. http://www.ggdc.net/

Box 3: Main Differences in PPPs Methodologies: PWT (Penn World Table) and the World Bank

The main differences between PWT and World Bank PPPs can be summarized as follows:

   (1) The initial *aggregation method* or price index number formula that is applied to the benchmark countries is not the same: PWT uses the G-K aggregation with plutocratic weights.

   (2) Estimates for *non-benchmark* countries are made using short-cut methods, but the equations and variables differ: the World Bank uses education and nominal incomes whereas PWT uses information on prices and no education variable.

   (3) Information on *previous benchmarks* is not used in the World Bank, but is collated and reconciled in PWT.

   (4) The *current price series*: PWT estimates PPPs and international prices for each component in each year, whereas the World Bank obtains the 1996 GDP PPPs and applies national accounts growth rates to obtain other years.

   (5) The *constant price series*: PWT's Laspeyres series is based on the growth rate of C, I and G from the national accounts plus the net foreign balance, the World Bank uses GDP growth rates.

   (6) *Chain series*: PWT provides a chained constant price series using component shares in international prices for each year.

   (7) *Consumption PPPs*: PWT provides the PPP and the constant and current international prices for consumption as well as for GDP for all countries and for as many years as there are national accounts series available.

Source: "Use of Penn World Tables for International Comparisons of Poverty Levels: Potentials and Limitations**,"** Bettina Aten and Alan Heston, Global Poverty Workshop, Initiative for Policy Dialogue, Columbia University, March 31-April 1, 2003. http://pwt.econ.upenn.edu/papers/PWTPoverty03.PDFBettina Aten and Alan Heston1

Summary:

This section conducted an assessment of GDP estimates by several entities, with a special focus on general estimation methods, assumptions, comparability and usability of data from cross-section and time-series perspectives, as well as the presentation of datasets and methodologies. Table 14 shows a summary of the evaluation findings, albeit based on limited information. The general estimation methods adopted by each entity are solid and logical. Common problems were identified in the entities' methods for estimating the DPRK's GDP, particularly concerning how to set assumptions. Amid the absolute and relative lack of necessary data, the BOK has opted not to make arbitrary assumptions regarding North Korea's prices and value-added ratios. The BOK method thus can serve its objectives of aggregating and comparing the two Koreas from the One Korea perspective. But it has limitations in grasping North Korea as a stand-alone economy to compare with other nations. CIA's methods to estimate PPP-based GDP and OER-based GDP are in accordance with generally accepted procedures. But its work creates particularly serious concerns for historical comparability. The CIA is the first entity that has presented two GDP figures based on different methodologies in its database, with technical notes and limitations, a positive step toward a creation of common ground for productive discussions. The UNSD and PWT databases have offered potentially promising and more reliable avenues for estimating North Korea's GDP, once more accurate and systematic price data becomes available.

Table 14: Overall Evaluation of Macro Data

	Method: General Procedures	Assumptions: Prices & Exchange rates	Comparability & Usability:		Database Friendliness/ Presentation
			Cross-section analyses	Time-series analyses	
NK	Unknown	Unknown	Uncertain	Adequate	Poor
BOK	Logical	Questionable	Not appropriate	Adequate	Adequate
UN	Logical	Questionable	Adequate	Satisfactory	Excellent
CIA	Logical	Questionable	Adequate	Not appropriate	Good
PWT	Logical	Questionable	Satisfactory	Satisfactory	Excellent

V. Analysis of Trade and Investment Statistics

A. Trade Statistics

This section will take a somewhat different approach from the previous parts of this report, in order to best evaluate the entities involved in producing and publishing the most reliable DPRK trade data available to the public. This section's analytical focus will be placed on the appropriateness of each particular database for use for different specific purposes. The findings in Part I clarified that the issue surrounding North Korean trade data is not so much a matter of a lack of comprehensive data (although the available trade data are almost exclusively mirror statistics). Rather, the issue is that there are too many data sources to choose from, and therefore the data user needs to be well-informed concerning which database is most appropriate to be utilized for which specific analytical purpose.

One existing comprehensive study (Lee 2007) tentatively concluded that it is almost impossible to determine or rank which trade database is more accurate or reliable than others, as the accurate aggregate level of North Korea's trade is hard to grasp. Lee's reliability test involved identifying the potential causes of discrepancies in trade data from four different sources, by comparing their aggregate levels, as well as export and import data separately.[64]

Building on the findings in Part I as well as existing studies, this section will make references to the following entities, expanding the scope for comparative analysis. This technical analysis on DPRK trade data, therefore, is intended to serve as a "user guide" for analysts and users to turn to specific data sources for particular purposes:

- KOTRA (*North Korea's External Trade*, an annual publication in Korean)
- MOU or KITA (publications and websites)
- IMF *Direction of Trade* (database and publications)
- UNCTAD's *UNCTAD Handbook of Statistics* (database and publications)
- UN's *Common Trade Statistics Database* (Comtrade)
- OECD's OECDStat.beta version
- Chinese Customs Office/Ministry of Commerce
- Japanese Ministry of Finance/Japan Customs
- US Global Trade Information Service (GTIS) *World Trade Atlas*
- UN International Trade Center

The rationale for the extending the coverage of entities is three-fold. First, given the size of the trade data (mirror statistics) that needs to be collected, many entities rely on other institutions' databases as "original sources." For instance, KOTRA relies for the bulk of

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[64] See Lee Suk (2007: 146-161) for detailed analyses of North Korea's trade data. Lee's reliability test involved trade data from four different sources, namely, DPRK official trade statistics, indirectly obtained through UNICEF, KOTRA, IMF, and UN.

its DPRK trade information on GTIS's World Trade Atlas (WTA), a US private venture specializing in compilation of world-wide trade data.[65] It is imperative, therefore, to understand GTIS's method for compiling trade data, in addition to KOTRA's treatment of GTIS's *World Trade Atlas* trade database. Second, there are differing figures even among UN agencies and their databases, which require more in-depth analysis to determine if these differences are caused by methodological differences or fall within the expected range of errors. Third, depending on the user's analytical purpose and objectives, some trade databases are more appropriate to be used as a relatively reliable reference than others. This does not necessarily mean that the methodologies adopted by certain entities are superior or more reliable than others. Rather, it is a matter of the appropriateness of using certain databases for specific purposes.

In this sense, there are five conceivable utilities or analytical objectives of trade databases. This list of objectives is neither mutually exclusive nor exhaustive. But they can be viewed as examples of the most frequently investigated themes by North Korea researchers and policymakers:

(1) To grasp North Korea's aggregate trade level;
(2) To understand the historical trend of North Korea's overall trade and structure by country groups;
(3) To obtain inter-Korean trade information;
(4) To learn about North Korea's trade with individual partner countries on the commodity level; and
(5) To access readily available value-added trade analyses on North Korea's international trade, such as marketing strategies and competitiveness analyses

The corresponding datasets are presented in an Appendix (Data Comparison).

North Korea's Trade – Aggregate Level:

To grasp North Korea's aggregate trade level, many turn to the *IMF Direction of Trade* database, the UN's *Comtrade*, as well as KOTRA. There is an inherent limitation to accurately grasping the aggregate level of North Korean trade, as these are all mirror statistics. There are huge discrepancies among the entities in their aggregate trade figures, ranging in 2007 from $2.9 billion (KOTRA), to $4.5 billion (US GTIS), to $4.7 billion (IMF). The difference between the aggregate trade figures of KOTRA and IMF amounted to $1.8 billion. The 2006 figures also ranged from $2.9 billion (KOTRA), to $4.0 billion (GTIS), $4.3 billion (IMF DOT Database), $4.4 billion (Comtrade), $4.7 (IMF DOT publication), $4.8 billion (UNCTAD), and $4.9 billion (World Bank).[66] How can we explain such large discrepancies? What datasets should we use as a reference point to indicate North Korea's aggregate trade?

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[65] See KOTRA's annual publications of *North Korea's External Trade*.
[66] All the data except 2006 figures in World Bank's World Development Online are the same as its original sources, UNCTAD. The reason for the discrepancy 2007 could not be confirmed.

Table 15: North Korea's Trade: Aggregate Level Comparison ($ billions)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
KOTRA	2.17	1.44	1.48	1.96	2.27	2.26	2.39	2.85	3.00	2.99	2.94
GTIS-WTA	2.21	1.64	1.76	2.40	3.46	2.51	2.56	3.34	3.29	4.01	4.54
IMF		2.03	1.98	2.97	4.05	3.13	3.04	3.90	4.03	4.35	4.75
UNCTAD	2.49	1.66	1.81	2.39	2.67	2.90	3.12	3.56	4.06	4.88	
UN						2.66	2.57	3.49	3.81	4.43	
World Bank	2.49	1.66	1.81	2.39	2.67	2.90	3.12	3.56	4.056	4.99	

Source: KOTRA; GTIS World Trade Atlas; IMF Direction of Trade; UNCTAD Handbook of Statistics; UN Comtrade; World Bank's WDI Online

There are several critical variables affecting the aggregate trade level and differences among the entities. One major variable is the breadth of coverage of North Korea's trading partner countries, as analyzed by Lee (2007). Some portions of the discrepancies are the result of reversing imports (cif) and exports (fob) in the process of assembling mirror statistics. Other sources of discrepancies are speculated to be methodological differences, including the frequency and timing of data updates, and the exchange rates used to convert local currency into US dollar terms. Also, North Korea's partner countries often make reporting errors as their customs officials confuse the two Koreas.

We should look first at what is possibly the largest source of discrepancies. Table 16 shows the historical trend of the number of trading partners for North Korea covered in each database. Building upon the analysis by Lee (2007), Table 16 updated some figures as well as added GTIS, one of the primary sources of KOTRA's trade data.

The coverage of trading countries by KOTRA and GTIS is much smaller than that of the IMF and the UN. IMF and UN databases covered their member countries in the range of 111 to 128 for exports and 115 to 136 for imports in 1997-2007. KOTRA covered consistently 50 to 60 countries as North Korea's trading partners in 1997-2007. GTIS, as a relatively new private venture, more than doubled the coverage of North Korea's trading partners from 31 in 1997 to 62 in 2007. GTIS's coverage surpassed KOTRA's in 2002. Still, the GTIS *World Trade Atlas* database covers only about one-half of the number of countries covered by the IMF and the UN. The coverage of countries is speculated to be among the primary reasons for the data discrepancies among the entities.

Table 16. Coverage of DPRK Trading Partners (number of countries/regions)

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
KOTRA	**Export**	59	54	64	55	55	51	51	56	@55	61	55
	Import	60	55	52	50	54	46	47	52		55	51
GTIS	**Export**	31	36	52	52	53	60	58	63	65	64	62
	Import	31	35	46	49	48	52	66	69	68	65	66

IMF	Export	118	128	118	118	113	111	113	116	117	116	
	Import	78	78	78	81	82	82	86	88	83	79	
UN	Export	115	119	127	129	128	126	136	124			
	Import	84	82	80	93	94	88	90	91			
Note:	IMF data coverage separates Hong Kong, Macao, from Mainland China.											
Source:	KOTRA. North Korea's External Trade Trend (Korean). Various years.											
	GTIS. World Trade Atlas Database (Courtesy of GTIS).											
	IMF. Direction of Trade , 2007, 2006, 2005.											
	Lee Suk (2007).											

Given that KOTRA subscribes to GTIS's *World Trade Atlas*, and relies on it as a primary source of North Korean trade data, it is important to understand the content of the *World Trade Atlas* and GTIS's methodology of compiling data, as well as KOTRA's procedures and treatment of the *World Trade Atlas*. GTIS is a growing company, with the current coverage of trading countries about 75. GTIS directly receives trade information from the respective customs offices of the countries covered. GTIS is currently equipped with about 30 specialists in data collection and entry into their system at their headquarters office in South Carolina. As a matter of principle, GTIS does not revise trade data collected from the national trade authorities, unless they publicly announce such revisions or errors. GTIS updates its trade data for most of the countries on a monthly basis, converting them into US dollar terms with corresponding exchange rates released by the U.S. Federal Reserve. If updating goes back to historical data, such information is also disclosed as well. One possible issue of the GTIS database is that it has not covered the Middle Eastern countries yet, although the company intends to expand its coverage into that region.[67]

While utilizing GTIS's trade data, KOTRA simultaneously gathers trade information from its overseas representatives. KOTRA's overseas representative offices have contacts with relevant foreign governments and their customs offices. Upon receipt of such data from overseas, KOTRA headquarters in Seoul compares data from the two channels, KOTRA's overseas offices and GTIS. If there are gaps between the two sources, it is a standard practice that KOTRA contacts the relevant ROK government agency to seek advice to determine which figure they should use and publish in its annual publication on North Korean trade.[68] KOTRA also drops some countries' data that are included in the *World Trade Atlas*, if they determine the reliability of such data is questionable. KOTRA has two officials specializing in this task at its headquarters in Seoul, making an assessment of the GTIS data and verifying it for inclusion in KOTRA's annual publication of data.

KOTRA's 2007 trade publication relied solely on the *World Trade Atlas* for the trade data of 16 countries (Japan, India, Australia, Netherland, Sweden, England, Ireland, Slovakia, Norway, Luxemburg, Cyprus, Malta, Estonia, Lithuania, Argentine, and Peru). For the five countries, China, Croatia, Mexico, Paraguay, and Uruguay, KOTRA relied

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[67] The author's interview with GTIS.
[68] KOTRA. The author's interviews with KOTRA. August date, 2008. Seoul.

on GTIS as well as the respective government agencies such as customs offices. The remaining 40 countries' trade data came from foreign trade authorities or their trade or statistical agencies.

KOTRA's data compilation procedures explained above are the cause of its smaller aggregate trade figures relative to those of the *World Trade Atlas*. In order to understand KOTRA's treatment of GTIS data and gaps in their trade figures, discrepancy analyses were conducted using KOTRA's publicly available trade data and *World Trade Atlas* data. Table 17 shows those trade data discrepancies and contributing factors in terms of KOTRA's decisions to adjust GTIS figures. In 2007, the total discrepancy in DPRK trade aggregate figures amounted to $1,606 million, of which differences in their exports and imports accounted for 42% and 58%, respectively. In-depth analysis reveals that as high as 55% of the aggregate discrepancy can be explained by KOTRA's downward adjustments for a dozen economies, including India, Brazil, South Africa, Hong Kong and the Netherlands. KOTRA seems to have made its single largest downward adjustment for India in 2007, from GTIS's $833 million down to $126 million, of which imports were cut as much as $624 million. It is speculated that this adjustment was made based on KOTRA's interpretation that entry mistakes occurred due to confusion between South Korea and North Korea at the foreign customs office.

Table 17: Discrepancies in DPRK Trade Figures: KOTRA vs. GTIS (2007)

Explanations of discrepancy and Contribution shares	Aggregate Difference	Difference in Exports	Difference in Imports
Discrepancy between KOTRA & GTIS ($ mn)	1,606	669	936
	100%	42%	58%
KOTRA's downward adjustments	73%	18%	55%
KOTRA's upward adjustments	-0.2%	0%	0%
KOTRA's dropping data	29%	25%	4%
KOTRA's addition of countries, which are not included in GTIS	-1.7%	-1%	0%

Source: The author's analysis based on KOTRA and GTIS Global Trade Atlas/World Trade Atlas databases (Courtesy of GTIS).

The second largest explanatory factor was KOTRA's dropping data included in the GTIS *World Trade Atlas* (12 countries in 2007), mostly Latin American countries. Venezuela accounted for the single largest amount, $377 million. KOTRA probably made a decision that these figures are unverifiable and dropped them from the GTIS list entirely, rather than making adjustments. A small portion of the discrepancy can be explained by KOTRA's upward adjustments for a few European countries, and the addition of certain countries not included in the GTIS *World Trade Atlas* (Pakistan, Cambodia, Cuba, Kenya, Burundi, Syria and Tanzania).

A similar comparative aggregate discrepancy analysis was conducted by using the 2006 trade data of KOTRA and IMF (Table 18). Out of a $1,733 million discrepancy of aggregate trade data, exports explain one-third while imports contributed to two-thirds of the difference. Individual countries' trade figures in the IMF database are generally larger than those of KOTRA, explaining 65% of the discrepancy, of which Algeria (21%) and Brazil (9.4%) are not reported by KOTRA (although we can find their names in KOTRA's trade data). For a dozen countries, including China, Greece, Lebanon, Netherlands, India, Thailand and Peru, KOTRA reported much smaller aggregate trade data than IMF. There are as many as 60 developing countries' trade data not included in the KOTRA data but covered by the IMF, accounting for 38% of the aggregate discrepancy. (See Appendix: Trade Data Analysis: Aggregate Data Discrepancy between KOTRA and IMF).

Table 18: Discrepancies in DPRK Trade Figures: KOTRA vs. IMF (2006)

Explanations of discrepancy and Contribution shares	Aggregate Difference	Difference in Exports	Difference in Imports
Discrepancy between IMF & KOTRA ($ mn)	1,733	579	1,154
	100%	33%	67%
IMF data is larger than KOTRA's	65%	-	-
IMF data is smaller than KOTRA's	-1.3%	-	-
Countries not reported by KOTRA, but included in IMF DOT	38%	17%	20%
Countries not reported or covered by IMF, but included in KOTRA's	-1.4%	-0.1%	0.4%

Source: Author's analysis based on KOTRA and IMF DOT (See also Appendix II).

Some analysts argue that the selective coverage of North Korea's trading partners by KOTRA does not necessarily mean that KOTRA's data is less accurate than those of the IMF and UN.[69] The rationale for this argument is that developing countries' trade data is not only inaccurate but also irregular, on top of entry errors due to their confusion of the two Koreas. This statement has a valid point. For instance, KOTRA's downward adjustment for DPRK-India trade can be supported as a right decision, as verified by analysts at the US Congressional Research Service. (Box 4).

Box 4. Reliability of DPRK-India Trade Figures by Dick Nanto and Emma Chnalett-Avery (2008)

A Congressional Research Service report by Dick. K. Nanto and Emma Chanlett-Avery (2008 August) explained that they made downward adjustments for DPRK exports to India for 2007 ($173 million to $41 million) and 2006 ($475 million to $9 million), as DPRK-India trade figures were abnormally high. Using the originally reported data, DPRK exports to India accounted for 9% of the total in 2007 and 23% in 2006. They took several steps to verify that these figures were in fact in error.

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[69] Lee Suk (2007) supported the view. PP. 147-149.

First, they found out which sector might be a source of the abnormally high DPRK-India trade figures. Items such as electrical machinery and parts, in particular, are likely to actually be imported from South Korea rather than North Korea. They also found that the mere comparison of India's imports from South Korea and North Korea do not provide any crucial information to determine which figures may be errors, due to huge gaps in the two Koreas exports to India. They compared the figures with China's exports to India instead, assuming that the DPRK's electrical machinery exports should not exceed China's. After comparing reported Indian data with that for China, 2006 imports by India from North Korea of $475 million were reduced to $9 million, and 2007 imports of $173 million were reduced to $41 million. Adjusted exports to India now account for 2% and 0.4% of DPRK's total exports to the world, in 2007 and 2006, respectively.

Source: Nanto, Dick K. and Emma Chanlett-Avery. (2008) "The North Korean Economy: Leverage and Policy Analysis." CRS Report for Congress RL32493. Washington, D.C.: Congressional Research Service: The Library of Congress. Updated August 26, 2008

That said, can we dismiss entirely a discrepancy as large as $1.8 billion in 2006 as errors by developing countries? The answer is probably no. As much as 38% of the discrepancy between KOTRA and IMF trade aggregate figures stems from North Korea's trade with 60 developing countries. The amount cannot be dismissed entirely as errors, if North Korea has in fact attempted to diversify its trading partners to reach multiple numbers of smaller states, especially developing countries. Also, from the 2007 discrepancy analysis, we can tentatively conclude that about $1.1 billion of the discrepancy relates to two large sources of the discrepancy between aggregate trade figures between KOTRA and GTIS ($707 million for India and $377 million for Venezuela). Assuming that these adjustments are correct, their aggregate figures should have been around $3.2 billion (instead of $4.3 billion) for IMF and $3.8 billion (instead of $4.9 billion) for UNCTAD.

While KOTRA's data verification procedures are prudent by not including some questionable data, it is highly likely that its aggregate figure is understated. The UN and the IMF data, on the other hand, are likely to be overstated. In other words, all these databases need to be treated with caution. But for the purpose of understanding North Korea's aggregate trade level, the IMF and UN data can probably better serve as the primary reference point, given the coverage of countries including developing nations, compared to KOTRA which dropped many developing countries, and GTIS which is still in the process of expanding the coverage of trading nations.

As of January 2005, North Korea had established diplomatic relations with 155 countries (out of 192 nations in the world excluding Taiwan, and South and North Korea). Of 155 countries, 24 are countries in the Asia-Pacific region, 22 in America, 48 in Europe, 11 in the Middle East and 50 in Africa. One cannot dismiss North Korea's trade with developing countries as a whole as irregular and insignificant. These small economies may in fact constitute a significant portion of DPRK's total trade. To prove this point, the next section introduces North Korea's trade in terms of historical trends and structure by country groups.

North Korea's Trade by Historical Trend and Structure by Country Groups:

Multiple sources of trade data show North Korean trade increasing with developing countries and decreasing with developed countries over the past ten years. For example,

the *UNCTAD Handbook of Statistics*[70] and the IMFs *Direction of Trade* (both the publication and the database) offer a quick overview of North Korea's trade in terms of its historical trend and structure by country groups, namely, developed and developing countries. North Korea's diplomatic efforts to participate actively in the Non-aligned Movement starting in the 1970s are well-known. North Korea has continued its efforts to establish diplomatic and trading relations with additional developing countries,[71] whether licit or illicit, especially with previously untapped countries and regions.

This general trend of trade diversification exposes the limitations of databases that have a more narrow coverage of North Korea's trading partner countries. Developing countries have increased their relative importance as trading partners of North Korea. If these countries are not covered in trade databases, those databases may not accurately reflect North Korea's historical trends and composition of trade by region, as well as the aggregate trade level.

Table 19 outlines North Korea's trade with developed economies and developing economies. North Korea's exports to developed economies decreased from 43.4% of the total (US$924 million) in 1990 to 38.9% ($925 million) in 2000, and fell sharply further as a share of the total to 16.3% ($1,131 million) in 2005. North Korea's exports to developing economies, on the other hand, increased from 53.6% of the total in 1990, to 58.4% in 2000, and further to 81.8% in 2005. Some of this can be explained by the increasing importance of China and decreasing importance of Japan in North Korea's foreign trade, but the shift toward developing countries is also true outside the East Asian region, and almost as clear for the import trade as it is for the export trade.

Table 19: UNCTAD-DPRK's Trade with Developed and Developing Countries (%)

	DPRK's Export Destination			DPRK's Import Origin		
	Developed Countries	Economies in Transition	Developing Countries	Developed Countries	Economies in Transition	Developing Countries
1990	43.4	2.9	53.6	39.5	0.4	60.1
2000	38.9	2.7	58.4	21.3	2.6	76.1
2005	16.3	1.9	81.8	21.0	9.5	79.8

Source: Global-UNCTAD-Handbook of Statistics (ICT Stat-DPRK file) Chap 2. International merchandise trade by region Table 2.1 Country trade structure by partner, presented in *International Trade by Region*

The published version of the IMF's *Direction of Trade* also shows, at the end of each country's trade data with partner-countries, analyses on historical trends of trade by country groups, including developed and developing countries. The developing countries group is further broken down into five regions, Africa, Asia, Europe, Middle East, and Western Hemisphere. According to the IMF, North Korea's exports to developed countries dropped from 36.5% in 1998 down to $16.4%, while the share of North Korea's

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[70] Global-UNCTAD-Handbook of Statistics (ICT Stat-DPRK file) Chap 2. International merchandise trade by region – useful to see the trend of North Korea's trade with developed and developing economies. P. 56.
[71] For instance, DPRK at the same time has put an increasing effort to establish diplomatic relations with more developing countries. Most recently, for example, North Korea established diplomatic relations with Kenya, according to the Korean Central News Agency. AFP News. September 28, 2008. http://afp.google.com/article/ALeqM5gI_XT0cxE114fKha2x7PZf1cxiDw

trade with developing countries increased from 63% to 84% over the same period. Asian developing countries accounted for roughly 30% of North Korea's exports in the late 1990s, increasing to over 50% in 2004-2006. African and Middle Eastern developing countries, while much smaller than the Asian counterpart, have more than doubled and tripled their shares up to 6% and 11%, respectively. (Table 20).

Table 20: IMF: DPRK's Export Trend by Trading Region (%; 1998-2006)

	Developed Countries	Developing Countries	Of which Exports to:				
			Africa	Asia	Europe	Middle East	Western Hemisphere
1998	36.5	63.5	3.3	28.8	5.7	8.8	16.9
1999	31.1	68.9	3.9	29.6	5.2	10.2	20.0
2000	36.8	63.2	2.7	22.8	5.6	2.7	29.3
2001	29.5	70.5	2.9	31.7	5.9	3.0	26.9
2002	33.1	66.9	3.6	41.6	4.0	3.3	14.4
2003	24.0	76.0	5.6	49.7	3.7	4.2	12.9
2004	18.6	81.4	5.7	54.3	3.6	7.4	10.3
2005	14.3	85.7	6.0	55.1	4.2	10.0	10.4
2006	16.4	83.6	6.3	50.1	5.8	10.8	10.7

Source: IMF DOT. Publication 2005, 2006, 2007.

If we look at imports, this phenomenon is even more pronounced. North Korea's imports from developed countries dropped drastically from 38.5% to 7.3%, while its imports from developing countries in total increased from 61.5% to as high as 92.7% in 2006 (Table 21).

Table 21: **IMF: DPRK's Import Trend by Trading Region (%; 1998-2006)**

	Developed Countries	Developing Countries	Of Which Imports from:				
			Africa	Asia	Europe	Middle East	Western Hemisphere
1998	38.5	61.5	1.2	44.8	6	2.1	7.4
1999	27.4	72.6	0.7	51	6	1.6	13.4
2000	21.0	79.0	14.3	49.3	3.0	4.5	7.9
2001	44.3	55.7	10.0	34.8	2.4	0.7	7.7
2002	23.5	76.5	19.2	47.1	2.8	1.4	6.1
2003	18.9	81.1	13.8	55.1	6.6	1.4	4.3
2004	17.0	83.0	10.2	51.9	9.2	2.9	8.7
2005	10.7	89.3	12.8	57.1	9.7	3.7	5.9
2006	7.3	92.7	17.2	58.6	7.5	4.3	5.2

Source: IMF DOT. The 2005, 2006 and 2007 Print Version.

It is undeniable that statistical errors as well as recording mistakes are more commonly made by developing countries. But it would be misleading and inappropriate if analysts

dismiss North Korea's increasing trade with developing countries as entirely a result of errors or clerical mistakes. While more comprehensive discrepancy analyses may be necessary as evidence to support this view, the following five implications or tentative conclusions can be derived from our observations.

First, databases produced by global entities such as the UN and the IMF with more comprehensive coverage of reporting countries are important references for understanding North Korea's aggregate trade and the overall historical trend and structure of its foreign trade by country groups. Given the current data accessibility situation where mirror statistics are by far the easiest way to obtain DPRK trade data (rather than trying to extract official DPRK statistics), the global entities' databases made available openly or at a reasonable cost will continue to be important sources of DPRK's trade data.

Second, it is inappropriate to rely on a single source, such as KOTRA or GTIS, to ascertain the historical trend and structure of North Korea's trade due to their smaller coverage of trading partners. KOTRA makes downward adjustments, not only when they find mistakes, but also if the data is unverifiable. GTIS's North Korea trade data currently ignores the entire Middle East region, accounting for as much as 11% of North Korea's exports and 4.3% of its imports in 2006. Recent puzzling phenomenon, such as the mysterious building boom in Pyongyang, may be explained partially from "missing information or data" including illicit trade that is not reflected in mirror statistics.[72]

Third, mirror statistics derived from databases of global entities with a regional focus, such as OECD and the EU, are probably not appropriate tools to grasp North Korea's aggregate trade and historical trends, even though they may be among the most sophisticated, comprehensive and user-friendly databases. For instance, OECDbeta is a user-friendly database and highly comprehensive in terms of data content, but its coverage is limited to OECD member countries and only some non-OECD countries. North Korean trade data derived from such a database inevitably reflects a partial picture. These databases can serve as an ideal database to observe North Korea's trade with OECD or EU member countries, but cannot fully satisfy the objective of grasping North Korea's aggregate trade level and overall composition.

Fourth, if South-South trade in fact continues to increase in the future, North Korea's trade data assembled through mirror statistics will continue to be problematic, prone to errors and omissions. Also, North Korea's trade with non-reporting countries will never be reflected in mirror statistics. This brings us back to the importance of capacity building for North Korea's statistics authorities to develop and refine official DPRK trade statistics, which should then be made available to users outside North Korea.

Fifth, as both South Korea and North Korea treat inter-Korean trade as domestic transactions, none of the databases reviewed, even those of the IMF and the UN, accurately reflect the magnitude of inter-Korean trade in their mirror statistics. Ultimately, none of the databases above can accurately reflect the aggregate level or

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[72] North Korea in the midst of a mysterious building boom, Associated Press, September 27, 2008. http://www.latimes.com/news/printedition/front/la-fg-boom27-2008sep27,0,3034325.story

historical trend of North Korea's external trade, unless inter-Korean commercial trade is added to the North Korean external trade figures derived from mirror statistics. The next section will discuss this issue in detail.

Inter-Korean Trade:

The treatment of inter-Korean trade in trade databases requires special attention. There are only a few entities, namely the South Korea Customs Service (KCS) and the Ministry of Unification (and the Korea International Trade Association (KITA) until March 2008) which have provided consistent and comparable inter-Korean trade data over time. Moreover, neither the ROK nor DPRK governments officially report inter-Korean trade data as "foreign trade," since they view such trade as internal "domestic" transactions rather than international trade. (Although in practice, the Korea Customs Services seems to have reported some inter-Korean trade figures for some selected years in the past.)

So, does non-reporting of inter-Korean trade contribute to undercounting in the aggregate trade figures of the entities discussed above? The quick answer is yes.

"Inter-Korean trade" figures are starkly different among the MOU/KITA, IMF/OECD and US GTIS databases. According to MOU data, total inter-Korean trade increased from $13 million in 1990 up to about $1.8 billion in 2007. North Korea's "exports" to South Korea increased from $12 million in 1990 to $152 million in 2000 and $765 million in 2007. North Korea's "imports" (South Korea's *ban-chul*) reached over $100 million in 1997 ($115 million), and skyrocketed to over $1 billion in 2007. (Appendix: See Data Comparison – Inter-Korean Trade).

In major global entities' databases, including IMF's DOT and the OECD database, however, the figures are much lower. North Korea's "exports" to South Korea (mirror statistics derived from South Korean trade data) are recorded for certain years including $8 million in 1998, $22 million in 2001, and $36 million in 2005. North Korea's imports (South Korea's exports to North Korea) are actually entered as zero for 1998-2006. These global entities share exactly the same data. IMF responded to queries regarding inter-Korean statistics figures entered into IMF DOT as follows: "The figures are reported by ROK Korea Customs Service. Goods carried in from or carried out to North Korea are excluded from merchandise trade statistics, which explains why we have 0 reported transactions since only South Korea reports to the IMF. Also, they may have reported their trade with North Korea in the past but stopped doing so."[73]

The South Korea Customs Services is the original source of inter-Korean transaction data for the GTIS and other global entities' databases. Yet, the figures reported to these entities are different and inconsistent. As a result, it is not appropriate to derive inter-Korea trade data from these databases. This also implies that the aggregate North Korean trade data derived from these databases are understated, not accurately reflecting inter-Korean trade. This conclusion underscores that the only option is to rely on data released by the Ministry of Unification, Korean Customs Services or KITA as sources of inter-

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[73] The author's email correspondence with relevant IMF staff members. September 2008.

Korean trade, then aggregate those figures with North Korean external trade data derived from other databases.

Even using such a methodology, the analyst must take care to consider which database is used to derive North Korea's external trade figures. For example, most North Korea analysts tend to add KOTRA's aggregate North Korean external trade data to MOU's inter-Korean trade figures, in order to derive the DPRK's aggregate international trade level.[74] Combined KOTRA and MOU (or KITA) figures bring North Korea's aggregate international trade data up to $4.3 billion in 2006, for instance, seemingly equivalent to those of the IMF, Japan's Economic Research Institute for Northeast Asia (ERINA), and UN Comtrade. As stated above, this aggregation of KOTRA and MOU data does not, however, make the data on North Korea's international trade comparable to other databases such as IMF DOT, due to the gaps in the KOTRA data.

Separate from the aggregation problem, and the overall undercounting resulting from the non-reporting of inter-Korean trade, are issues related to the character of inter-Korean trade itself. The breakdown of inter-Korean trade announced by the MOU includes components which are generally not considered to be commercial, and therefore it is questionable whether they should be considered as interchangeable with "normal" trade figures. Inter-Korean trade data as officially announced by the MOU is categorized into commercial and non-commercial trade. Commercial trade as defined by the MOU includes general trade, processing-on-commission trade and trade related to economic cooperation projects including the Kaesong Industrial Complex. According to such a classification, commercial and non-commercial trade accounted for 56% and 44% in 2000, respectively. A more useful classification would be (1) commercial trade, comprising both general trade and processing-on-commission (POC) trade, which is commission-based and uses North Korean labor but no North Korean industrial inputs; (2) government-sponsored trade, covering the inputs and product output of the Kaesong industrial complex; and (3) government-organized transactions, comprising humanitarian aid, social and cultural cooperation projects, and the erstwhile light-water reactor project.[75] Further, more in-depth analysis of each global database, leading to classification, alignment and aggregation of North Korea's external trade with MOU's inter-Korean trade based on HSK codes, for example, will be necessary.

Such an exercise may provide useful data on inter-Korean commercial merchandise trade for North Korea analysts, who will need to continue the practice of aggregating the two statistics as a necessary step to derive North Korea's "real" international trade. The ROK government is restricted by law and not likely to announce North Korea's international trade data inclusive of inter-Korean commercial trade.

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[74] As of March 2008, KITA's function of providing details of inter-Korean trade data was shifted to Ministry of Unification's website.

[75] See Marumoto (2008) "The Role of China and South Korea in North Korean Economic Change," *Korea's Economy 2008*. Volume. 24. Washington, D.C. and Seoul: Korea Economic Institute and the Korea Institute for International Economic Policy.

In sum, concerning the process of accessing and interpreting inter-Korean trade data, we can reach following tentative conclusions. First, inter-Korean trade is not a major contributing factor to the large discrepancies in aggregate trade figures among the different entities covered, but it is a cause of systemic undercounting of North Korea's "real" aggregate trade. Second, none of the global entities' databases can be used as a source of accurate inter-Korean trade data. Third, while the MOU offers the most reliable information on inter-Korean trade, special caution is necessary especially when aggregating it to North Korea's external trade figures to derive total "international trade." Before aggregating the two, some steps should be taken to decide which relevant and appropriate portions of inter-Korean trade can be aligned and aggregated with North Korea's external trade derived from other data sources.

Bilateral Trade with North Korea:

There are a number of databases that may be of particular interest to analysts who need to discern the detailed composition and trend of North Korea's bilateral trade with specific countries. Used together with comprehensive and comparable trade databases such as the UN Comtrade, the utility of such bilateral data sources is expected to increase.

One can of course refer to the respective partner country's official websites, which provide mostly open trade data available to the public. For instance, China's trade data is available on-line at relevant government agencies' official websites, such as those of the China Customs Office[76] and the Ministry of Commerce,[77] as well as in subscription-based online services, such as China Data Online.

The China Customs Office is the primary source for Chinese trade data in general, and PRC-DPRK trade, in particular. The China Customs Office is most frequently cited by entities including other Chinese government agencies. But the China Customs Office's official website in Chinese provides trade data with China's major trading countries only, not all the partners. North Korea is not among the ten largest trading partners for China. As a result, one needs to refer to trade data from China Customs publications.

The Ministry of Commerce's websites are more user-friendly both in Chinese and English. The Chinese site, however, provides trade data in a more comprehensive and user-friendly manner on monthly, quarterly and annual bases, and also trade data in aggregate, by types of enterprises, by province, by commodity, and by partner country and region.[78] PRC-DPRK data is easily accessible on an annual basis from the MOC website.

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[76] China Customs English site: http://english.customs.gov.cn/default.aspx; Chinese site:
http://www.customs.gov.cn/Default.aspx?tabid=4370&moremoduleid=15677&moretabid=2453
[77] Ministry of Commerce (MOC) of People's Republic of China's official main website listing China's trade data: http://english.mofcom.gov.cn/statistic/statistic.html. MOC's Department of Asian Affairs are the original sources of China's trade data with Asian countries, listed in the main trade website http://yzs2.mofcom.gov.cn/index.shtml Department of Asian Affairs.
[78] http://zhs.mofcom.gov.cn/tongji.shtml.

China Data Online is often accessible at university libraries and research institutions. North Korea's trade with China at the national level, as well as with individual Chinese provinces, can be retrieved.

The Trade Statistics of Japan are compiled and published by the Ministry of Finance and the Customs under the provision of the Customs Law and relevant international conventions, and the method is described in the Order of Director General of the Customs and Tariff Bureau. [79]   The source of data is declarations submitted to Japan Customs.

Japan's official trade statistics database is available both in Japanese and English in a user-friendly format. One of the relative strengths of MOF's trade database is that virtually the same data content and functions are available in English and Japanese. The database enables analysts to retrieve North Korea's trade data with Japan for the period 1998-2008, with different options such as data for a single year and month, multiple years, and multiple months in a year. One can also conduct more detailed trade analyses based on 2-digit, 4-digit or 6-digit commodities.

The MOF database is not without its quirks, however. Analysts point out the anomalous data of Japan's exports to the DPRK in 2001.[80] The year 2001 saw a sudden hike in Japanese exports to North Korea to the amount of Y129.5 billion, up from Y22 billion in 2000, before falling back to Y16.5 billion in 2002. This can be explained, however, by Japanese food aid to North Korea, or cereal imports by North Korea from Japan, which were assigned a value based on commercial terms and integrated into the export data.

North Korea's Trade Performance and Market Access:

The last objective is to understand North Korea's trade performance. There are some databases that cater to this particular objective, and provide quick but in-depth overviews and analysis of North Korea's trade performance. While costs differ depending on the database, some entities offer easily accessible and available analyses on North Korea's comparative advantage and competitiveness at the country and industry levels in the world market. This section introduces two databases in which such user-friendly market analysis tools are conveniently imbedded: GTIS's *Global Trade Atlas* and the UNCTAD/WTO-International Trade Centre's trade performance index database.

GTIS's simple but effective database tools enable analysts to derive instantly the unit costs of traded goods according to Harmonized System code. Tables containing trade datasets are displayed with the following tabs: (1) value, (2) quantity, (3) unit price, and (4) quantity and value. One can simply press the unit price tab to obtain results. Results show market prevailing unit prices (world), as well as those of North Korea's trading partners individually. For example, if one would like to see the unit cost of China's oil exports to North Korea and other countries, he can choose China's export and HS-code number (commodity 2709, petroleum oils and oils obtained from bituminous minerals,

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[79] Ministry of Finance Japan Official Website, Statistics Section. http://www.mof.go.jp/english/files.htm; also see *About Trade Statistics of Japan*. http://www.customs.go.jp/toukei/sankou/howto/gaiyou_e.htm

[80] The author is indebted to DPRK Economic Forum member discussions.

crude), which leads to the list of oil importers from China, including North Korea (Table 22). Such analyses are useful if one would like to see if North Korea is paying below, above or equivalent to market prices of particular import products from its trading partners.

Table 22: GTIS Global Trade Atlas Output Example – Unit Cost Analysis

Partner Country	Unit	Unit Value (United States Dollars)			% Change 2008/2007
		2006	**2007**	**2008**	
World	KG	0.41	0.35	0.71	103.1
Japan	KG	0.42	0.38	0.73	95.5
Korea North	**KG**	**0.47**	**0.49**	**0.83**	**69.3**
Korea South	KG	0.37	0.3	0.64	115.6
United States	KG	0.41	0.35	0.68	96.4
Singapore	KG	0.39	0.28	0.67	139.4
Malaysia	KG	0.45		0.72	
Thailand	KG		0.38	0.50	33.8
United Kingdom	KG	15	70		
Australia	KG	0.42			
Canada	KG		7.5		
Indonesia	KG	0.45	0.43		
Netherlands	KG		2		
Norway	KG	2.67			

China Export Statistics / **Commodity: 2709, Petroleum Oils And Oils Obtained from Bituminous Minerals, Crude** / **Year To Date: January - July**

Source: GTIS, Global Trade Atlas. Courtesy of GTIS, Ms. Mary Ann Boukalis. Interviews with Dick Nanto regarding unit cost analysis.

The International Trade Centre (ITC) under UNCTAD/WTO has developed a series of analytical tools for strategic market research, encompassing trade maps, market access maps, investment maps, trade competitiveness maps and product maps. ITC uses UN Statistics Division's Comtrade as its original source, covering 184 countries, where more than 95% of world trade in 5000 products is reported at the 6-digit level of the Harmonized System (HS).[81] Countries which do not report trade statistics such as North Korea are also included in their analyses. The only missing data is trade among non-reporting countries.

The Trade Competitiveness Map is among the examples of the ITC market analytical tools, directly showing North Korea's trade performance. A number of performance indices are embedded under the Country Map,[82] including (1) trade performance index –

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[81] International Trade Centre. *The Trade Performance Index: Technical Note*. May 2007. Geneva: Market Analysis Section International Trade Center (ITC). P.4.
[82] See www.intracen.org.

TPI and national export performance and national import profile.[83] Due to limitations of North Korea's trade statistics (mirror statistics), some analyses have yet to be applied and presented on the web. For instance, analysis of the reliability of trade statistics is not available for North Korea, as this analysis can be done only by comparing <u>official</u> statistics reported by the respective countries with their mirror statistics.

The Trade Performance Index (TPI) Trade Competitive Map provides country, industry and product competitiveness in the world market, through three types of indicators: a general profile, current position index (a country position for the latest available year), and change index (changes in export performance over the past several years).[84] TPI is an effective tool expressing both static and dynamic aspects of trade performance for 14 sectors separately as well as all industries as a whole, facilitating strategic decisions for trade and business promotion as well as national development planning.

Table 23 below is an example of TPI's output, showing North Korea's trade performance in the minerals sector in 2006. The General Profile contains the basic sector trade information, including absolute value (G1) and growth rate of minerals exports (G2), share in national exports (G3) and imports (G4). In 2006, North Korea's mineral exports stood at $301 million. Out of 156 minerals exporting countries, North Korea's export growth and per capita exports ranked 89th and 131st, respectively. The Position in 2006 for Current Index is derived from specific indicators such as per capita minerals exports (P2), share in world market (P3), as well as product and market diversification and concentration (P4 & P5). North Korea's minerals exports share in the world stood at 0.02%, ranking 108th out of 159 in 2006. The Change Index is a dynamic component of TPI, including relative change of world market share per annum (C1), which is decomposed into competitiveness effect (C1a), initial geographic specialization (C1b), initial product specialization (C1c), and adaptation effect (C1d). North Korea's minerals exports relative market share change was 0.0185% per annum. Overall, North Korea's minerals exports ranked 91st (change index) and current index (121st).

The TPI index can be derived for individual sectors as well as for all the industries as a whole to see the relative strength and comparative advantage of specific industrial sectors at the national level. Figure 5 shows another example of TPI analytical output (2005), by choosing current and change indices for all the sectors. Based on the indicators available from the ITC site, DPRK's eroding competitiveness in many sectors are evident over the period of 2003-2006. For instance, the DPRK's ranking in the current index in the food sector fell from 127th in 2003 to 160th in 2006, and its change index fell from 19th to 150th over the same period.

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[83] Other tools include (3) trade and employment, (4) trade simulation (TradeSim), (5) trade statistics; and (6) the reliability of trade statistics and technical notes on trade data.
[84] Detailed technical notes are available at ITC website, with all definitions accompanies with mathematical equations of each indicator. Technical notes also discuss some limitations of TPI that users should take into consideration. International Trade Centre. *The Trade Performance Index: Technical Note*. May 2007. Geneva: Market Analysis Section International Trade Center (ITC). http://www.intracen.org/menus/countries.htm.

These highly sophisticated analytical tools should be treated with particular caution, however, in light of the "garbage in, garbage out" principle. As was discussed, the recently reported India-DPRK trade figures are an example of likely reporting errors. Aside from individual researchers who noted and corrected for this potentially significant error, KOTRA is probably the only entity which adjusted the figure in its database accordingly. Other entities/databases including the UN Comtrade have not adjusted the figures. As a result, these value-added analytical tools, as convenient and effective as they may be, require an extremely careful interpretation of outputs, if used for strategic decisions by analysts and policymakers.

Table 23: ITC Market Analyses Tool Output Example (1): Trade Performance Index - DPRK's Minerals Sectors Competitiveness in the World Market

		Indicator's Description	Minerals (Rank; $'000;%)	Minerals (Rank)
General Profile	N	**Number of exporting countries for the ranking in the sector**	156	
	G1	**Value of exports (in thousand US$)**	301,517	
	G2	**Export growth in value, p.a. (%)**	26%	89
	G3	**Share in national exports (%)**	18%	
	G4	**Share in national imports (%)**	38%	
	G5	**Relative trade balance (%)**	-51%	
	G6	**Relative unit value (world average = 1)**	0.3	
Position in 2006 for Current Index	P1	**Net exports (in thousand US$)**	-621,094	97
	P2	**Per capita exports US$/inhabitant)**	13.4	131
	P3	**Share in world market (%)**	0.02%	108
	P4a	**Product diversification (N° of equivalent products)**	4	30
	P4b	**Product concentration (Spread)**		48
	P5a	**Market diversification (N° of equivalent markets)**	1	136
	P5b	**Market concentration (Spread)**		130
Change 2002 - 2006 for Change Index	C1	**Relative change of world market share p.a. (%)**	-0.0185%	
	C1a	**Competitiveness effect, p.a. (%)**	-0.1091%	139
	C1b	**Initial geographic specialization, p.a. (%)**	0.0579%	26
	C1c	**Initial product specialization, p.a. (%)**	0.0805%	12
	C1d	**Adaptation effect, p.a. (%)**	-0.0477%	123
	C2	**Matching with dynamics of world demand**		90
Indicators included in chart	A	**Absolute change of world market share (% points p.a.)**	-0.0003%	81
	P	**Average Index: Current Index**		121
	C	**Average Index: Change Index**		81

Source: International Trade Centre. *The Trade Performance Index: Technical Note*. May 2007. Geneva: Market Analysis Section International Trade Center (ITC). http://www.intracen.org/menus/countries.htm

Figure 5: ITC Market Analysis Tool Output Example (2):
Trade Performance Index, 2005
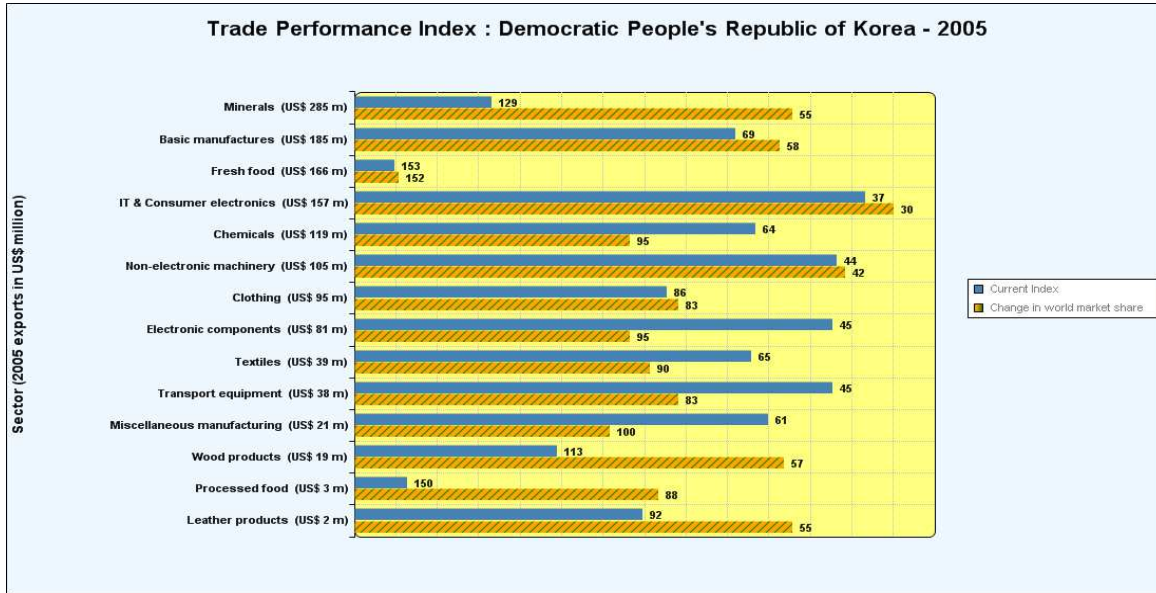
Source: International Trade Centre Market Analysis Services. Ranking of international competitiveness in terms of statics indicators (Current index) and the change in world market share (percentage points). The numbers indicate position in the ranking out of 189 countries (1 best performer).

TPI also offers other disaggregated indices, such as national export performance and national import performance based on HS products. Export performance indices include export values, growth rates, and shares in world market by each HS 2-digit commodities, as well as specialization indices such as the Balassa Index (revealed comparative advantage).[85] The Balassa Index, defined by Bela Balassa, is widely used as reference to determine a specific country's relative strength and weakness in particular products/sectors. Table 24 shows selected results of the Balassa Index for North Korea's products on a HS 2-digit basis, derived from ITC's trade performance database.

In general, if the Balassa Index exceeds one, a country is said to have a comparative advantage in this particular commodities or industry. In case of exceeding 2, the industry is viewed as highly competitive. According to these analyses, fishery products, textiles, and mineral products are among the highly competitive products that North Korea should specialize in trading.

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[85] Analytical and methodological issues revolving the Balassa Index to analyze trade specialization patterns are beyond the scope of this final report. The report introduces the Balassa Index, as calculated in ITC database, as an example of readily available value-added analyses of export performance of North Korea.

Table 24: ITC Market Analysis Tool Output Example (3): The Balassa Index – Revealed Comparative Advantage

	2006	2003
BI > 2	**9.9:** Fish, crustaceans, mollusks, aquatic invertebrates; **8.7:** ores, slag and ash; **7.7:** vegetable planting materials; **6.7:** vegetable products; ships, boats, and other floating structure; **6.1:** silk; **5.2:** zinc; **4.2:** manmade staple fibers; **4.0:** articles of apparels, accessories, not knit or crochet; **3.4:** lead and articles; **2.2:** manmade filaments	**47.2:** fish, crustaceans, mollusks, aquatic invertebrates; **19.9:** zinc; **10.9:** silk; **6.6:** articles of apparel, accessories, not knit or crochet; **5.1**: lead; **4.0**: ores, slag and ash; **3.6:** salt, sulpher, earth, stone, plaster, lime and cement; **3.3:** vegetable plaiting materials, vegetable products; **2.9**: iron and steel, edible vegetables and certain roots and tubers **2.5**: manmade filaments, oil seeds, oleagic fruits, grain, seed, fruit; manmade staple fiber.
BI > 1	**1.9:** salt, sulphur, earth stone, plaster, lime and cement; pearls, precious stones; **1.8:** edible vegetables, certain roots and tubes; **1.7:** iron and steel; wood and wood articles, charcoal; musical instrument; **1.5:** organic chemicals; electrical and electronic equipment; **1.4:** oil seeds, oleagic fruits grain, seed fruit; **1.3:** edible fruits; **1.2:** aluminum; **1.1**: knitted or crocheted fabric; plastics	**1.5**: wood and article of wood, wood charcoal; **1.3**: manufactures of plaiting material, basketwork; **1.2**: plastics and articles thereof; **1.0:** knitted or crocheted fabric **1.0:** electrical, electronic equipment
BI < 1	**0.9:** Articles of iron and steel; lace tapestry; impregnated, coated or laminated textile fabric; base metal; **0.8**: boilers, machinery, nuclear reactors; commodities not specified elsewhere; rubber; **0.7:** copper; wadding, felt, nonwovens, yarns, twine, cordage; nickel; minerals fuels, distillation products; **0.6**: stone, plaster, cement, asbestos, mica; other made textile articles, sets, worn clothing **0.5:** optical photo, technical medical apparatus; inorganic chemicals, precious metal compound, isotopes; glass, glassware; cutlery, base metal; **0.4:** vegetable textile fibers; miscellaneous chemicals; soaps, lubricants, waxes, candles; meat, fish and seafood prep; **0.3:** paper, paperboard, pulp; apparel, accessories, knit; aircraft, spacecraft parts; cotton; sugars, sugars confectionery; railway, tramway; products of animal origins; bird skins; manufacturing of plaiting material, basketwork; **0.2**: vehicles except railway, tramway; pharmaceutical products; tanning, dyeing extracts; photographic goods; albuminoids, glues, enzymes; headgear; gums, resins, vegetable saps, extracts; **0.1:** furniture, lighting, signs; footwear; toys, games; printed books, newspaper; essential oils; clocks, watches, ceramics, base metals, millings, art works; wool;	**0.9:** rubber and articles thereof; **0.8:** pearls, precious stones, metals, coins; **0.6:** boilers, machinery; nuclear reactors; coffee, tea, mate and spices; articles of apparel; **0.5:** organic chemicals; articles of iron and steel; wadding, felt, nonwovens, yarns, twine, cordage; 0.4: copper and articles; **0.3:** mineral fuels, oils distillation products; optical, photo, technical, medical apparatus; tanning, dyeing extracts; **0.2:** cotton; inorganic chemicals, precious metal compound, isotopes; fertilizer; paper, paper board articles of pulp; milling products; pharmaceutical products; **0.1:** vehicles other than railway, tramway; sugar and sugar confectionary; furniture, lighting signs; glass, glassware; railway, tramway locomotives, rolling stock, equipment **Sources:** Adapted from ITC Data.

Furthermore, as part of TPI national export profiles, each country's dynamic perspective charts[86] are available, showing the export performance of the 20 leading export product groups of the respective countries. For North Korea, dynamic charts can be retrieved for 2004-2006. The chart shows the total export value of the product group under review (size of the bubbles), and it compares the national increase in world market share (horizontal axis) to the overall growth in international demand (vertical axis).[87] Position and size of bubbles indicate whether or not specific product groups are winners or losers in growing or declining markets.

For instance, North Korea's seafood exports are viewed as "achievers in declining markets" in 2004 and 2006, but export values declined markedly over the same period as shown by the shrinking bubble size. Within the product group of ores, slag and ash, North Korea demonstrated its improving export performance both in terms of export value and its position in the world market. The bubble got larger over time, shifting from the position of "losers in growth market" to "winners in growth market." Dynamic charts also indicate North Korea's exports are concentrated in the lower left quadrant, meaning that North Korea's top export products are not competitive enough to gain market share in low-growth world markets.

The results derived from these analyses are not precise due to the limitations of mirror statistics. But they could give the North Korean trade and economic authorities as well as North Korea analysts elsewhere a quick overview of North Korea's overall export performance and competitiveness in major product groups. They can also serve as useful tools and background information before developing a more sophisticated trade promotion policy or marketing strategy.

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[86] Drawing upon firms' portfolio models used in marketing, such as the Boston Matrix model or the General Electric model, ITC's Market Analysis Section developed dynamic perspective charts. ITC Market Analysis Section. National Export Profiles: Explanatory Notes, 1999-2003 Data. http://www.intracen.org/appli1/TradeCom/Documents/Export-notes.pdf. P. 5.
[87] Ibid. P.5.

Figure 6: ITC Market Analysis Tool – Export Performance Dynamics Perspectives Charts (2004-2006)
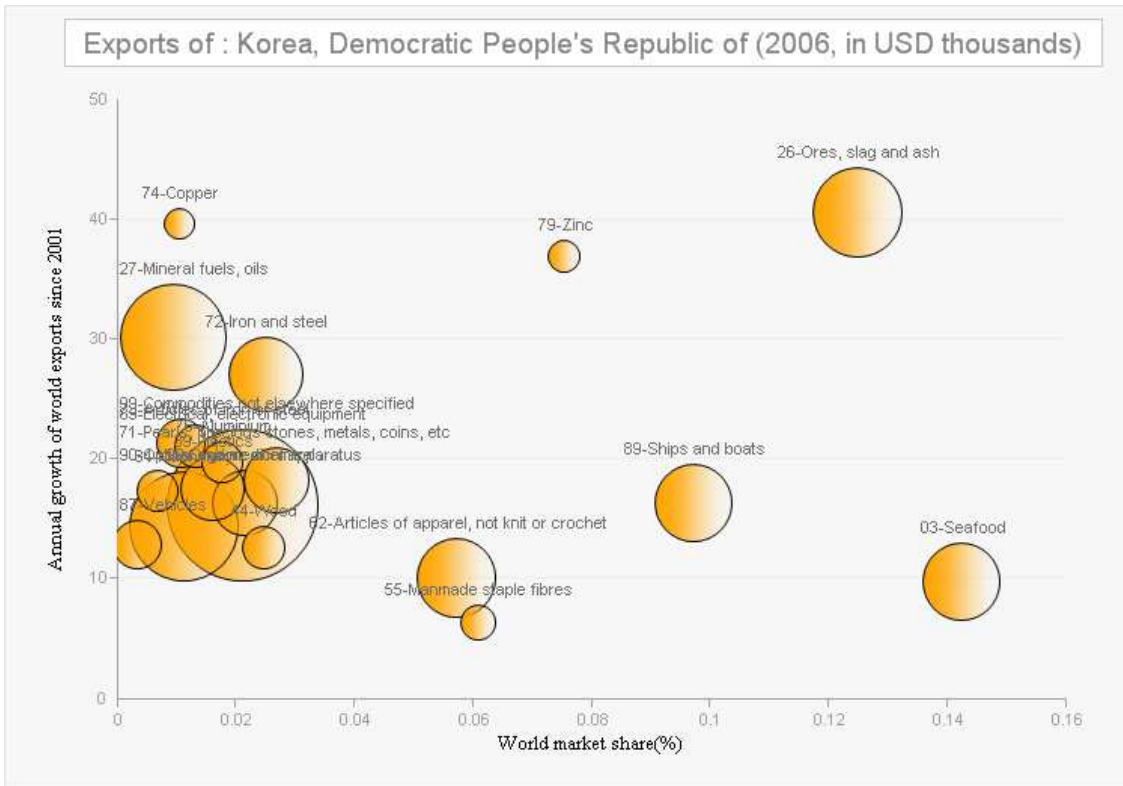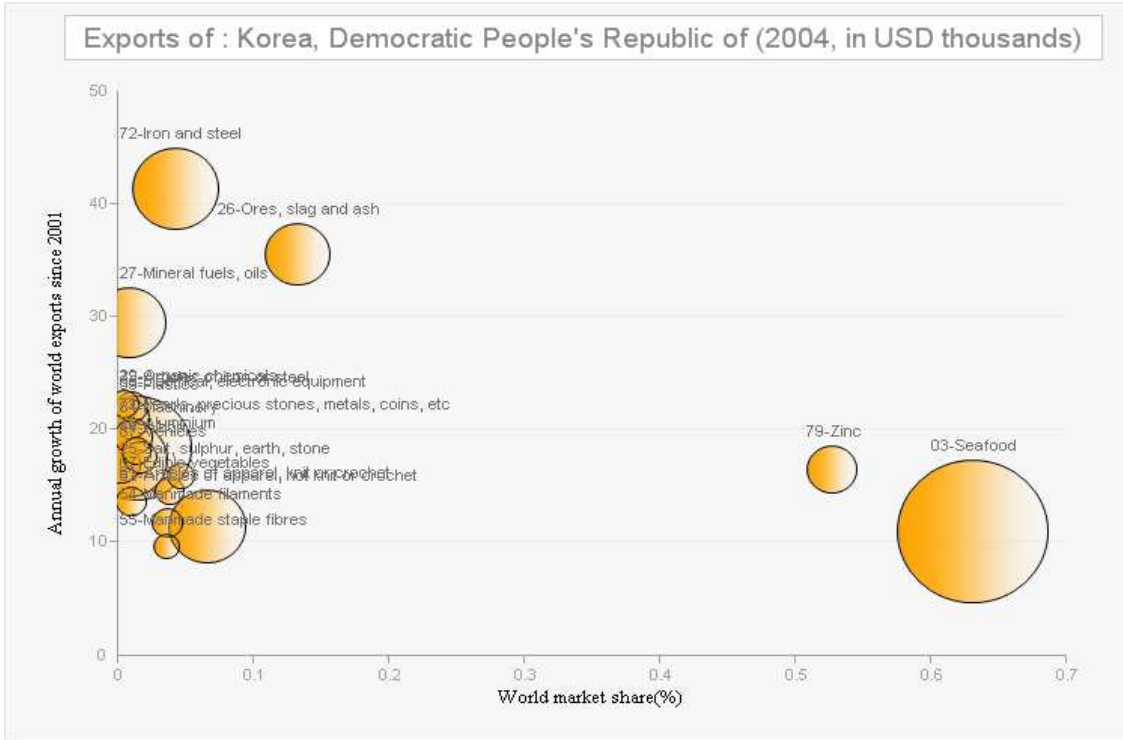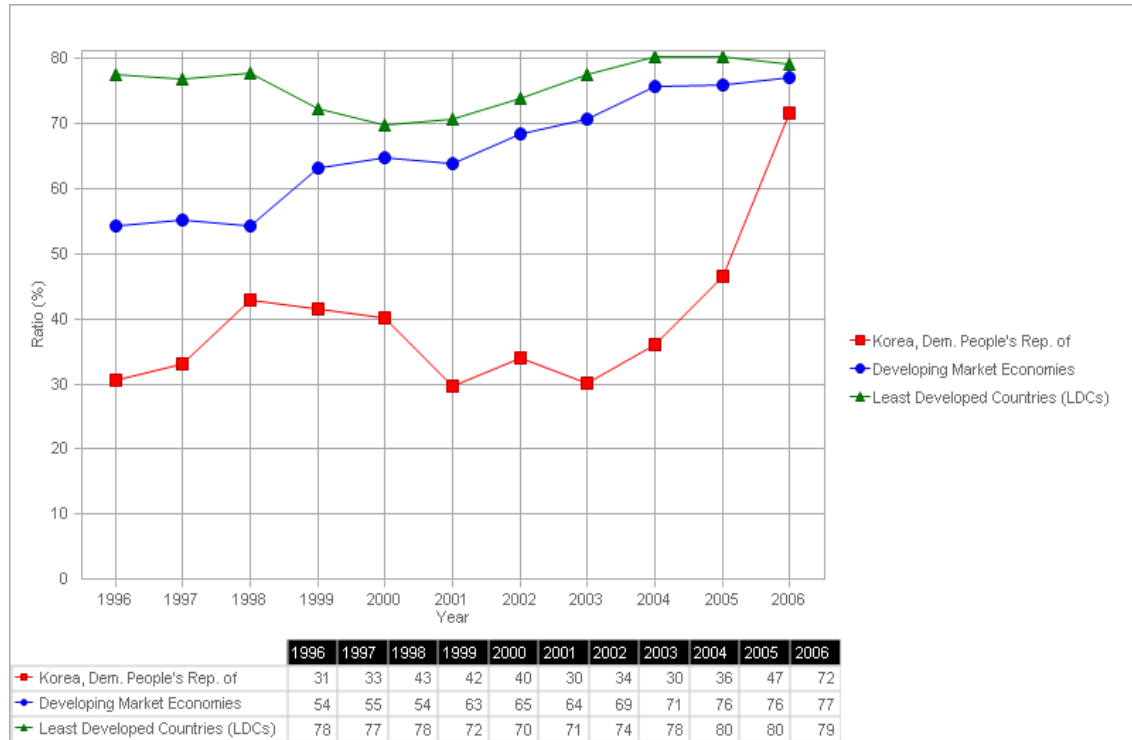

Source: Market Analysis Section. National Export Profiles: Explanatory Notes. 1999-2003 Data.

Another interesting embedded analytical tool is Market Access Map, which is one of the Millennium Development Goals (MDG) indicators, reporting on market access to developed countries. Table 25 below indicates the DPRK's market access vis-a-vis imports from developed countries region, compared to other developing and least developed countries. Clearly, the table indicates North Korea's severely restricted market access to developed countries markets in 1996-2005, but the situation is reported to have improved significantly in 2006. Similarly, Table 26 shows average tariffs imposed by developed nations on North Korea's exports, compared with those imposed on other developing countries. The tariff rates were imposed on North Korean products at over 27%, two to three times as high as those set for other developing countries in 1996-2003. But they dropped down to 12% in 2004. (http://www.mdg-trade.org)

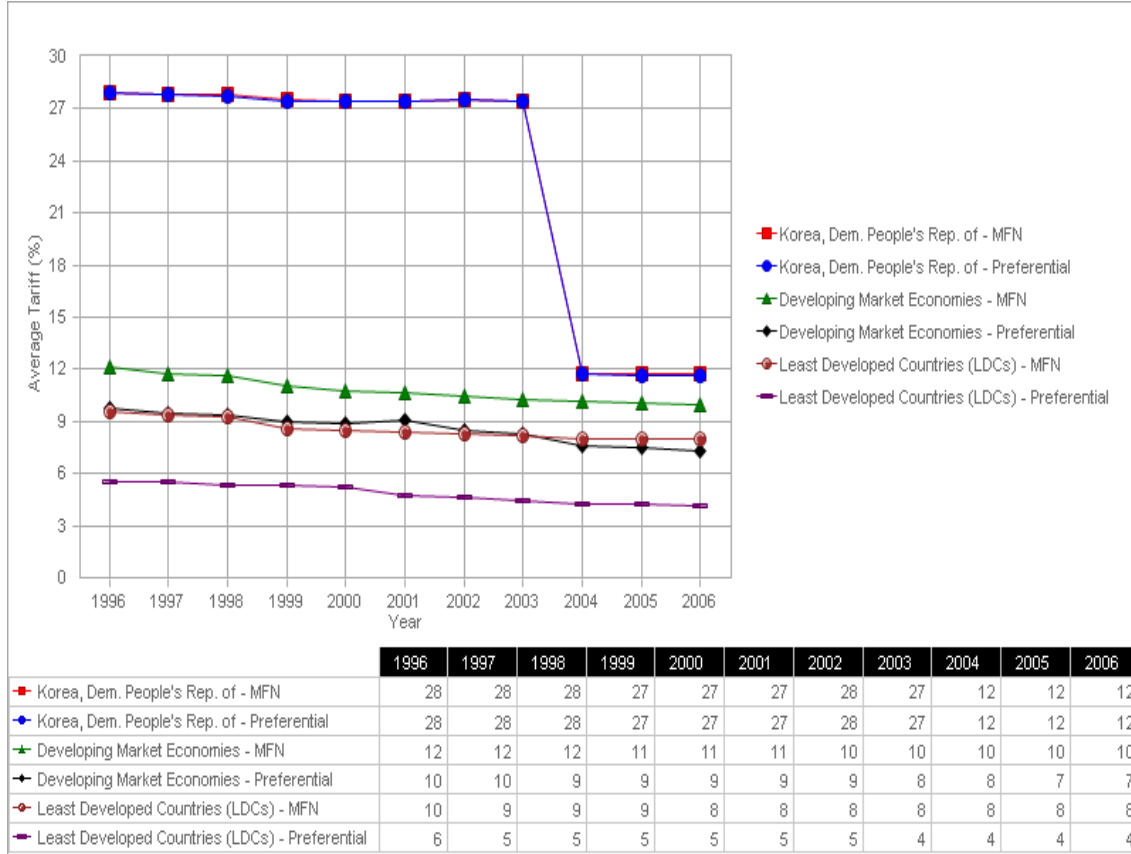**Table 25: Millennium Development Goal 8.6: Market Access Indicator by UNCTAD-WTO-ITC (1)**

Proportion of total Developed Market Economies imports (by value) from Developing and Least Developed Countries, as compared with DPRK, admitted free of duty for All Product Categories (Excluding arms and oil).

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Korea, Dem. People's Rep. of	31	33	43	42	40	30	34	30	36	47	72
Developing Market Economies	54	55	54	63	65	64	69	71	76	76	77
Least Developed Countries (LDCs)	78	77	78	72	70	71	74	78	80	80	79

Source: UNCTAD, WTO and ITC. http://www.intracen.org/mat/. The Millennium Development Goals Goal 8: Market Access Indicators by ITC, UNCTAD and WTO.

Table 26: Millennium Development Goals Indicators: Millennium Development Goal 8.6: Market Access Indicator by UNCTAD-WTO –ITC (2)

Average tariffs imposed by Developed Market Economies on Agricultural + Clothings + Textiles Products from Developing and Least Developed Countries, as compared with DPRK.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Korea, Dem. People's Rep. of - MFN	28	28	28	27	27	27	28	27	12	12	12
Korea, Dem. People's Rep. of - Preferential	28	28	28	27	27	27	28	27	12	12	12
Developing Market Economies - MFN	12	12	12	11	11	11	10	10	10	10	10
Developing Market Economies - Preferential	10	10	9	9	9	9	9	8	8	7	7
Least Developed Countries (LDCs) - MFN	10	9	9	9	8	8	8	8	8	8	8
Least Developed Countries (LDCs) - Preferential	6	5	5	5	5	5	5	4	4	4	4

Source: UNCTAD, WTO and ITC. http://www.intracen.org/mat/. The Millennium Development Goals Goal 8: Market Access Indicators by ITC, UNCTAD and WTO.

In sum, these are selected examples of highly sophisticated and readily available analytical tools embedded in trade databases. The tools enable North Korea analysts, as well as the North Korean authorities, to see a quick overview of the DPRK's trade performance and competitiveness. At the same time, ITC databases and analytical tools can be used to convey a message to the North Korean authorities, policymakers and stakeholders that a transition from survival economy to growth-oriented economy would require North Korea to make proper policy choices in a more positive direction, that is, that there is no choice but to further open the country. As is the case with other objectives discussed, a cautious approach is necessary to understand and interpret outputs, given that North Korea's trade data is, after all, based on mirror statistics.

Summary:

Table 27 gives an overall assessment of the appropriateness for use of certain trade statistical databases for specific purposes. Depending on the analytical objective, these

databases' appropriateness and usability can vary. Given the coverage of trading partner countries, the IMF-DOT and UN databases seem to be more appropriate than others to observe the aggregate level and historical trend of North Korean trade, although reporting errors are not corrected in these databases. KOTRA adjusts verifiable errors and drops unverifiable trading partner countries. While that methodology is prudent in a way, it may pose some problems since historical trends show increasing trade between North Korea and developing countries, and KOTRA disproportionately excludes trade with developing countries. Thus, dropping unverifiable small developing countries as a group may pose issues especially when trying to understand the historical trend and overall composition of North Korean trade. Furthermore, inter-Korean trade needs to be added to any of North Korea trade data, as it is treated as domestic trade in South Korean statistics and is therefore not picked up by the global databases as mirror trade data. But simple aggregation of MOU inter-Korean trade data and data on the DPRK's general external trade is also problematic. In the bilateral sphere, there are potentially under-utilized bilateral trade databases, such as the Chinese version of the Ministry of Commerce trade database. Also, there exist highly sophisticated databases that include North Korea data, with value-added analytical tools embedded into databases; ITC's trade performance index and GTIS's trade analyses based on ports and cities are among the examples of such value-added analyses using the databases. These tools could enable North Korean authorities and North Korea analysts elsewhere to gain an insightful overview of the DPRK's trade performance and competitiveness.

Table 27: Overall Assessment of Trade Data Usability

Entity (Database/Publication) Purposes – Analytical Focus	KOTRA	MOU/KITA	IMF-DOT	UN Comtrade	UNCTAD Handbook	OECD/EU	DPRK Official Statistics	Customs Office: China	Customs Office: Japan MOF	UNCTAD-ITC	GTIS-World Trade Atlas
1. Aggregate level of North Korea's trade	M	M	H	H	H	L	L	L	L	L	M
2. Historical trend of North Korea's overall trade and structure by country and region	M	M	H	H	H	L	L	L	L	M	L
3. Inter-Korean trade & detailed analyses	H	H	L	L	L	L	L	L	L	L	L
4. Individual partner countries detailed trade data - commodity level analyses (e.g. HS 2-digit, 4-digit)	L	L	L	H	M	M	L	M	M	M	H
5. Readily Available Value-Added Analyses (i.e., Unit price/volume analyses; Balassa Index; Marketing tools)	L	L	L	M	M	L	L	L	L	H	H

B.   Investment Statistics

According to the OECD, IMF and UNCTAD, foreign direct investment (FDI) is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise of foreign affiliate).[88] To obtain DPRK investment information, especially FDI inflow, North Korea analysts seem to rely largely on UNCTAD's statistical database online – Foreign Direct Investment. The FDI database offers, among others, *Foreign Direct Investment Statistics – Interactive Database* and annual publications, *The World Investment Report (WIR)* for 1991-2007, from which aggregate inflows, outflows, inward stocks and outward stocks of FDI for close to 200 reporting economies are recorded. North Korea data, mostly UNCTAD's estimates, are available starting in 1981, although for the first six years (1981-1986), no data is entered for FDI inflow, on either a stock or flow basis. This may be natural given that it was not until 1984 that the DPRK officially promulgated the Joint Venture Law, and started to promote foreign investment from overseas. (Appendix Datasheet). Some FDI qualitative data can be derived from MIGA's FDI net, with useful links to various institutes covering some legal aspects or political risks of investing in North Korea.[89]

According to UNCTAD FDI statistics, the DPRK's total FDI inflow (flow-based) and per capita FDI increased at compound growth rates of 15% and 14%, respectively, over the twenty-year period of 1987 to 2007 (Table 28). But compared to FDI inflows into China and Vietnam, both in terms of magnitude and growth rates, North Korea's FDIs appear completely dwarfed.

Table 28: Comparison of FDI Inflow: China, DPRK and Vietnam

|	DPRK		China		Vietnam	
	FDI ($ mn)	Per Capita ($)	FDI ($ mn)	Per Capita ($)	FDI ($ mn)	Per Capita ($)
1980	-	-	57	0.06	2	0
1987	3	0.2	2,314	21	10	0
1992	2	0.1	11,008	94	474	7
1998	31	1.4	45,463	366	1,700	22
2007	53	2.2	83,521	633	6,739	79
Compound Annual Growth Rate (%) 1	15%	14%	31%	41%	35%	33%

Note 1/ CAGR for the period of 1987-2007 for DPRK; CAGR for the period of 1980-2007 for China and Vietnam.
Source: UNCTAD. Foreign Direct Investment Statistics – Interactive Database.
http://www.unctad.org/Templates/StartPage.asp?intItemID=2921&lang=1

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[88] OEDC. *Detailed Benchmark Definition of Foreign Direct Investment*, third edition (OECD 1996); IMF. *Balance of Payments Manual,* fifth edition (IMF 1993). UNCTAD. *World Investment Report 2006: FDI from Developing and Transition Economics: Implications for Development, Annexes A & B & Definitions and Sources.* (UNCTAD 2006).
[89] Multilateral Investment Guarantee Agency (MIGA)'s official website on FDI. http://www.fdi.net/

Figure 7: FDI Inflow Per Capita (flow and stock): DPRK, China and Vietnam
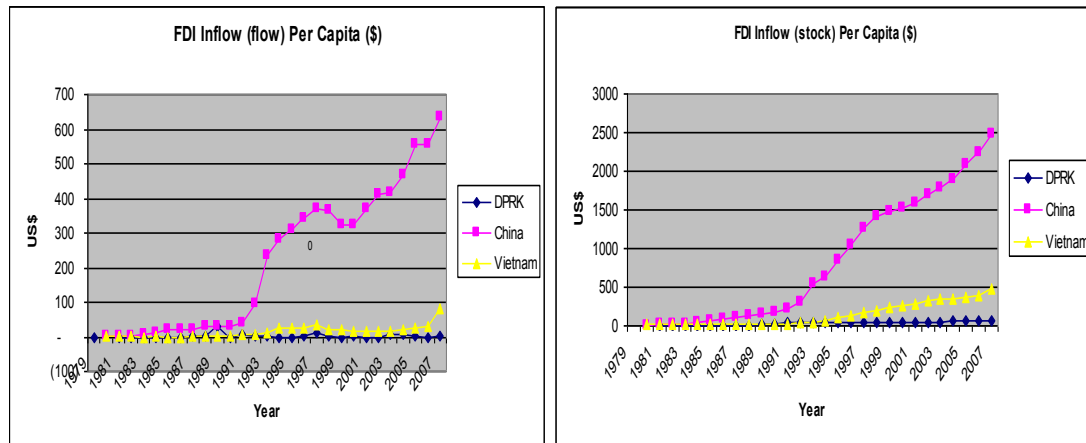
Source: UNCTAD. Foreign Direct Investment Statistics – Interactive Database.
http://www.unctad.org/Templates/StartPage.asp?intItemID=2921&lang=1

Methodology: UNCTAD's *WIR* explains the availability, limitations and estimates of FDI data in the section titled "Definitions and Sources." As for its original sources, UNCTAD generally relies on the following entities listed in order: (1) published and unpublished national official FDI flow data from central banks, statistical offices or national authorities; (2) the IMF's International Financial Statistics and Balance of Payments; (3) the World Bank's *WDI Online*; and (4) other sources including European Bank for Reconstruction and Development's *Transition Report* and OECD. Currently, none of the above sources offer North Korea's FDI statistics. As a result, UNCTAD itself estimates North Korea's FDI data.

UNCTAD's standard estimation methods include: (a) annualizing the data, if they are only partially available; (b) using the mirror FDI data of major economies as a proxy; (c) using secondary national information sources; (d) using data on cross-border mergers and acquisitions (M&As) and their growth rates; and (e) other specific factors.[90] After compiling its FDI data, UNCTAD undertakes final data verification and confirmation procedures by contacting the respective countries governments and related authorities. UNCTAD lists those countries that responded to verify and confirm. North Korea is not listed among the countries, and the FDI figures should therefore be treated with great caution.[91]

For instance, North Korea's 1989 reported FDI inflow stood at $629 million, a sudden jump from $1 million. Several possibilities can be considered. Since there is no specific explanation regarding the hike, it is speculated that the sudden increase can be attributed

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[90] UNCTAD. *World Development Report 2006.*

[91] The following specific questions were raised with UNCTAD FDI Statistics Division in October 2008, but UNCTAD currently provides no services to respond to specific queries: (1) the original sources that UNCTAD used for North Korea FDI estimates; (2) the most frequently used method for estimations among the methodological procedures mentioned in "Sources and Definitions" (i.e., annualized data; mirror data of FDI; national/secondary information); and (3) possible reasons for the sudden hike in 1989 FDI for North Korea.

to methodological factors such as change in measurement due to disintegration of the Eastern Block, an annualized figure of relatively high monthly data, or a combination of the above.

Figure 8: FDI Inflow (flow and stock): DPRK vs. Vietnam
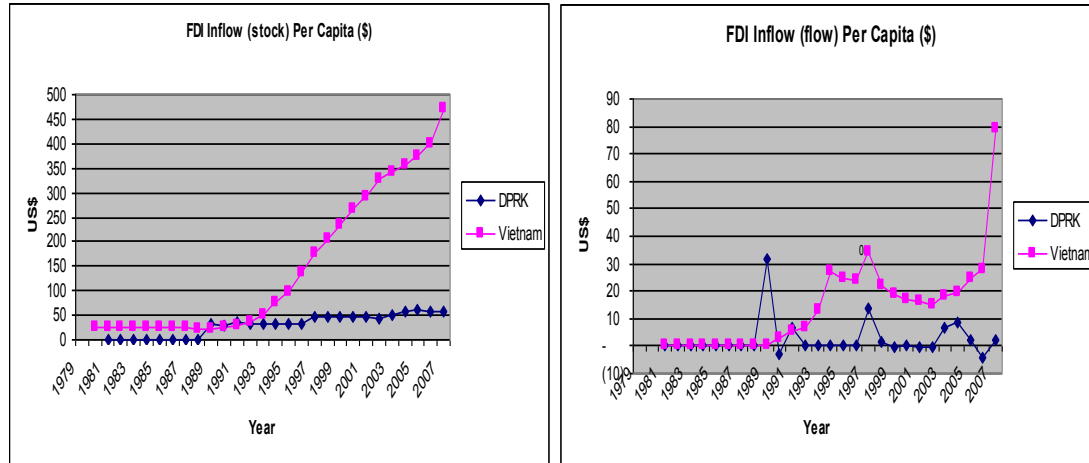
Source: UNCTAD. Foreign Direct Investment Statistics – Interactive Database.
http://www.unctad.org/Templates/StartPage.asp?intItemID=2921&lang=1

Summary:

In sum, North Korea's FDI statistics data announced by UNCTAD, while perhaps the best available FDI data, should be treated with caution. Especially when abrupt hikes or anomalies in estimations are observed, they may most likely be caused by one or combinations of the estimation methods (i.e., annualized figures). Unfortunately, the main alternative – particularly given that China is a top source of FDI into the DPRK, and China's FDI outflow data is less than reliable – is collection of anecdotal reporting. Some scholars and government observers in South Korea have attempted such collection, but their coverage is uncertain both in terms of scope and length of time period considered.

PART THREE: CONCLUSIONS AND RECOMMENDATIONS

VI.   Toward Knowledge Sharing

A. Major Findings and Lessons Learned

The Project identified DPRK economic and social statistics available in the public domain, and gathered selected data for in-depth analysis. The Project systematically reviewed different types of entities such as international organizations, UN agencies and departments and bilateral official governments, encompassing a wide geographical area, covering not only South Korea but also other Asian countries, the United States and European Union member countries.

Out of 221 data sources or databases checked, two-thirds contain North Korean statistical data, of which roughly 60% (141) is available only in English, while 18% is available only in Korean. Databases that contain comprehensive data, defined as covering over ten-year historical data, account for about 40% of the identified sources, while partial data sources account for 56%. The remaining 5% of databases do not list DPRK data in the public domain, or such data possession could not be confirmed.

The Project conducted an overall assessment of identified databases, using supply and demand side criteria, including: (1) data update frequency; (2) institutionalization of staff members who collect and analyze North Korea economic statistics; (3) sources of data and technical notes/explanations; (4) reliability of methodology; (5) comprehensiveness of data; (6) data accessibility; (7) language; and (8) data presentation format and functions. Of 121 databases that were evaluated, those with the highest points share some common characteristics. Most of them are global entities providing comprehensive trade data or economic and social indicators through their databases in the public domain, including UN Comtrade, OECD database, and UNCTAD.

DPRK data is more prevalent than expected in the public domain, including in available databases. However, there were common problems identified in available DPRK statistical data: (1) limited primary sources; (2) limited accessibility to data and methods; and (3) a range of issues or obstacles encountered in terms of collection and analysis of data, depending on the types of economic and social indicators.

The relative absence of primary sources (North Korean official/non-official data) and the limited number of secondary sources (other "authoritative" sources) explains the questionable reliability issue of much of the DPRK statistical data available, especially in the microeconomic, macroeconomic and social indicator data categories. Many third-tier databases or analysis rely on extremely limited primary statistical sources made available by the North Korean authorities, or the limited number of "authoritative" secondary data sources, such as the South Korean and other governmental agencies, as well as the UN agencies to which the North Korean authorities submit statistical data.

This creates a "reverse pyramid structure" of available DPRK statistics. The North Korean primary data sources are at the bottom and the secondary sources at the second tier, servicing an increasing number of third-tier entities on the top by providing key DPRK economic and social statistics. The amount and reliability of new information becoming available at the bottom (from North Korea) is extremely limited, complicating the efforts of the second tier authoritative entities to make progress in terms of compiling data or improving estimation methods. Meanwhile, numerous third-tier entities cite secondary sources in their databases without much attention to technical notes or methodologies. DPRK economic analysis and policymaking rely on this fragile foundation. The issue is particularly acute in the case of macroeconomic data such as GDP and GNI per capita and price data. An increasing number of third-tier entities cite only a handful of secondary entities such as the BOK and the CIA.

The Project confirmed that data accessibility issues limit the ability of researchers to gain a better understanding of certain datasets, methods and assumptions adopted, and the underlying objectives behind them. Accessibility issues need to be understood in the context of language barriers and proprietary access issues. Language barriers are problematic, but can be overcome with certain measures. There are a number of comprehensive and user-friendly databases in non-universal languages, which may be overlooked by English-speaking analysts. The Project identified valuable but potentially under-utilized statistical databases. Such examples include KOSIS (Korean) and China MOC trade database (in Chinese). These entities were introduced in the draft final report, and selected datasets from their databases have been reflected in the Project datasheet.

Proprietary access issues encompass non-financial and purely financial factors (i.e., fees payable for data services), which require more elaboration. Accessibility restricted by non-financial types of proprietary rules can be further broken down and need to be understood as individual or institutional level obstacles. Individuals who have access to North Korea data are often unwilling to share it with others, but only make public a part of the data as research findings, in order to protect "exclusive contacts" with data providers in North Korea. This finding is not necessarily new but confirmed what we have already known as a challenge, requiring creative solutions for knowledge sharing. This will continue to pose serious implications for future knowledge sharing endeavors including the next phase of this Project, if extended.

Proprietary access issues at the institutional level include not only the above-mentioned obstacles, but also restrictions set on data access by rules, procedures and regulations. Some South Korean entities request membership registration and member log-in, often requiring Korean resident identification numbers, before access is allowed to North Korean data, especially data released by the North Korean authorities. This makes it virtually impossible for non-Korean nationals to access to such data in the public domain even if they possess Korean language ability. Some entities have two channels, one for Korean nationals and the other for foreigners (i.e., Samsung Economic Research Institute). But the majority of such entities' underlying assumption is that only Korean nationals should access such data.

Accessibility limitations derived from purely financial proprietary issues also exist. For example, the GTIS trade database and China Data Online (subscription-based accessibility) are widely subscribed to by US government institutions, universities and research institutions. But it may be the case that Korean institutions or individual analysts may under-utilize these highly useful databases with advanced functions.

These issues on data sources and accessibility have created a vicious circle undermining the reliability of DPRK statistics. Under the prevailing circumstances, North Korea analysts in general and third-tier entities in particular take a conservative but second-best approach to cite estimations made by "authoritative" secondary entities or individual experts. These figures have rarely been challenged in a true sense, mainly because of the lack of alternative data or information to contest or prove otherwise. There is little way in such a situation to realize improvement or progress in terms of the reliability of DPRK statistics data. Also, if there are errors in the first tier, the same mistakes are circulated and perpetuated in other databases, as is seen in some trade mirror statistics.

The Project also revealed that different analytical approaches are necessary to address DPRK statistic problems, especially the reliability and usability of datasets, depending on the types of data. For analytical purposes, the Project divided identified DPRK statistics into two sections for technical analysis. First, the study of *Major Economic and Social Indicators* discussed entities estimating macroeconomic indicators such as GDP, but also took up population and health indicators, as well as microeconomic data such as prices as critical building blocks or assumptions, which are in turn used to derive macroeconomic figures such as GNI per capita. Second, the Project's study of *Trade Data* resulted in intended to serve as a "user guide" to help North Korea analysts understand the advantages and disadvantages of available trade databases and to choose among them appropriately depending on the analytical purpose.

For analysis on population and social indicators, selected entities or databases included DPRK official statistics, the ROK National Statistics Office, UN Statistics Division, UN Population Division and US Census Bureau. For macroeconomic indicators such as GNI, the Bank of Korea, US Central Intelligence Agency, the United Nations and CIC's Penn World Table were evaluated. Good Friends and Deutsche Bundesbank are among the entities selected for analysis and introduction of microeconomic datasets. Some noteworthy findings are as follows:

- North Korea's demographic and population data remain questionable, given that all reporting entities, regardless of some differences in assumptions on mortality rates, rely on North Korea's first and only census conducted in1993. These questionable population figures create complicated issues and exacerbate the unreliability of other basic economic and social indicators, especially when calculated on a per capita basis. Until the results of the second nation-wide census survey funded by UNFPA (October 1-15, 2008) is released in late 2009, North Korea analysts have no choice but to interpret any demographic data with special caution.
- Major supply-demand gaps in information continue to exist in the area of microeconomic data. Price data (i.e., price datasets of basic commodities and items,

market versus planned portions) as well as reliability methodologies concerning how to assign values to production are difficult to obtain. Yet such facts are fundamental as critical building blocks or assumptions, which are in turn used to derive aggregate macroeconomic data. The current phase of the Project could not meaningfully fill the supply-demand gap by integrating price data in the final datasheet due mainly to the data accessibility issues and obstacles explained above.

- Methods and general procedures adopted by selected entities to estimate North Korea's GDP, the SNA-based or PPP-based approaches, seem to be logical. But some assumptions such as concerning prices and value-added ratios are questionable.

- The BOK's unique perspective in estimating North Korea's GNI does not seem to be well understood by outside analysts. By taking the Systems of National Accounts production approach, with assumptions of ROK prices and value-added ratios, the underlying objective of and rationale for BOK's method seems to grasp North Korea's economic state from the One Korea perspective. In theory, the two Koreas' GNI can be comparable, and when combined, they can be viewed as the economy of a "single country." The BOK's assumptions are problematic, however. One must interpret the resulting data with caution and realize that North Korean GDP derived using BOK's method is consistently (but logically) over-valued. Still, the BOK data may be more reliable than other estimations based on speculative assumptions of North Korean prices and value-added ratios.

- Historical and spatial comparability and usability of datasets vary depending on entities and methods adopted. For example, the BOK's data on North Korea GNI is not intended to be compared with other nations, except South Korea. CIA data, both PPP-based and OER-based GDP, are not supposed to be comparable over time, as clearly stated in its website explaining non-comparability in technical notes.

- Debates surrounding North Korean GDP data often stem from misuse or misinterpretation of the existing data and methods. For instance, third-tier entities frequently cite and list CIA's GDP estimations historically as if they were comparable overtime. Some data users and analysts also make arguments, comparing incomparable sources such as SNA-based GDP and PPP-based GDP.

- The United Nations' estimates of GDP are satisfactory in terms of comparability and usability, based on North Korea's official statistics as original sources, but adopting unique assumptions to estimate GNI, especially in the mid 1990s.

- The actual and potential utility of the CIC's Penn World Table is high and promising given that it is backed by on-going academic research and practical application to refine methodologies such as international comparability of national accounts, in cooperation with organizations including the UN and the World Bank, demonstrating a useful example of well-intentioned knowledge-sharing.

- The Project also identified the cause of unnecessary misunderstandings directed toward certain entities. For instance, the BOK discloses its GNI calculation methods in a completely separate webpage, but not under GNI tables. The unnecessary misunderstanding that "the BOK does not share methodologies" could be resolved simply by displaying its methodology notes on the same page of data or linking to such a paper.

As for trade data, the Project adopted a somewhat different "user guide" approach, while clarifying issues to be addressed to assess the reliability and usability of selected datasets. Here, the central issue is not the lack of available data. There are a quite a number of entities announcing North Korea's international trade figures (albeit almost all are mirror statistics). But there are confusingly wide gaps in figures that cannot be explained as minor statistical errors. Some noteworthy findings regarding trade data include the following, among others:

- None of the entities can provide completely accurate international trade data for North Korea, especially aggregate figures, due to factors including: (1) errors caused by mirror statistics; (2) non-inclusion of trade with other non-reporting countries; and (3) non-inclusion of inter-Korean commercial trade.
- Excluding these factors, North Korea's aggregate trade figures by different entities still show wide gaps, varying from the low estimate of KOTRA ($2.9 billion in 2007) to those of the IMF ($4.7 billion) and World Bank ($4.9 billion).
- KOTRA's data is widely used among Korean analysts. To grasp the aggregate level of North Korea's trade, however, it is advisable to interpret KOTRA's data with caution; KOTRA's data understates actual figures due to its method of adjusting mirror statistics. KOTRA subscribes to the GTIS World Trade Atlas as one of the major sources for its trade data (a subscription-based database that is widely used by the U.S. government agencies due to its extremely user-friendly format and functions to analyze worldwide trade data). But in-depth discrepancy analysis in trade aggregate figures among different entities reveals that KOTRA drops "unreliable or unverifiable" trade data, especially small developing countries from the WTA. KOTRA also makes substantial downward adjustments from the WTA data after checking with foreign customs data through KOTRA's overseas representatives and the ROK's relevant government authority.
- Aggregate trade data published by the UN and the IMF are likely to more closely reflect reality, given their more comprehensive coverage of trading partner countries (over 120 member countries). GTIS's coverage of North Korea's trading partners is about half that in terms of number; KOTRA's coverage is even smaller due to its downward adjustments and dropping some trading countries. But there are mistakes and errors by reporting countries in the IMF and UN databases, which are not corrected unless relevant trade authorities make an official announcement of changes or corrections.
- Based upon various statistical sources, one can observe an undeniable trend of increasing trade between North Korea and developing countries over time. Given this trend, the practice of dropping small developing countries from North Korea's trade data (as adopted by some entities including KOTRA) may pose serious problems in interpreting accurately the historical trend and composition of North Korean trade by country or region.
- Inter-Korean trade does not seem to constitute a critical factor influencing wide gaps in aggregate trade figures *among* major entities mentioned above, but it does result in consistent overall under-reporting by all those entities. Given that the ROK government is restricted by law and not likely to announce North Korea's international trade data inclusive of inter-Korean commercial trade, DPRK

analysts will need to continue the practice of aggregating the two statistics (North Korea's external trade and inter-Korean trade) as a necessary step to derive North Korea's "real" international trade. But a simple aggregation, as currently practiced by many entities and analysts, should be interpreted cautiously as inter-Korean trade figures include considerable grant aid as "non-commercial trade."

- The Project accessed a variety of bilateral and multilateral trade databases which could enable enterprising analysts to conduct in-depth commodity-level trade analyses, such as Japanese MOF/Customs database and the UN Comtrade.

- The Project also encountered examples of highly sophisticated and readily available analytical tools embedded in some trade databases. The International Trade Center's trade competitiveness index (TPI) based on UN Comtrade is among such examples. TPI is an effective tool expressing both static and dynamic aspects of trade performance and competitiveness. The database also provides export performance indices such as the Balassa index for HS 2-digit commodities, instantly. These tools could enable North Korean authorities as well as DPRK analysts elsewhere to gain an insightful overview of DPRK's trade performance and competitiveness. But again, these analyses need to be interpreted with caution, as the raw data all comes from mirror statistics which may not correct some major reporting errors.

- The US GTIS database (i.e., World Trade Atlas) enables analysts to quickly derive valuable analytical figures such as unit costs of North Korea's imported products from various countries, to see if such such imports are based on commercial terms from particular countries.

- Available FDI data are all estimates, requiring careful interpretation especially in the case of sudden jumps in figures occurring in some years.

The above-mentioned issues, namely, data sources, accessibility and different types of issues depending on the types of statistics, are problematic obstacles. They often prevent DPRK analysts and policymakers from understanding accurately the North Korean economy, conducting meaningful economic analysis and deriving sound policy implications. Nevertheless, the Project has taken steps to improve knowledge-sharing of DPRK statistics data, clarifying the issues to be addressed and providing resources on how to tackle these issues.

At the same time, many problems and issues remain unanswered by the current Project plan and its implementation. First, the identification and collection of data available in other non-universal languages such as Russian remains to be done. As for proprietary data, which is not publicly available, the Project needs to take a more targeted approach to contact selected entities which are willing to share DPRK data, to ascertain the possibility of future collaboration.

B. Recommendations: Operationalization of the DPRK Statistics Databank

During the course of Project implementation, the Project identified what sources and datasets tend to be used more and why, as well as what is lacking in available sources, and therefore most needed in the future.

Based on the overall analysis in Part I and case studies in Part II, the Project identified four characteristics for a new database for effective knowledge-sharing beyond the current phase of the Project, namely:

(1) Inclusion of comprehensive data along with user-friendly and simple but powerful functions;
(2) Inclusions of listings of data from multiple sources, with methodologies for comparisons;
(3) Highlighting of rare and unique data; and
(4) Database sustainability, through partnership with selected entities and a data depository system.

Table 29 shows examples of databases that are equipped with the above-mentioned characteristics. The Project could learn from each of the following databases (and other databases), while determining a model for an ultimate Project output beyond December 2008.

Table 29: Expected Database Characteristics and Examples of Data Sources

(1) **Comprehensive database w/ user-friendly functions**	(2) **Listing of data from multiple sources for comparisons**
• Korea Statistical Information Services • CIC-Penn World Table • IMF DOT • ITC-UNCTAD/WTO • GTIS World Trade Atlas	• CIA (2 GDP estimates) • Korea Rural Economic Institute • Kyungnam University • Hyudai Research Institute
(3) **Rare and unique data**	(4) **Sustainable database**
• Korea Institute for National Unification • Good Friends • Inter-Korean Summit Secretariat	• SIPRI First Database, w/ collaborating institutes as data sources • Economic Social Data Service (ESDS) – Universities of Essex and Manchester

Comprehensiveness: Some entities offer "comprehensive" North Korea statistics, as well as user-friendly functions for data analyses. For instance, the National Statistical Office's Korea Statistical Information Services (KOSIS) provides open DPRK statistics encompassing a wider range of time-series economic and social indicators in its Korean website. While it is widely known among Korean analysts, it is highly likely that non-Korean users under-utilize the database due to language barriers. KOSIS also makes available the published version of its database only in Korean. Given KOSIS's coverage

of comprehensive DPRK statistics data in Korean, the Project should keep close contact with the National Statistical Office to explore areas for potential future cooperation and collaboration to learn from their databases as well as to disseminate such information to non-Korean analysts.

Other databases that the Project has so far identified as comprehensive and user-friendly include CIC's Penn World Table, especially for macroeconomic indicators such as GDP. The database is backed by authoritative economists engaged in research and application of macroeconomic indicator estimation methodologies. The IMF's DOT database, the CIC's Penn World Table, and GTIS all have common features, that is, simple but powerful functions to derive data and conduct analysis. Each database's strengths should be further studied and integrated into a databank at an operational stage.

Listing Data from Multiple Sources for Comparison: Some entities such as the Korea Rural Economic Institute (KREI) have already done what the Project has intended to do, that is, listing DPRK datasets from multiple sources for comparison. For instance, KREI's database lists DRPK's historical demographic trends (populations) from three different sources, Food Agriculture Organization (1961~), KOSIS (1944~) and the North Korean authorities (only selected years).

While databases with multiple sources of datasets exist, it is still rare to find databases that provide detailed technical analysis and comparative notes of datasets from multiple sources (as attempted in the Project through trade aggregate figures discrepancy analysis). The databank should be structured to provide value-added analysis on factors influencing discrepancies in DPRK statistics from different sources.

The CIA is the first entity to disclose GDP data using two different methods with technical notes and limitations. This should be viewed as a positive step to clarify issues revolving GDP estimations, and avoid misuse of data to compare with non-comparable sources.

Rare and Unique Data: The Project also identified some rare and unique data collected or produced by various entities and individual researchers, both Korean and non-Korean. The Korea Institute for National Unification has a series of DPRK statistical data announced by North Korean authorities, which is difficult to access even though they are listed in the public domain. Good Friends, an NGO advocating the need for external interventions to prevent the North Korean people from suffering from food shortages and famine, has conducted a series of surveys revealing malnutrition of specific age-group populations. Good Friends has also monitored prices of about 80 commodities starting from 2004. It is also exceptionally cooperative and willing to share the information. The Project should consider Good Friends as one of the promising candidates to explore forging partnership in this sense.

Also some unique data such as data related to inter-Korean summit meetings by themes, politics, economy, military and culture are made available by the Inter-Korean Summit Secretariat. The Nuclear Threat Initiative offers detailed information regarding DPRK's

military exports and imports in a chronological order, which may be useful for deriving assumptions for calculate transactions which do not appear in official statistics.

As discussed, proprietary access issues have data turned out to be obstacles to compiling price data, either from institutional or individual sources. There are a number of entities and individuals identified during the course of the Project research as possessing or being likely to have rare data. Given that the majority of these people are unwilling or unlikely to share data for knowledge-sharing purposes for various reasons, the databank can start with the minimum available data from cooperating/willing individuals and entities. While these data may pose challenges in terms of regular updating and consistency, the databank should take into consideration the most effective and feasible ways to integrate rare and unique data into the databank.

Sustainable Database: Sustainability is another characteristic that the Project should look into when determining the ultimate goal of the Project database beyond the current phase of the Project. So far, some entities from the EU have offered potential models for the future direction of the Project. For instance, the Stockholm International Peace Research Institute (SIPRI) has tied up with over 30 project partners and cooperators in drawing statistical data and information for its database called Facts on International Relations and Security Trends Database (FIRST). Social and health statistics (i.e., population, life expectancy) in FIRST are cited from a World Bank Group database, the World Development Indicators. Aside from original data sources, FIRST includes critical information such as data update frequency, dates for last update, and technical notes that are linked to detailed explanations.

Economic Social Data Services (ESDS) also offers a promising model for database sustainability. ESDS is jointly funded by the U.K. Economic and Social Research Council and the Joint Information Systems Committee, and operated by both University of Manchester and University of Essex. Like SIPRI, ESDS has also forged partnerships with premier data-producing organizations as data providers. ESDS also operates the unique data deposit system, through which its sustainability is partially maintained. Data creators and producers can deposit their original datasets to ESDS. The Acquisitions Review Committee of ESDS reviews critically submitted datasets and their quality, to determine if they can be included in the ESDS databases.

The ESDS model can be utilized for gathering and compiling North Korea's most needed microeconomic data. Microeconomic data is often collected by individual researchers conducting surveys or NGOs operating in North Korea. By calling for such data for submission, the Project may be able to build a sustainable mechanism for the Project database. Still, given the nature of accessibility issues as discussed above, many may be reluctant to share the information. That said, the ESDS model is a potentially promising way to sustain a database. Cost and human resource implications for such operations should also be examined and discussed.

Comprehensiveness, comparability (or incomparability explained in technical notes), uniqueness, and sustainability are among the ideal characteristics that the Project

databank should take into consideration. Time and cost implications, as well as feasibility will be examined for establishing a database that is equipped with these characteristics.

C. Concluding Remarks

The Project identified and gathered available DPRK statistical data to the extent possible, and clarified issues and obstacles encountered in compilation of data. It also introduced some user-friendly and potentially under-utilized databases available to the public. In-depth technical analyses on selected entities and datasets provided methods and keys to answering the reliability and usability questions of some DPRK statistics (i.e., factors influencing data discrepancies among entities), while clarifying issues of inappropriate usage of certain data for particular analytical purposes.

The fragile and unreliable "reverse pyramid" structure of available DPRK statistics needs to be altered so that more North Korean primary data sources become available and are shared to make a foundation for sound economic analysis and appropriate policymaking. Ultimately, the best way to address the fundamental issue of the absolute lack of original sources and accessibility to DPRK statistics is to convince North Korea to become a more open society.

In October 2008, the United States removed North Korea from its list of State Sponsors of Terrorism in the context of the Six-Party Talks to denuclearize North Korea and build peace and stability on the Korean Peninsula. Although more symbolic than practical in nature, that step increased expectations that North Korea might be headed in the right direction to be integrated into the international community, leading to DPRK's eventual participation in IFIs.

The DPRK Statistics Project should embody the cooperative spirit of on-going efforts by the rest of the world to attempt to integrate North Korea into the international community. If successfully implemented through cooperation among the concerned parties and North Korea experts from different parts of the world, the Project can have a demonstrative effect to convince North Korea to overhaul its statistical system in the future.

Appendix. Project Implementation Schedule (C: completed; U: underway)

Implementation Stage & Planned Activities	2008									Note
	4	5	6	7	8	9	10	11	12	
Stage I: Data Identification & Collection										
1 Preliminary entity/data identification	C									
2 Preliminary discussions with SC & DPRK-EF members	C									
3 Kick-off meeting and follow-up interviews w/ members	C									
4 Further identification and collection of data		C	C							
5 Stage I Output & Preliminary data			C	C						
Stage II: Data Assessment & Classification										
6 Interview & Survey Questionnaire			C	C						The interim-meeting with KDI School and field interviews.
7 Conduct Field visits (outside U.S. if necessary)					C					
8 Discussions with SC to determine (i.e.,) criteria for data classification and data-sharing policy				C	C					
9 Draft technical report					C					
10 Stage II Output & Midterm Evaluation Report				C	C					
Stage III: Database Construction & Workshop										
11 Recruitment of a database consultant (if necessary)										
12 Informal and formal meetings with SC and DPRK-EF members to determine a database structure					C	C	C			
13 Database construction **=> @20 datasets will be selected for a datasheet.**							C	C		
14 Draft final report and finalization of technical reports **=> technical analyses on methodology will be included in Draft Final Report**							C	C		DPRK Economic Forum will be held on Dec 4, prior to the final workshop.
15 Assessment workshop **=> December 8 in Washington, D.C.**									C	
16 Final report and preparation for publications									U	
DPRK Economic Forum & Steering Committee Meetings (x planned)	C		C	C		C	C		C	

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