# 2017 THE DPRK ECONOMIC OUTLOOK

Edited by Suk Lee

KDI Korea Development Institute

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# Preface

A widely held belief among the DPRK watchers is that economic sanctions do not work for North Korea. Although international society has imposed various economic sanctions on North Korea, they have hardly changed the country's behaviors or even its economic performances. According to the Korea Trade Investment Promoting Agency (KOTRA) the DPRK trade volume increased three times from 2.3 billion US dollars in 2001 to 6.5 billion in 2016. During this period however North Korea has faced a series of bilateral and multilateral economic sanctions. Japan who used to be the biggest trading partner of North Korea in the late 1990s, for example, prohibited its trade with the country in the mid-2000s when the Japanese abductee issue badly hit the DPRK-Japan relations. South Korea imposed an economic sanction shutting down all its trade and economic cooperation with North Korea except Gaeseong Industrial Complex on 24 May 2010 soon after the ROK naval ship Cheonan sunk down in Yellow Sea allegedly by a North Korean torpedo attack. The UN also adopted five consecutive resolutions on North Korea between 2005 and 2016 in order to demand the cessation of the DPRK nuclear and missile activities and restrain its foreign trade and investment. As a result, many DPRK watchers came to believe that the economic sanctions could not make any significant impact on the DPRK economy.

Yet the year 2017 saw an important challenge to this belief. Above all, the DPRK trade began to fall dramatically as international economic sanctions intensified much further. The export to China, which has accounted for more than 90 percent of total DPRK export since 2011, dropped by 80 percent in the second half of 2017 compared to the previous year. This sharp decline in export made the country's import from China fall by 40 percent as well. It was the first time in last 20 years that both export and import of the DPRK declined in such dramatic scale simultaneously. What should be noted is that this trade shock can be a serious strike to the DPRK domestic economy and its market economic activities. Indeed the DPRK industrial production is widely observed to stagnate significantly in 2017, especially in the mining industry, as the UN resolutions have completely banned the DPRK export of coals and iron ores. Activities of market economy were not much lively as the previous years, since both the trade shock and the negative expectation on international sanctions provided adverse impacts on daily economic trades among people. In this circumstance the DPRK government increasingly criticized the international sanctions, arguing that the country's economy will survive the sanctions with its self-reliance doctrine.

This book is a collection of early observations on those important changes of the 2017 DPRK economy. Every year *KDI Review of the North Korean Economy* makes a special edition in January or February, publishing selected articles which observe and analyze the DPRK sectoral economic movements and trends of the previous year. The special edition of this year was published as *KDI Review of the North Korean Economy January 2018* consisting of seven chapters on the 2017 DPRK economy. The book categorized the 2017 DPRK economy into six sectors such as economic policy, industry, trade, market, agriculture, and military economy. Six papers of this special edition provide their own observations and analysis for each of those sectors. The first paper overviews and aggregates the other sectoral studies, developing an analytical framework for the 2017 DPRK economy in general. All seven papers have been written in Korean by leading experts in the ROK government research institutes, including Korea Development Institute (KDI), Korea Institute for National Unification (KINU), Korea Institute for International Economic Policy (KIEP), Korea Institute for Industrial Economics and Trade (KIET), Korea Rural Economic Institute (KREI), Korea Institute for Defense Analysis (KIDA). This book is a full translation of those seven articles.

I am honoured to be in charge of making the special editions of *KDI Review of the North Korean Economy* since 2011. It is also an honour to serve as the editor of this book. I would like to thank all the contributors and KDI staffs who worked hard to make the special editions and this book possible.

**Suk Lee**
Editor

# Contributor

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# CHAPTER 1

## An Overview_ The Assessment of North Korea's Macroeconomic Trends in 2017 and Its Outlook for 2018

# CHAPTER 1

## An Overview_ The Assessment of North Korea's Macroeconomic Trends in 2017 and Its Outlook for 2018

*By Lee, Suk*
*Korea Development Institute*

### 1. Introduction

The purpose of this paper is to present an overview of six sectoral studies on the North Korean economy conducted under the common topic of 'assessing the North Korean economy in 2017 and its outlook for 2018'.[1] More specifically, this paper aims to consolidate the contents of these individual studies into a common narrative framework to facilitate the readers' understanding of the North Korean economy. In other words, this paper sets out to bring together the different pictures drawn by the sectoral studies to build a one all-encompassing and comprehensive image of the North Korean economy.

This task can be either very simple or complex and difficult depending on the views set forth by the studies on hand. If their views are in harmonious agreement, the task is quite straight-forward, but if they are in conflict or contradict one another, it is not so simple. Thus, the practical job of this paper

1. For more information, refer to Lee, Jongkyu (2018) and Kim, Yeong-hun (2018).

is to conceptually deconstruct these six sectoral studies and extract the basic trends they draw explicitly or implicitly concerning the North Korean economy in 2017 and 2018, then, based on this extraction, to identify the common denominators. At the same time, should the trends presented by the studies are not in agreement, it will be upon this paper to find a way to reconcile the different views and create a single coherent picture.

Through this process, this paper found three themes that summarize the basic trends extracted from the six sectoral studies on the North Korean economy in 2017 and 2018: 'sanctions against North Korea,' 'economic stagnation,' and 'worsening prospects.' In 2017, the North Korean economy faced a recession due to the intensifying international sanctions against North Korea, and if such sanctions continue, it is inevitable that the economy will worsen in 2018. Fortunately for this paper, there were few conflicting points among the different economic trends outlined in the six sectoral studies. That is, as far as the North Korean economy in 2017 and 2018 is concerned, the three themes mentioned above apply in common to all economic sectors of North Korea. Thus, this paper was able to provide an overview of the North Korean economy in 2017 and 2018 centering on these three themes without the need to reconcile the views of the individual studies.

The remainder of this paper is composed of three sections. First, Section 2 examines the economic trends of North Korea in 2017. Here, North Korea's foreign trade, industrial and agricultural production, and market trends in 2017 are analyzed to discuss how the themes, 'sanctions against North Korea' and 'economic stagnation,' mentioned above appear in the economy as a whole and the economic trends of each sector. Section 3 presents a simple forecast of the North Korean economy in 2018. Here, the key factors that will affect the North Korean economy, assuming that the ongoing international sanctions on North Korea will continue or even strengthened in 2018, are examined. Finally, Section 4 concludes this paper by presenting the North Korean economy in 2017 and 2018 in a few simple propositions based on what is discussed herein.

## 2. An Assessment of North Korea's Macroeconomic Trends in 2017

The North Korean economy in 2017 strikes a clear contrast against that in 2016 in many ways.[2] In both years, North Korea faced intensifying international sanctions as a common external factor. However, the impacts of the sanctions were noticeably different. In 2016, the sanctions had little or no actual effect on the country's economic progress, and even when its economy was affected by the sanctions, their impact weakened over time to allow the economy to grow. However, in 2017, not only did the sanctions have very real and apparent effects on the North Korean economy but their influence became more pronounced over time. Consequently, in 2017, what we find is a weakening of economic activities in almost all areas of the North Korean economy.

### A. Foreign Trade – The Shock from Sanctions Becomes Real

One of the most notable characteristics of the North Korean economy in 2017 is that international sanctions began to have a very direct and clear impact on the country's foreign trade.[3] In fact, North Korea's exports to China, which make up most of the country's exports, is reported to be lower than the previous year for ten consecutive months from March to December 2017. Moreover, it was observed that North Korea's exports has been decreasing at an increasingly steeper rate since September 2017. It was around this time that North Korea pushed forward with its sixth nuclear test, which led the international community to pass additional economic sanctions such as the UN Security Council Resolution (UNSCR) 2375 that put a complete ban on the transaction of North Korea's major exported goods and commodities including not only mineral resources such as anthracite coal and iron ore but also textiles and marine products. As a result, North Korea's exports to China declined at least 61% and at most 83% in the fourth quarter of 2017 year-on-year. These numbers imply that North Korea's exports, which began to wane from early in the year, shrank to a level that is just short of a complete economic blockade in the second half of

2. For more information on the North Korean economy in 2016, refer to Lee, Suk (2017).
3. A detailed discussion on North Korea's foreign trade in 2017 can be found in Jeong, Hyung-gon (2018).

2017.

Imports to North Korea, which have been considered so far as being outside the influence of international sanctions, also showed anomalous signs in 2017. The volume of North Korea's imports from China was lower year-on-year for five consecutive months from August to December 2017. In particular, since the implementation of UNSCR 2375 restricting the export of crude and refined oil to North Korea, the volume of North Korea's imports from China has been noticeably decreasing at a faster rate. For example, August and September of 2017 saw a shrinkage in North Korea's imports from China, but the drop was only 6% compared to the previous year. However, the rate of decrease grew significantly, to 15% in October 2017, 18% in November, and 23% in December 2017. Consequently, it is becoming clear that since October 2017, a sudden brake has been put on North Korea's imports from China.

These trends in North Korea's foreign trade in 2017 can only be explained as the realization of the negative impact intended by the international sanctions. Due to increasingly powerful international sanctions, North Korea's exports to China started to decrease from early on in the year in March and became almost non-existent by the end of the year, and even the country's imports from China, which was considered to be relatively free from the influence of sanctions, also began to show a downturn from August to fall at an increasingly faster rate towards the end of the year.

**<Table 1-1> Monthly North Korea-China Trade (January-December, 2018)**

(Unit: USD million,%)

| | Exports (YoY growth) | Imports (YoY growth) |
|---|---|---|
| Jan | 201.1 (13.3) | 241.5 (14.5) |
| Feb | 172.8 (6.7) | 151.9 (-5.9) |
| Mar | 109.3 (-52.3) | 328.0 (39.1) |
| Apr | 92.9 (-42.4) | 288.2 (7.5) |
| May | 115.9 (-34.0) | 319.8 (33.6) |
| Jun | 152.4 (-27.6) | 326.8 (13.4) |
| Jul | 150.4 (-33.8) | 299.8 (55.7) |
| Aug | 282.9 (-1.0) | 316.0 (-6.1) |
| Sept | 137.3 (-39.9) | 266.3 (-6.7) |
| Oct | 85.1 (-63.0) | 244.1 (-14.8) |
| Nov | 99.7 (-61.0) | 287.8 (-18.0) |
| Dec | 50.8 (-82.6) | 257.7 (-23.3) |

*Note:* KITA(www.kita.net, Last access date: 2. February, 2018).

## B. Industrial Production and Agriculture – Stagnation or Contraction

Although specific figures are not available for these sectors as in the case of foreign trade, the observation is that North Korea's industrial activities and agricultural production in 2017 were also unable to escape the trend of stagnation or contraction. First, the Rural Development Administration, etc. estimates that North Korea's agricultural production fell by about 2% in 2017 compared to the previous year,[4] since adverse weather conditions such as drought and the decrease in imports have worsened the conditions for agricultural production. However, since North Korea enjoyed a good harvest in 2016, with its grain yield exceeding 3.9 million tons (based on milled grains), the stagnation in agricultural production in 2017 would not have noticeably worsened the

4. A detailed discussion on the trends in North Korea's agricultural production in 2017 and their meaning, refer to Kim, Yeong-hun (2018).

country's overall food situation.

**<Table 1-2> Trends in North Korea's Agricultural Production**

| Category | | Total | Rice | Corn | Root and Tuber Crops | Winter Cereal Grains | Beans | Other Grains |
|---|---|---|---|---|---|---|---|---|
| Cropland (1,000 ha) | | 1,869 | 571 | 711 | 343 | 85 | 131 | 28 |
| Weight (kg/10a) | | - | 384 | 246 | 160 | 187 | 122 | 70 |
| 2017 Yield (10,000 tons) (A) | | 471 | 219 | 167 | 53 | 15 | 15 | 2 |
| 2016 Yield (10,000 tons) (B) | | 481 | 222 | 170 | 50 | 17 | 15 | 2 |
| Against 2016 | Change in Yield (10,000 tons) (A-B) | △10 | △3 | △3 | △2 | △2 | - | - |
| | Rate of Change (%) | △2 | △1 | △2 | △4 | △12 | - | - |

*Note:* Table 6-1 recited.
*Source:* Kim, Yeong-hun (2018).

The drought in 2017 also appears to have negatively impacted North Korea's power generation, e.g., hydropower.[5] As a result, it is supposed that North Korea's overall power generation is similar to or maybe even less than the previous year despite the slight increase in thermal power generation. In addition, due to factors in foreign trade such as the restrictions imposed by international sanctions on the export of minerals (e.g., anthracite coal and iron ore), the mining and construction industries would not have seen a significant increase in production either.

In particular, it is believed that North Korea's industrial production remained stagnant or faced decline in 2017 due to the side effects of the policies or resource allocation for the so-called 'speed battles' which lasted nearly 300 days in 2016. Speed battle is an economy policy that involves the early concentration of the labor force and resources within a short period to achieve goals that are

5. The information on the trends in North Korea's industrial production in 2017 is largely based on Lee, Seogki (2018). At times, the contents from Lee, Seogki (2018) are directly used in the discussion herein, however, additional citations were not marked as a matter of convenience.

set significantly higher than usual. Although engaging in a speed battle may temporarily hike up production and investment activities, it ultimately leads to a distortion in resource allocation, which usually requires a considerable adjustment period. Especially as the speed battles in 2016 continued almost year-long, it would have been inevitable for North Korea to undergo an adjustment period in 2017. Thus, it appears that North Korea's industrial policies were geared towards economic stabilization rather than expansion to forego the full-fledge undertaking of construction or civil engineering projects, such as large-scale housing projects, which have been in motion so far.

Meanwhile, the decrease in imports from China since August 2017 would have also shrunk the import of capital goods necessary for industrial production, thereby causing a negative impact on North Korea's overall production. As a result, the assessment is that investments in industrial production throughout the whole North Korea economy has stagnated even further than in previous years.

### C. The Market – Still Stable!

As mentioned above, North Korea's foreign trade, industrial production, and agricultural activities were relatively stagnant or diminishing in 2017 compared to the previous year, and the international sanctions on North Korea particularly had a significant adverse impact on the country's economy. However, a slightly different nuance is observed in North Korea's market activities.[6]

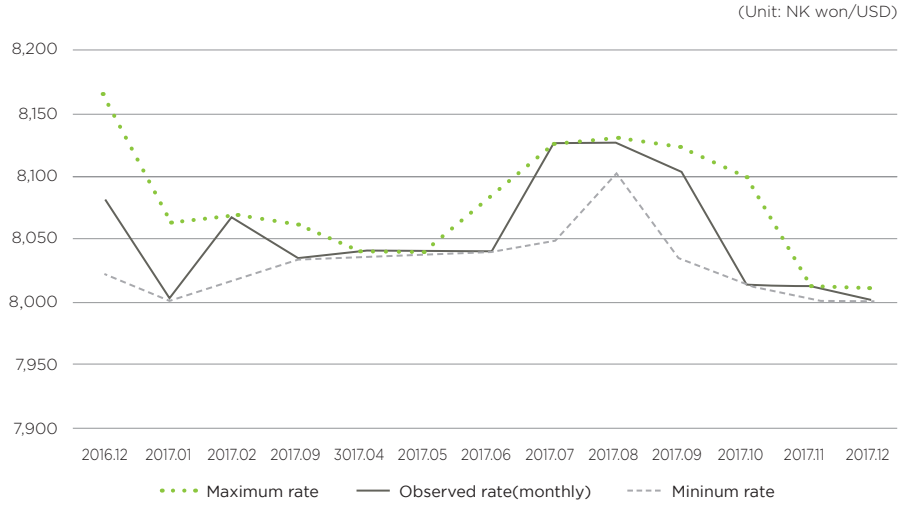
First of all, North Korea's exchange rates and market prices did not show much change despite intensifying sanctions. In fact, North Korea's market exchange rate remained stable, standing within the range of 8,000-8,150 won against the U.S. dollar throughout the year. Furthermore, although the market exchange rate, which was 8,000 won against the dollar in early 2017, experienced some fluctuation during the year, it returned to the 8,000 won level in December 2017. Thus, at least in terms of market exchange rate, the influence of the sanctions was barely observed. It may be said that the market price of rice

6. The discussion on North Korea's market trends here in are based on Lim, Kang-Taeg (2018).

in 2017 showed a slight tendency to increase when excluding seasonal factors, but this also remained remarkably stable overall at around 5,000-6,000 won/kg. These trends suggest that North Korea's market price experienced little fluctuation following the imposition of sanctions, even in the second half of 2017 when North Korea's foreign trade contracted sharply.

Of course, the price of oil, a commodity which was directly targeted by the sanctions, changed significantly throughout 2017. North Korea's oil price rose steadily from May to September 2017, then following when the adoption of the UNSCR 2375 in September announced the cap on the supply of crude oil and refined petroleum products to North Korea, the price became unstable and underwent surges and plunges. Immediately after the restrictions on the export of oil to North Korea was announced at the end of October, North Korea's gasoline price rose to a maximum of 21,780 won/kg, but then afterwards fell to 15,990 won/kg by December. To summarize, North Korea's oil price fluctuated considerably due to the sanctions, but other than oil and oil products North Korea's market prices and exchange rates overall remained stable throughout 2017 without any major ups and downs.

**[Figure 1-1] Trends in North Korea's Market Exchange Rate**

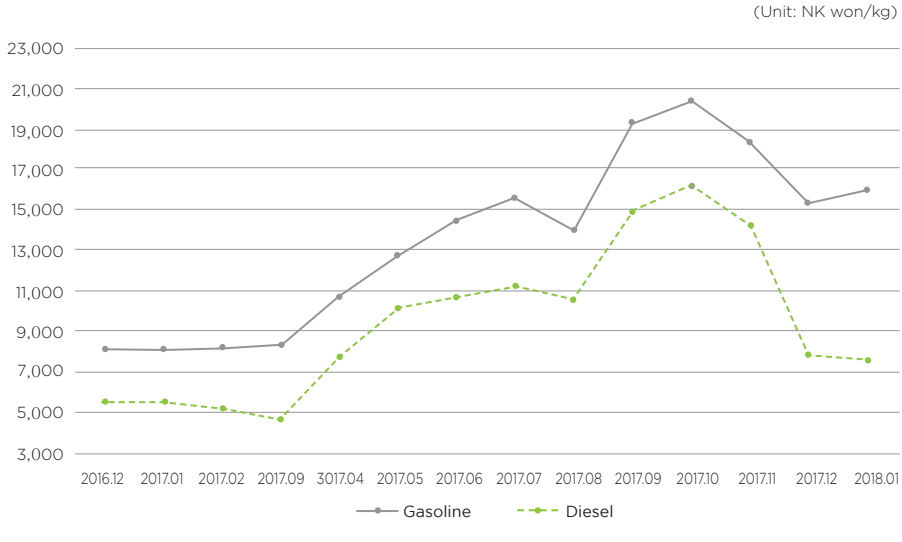



*Note:* It is an author's analysis based on "North Korea's Market Trends" of DailyNK
*Source:* DailyNK (www.dailynk.com, Last access date: 22. February, 2018).

**[Figure 1-2] Trends in North Korea's Rice Price in U.S. Dollar**


*Note:* It is an author's analysis based on "North Korea's Market Trends" of DailyNK
*Source:* DailyNK (www.dailynk.com, Last access date: 22. February, 2018).

**[Figure 1-3] Trends in North Korea's Oil Prices**




*Source:* Analysis made by the author based on articles published in the DailyNK.

This phenomenon suggests that North Korea's market activities were not affected much despite the imposition of international sanctions. Moreover, some observers say that as the sanctions blocked North Korea's export routes for products such as anthracite coal, the products were released in the domestic market to lower market prices as a result. More than anything, it has been reported that even while North Korea's trade and industrial production experienced decline in 2017, when it comes to the market, new production activities were appearing. As a representative example, it is said that various sales activities emerged with the increase in the number of vehicles in operation in North Korea. Sales activities such as car washing services emerged as promising new businesses with the number of gas stations and car wash centers rapidly growing around major roads as well as in the larger cities such as Pyongyang.

As illustrated above, despite the stronger sanctions against North Korea in 2017, the country's market activities were not significantly affected, at least on the surface. Of course, there is still a possibility that the sanctions may have caused a decrease in the purchasing power of the residents to reduce market transactions, etc., but such effect cannot be directly observed from the available data, and the qualitative information on this area is also very limited. Therefore, based on the information and data available at present, it appears difficult to say that North Korea's market activities suffered a serious downturn or exhibited the adverse effects of the international sanctions in 2017, unlike the country's other economic sectors.

## D. North Korea's Economy in 2017 – The Shock from Sanctions and Stagnation

As discussed so far, the North Korean economy in 2017 as observed from the outside world shows three broad trends. First, North Korea's foreign trade clearly shrunk in 2017 as a direct outcome of the intensifying sanctions on North Korea, and this trend became more pronounced in the second half of 2017. Second, moving along with the trend in foreign trade, North Korea's industrial activities and agricultural production have also stagnated or slightly declined from the previous year. Third, however, despite the trends in foreign trade and

industrial and agricultural production, no significant changes were observed in North Korea's market activities in 2017, that is, the impact of the sanctions on North Korea had not materialized when it comes to the market. In spite of the increasing sanctions imposed on North Korea, its overall market prices, exchange rates, and economic activities remained mostly unchanged except for a few products such as oil.

## 3. Forecasting North Korea's Economy in 2018: Trends and Factors

As mentioned above, in 2017, the North Korean economy appears to have been shrinking due to the increasingly powerful international sanctions imposed on North Korea. However, such sanctions on North Korea have already been in full swing since 2016; it was just that their impact had not yet come to the surface in 2016. When linking these facts into a single trend, what we see is that the sanctions imposed on North Korea since 2016 have been intensifying over time, and their real impacts on the North Korean economy have also become more pronounced. The obvious implication here is that as long as the current trends continue, the North Korean economy will exhibit the impacts of the sanctions to a greater degree in 2018. Based on this simple yet powerful intuition, this chapter examines some of the critical factors that may influence the movement of the North Korean economy in 2018.

### A. Foreign Trade – Bearing Through vs. Catastrophe

First, let's consider what will happen to North Korea's foreign trade in 2018. As mentioned above, the shock of the sanctions against North Korea started to affect North Korea's foreign trade in full-fledge in 2017. North Korea's exports and imports both declined markedly due to the increasingly stronger sanctions imposed on North Korea, and this trend strengthened further in the second half of 2017. If this trend continues, that is, if the sanctions against North Korea are executed at the same level or in even greater intensity than the second half of 2017, it seems almost certain that North Korea's exports will shrink even more

this year since the international sanctions, including the aforementioned UNSCR 2375, effectively put a stop on the trade of North Korea's major export products. For this reason, North Korea's export volume may drop at an unprecedented rate compared to previous years. For instance, North Korea's exports to China decreased by 83% in December 2017 year-on-year, but in 2018, it is difficult to completely rule out the possibility that North Korea's exports may wane at such a rate throughout the year. Of course, it is still uncertain whether North Korea's export volume will shrink at such an extreme scale. Nonetheless, it can be said with certainty that North Korea's exports will be significantly smaller in 2018 than that from 2013 to 2016 in the past or in 2017.

However, in the case of imports, the situation is slightly different. More than anything, the current sanctions regulate the foreign trade of nuclear and missile parts and a few commodities such as crude oil and refined oil with North Korea but do not place many restrictions on most other imported goods. Therefore, as long as North Korea has sufficient foreign currency, it is unlikely that the volume of the country's imports will diminish dramatically as in the case of exports, although there is little possibility that it will expand at great lengths this year. What is key will be the amount of foreign currency held by North Korea at present. If North Korea does not have a sufficient foreign currency reserve on hand, if the country's export volume falls sharply in 2018 to cause a rapid decline in its foreign currency earnings, the volume of imports is bound to drop severely as well, as imports are made based on foreign currency.

Table 1-3 provides hints to the possibility of this chain reaction. Here, we conducted the Granger Causality Test on North Korea's bilateral trade with China from July 2010 to December 2017. According to the results, between July 2010 and January 2013, shortly after South Korea's May 24 measures on North Korea, North Korea's exports to China exerted a one-way causal effect on North Korea's imports from China. In other words, the changes in the volume of North Korea's exports to China unilaterally influenced its imports from China. Interestingly however, this causal relationship seems to disappear from January 2013 to December 2017; there was no statistically significant causal link between North Korea's exports to China and imports from China during this period.

In a way, these results may be quite natural. It is a well-known fact that until 2010, North Korea acquired a considerable amount of foreign currency through the inter-Korean economic cooperation. The foreign currency earned during this period would have been a great help in resolving North Korea's trade deficit with China. That is, North Korea may have used the foreign currency acquired through the inter-Korean economic cooperation to boost its imports from China.

**<Table 1-3> Results of the Granger Causality Test on North Korea's bilateral trade with China**

| Time difference (Months) | July 2010-January 2013 | | | January 2013-December 2017 | | |
|---|---|---|---|---|---|---|
| | F-statistic | | Causal Relationship | F-statistic | | Causal Relationship |
| | Exports | Imports | | Exports | Imports | |
| 1 | 0.368 (0.549) | 18.797 (0.000) | Imports ⇐Exports | 1.900 (0.174) | 0.719 (0.400) | Imports ⋯Exports |
| 2 | 0.199 (0.821) | 7.876 (0.002) | Imports ⇐Exports | 1.038 (0.361) | 0.965 (0.387) | Imports ⋯Exports |
| 3 | 0.431 (0.733) | 5.991 (0.004) | Imports ⇐Exports | 0.765 (0.519) | 1.484 (0.229) | Imports ⋯Exports |
| 4 | 0.729 (0.584) | 3.523 (0.027) | Imports ←Exports | 0.749 (0.563) | 1.388 (0.251) | Imports ⋯Exports |

*Note:* The values within the parentheses are p-values, →, ⇒ note the direction of causality at 95% and 99% confidence levels, respectively.

However, due to South Korea's May 24 measures in 2010, it was no longer possible for North Korea to acquire foreign currency through the inter-Korean economic cooperation. Therefore, obviously, North Korea had to export more goods to China after 2010 to increase its imports from China. Based on this logic, it may not be surprising that from July 2010 to January 2013, North Korea's exports to China exerted a one-way causal effect on its imports from China. The reason being that, at this time, the only way North Korea would have been able to increase its imports from China further is if it earned more foreign currency through its exports to China.

Since 2010, however, North Korea's foreign transactions also exhibit many

other new phenomena besides the trade of commodities. For example, as shown in Table 1-4, different types of transactions which enable North Korea to earn foreign currency, besides the export of commodities, increased significantly, such as the large-scale overseas dispatch of its labor force or attracting foreign tourism or investment. Through these transactions, it is clear that North Korea acquired and accumulated a considerable amount of foreign currency. In consideration, it also does not come as a surprise that the causal relationship between North Korea's exports from China and imports to China disappeared after 2013 when the level and scope of foreign currency circulation in the overall North Korean economy increased sharply. By 2013, North Korea had accumulated a certain amount of foreign currency through various sources other than foreign (commodity) trade, so it was no longer necessary for North Korea to have a preceding increase in its (commodity) exports to China to increase its (commodity) imports from China as much.

The application of this experience to 2017 North Korean foreign trade data renders interesting results. First of all, even when the data up to December 2017 is taken into consideration, there is still no statistically significant causal relationship between North Korea's exports to and imports from China. The implication here is that, even if North Korea's imports from China have decreased since August 2017, this may not have been caused by 'the need to reduce imports from China as the decline in its exports to China led to a smaller acquisition of foreign currency.' In other words, the North Korean economy still has a certain amount of foreign currency reserve acquired through sources other than the export (of commodities), so even with the decrease in (commodity) exports, North Korea still has room to maintain a certain level of imports.

**<Table 1-4> Number of North Korean Visitors to China by Year**

(Unit: 10,000)

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total number of visitors | 12.58 | 11.01 | 11.37 | 10.18 | 10.39 | 11.64 | 15.23 | 18.06 | 20.66 | 18.44 | 18.83 |

*Source:* 中华人民共和国国家旅游局(China National Tourism Administration) http://www.cnta.gov.cn/, Last access date: 18. January, 2016).

In this sense, for now, it would be realistic to say that in 2018 also, the possibility of North Korea's exports and imports both plummeting to cause a catastrophe in North Korea's foreign trade is relatively small. Even if North Korea's exports fall sharply in 2018 as mentioned earlier, the country will be able to maintain a certain level of imports to 'bear through,' in a manner of speaking, in terms of its foreign trade.

It should be noted, however, that since August 2017, a consistent trend of decline is observed in North Korea's imports, and this decline is also intensifying over time. Thus, although it is unlikely that the entire foreign trade of North Korea will face a catastrophe in 2018 thanks to the country's existing foreign currency reserve, the North Korean economy will find it hard to escape the burden of its dwindling import volume and foreign currency situation as the decline in exports from the effects of the sanctions continues. If the current decline in North Korea's exports continues and the amount of foreign currency that can be earned through other means such as dispatching workers overseas, investment, and tourism also becomes uncertain due to increasing sanctions, North Korea's imports will inevitably be affected to undergo an adjustment.

In this respect, observing the changes in North Korea's exports and imports in 2018 gains critical meaning. For instance, let's suppose that in the course of the rapid decline in North Korea's exports, a "one-way causal effect of exports on imports" is quantitatively observed again in 2018. This will naturally mean that the decrease in North Korea's exports due to the sanctions has exacerbated its foreign currency situation to a level that the country's ability to import is affected. Therefore, this will also mean that if the sanctions continue, the entire North Korean economy will face considerable difficulties in the near future. On the other hand, if this causal relationship remains elusive, it will be difficult to deny the possibility that North Korea's foreign trade will continue to bear through, at least in numbers.

In short, there seems to be three predictions that can be made about North Korea's foreign trade in 2018 at present time. First, it is almost certain that North Korea's foreign trade will decline sharply from the previous year, mainly in

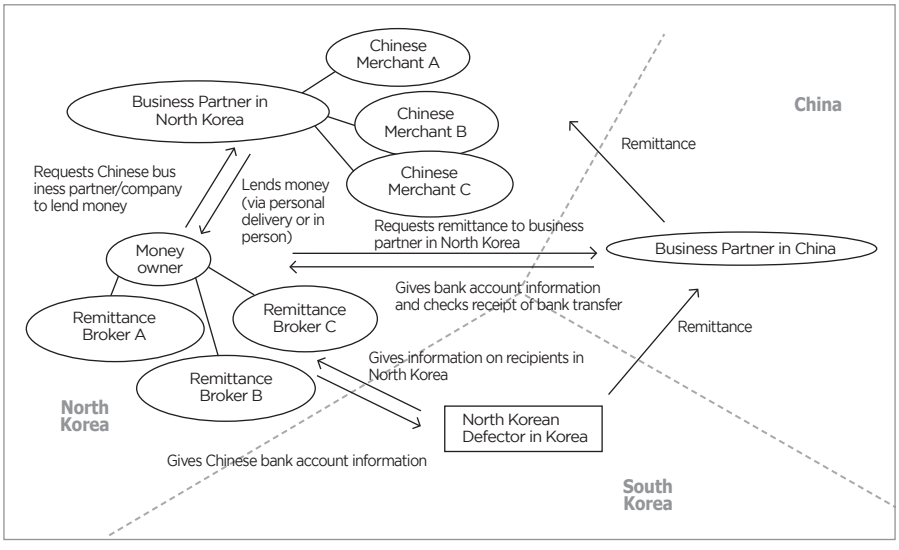
terms of exports. Second, however, it is unclear whether this decline will lead to rapid loss of foreign currency and a sharp drop in imports to put North Korea's foreign trade under a catastrophe, as North Korea can enter into a mode of 'bearing through' by maintaining a certain level of imports through the use of its foreign currency reserve. Third, yet, if quantitative analysis reveals once again a causal relationship between North Korea's monthly exports and imports in 2018, this can be a signal that North Korea will soon be experiencing an emergency situation in its foreign trade in the flow of "a massive decline in exports ⇒ a rapid decline in incoming foreign currency ⇒ a massive decrease in imports."

### B. The (Unofficial) Foreign Currency Circulation System - the Possibility of Chaos and Its Repercussions

In 2018, however, there is one possibility that begs attention regarding North Korea's foreign trade, especially concerning its economic activities related to foreign currency. This is the possibility that 'even if the North Korean economy holds a sufficient foreign currency reserve, the system for circulating the foreign currency will fall into chaos, causing considerable difficulties in North Korea's foreign trade as well as in the economy as a whole.' To see what exactly is meant by this, let's look at Figure 1- 4 first.

Figure 1-4 shows how foreign currencies owned by economic entities, the so-called 'money owners (*donju*)' of North Korea, are managed, by illustrating an example of the channel through which a North Korean defector can send US$100 to his family in North Korea. As the figure shows, the 'money owner' gives the North Korean defector the number of a bank account at a Chinese bank located in China.

**[Figure 1-4] An Example of an Unofficial Channel for Foreign Currency Circulation and Management – a Fictional Remittance from a North Korean Defector**




This bank account is created under a Chinese name or the name of a person or company in China that is associated with the 'money owner.' When the defector sends US$100 to the bank account, the 'money owner' contacts his associate or business partner residing in North Korea in a region where a Chinese company or business owner is located.[7] The 'money owner' has his associate or business partner to borrow US$80 from the Chinese company or business owner listed in that area, reserving the remaining US$20 for commission fees. The US$80 that is borrowed is delivered to the defector's family. A commission of US$5 is allotted to the Chinese company or businessman who lent the US$80, and a total of US$85 is sent to the bank account, which is not in North Korea but in China at a Chinese bank. These remittances are made in China from the Chinese bank account that was used for receiving money from the North Korean

7. As part of its yearly project in 2017, the Department of North Korean Economy at KDI conductedinterviews with various North Korean defectors who had played significant economic roles in NorthKorea in the past to understand North Korea's economic management system under Kim Jong-un's rule. Figure 1-4 is one of the abstract models which has been drawn to assist the systemic understanding of the information obtained from the interviews.

defector. In the end, the 'money owner' takes US$5, and distributes US$5 each to the associate or business partner in North Korea and the acquaintance or business partner managing the Chinese bank account in China as a commission fee. These commission fees, naturally, are also distributed using bank accounts at Chinese banks located in China.

Of course, the channel illustrated in Figure 1-4 is a fictional example, not an actual one. That is, Figure 1-4 presents a type of conceptual construct that was built based on the information from interviews with various North Korean defectors. Nonetheless, it sufficiently gives an idea of the sophistication and complexity of today's North Korea's foreign currency system. In actuality, the foreign currency system that is currently in operation in North Korea is not constructed by its official financial institutions but is managed through informal mechanisms involving multiple individual economic actors. Most of these mechanisms directly or indirectly involve Chinese individuals, companies, and banks in China or North Korea, as well as North Koreans. Also, this system is managed in a way that the various economic actors, including not only individuals in North Korea who handle foreign currencies but also state-owned enterprises engaging in foreign trade and their employees, customize and operate different channels according to their needs. What is noteworthy here is that the foreign currency that is procured and managed through this system flows into the government, state-owned enterprises, organizations, and individual economic actors to support the entire North Korean economy.

However, the international sanctions against North Korea, which have become more powerful since 2017, and the unilateral financial sanction imposed by the United States, etc. may have a significant impact on the operation of this system. If stronger sanctions are put in place to restrict and monitor overseas bank accounts connected to North Korea and limit foreigners from entering North Korea, there is a possibility that these systems no longer work. For example, suppose that the Chinese companies and businessmen in North Korea in Figure 1-4 are forced to withdraw to China and that Chinese bank account used by the 'money owner*(donju)*' is in the name of the Chinese businessman or company. In this case, would the 'money owner' still feel safe about operating

this channel? Maybe so, but most likely not since the 'money owner' would not be able to keep the existing system in function while also having to deal with the additional worry of safeguarding his foreign currency held in the Chinese bank account.

What this implies is that if the sanctions currently in place move towards putting greater pressure on North Korea, even if the absolute amount of foreign currency held by the North Korean economy is sufficient, the system behind foreign currency operations may potentially fail to work. Such malfunction will cause a negative impact not only on North Korea's foreign trade but on all areas of the North Korean economy, since a significant part of the foreign currency that supports the North Korean economy is held by various North Korean economic actors outside the official foreign currency reserve of the North Korean government.

### C. Industrial Production and Market Economy Activities – Simultaneous(?) Stagnation of Decline

Meanwhile, the possibility that North Korea's industrial production, agriculture, and even market activities in 2018 will become more stagnant than in 2017 is relatively even higher. Above all, as mentioned earlier, if North Korea's foreign trade declines in 2018 and if difficulties arise in circulating foreign currency, there is certain to be a disruption in the import of foreign capital goods and raw materials, which are of utmost importance to North Korea's industrial production and agriculture. In fact, since the 2000s, the mechanism of economic recovery and growth, in the flow of "increase in exports → expansion of foreign currency→ expansion of imports → increase in production and investment," largely contributed to the partial recovery of North Korean industrial and agricultural production. In 2018, however, we cannot completely rule out the possibility that this mechanism will work in reverse.

The greater problem is the inevitable blow expected on North Korea's production of mineral products, such as anthracite coal, and other export-oriented products. As is well known, mining is the area of production that has

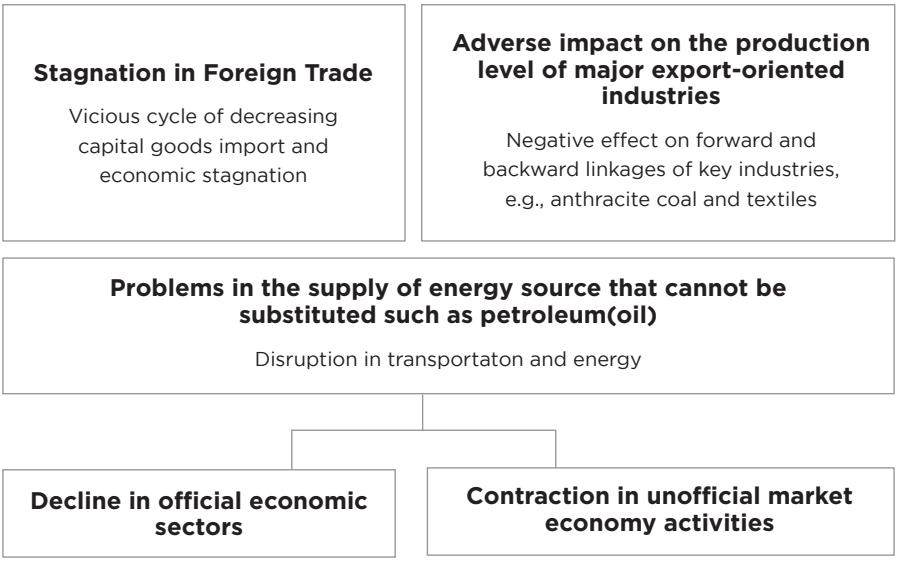
the highest economic ripple effect in the North Korean economy through its forward and backward linkages. Many North Korean workers are engaged in the mining, transport, storage, and export of mineral products, and significant human resources are also put into the industries that support mining production. Another area that is almost equal in scale to anthracite coal production is textile production, and natural food production such as high-priced seafood is also a sector that is very important for ordinary North Koreans. However, the essential reason why these production areas were able to continue their operations in North Korea is that their products can be exported to earn foreign currency. That is, the foreign currency obtained through the export of these goods feeds into the North Korean authorities as well as each level of the party and government agencies, general enterprises and individual economic actors to become the driving force behind the official economy as well as the market. However, North Korea's export of anthracite coal, etc. started facing restrictions since 2016, and since the latter half of 2017, it has become entirely impossible to export these major goods. Thus, if the production of these key export-oriented products is disrupted in 2018, its impact on the official North Korean economy as well as even the informal economy, e.g., the market, will be immense.

Of course, even if these products cannot be exported, they can be released in the domestic market to prevent sudden dips from occurring in their production. However, realistically, this possibility may exist in the short term but not so much in the mid-to-long term. For example, anthracite coal, whose production and exports have increased sharply since 2010, mainly expanded in production due to China's capital investment. The production of textiles, etc. is also largely dependent on the investment and demand from China. However, since the second half of 2017, the reality is that China has withdrawn from the North Korean economy or at least refrained from making additional investment. Under such circumstances, it is not realistic to think that Chinese capital will continue to invest in the production of North Korean anthracite coal, which has been blocked from overseas exports.

It is also not convincing that the North Korean 'money owners' will make new investments in place of China. Assuming that the investments by the

North Korean 'money owners' are ultimately for acquiring foreign currency, it is unlikely that they will actively participate in the production of anthracite and textiles which cannot be exported.

**[Figure 1-5] Factors Behind the Stagnation in North Korea's Industrial Production and Market Activities**




From this standpoint, we believe that from 2018 onward, there is a possibility that the production of North Korea's export-oriented products, such as anthracite coal and textiles, will face significant obstacles. And considering the forward and backward linkages of these industries, the economic ripple effect arising from their disruption will be also quite considerable. It should be noted that this ripple effect will affect not only North Korea's official economic sectors but also the informal economic activities such as markets. In other words, the outlook on North Korea's economic activities is not bright for either the official sectors or the market.

Lastly, in addition to these factors, if the supply of oil to North Korea, which began to attract attention since the second half of 2017, becomes disrupted, its

negative impact on the North Korean economy will also be hard to ignore. Oil is not just a source of energy, but almost the sole and irreplaceable source of energy for the means of transportation. Therefore, if a problem arises in the supply of oil, its impact on the North Korean economy will be too significant even to predict.

### D. Prospects of the North Korea's Economy in 2018 – Will Worsen, But By How much?

As discussed so far, from the present standpoint, a rather depressing future awaits the North Korean economy in 2018. First, North Korea's exports are expected to fall sharply due to the strong international sanctions, while imports may also face significant decline depending on the country's foreign currency situation. The blow received by North Korea's foreign trade in 2018 is expected to be more severe than any experienced in the past. If the current international sanctions and the unilateral sanctions of the U.S. continue, there is a possibility that the foreign currency circulation system, unofficially developed and managed by North Korea's individual economic actors up to now, may suffer some disruption. If this possibility becomes a reality, North Korea's official and informal economic activities that have been supported by the foreign currency operations of these individual economic actors will confront obstacles of matching levels. In addition, North Korea's industrial production, as well as market economy activities, are expected to remain sluggish in 2018. ① There is a possibility that the flow of 'increase in exports → expansion of foreign trade → expansion of imports → increase in production and investment,' which has been the economic recovery and growth mechanism of North Korea since 2000, will be reversed in 2018; ② the production of export-oriented products such as anthracite coal and textiles, which have the strongest forward and backward linkages, will inevitably shrink due to sanctions imposed on North Korea by the international community; and ③ there looms the possibility of a disruption in the supply of basic energy sources such as oil, for which there are no substitutes when it comes to the means of transportation. In this sense, the North Korean economy is likely to become more depressed in 2018 in terms of production, trade, and consumption than in previous years, and depending on

the circumstances, the informal economy, such as the rapidly growing market economy, may also experience a downturn to cause potentially a massive setback in the welfare of general economic actors.

## 4. Conclusion

This paper attempted to compile six sectoral studies conducted on North Korea's economy under the topic of 'assessing the North Korean economy in 2017 and its outlook for 2018,' with the goal to construct a comprehensive image of North Korea's economy in 2017 and 2018. To this end, we extracted three common themes from the six papers: 'sanctions against North Korea,' 'economic stagnation,' and 'worsening prospects.' The assessment of the North Korean economy in 2017 and its outlook for 2018, analyzed based on these topics, were presented as follows.

First, in 2017, North Korea's foreign trade showed clear and direct signs of contraction due to the strengthening international sanctions against North Korea, and this trend became more pronounced in the second half of 2017. In the like, North Korea's industrial activities and agricultural production also stagnated or slightly decreased compared to the previous year. However, market prices and activities did not show any significant changes in 2017, leading to the conclusion that the influence of the sanctions has not yet spread to the market.

Meanwhile, the outlook on the North Korean economy for 2018 is more depressing than that of 2017. Above all, North Korea's exports are expected to fall sharply in 2018 due to the sanctions, and the possibility that imports will also face a substantial decline to bring a catastrophe to North Korea's foreign trade as a whole cannot be completely ruled out. Also, if the current international sanctions and the unilateral financial sanctions of the U.S. continue, there is also a possibility that unofficial foreign currency operations of North Korea's individual economic actors may be disrupted to cause an adverse effect on the whole economy. In particular, North Korea's industrial production and even the activities of its market economy are forecasted to be sluggish in 2018. There is a

high possibility that the import of capital goods will decrease; the production of export-oriented products with large economic ripple effects such as anthracite coal and textiles will face severe reduction due to the international sanctions; and the supply of energy sources such as oil, which is vital for transportation, will be obstructed. As a result, North Korea's economy in 2018 is likely to become more stagnant in production, trade, and consumption than in previous years; in some cases, even in the unofficial economy, such as the market economy which has been growing at a rapid pace so far, causing a significant retreat even in the welfare of general economic actors.

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# CHAPTER 2

## North Korean Policy Responses to Sanctions_ Trends in 2017 and Outlook for 2018

# CHAPTER 2

## North Korean Policy Responses to Sanctions_ Trends in 2017 and Outlook for 2018

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### 1. Foreword

In 2016, after holding its 7th Party Congress, North Korea began 'speed battles' (200-Day and 70-Day Battle) while also attempting to stimulate their economy in an artificial and heavy-handed manner. These policy efforts resulted in a small improvement to North Korea's growth rate, and also somewhat reduced the economic impacts of international sanctions.[1]

However, the situation began to change drastically in the beginning of 2017. This was because international sanctions no longer recognized 'livelihood purpose exceptions' for North Korea's main export, coal, and instead imposed total upper limits. These measures resulted in the North Korean economy beginning to show signs of being directly affected. With North Korea beginning to feel the economic effects of international sanctions, the country had no choice

1. While UN Security Council resolution 2270 (March 3, 2016) had been adopted, its acknowledgment of exceptions on humanitarian grounds meant that its effect on the North Korean economy was limited.

but to focus their policies for 2017 around responding to sanctions.

As such, this paper will focus on examining UN Security Council resolution 2321 (November 30, 2016), which began to actually impact the North Korean economy in 2017, and resolution 2375 (September 11, 2017), which is expected to impact the North Korean economy in 2018.[2] This is because the responses to Security Council resolution 2321 are mostly linked to the policy trends for 2017, while Security Council resolution 2375 can be seen as being related to the policy outlook for 2018. First, the main details and economic effects of the sanctions will be examined, then North Korea's responses to them will be analyzed.

## 2. Responses to UN Security Council Resolution 2321

### A. Details and Impact

Security Council resolution 2321 was adopted in November 30, 2016 after North Korea's 5th nuclear weapons test (September 9, 2016). In contrast to Security Council resolution 2270, which contained an exception for humanitarian goods, this resolution was made a step more severe, but the most important characteristic of this resolution was the introduction of export limits for coal that directly affected North Korean foreign trade. Furthermore, a metal goods category (silver, copper, iron, nickel) was added to the existing export ban, in addition to a ban on the export of statues and limits on the diplomatic activities of North Korean diplomats (demanding staff reductions, limits on bank accounts, prohibiting lease profits).

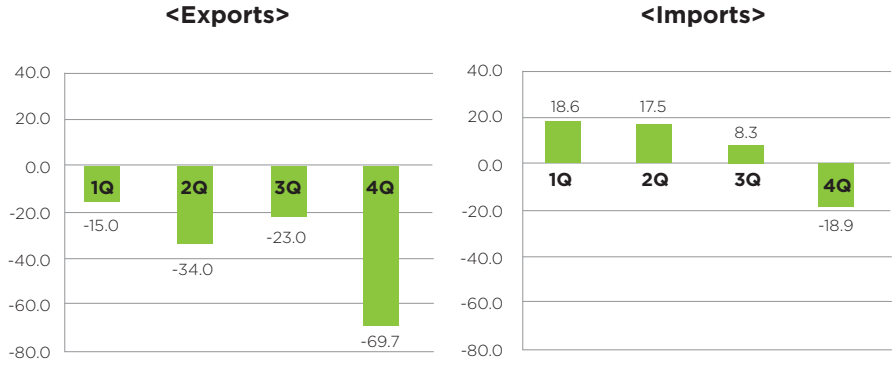
UN Security Council resolution 2321 had the real world effect of drastically reducing North Korea's coal exports to China, with a 66.0% reduction in terms of value and a 78.5% reduction in terms of volume.[3] This led to a 37.3%

2. While UN Security Council resolutions 2356 (June 3rd), 2371 (August 6th), 2375 (September 11th), and 2397 (December 22nd) were adopted in 2017, this paper will focus on examining Security Council resolutions 2321 and 2375, which were expanded in scope to the point of having a direct effect on the North Korean economy.
3. North Korean Anthracite Exports to China (Value and Volume): 2016 (1.18 billion USD, 22.5 million tons) → 2017 (400 million USD, 4.83 million tons)

reduction in North Korean exports to China, and also led to a reduction in total trade with China (14.5%). In terms of contribution, 79% of the reduction in total trade with China was due to the reduction in coal exports. It appears that it is not an exaggeration to say that the coal export limits had a decisive effect on the sudden drop in total trade volume.

**[Figure 2-1] Effects of UN Security Council Resolution 2321: 2017 North Korean Trade with China(by quarter)**

(Unit: %)




*Note:* Percentage increase compared to same period during previous year
*Source:* KITA (www.kita.net, Last access date: 1. February, 2018).

## B. Policy Responses by North Korean Authorities

North Korean foreign trade in 2017 was directly affected by UN Security Council resolution 2321. In particular, as North Korean coal exports were central to their attempts to obtain hard currency over the past 10 years, it seems this will lead to real problems with importing foreign currency. As such, North Korea could not help but trot out their 2016 focus on 'Self-Reliance First Doctrine' initiative again in 2017. As can be seen from their definition of self-reliance that states, "The scientific technologies that will create miracles even in the worst conditions and environments; a powerful weapon that strongly advances the construction of a strong socialist state and ensures its success,"[4]

4. Bong, Eun-shim (2017, p. 29) .

North Korea seems to be acknowledging the fact that they are experiencing negative effects due to the sanctions, and has decreed that technology will be the way to overcome them. But while it is true that the North Korean sanctions limiting trade and financial transactions, which also prohibit scientific and technological exchanges, have had a negative effect on their economy, they argue that the effects are limited in scope and degree, and say that their economy is "not an export-driven economy reliant on foreign markets, but a self-sufficient economy that meets domestic demand.[5]

The biggest difference between the policies advanced by North Korea in 2017 and the ones advanced in 2016 are a shift away from forced labor mobilization, such as the '200-Day Battle' and the' 70-Day Battle', to the localization of various sectors. In particular, localization was emphasized for light industry, energy, and agriculture.

A policy focus on the localization of light industry had already been emphasized in various media outlets, with technological development once again being put forth as the way forward for realization. The argument is that light industry must experience growth in terms of both quantity and quality in order to meet the economic demands of their citizens, and in order for this to happen, technological development must occur. North Korea's leader Kim Jong-un had previously emphasized that they must move towards localizing the raw materials and resources used by light industry, correcting their economic strategy to expand production, and improving the diversity, variety, and quality of their consumer goods. Similar themes are often present in North Korean publications, including statements such as, "Establishing a strong material and technological foundation for light industry factories and improving their labor productivity ratios will ensure that the people's diverse demands in terms of the quantity and quality of consumer goods will be met."[6]

In other words, light industry must be developed in order to meet the increasing demands of their citizens, with the necessary supplies coming from

5. The Chosun Shinbo (2. March, 2017).
6. Heo, Cheol-ryong (2017, p. 10).

within as opposed to foreign imports. They argue that, while slightly more detailed methods have been set forth policy-wise, the demands of the public regarding consumer goods must be ascertained in an accurate fashion, and in order to do so, there must be "standardization work to set and guarantee comprehensive product categories and quality standards for consumer goods" along with updates to product designs and packaging.[7]

Ryu, Jeong-won(2017, p. 66) stated, "Technology plays an important role in strengthening the foundations of a self-reliant economy. No matter how developed the economy, an economy reliant on others can only be a crippled economy, and an economic powerhouse nation can never be built on such an economic foundation," and Kim, Jeong-cheol(2017, p.10) stated, "The road to technological development also leads to independence, self-reliance, and guarantee of survival," while citing the 'Kwangmyongsong-4' launch and the 'acrylic paint' from the Suncheon Chemical Complex as examples. In sum, the 'Focus on Self-Reliance' must be realized by using technological development as a foundation, starting with light industry that can meet the economic demands of the populace, and it is only when this occurs that the current situation under sanctions can be overcome.

Second, the localization of the energy sector through a focus on thermal power generation was emphasized. This can be seen as the result of searching for domestic uses for coal, given the drop in coal exports due to the direct effect of UN Security Council resolution 2321. The importance of thermal power generation was often stated, with statements such as, "In order to normalize the power generation of thermal power plants and produce more power, coal production must increase and the extracted coal must be transported in a timely manner," that emphasized the normalization of thermal power generation. There were also statements such as, "New combustion technologies to increase the thermal efficiency of the coal burning process must be introduced, and the work of making technological improvements to power plants must proceed well so that the same amount of steam can produce more power," that emphasized the

7. Roh, Myeong-seong (2017).

need for efficiency improvements.[8]

They also emphasized the need to build large scale thermal power plants near large cities and in regions with many coal deposits, while small and mid-scale power plants must be built all throughout the country. In other words, they are attempting to improve their energy supply situation by utilizing the coal that is forced to remain in the country. In addition, they also emphasized modernization through statements such as, "Thermal power plants must valiantly fight to bring in new equipment that can improve combustion efficiency and emissions so as to produce even more power."[9]

There were also many statements on Juche steel, including those that cited specific examples such as, "The Hwanghae Iron and Steel Complex, which completed installation of the anthracite coal based steel production system, steadfastly saw record production results despite the sanctions and restrictions imposed by hostile nations this year."[10] This shows that the North Korean authorities are also thinking about effective domestic utilization of coal that cannot be exported.

There are even signs that the 'Focus on Self-Reliance' is being emphasized in all sectors, including the agricultural sector.[11] As the sanctions are having a direct economic effect, it seems that even North Korea is forced to admit that there are no other policy options besides insisting upon a 'Focus on Self-Reliance'.

8. Kim, Nam-ung (2017, p. 7).
9. Park, Sang-cheol (2017, p.22).
10. The Chosun Shinbo (20. December, 2017).
11. For example, Kim, Kwang-nam (2017, p. 35) said, "Agricultural revolutions can be created through technology even in situations where there is insufficient agricultural supply if internal reserves are effectively mobilized and utilized," arguing that the 'Focus on Self-Reliance' can be realized despite the difficulties of the sanctions, and emphasized that, "bringing about a wave of scientific farming is an effective way to carry out quality farming by raising, through our own strenuous efforts, labor productivity ratios to incomparable levels even with the same amount of labor and agricultural supplies, thus greatly improving the production of grains and other agricultural products."

## 3. Responses to UN Security Council Resolution 2375

### A. Details and Impact

UN Security Council resolution 2375 was adopted on September 11, 2017, after North Korea's 6th nuclear test (September 3, 2017). Its most notable aspect is its supplementation of Security Council resolution 2371 (August 6, 2017), which was a total export ban on minerals (coal, iron, iron ore, lead, lead ore) and agricultural products, to include an export ban on textile products and an upper limit on refined petroleum product imports. It also bans the establishment, management, and operation of all collaborative/cooperative enterprises with North Korea, gives existing enterprises 120 days to disband, and prohibits the employment of all North Korean workers overseas, excluding those working under pre-existing agreements. As such, goods that account for roughly 90% of North Korean exports are practically banned from export, and a UN Security Council resolution has been adopted that limits, for the first time, the importation of goods related to the livelihood of North Korean citizens while also being structured to affect capital balances and income.[12] All of these aspects can be seen as measures that will directly impact the North Korean economy.

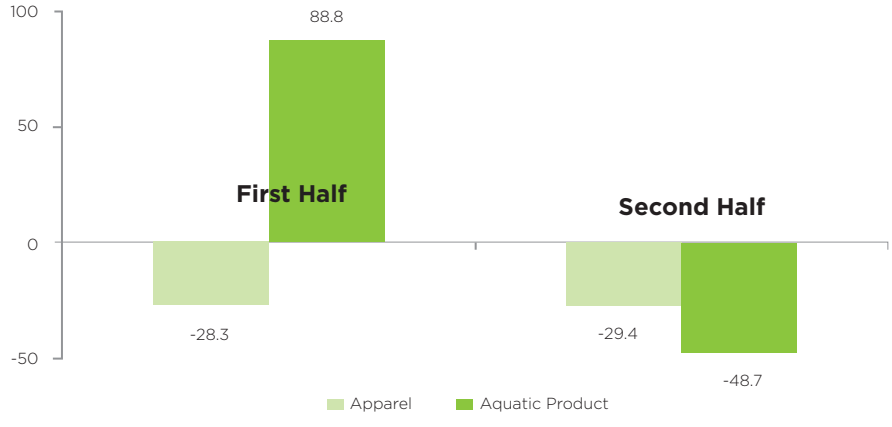
However, as UN Security Council resolution 2375 was adopted in September of 2017 and resolution 2397 in December of 2017, their effects cannot yet be seen, and can only be confirmed through further observation. But an examination of previous trends can allow for a degree of prediction with regard to the effects. For example, aquatic products accounted for roughly 5% of North Korea's trade with China (in 2016). And while aquatic product exports grew by 88.8% as compared to the previous year in the first half of 2017, they experienced a sudden drop of 48.7% in the second half of the year due to the

12. Subsequently, an ICBM launch by North Korea precipitated the adoption of UN Security Council resolution 2397 (December 22, 2017). The resolution includes an expansion of the export ban on North Korea to include agricultural products, machinery, electronics, lumber, and seafaring vessels, lowering the refined petroleum product supply from 2 million barrels to 500 thousand barrels, and having all North Korean laborers working overseas be sent back to North Korea within 24 months. However, as most of the content of Security Council resolution 2397 is based on, and simply strengthens, the measures contained within Security Council resolution 2375, this paper will focus on examining Security Council resolution 2375.

total export ban under the Security Council resolution 2356 (August 6, 2017).

**[Figure 2-2] Progression of North Korean Apparel and Aquatic Product Exports in 2017(by half year)**

(Unit: %)




*Note:* Percentage increase compared to same period of previous year
*Source:* KITA (www.kita.net, Last access date: 1. February, 2018).

Meanwhile, as Security Council resolution 2375 contains an export ban on apparel, a category that accounted for 27.5% of their exports to China (in 2016), apparel exports are expected to be impacted in a similar fashion. The same is also expected for the categories newly added to the export ban on North Korea. And given the inclusion of provisions that can affect Chinese investments in North Korea and North Korean laborers sent abroad, areas besides trade are also expected to experience historic impacts.

### B. Policy Reponses by North Korean Authorities

As examined above, almost all of the channels for acquiring foreign currency (exports, overseas laborers, international investments) have been shut down, therefore North Korea is facing a situation where they are forced into further reliance on domestic demand. And as the market impact of the sanctions has yet to reveal itself, they are most likely aiming to actively utilize this fact. While

there are no overt indications of this, it is obvious when looking at their financial sector; North Korea understands that their populace possesses large amounts of capital, so it is presumed that they are thinking deeply about how to utilize this fact. Examples that suggest such a policy trend include North Korea's emphasis on centralizing all KPW and foreign currency flow through banks by saving, borrowing, getting interest from, and making payments through commercial banks, their arguments for having high interest rates for long term savings, and their emphasis on being able to centralize capital through the bank by making payments with a debit card or credit card.

Even though North Korea is currently emphasizing a 'Focus on Self-Reliance', the fact that their economic structure makes it difficult to sustain such initiatives means that they will attempt to improve their foreign sector at some point. But when the current state of sanctions and North Korea's industrial composition is taken into consideration, there is a high likelihood that North Korea will start looking for ways to strengthen their economic ties with 3rd party nations such as Russia in order to diversify their export channels, as opposed to searching for main export alternatives. Ultimately, so long as the current external situation does not change completely, there should be limits to the degree to which policies can bring about drastic improvements to North Korea's economic situation.

## 4. Analysis and Outlook

In 2017, North Korea was directly affected by UN Security Council resolution 2321. This is because the reduction in coal exports led directly to a reduction in total trade volume. In order to deal with these sanctions, North Korea was forced to continue their 2016 initiative, a 'Focus on Self-Reliance', in 2017. Differences with past policy initiatives include the absence of large scale mobilization of domestic manpower, and the fact that detailed localization methods were set forth for a diverse set of areas including light industry, energy, and agriculture.

All of this is predicated on technological development; North Korean academic publications and media outlets have recently been addressing the issue of technological development more frequently, especially given the fact that it was emphasized by North Korean leader Kim Jong-un. North Korea's argument can be simplified as: Technological development → Reduced foreign dependence for every sector (raw materials, resources, processes, etc.) → 'Realization of the Self-Reliance First Doctrine' → Overcoming sanctions.

However, the situation this year is expected to be much worse than it was in 2017. This is because UN Security Council resolutions 2375 and 2397 will also begin to affect the North Korean economy. To start with, main exports such as minerals, aquatic products, and apparel will all be prohibited from export. The effects of an export ban can be somewhat presumed by examining instances such as the sudden drop in North Korean coal exports after the adoption of Security Council resolution 2321, or the sudden drop in North Korean aquatic product exports after the adoption of Security Council resolution 2356. Furthermore, the provision that all North Korean workers overseas must return to North Korea within 24 months means that their ability to acquire foreign currency will only worsen.

**<Table 2-1> North Korean Policy Responses: Trends in 2017 and Outlook for 2018**

| | UN Security Council Resolution 2321 (Adopted on November 30, 2016) | UN Security Council Resolution 2375 (Adopted on September 11, 2017) |
|---|---|---|
| Main Details | - Maximum limit for coal exports<br>- 400 million USD or 7.50 million tons | - Export ban encompassing nearly all categories including minerals, aquatic products, apparel (textiles), etc.<br>- Partial limitations on petroleum imports |
| Economic Effect | - Reduction in total trade volume due to drop in coal exports (contribution of drop in coal exports: roughly 79%) | - Reduction in exports for the newly added categories (such as aquatic products)<br>- Reductions in the future also expected for categories such as apparel |
| North Korean Policies | - Realization of the 'Focus on Self-Reliance' through localization<br>- Appears in all areas including light industry, energy, and agriculture | - On the surface, a repeat of the 'Focus on Self-Reliance' initiative while also utilizing the market<br>- Attempts to set up a breakthrough in the foreign sector |

Second, there are also petroleum import limitations, in addition to major restrictions on investments such as collaborative/cooperative enterprises. As all of these provisions affect North Korea's income, they may ultimately result in increased inflation. When taking into consideration the fact that North Korea's economic recovery after the appointment of Kim Jung-un as the leader of North Korea was based on stable inflation and stable foreign exchange rates, the economic stability of North Korea may be threatened.

All of these internal and external circumstances mean that the North Korean economy needs a breakthrough this year. Even so, as there is little chance for changes to the external situation, North Korea will most likely be forced to maintain their current technology-based 'Focus on Self-Reliance' initiative while searching for policy measures that will allow for the absorption of the capital held by the informal sector (markets) and the populace. While North Korea could strengthen their economic ties with 3rd party countries such as Russia in order to improve their foreign sector, such efforts are deemed to be limited in scope with regard to overcoming these difficult circumstances. So long as there are no drastic changes to the current external situation, it seems that North Korea cannot avoid having an exceedingly limited set of policy options.

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# CHAPTER 3

## North Korea's Industrial Trends in 2017

# CHAPTER 3

# North Korea's Industrial Trends in 2017

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## 1. Introduction

The factors that led North Korea's economic growth in 2016 all worked against the country's industry and real economy in 2017. Climate conditions, which was at least a neutral factor in 2016, brought a prolonged drought that affected North Korea's agriculture and hydropower generation.

The drought, which began early in the year and continued up to September 2017, appears to have negatively impacted North Korea's agricultural production and hydropower generation. As a result, agricultural production saw a slight decline, and despite the minor increase in thermal power generation, overall power generation would have also decreased slightly or stagnated due to the fall in hydropower output. Also, in 2016, the economic sanctions against North Korea still allowed the country's overall trade volume to grow, mainly through trade with China, but in 2017, North Korea saw a large drop in its trade volume, including a 66% drop in their export of anthracite coal to China. Moreover, it is speculated that the massive blow faced by export-oriented mining led to a significant decrease in North Korea's mining industry as a whole, despite the slight increase in mining for domestic use.

The speed battles that continued throughout 2016, although bringing a distortion in resource allocation, spearheaded a short-term growth in the energy, mining, and manufacturing industries, however, the adjustment period that came after the speed battles decelerated production and investment activities in 2017. The North Korean authorities also seem to have pursued a policy of stabilization rather than of economic expansion. Consequently, it is speculated that there were few achievements in terms of the overall performance of the manufacturing sector, apart from the machine industry. The production activities of the construction sector also seem to have slowed somewhat compared to the previous year, as new large-scale housing construction projects were not put into motion. However, since the annual import volume of machinery and raw materials has increased in 2017, so the economic sanctions on North Korea seems to have had limited impact on the country's overall industrial activities, the manufacturing sector in particular, through the means of restricting imports.

Overall, it is estimated that North Korea's industry and real economy have slightly retreated or stagnated in 2017 compared to 2016 and that this sluggishness was caused more by climate conditions and internal factors than the economic sanctions against North Korea. More than anything, the nearly year-long speed battles, which concentrate the input of labor and resources at an early stage, would have made it inevitable for North Korea to moderate its production and investment activities. Based on the trends in North Korea's official media news coverage, the effects of the adjustment period seem to have been concentrated in the second half of the year. As the Kim Jong-un regime places weight on the stable management of commodity prices and exchange rates, it may have refrained from excessively pursuing government-led projects that could harm the stability of the economy. The relative stagnation of the construction sector may be related to this economic policy direction. On top of this, the continued drought appears to have negatively affected agricultural production and hydropower generation. However, it is speculated that the recession in production due to the drought was less severe than the situation in 2015. On the other hand, the assessment for 2017 is that the economic sanctions on North Korea hit a direct blow on North Korea's exports, but its impact on the overall industry was limited. North Korea's exports to China decreased by

37%, but its imports from China rose by 4.3%. Specifically, the imports of machinery and raw materials, such as machines, electronic goods, chemical products, and textiles, either increased or remained constant, with the exceptions of transport vehicle imports (e.g., automobiles) which decreased by 21%, and steel imports, which decreased by 9%. Given that the limited recovery of North Korea's industries under Kim Jong-un's rule was largely rooted in the increase in the imports of machinery and raw materials from China, the continued growth in the import of capital goods from China in 2017, albeit at a lower rate than in 2016, signifies that the worsening foreign economic relations of North Korea were not the core cause behind the slump experienced by the country's industry and real economy in 2017.

## 2. Trends in North Korea's Industry and Real Economy in 2017

### A. Power Generation and Mining

#### 1) Power Generation

The shortage in water resources due to the drought caused North Korea's hydropower generation to decline slightly from the previous year, while thermal power generation is speculated to have increased slightly through the renovation of thermal power plants and larger supply of thermal coal after the emphasis made on power generation in the country's five-year strategy for national economic development. Thus, overall, North Korea's power generation would have been similar to or slightly lower than the previous year. The number of reports made on the performance of hydropower generation showed a clear drop to the level in 2015. In comparison, the reports on the performance in thermal power generation were greater in number and more concrete in their contents, but in this area as well, their frequency and specificity fall short compared to 2016.

Hydropower generation is estimated to have decreased slightly from the previous year due to the drought that lasted up to the summer of 2017.

According to the BOK's estimation, North Korea saw a 20% increase in its hydropower generation in 2016 compared to 2015, and although the volume of hydropower produced in 2017 would not have dropped as far as the level in 2015, it would have decreased significantly.[1] The number of reports alluding to the achievements in hydropower generation in North Korea's official media, e.g., The Rodong Sinmun, was also markedly fewer. Only the first quarter performance in hydropower generation was reported at the beginning of the year, and no reports were made on the overall performance in the second half of the year.[2] News on the performance of individual hydropower plants also diverged from 2016 when reports were made on all major hydropower plants; North Korea's media only covered the performances of Sodusu Power Station, which was repeatedly mentioned in the media throughout the year; Paektusan Hero Youth Power Station, whose Power Station No. 1 reportedly renewed its record in annual power generation; and Wonsan Army-People Power Station. The number of reports on the performance of mid-to-small scale hydropower plants was similar to the level of previous years, but it is difficult to confirm whether or not the reported performances have actually been achieved.

Thermal power generation seems to have fared better. The power sector was highlighted at the Seventh Party Congress as one of the key tasks of North Korea's five-year strategy for national economic development, so it is expected that more resources were allocated towards power generation, especially to thermal power generation where a more substantial input can boost the production volume. North Korea's official media also reported a 20% increase in thermal power generation year-on-year as of November 16,[3] which is closer to the end of the year, as opposed to the beginning of the year. Detailed reports were made on the achievements of most major thermal power plants, including Pukchang Thermal Power Station, Sunchon Thermal Power Station, and Pyongyang Thermal Power

1. North Korea's official media outlets have repeatedly mentioned the difficulties faced by the hydropower industry due to the lack of precipitation in their reports on the performance of several hydropower plants.
2. On the other hand, in 2016, the media continuous reported performance of the hydropower industry from the first half of the year. On December 16, 2016, North Korea surpassed the target of its 200-Day Speed Battle and reported that they had produced an average of 50% more power daily year-on-year. (Lee, Seogki et al., 2017, pp.80-82).
3. The Rodong Sinmun (17. November, 2017).

Station. The international ban on the import of North Korea's anthracite coal also seems to have had a limited but positive impact on the production of coal for domestic use and the supply of thermal coal for the country's thermal power plants. However, the inevitable adjustment period following the nearly 300 days of speed battles in 2016 would have likely had an impact on the thermal power and mining industries, so the growth in performance would have been limited.

The construction of the mid-to-large scale hydropower plant in Danchon began in 2017, and Yesung River Power Plant No. 5 and Urangchun Power Plant No. 5 continue to be under construction. However, the power plant in Danchon only started construction in May, and the level of resources and support given to its construction seems to have been far below than that given to the construction of Huichon Power Station or Paektusan Hero Youth Power Station. It has been reported that a large number of small and medium-sized power plants are being built, such as Kowon Army-People Power Station and Usi Power Station No.2. Also, North Korea has been improving its power management system by building a nationally-integrated electricity management system and restructuring its electric transformers and distribution lines, etc. The development and use of renewable energy were also encouraged, but to a lesser degree compared to the last two years.

### 2) Mining

North Korea's anthracite exports to China experienced a huge dip due to the economic sanctions, causing its export-oriented mining to shrink significantly compared to the previous year. Thus, even if North Korea's mining for domestic use saw some growth, overall, mining production is speculated to have experienced a large decline.

North Korea's anthracite export to China was virtually blocked since March 2017, leading to a 66% drop compared to the previous year. Meanwhile, the iron ore exports increased by 39% from the previous year, but as anthracite coal takes up the majority of North Korea's export-oriented mining, overall, the export-oriented mining industry would have experienced a sharp decline in exports and

production compared to 2016.

Coal mining for domestic use is estimated to have grown somewhat due to the continuing efforts to increase the supply of fuel to the electric power sector, which is one of the core sectors in North Korea's five-year strategy for national economic development.[4] The performance of the coal mining industry was more frequently reported in the North Korean media compared to other industries, yet, the reports lacked in number and specificity compared to those in 2016. The reports on the overall performance of the coal mining industry, such as the news on the coal industry's successful completion of its first-semester target by June 21, were concentrated mainly in the first half of the year, then their number weaned noticeably in the second semester.[5] Other than coal mining, iron ore exports to China increased 39% from the previous year, but no significant performances seem to have been made in mining for domestic use. With no notable reports on the overall performance of the mining sector, reports on the performance of Musan Mine, one of North Korea's largest mines, have also disappeared from the media, and the number of reports on the performance of the Komdok Mining Complex decreased sharply. No significant investment trends were observed either.

## B. Manufacturing

### 1) Heavy and Chemicals Industry

The heavy and chemicals industry seems to have experienced a slight decrease in their production and investment activities in 2017 compared to the previous year. Despite the economic sanctions, there were positive aspects such as the growth in the imports of machinery and raw materials and the production activities of the machine industry through North Korea's continued self-sufficiency policy. However, the effect of negative factors, such as the decrease in

4. Although limited, there still exists a possibility that some of the export-oriented mines transferred their production to domestic use as mining exports became blocked. Thus, it is speculated that the ban on the export of anthracite coal would have had a limited but positive impact on coal mining for domestic use.
5. This is also the general trend observed in North Korea's media reports on most of its industries in 2017.

power supply due to the slump in hydropower generation and the sluggish input of labor and material resources after the speed battles, would have been more dominating.

There seems to have been no significant performance made in the metal industry, which was also set as a core area in the five-year strategy for national economic development, due to the decrease in the supply of power. The number of reports on the performance in metal production decreased significantly in 2017 compared to the previous year, with no reports by the North Korea's official media on overall performance or the performance of Kim Chaek Iron and Steel Complex, the largest steel mill in North Korea. Amid the news on the growing production of '*Juche* Steel' at Hwanghae Iron and Steel Complex,[6] which make up the majority of North Korea's media reports related to metal production performance in 2017, among the major steel mills, there was a report on the production of rolled structural steel and steel at Chollima Steel Complex.[7][8] However, considering that the North Korean media omitted to mention the achievements in export-oriented metal product production at Kim Chaek Iron and Steel Complex, etc. despite the 35% growth in the country's pig iron exports to China in 2017, the fewer number of reports may not signify an absolute decline in metal production.[9] Meanwhile, North Korea completed its installation of the large-capacity oxygen heating furnace and large-scale oxygen separator at Kim Chaek Iron and Steel Complex and has been publicizing that pig iron production at the complex began in January 2018.[10] The media also reported

6. There were almost monthly reports on the performance in metal production at Hwanghae Iron and Steel Complex, such as the news on the complex's achievement in meeting the targeted volume of Juche Steel production in November.
7. It is reported that Chollima Steel Complex met its targeted annual production volume by the end of August and that its steel production increased 20% compared to the same period in the previous year. (The Rodong Sinmun, 11. September, 2017).
8. Other than this report, the only other reports on specific steel mills were those on the performances of Chongjin Steel Works and Chongjin Structural Steel Works.
9. North Korea exports pig iron and ferroalloy to China and imports steel and steel products from China. North Korea's pig iron exports to China, which once rose to $155 million in 2011, have continued to decline since 2012 but saw a rise in 2017. This rise may have happened due to North Korea's export of pig iron that was designated for domestic use in order to bring in foreign currencies as the ban on import of mineral resources, such as anthracite coal, came to effect.
10. The oxygen heating furnace at Kim Chaek Iron and Steel Complex is said to have a higher production capacity than that at Hwanghae Iron and Steel Complex which North Korea believes is a success, but its specific capacities are yet to be confirmed. An oxygen heating furnace is a furnace for producing the so-called "Juche Metal" which does not use coke, a material which is 100% imported in North Korea.

extensively on the new iron ore pellet production process at Chongjin Steel Mill. The significant performance seems to have been achieved by the chemicals industry either, signifying that North Korea's efforts in expanding its material supply capacity for a self-reliant economy have yet to see a tangible outcome. The methanol production line is being built at Sunchon Chemical Complex to establish a C1 chemical industry, which was proposed at the Seventh Party Congress, but it seems that construction is still underway. The investment in the construction of Kim Chaek Iron and Steel Complex's oxygen heating furnace and Sunchon Chemical Complex's methanol production line is the first large-scale investment in new infrastructure, apart from power plants, since Kim Jong-un came to power.

On the other hand, the machine industry seems to be maintaining its recent growth trend. North Korea's Kumsung Tractor Factory and Sungri Motor Plant developed new 80-horsepower tractors and five-ton trucks, respectively, in 2015-16, and in 2017, these new models seem to have gone into mass production.[11][12] It seems that not only did the production levels at these factories, which had severely declined in the past, see a significant increase but also did the production activities at companies that produce parts for engines and interior materials, etc. The manufacture of agricultural machines, such as combined farming machines, and ships, including fishing boats, were also relatively active. As if reflecting these circumstances, the production performance of the machine industry was most frequently and specifically reported.[13] The performance of the electronics industry, including the achievements of Pyongyang Automation Appliances Factory, were also reported relatively often by the media.[14] The construction materials industry that centers around the production of cement appears to be maintaining its recent growth trend as well.

11. The Rodong Sinmun reported on October 21 and 25, 2017, respectively, that Kumsung Tractor Factory and Sungri Motor Plant met their targeted production volume for the new-type tractor and truck models and are in the process of test driving the models.
12. Also, the production of a small-sized 12-horsepower tractor in 2017 by Chungsong Lake Tractor Factory, which had been producing eight-horsepower tractors, was also reported in great detail.
13. The Rodong Sinmun (8. June, 2017), The Rodong Sinmun (26. November, 2017), The Rodong Sinmun (15. October, 2017), etc.
14. The Rodong Sinmun (20. October, 2017).

### 2) Light Industry

Despite the slight decrease in power supply, no significant change was observed in North Korea's light goods supply capacity, as can be seen from the increase in textile import from China. However, it appears that for North Korea was unable to maintain the expansion in production it achieved in 2016 when speed battles took place throughout the year. There were barely any reports on the overall performance of the light industry or its individual areas, e.g., textiles and clothing, and food processing, etc., but some reports were made on the performance of individual factories.[15] Rather than achievements in production levels, these reports mainly dealt with factory expansion and modernization as in the cases of Ryuwon Footwear Factory and Pyongyang Cosmetics Factory; the introduction of new production processes such as Kim Jong Suk Pyongyang Textile Mill's new bag material production process; or the construction of new factories including a kimchi factory and a bag factory. In particular, Pyongyang Cosmetics Factory and Ryuwon Footwear Factory have been widely publicized through Kim Jung-un's factory visits, etc. as models of factory modernization. North Korea has also been strengthening the promotion of new products developed by its light industry.

## C. Construction

The activities of the construction industry seem to have slowed somewhat from the previous year. Most of all, large-scale housing projects that steer North Korea's construction industry have not been pursued since the completion of Ryomyung Street in April.[16]

The construction of the hydropower plant in Danchon began, and investment was made in new production facilities for the first time under Kim

15. The only reports on specific industrial achievements were the news that the Pyongyang Clothing Industry Department met its yearly production target by July 19 (The Rodong Sinmun, 7. August, 2017) and that the Sericulture Silk Industry Department produced tens of tons more silkworms than the previous year (The Rodong Sinmun, 10. November, 2017).
16. Further observation is needed to determine whether this hold on large-scale construction projects is due to the change in policy direction to activate the housing construction in regional areas after the completion of the housing project in Pyongyang or the burden felt towards continuing large-scale housing projects that require supply of imported construction materials.

Jong-un's rule, but the intensity of construction activities was considerably lower than those in 2015 or 2016. These major facility investment projects started construction around May 2017, and apart from Kim Chaek Iron and Steel Complex's oxygen heating furnace, which was completed in November, they seem to be progressing at a moderate pace.[17] Large-scale civil engineering works, such as the construction of waterways, are still in operation, but there was no undertaking of large-scale flood damage recovery projects as was seen in 2015 and 2016, nor large-scale construction projects, such as Sci-Tech Complex.

## 3. Assessment and Outlook

In 2017, North Korea's industry and real economy seem to have stagnated or experienced a slight decline from the previous year due to the prolonged drought, the adjustment after the excessive speed battles in 2016, and the decrease in foreign trade caused by the economic sanctions. Mining, agriculture, and construction industries were likely sluggish, and power and manufacturing industries are speculated to have been at a similar or lower level than the previous year.

The economic sanctions on North Korea brought a heavy blow to the mining industry, which is largely export-oriented, but there was a 4.3% increase in imports from China, so the impact of the sanctions was limited on North Korea's industries as a whole. However, the import of capital goods began to fall in August and continued its rate of decline, suggesting that after August, the economic sanctions spread its influence on a wider range of industries in North Korea. The long drought also appears to have adversely affected North Korea's industries. It is speculated that the shortage of water resources caused hydropower generation to decline, and according to the Rural Development Administration, North Korea's agricultural output is estimated to have dropped

17. For example, compared to the national promotion, incitement, and support for the early completion of the Chongchon Multi-tier Power Station or Paektusan Hero Youth Power Station to meet the Party Foundation Day or the start of the Seventh Party Congress, the construction of the power plant in Danchon, which was mentioned specifically at the Seventh Party Congress, seems to be progressing in a relatively quiet manner.

by approximately 2% in 2017.

Although the climate conditions negatively impacted North Korea's industrial production in 2017, the BOK assesses that the situation in 2017 was better than that in 2015 when North Korea's agricultural production and hydropower generation dropped by 5% and 20%, respectively.

The factor that had the most all-encompassing effect on North Korea's industries as a whole seems to be the need for adjustment after the nearly 300-days of speed battles in 2016. Speed battle is an economic policy that concentrates the input of labor forces and resources in advance for a short-term to achieve a much higher goal than usual. Speed battles can be effective for temporarily increasing production and investment activities, but as they end up distorting the distribution of resources, a significant adjustment period takes place afterward in general. The intensity of the speed battles in 2016 was weaker than those pursued under Kim Jong-il, but as they continued almost year-long, an adjustment period would have been unavoidable in 2017. The North Korean authorities also seem to have directed their policies towards stabilization than stimulation in 2017, although it cannot be confirmed whether this policy direction was set out of concern over the aftereffects of the speed battles. North Korea also did not pursue large-scale housing projects, which are the most effective means of boosting the economy, in 2017. The aftereffects of the speed battles or North Korea's stabilization policy package seem to have taken visible form in the second half of the year. The North Korean authorities emphasized "Mallima speed" or "Mallima spirit," but it appears that the use of these slogans was more of the usual economic incitement rather than a call for speed battles as in the case of 2016. Even this stress on "Mallima spirit" faded away towards the end of the year, and the "Mallima Pioneers Conference," which was planned to be held as a finale for celebrating the economic performance achieved through 'Mallima spirit,' did not take place. However, the supply side appears to have received relatively less shock as can be seen from the continued growth in North Korea's capital goods imports from China, and North Korea's policies on self-sufficiency and marketization remained unchanged, so it does not seem that the manufacturing sector as a whole experienced significant shrinkage.

In 2018, it seems highly likely for North Korea's industry and real economy to face even greater difficulty than in 2017. The economic sanctions have practically blocked the country's import of capital goods, such as machinery, metal products, and chemical products, from China, which is a must for the circulation of North Korea's industries. Thus, the recovery and growth mechanism of the North Korean economy since the 2000s, which can be summarized as 'increase in exports → increase in foreign currency reserve → increase in imports → increase in production and investment,' will not be able to function. Moreover, the expectation is that the North Korean authorities will maintain the stabilization policy package in 2018 rather than pursue economic expansion, directing the country's policies towards the capping of large-scale investment activities and increasing production levels through improvements in efficiency. Considering these circumstances, it is very likely that North Korea's industry and real economy will retreat further in 2018 than it has in 2017. However, as it is highly probable that North Korea will pursue its policy for self-sufficiency more strongly based on its machine industry, which is already equipped with larger production capacity, as well as maintain its policy for marketization, North Korea's industrial production will not stagnate rapidly within a short period. North Korea's production activities may even appear to increase in some industries as the country will procure necessary machinery and raw materials through domestic means instead of relying on imports and maintain its production and investment activities. Despite these factors, the deterioration in the quality of North Korean industries, in general, will be inevitable, and if this situation persists, soon the deterioration will not only show in quality but also in quantity.

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# CHAPTER 4

## Analysis and Forecast of North Korea's Foreign Trade in 2017_ Focus on Trade with China

# CHAPTER 4

# Analysis and Forecast of North Korea's Foreign Trade in 2017_ Focus on Trade with China

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## 1. Introduction

The year 2017 presented North Korea with the strongest economic sanctions it ever faced. The United Nations Security Council followed up its two rounds of sanctions imposed on Pyongyang in 2016 with another four sets of sanctions in 2017. The Security Council penalties against North Korea are only growing more stringent with time; bilateral sanctions imposed by the United States and countries neighboring North Korea are also growing more extensive and harsh.

More than ever, the sanctions imposed by the international community in 2017 had clear objectives. The heightened control over imports and exports of individual items translated into stronger sanctions that would not only affect North Korea's foreign trade but impact its entire economy. The most prominent sanction is UNSCR 2371 (August 5, 2017). This resolution completely prohibited the procurement of anthracite coal, iron, iron ore, lead, lead ore and seafood from North Korea. Of particular note is that it froze the employment of additional North Korean nationals working overseas, to reinforce the restriction

on foreign export earnings by the country. Further, it banned the opening of new joint ventures or the expansion of existing joint ventures with the regime. UNSCR 2375 (September 11, 2017), adopted in response to the sixth nuclear test conducted by Pyongyang, included even harsher sanctions on North Korea's imports and exports. The resolution limited North Korea's imports of crude oil and refined petroleum to 500,000 barrels during the fourth quarter of 2017, then restricted the supply of refined petroleum for 2018 to 2 million barrels, which accounts for 55 percent of the current supply, and capped the volume to 4 million barrels for crude oil, which equals current levels. All supply or transfer of natural gas liquids and condensates to North Korea were also banned completely. The resolution proceeded to ban the regime's exports of textiles such as fabrics and clothes, ended future work authorizations of North Korea's overseas laborers, and forbid the renewal of visas for those nationals already employed in other countries. Not only were new joint ventures with North Korean entities or individuals prohibited, but any such existing joint ventures were to be closed within 120 days of the adoption of the resolution. Stronger sanctions on cargo transfer took shape in the prohibition of North Korean vessels shipping cargo on the high seas.

UNSCR 2397 (December 22, 2017) was adopted in response to North Korea's launch of an intercontinental ballistic missile (ICBM) on November 29, 2017. The resolution called for the repatriation of all North Korean nationals earning income abroad to North Korea within 24 months of the adoption of the resolution. Crude oil transferred to North Korea was subject to a ceiling of 4 million barrels per year, provided that is was used exclusively for the livelihood purposes of North Korean nationals; petroleum products were also capped at 500,000 barrels a year, on the condition that they were only for livelihood purposes and that the member state involved notified the UN Security Council Sanctions Committee of such export every 30 days. Further, resolution 2397 completely banned imports of food and agricultural products (HS codes 07, 08, 12), machinery (HS code 84), electrical equipment (HS code 85), earth and stone including magnesite and magnesia (HS code 25), wood (HS code 44), and vessels (HS code 89) from North Korea.

In line with the sanctions by the UN Security Council, the United States also stepped up its bilateral sanctions against North Korea. In August 2017, as part of a comprehensive Act prescribing sanctions against Iran, Russia, and North Korea, the United States enacted the Korean Interdiction and Modernization of Sanctions Act; the Treasury Department's extended list of entities subject to sanctions only made the measures more effective. A presidential executive order was also introduced, issuing sanctions against companies or individuals of third countries trading with North Korea.[1]

How strongly was North Korea's foreign trade and economy in 2017 affected by the aforementioned sanctions against the regime? This paper attempts to answer this question through a detailed analysis of North Korea's foreign trade in 2017, and forecasts how the nation's foreign trade and economy will fare in 2018.

## 2. North Korea's Trade with China

There are several points to consider before analyzing North Korea's foreign trade in 2017. The first is that over 90 percent of North Korea's imports and exports are traded with China. Therefore, North Korea's foreign trade in 2017 is analyzed with a focus on imports and exports between these two countries. Further, the foremost matter of concern is how the international community's severe sanctions against North Korea impacted the country's exports and imports in 2017. To understand this, we must decide on the subject of analysis. The sanctions on North Korea's imports and exports involve restrictions on individual items. In other words, instead of completely blocking trade, the sanctions prohibit the export of luxury goods, military supplies and items that could be used for other purposes to North Korea, as well as goods or services that could incur foreign exchange earnings for the regime. Thus, our examination of the impact of sanctions against North Korea should be conducted within the scope of such restricted items. Those items not prohibited from trade may also suffer

1. Details on the multilateral and bilateral sanctions imposed by the international community can be found in Im, Sojeong (2018).

from the sanctions, but only with time. The reason this paper aims to analyze the impact of sanctions on North Korea in 2017 is to ascertain the direct impact the sanctions had in a relatively short time.

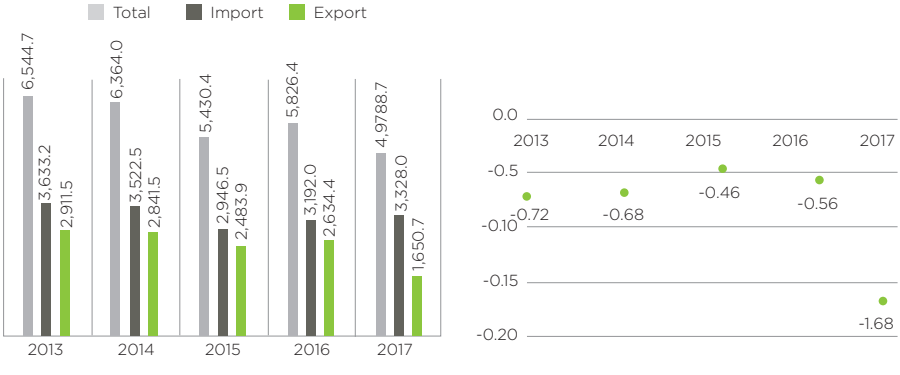
### A. North Korea's Trade with China in 2017

North Korea's trade with China recorded USD 4.98 billion in 2017; 850 million, or 14.5 percent lower than the USD 5.82 billion recorded in 2016. In 2017, while exports from North Korea to China fell 37.3 percent from USD 2.63 billion in 2016 to USD 1.65 billion, imports from China rose 4.3 percent, or USD 140 million, from USD 3.19 billion to USD 3.33 billion.

Figure 4-1 shows that North Korea's trade volume has been on a constant decline since recording USD 6.55 billion in 2013, and the share of North Korea's exports to China has shrunken by a significant degree. On the other hand, imports from China into North Korea have recovered compared to 2016, nearing the average of 2013 and 2014. On account of the sharp decline in exports, North Korea's trade deficit with China rose heavily, recording USD 1.68 billion in 2017.

**[Figure 4-1] North Korea's Trade with China (left); North Korea's Trade Balance with China (right)**

(Unit: USD million, billion)



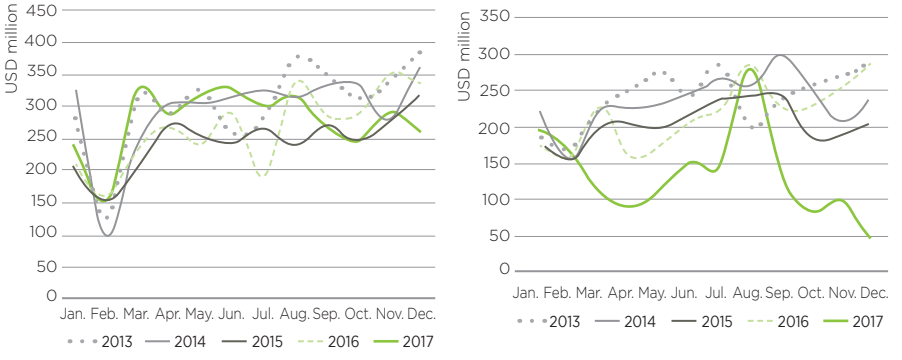

*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

### B. Trade with China by Month

The graph on the left of Figure 4-2 compares North Korea's monthly imports from China for the past five years. North Korea's imports from China in general begin at low levels early in the year, which rise later on in the second half. In the case of 2017, however, North Korea's imports from China jumped sharply from February onwards at a much faster pace compared to the previous five years, which then subsequently slackened from August. Although in the latter half of the year imports display a downward trend, the aggregate of North Korea's imports from China in 2017 is on par with the average of USD 3.32 billion for the past five years.

Meanwhile, the graph on the right of Figure 4-2 compares North Korea's monthly exports to China for the past five years. As in the case of imports, monthly exports also start off at low levels, which begin to climb closer to the end of the year. Contrary to such trends, monthly imports in 2017 dropped sharply from January onwards. Although the volume rebounds from April, it is still markedly low compared to the same months of previous years; the sharp rally in August recovers the average level, but the export volume plunges once again in September. In December, the monthly import hovers around USD 50 million, a striking difference from the average monthly figure for the past five years. From Figure 4-2 we can deduce that North Korea's imports suffered less from the sanctions compared to exports.

**[Figure 4-2] North Korea's Monthly Imports from China (left); North Korea's Monthly Exports to China (right)**




*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

## C. Trade with China by Item

### 1) Key Export Items

As mentioned above, North Korea's exports to China recorded USD 1.65 billion in 2017, which is down 37.3 percent from the USD 2.63 billion in 2016. Table 4-1 below displays North Korea's export volume to China by item. The top six items account for approximately 85 percent of North Korea's exports to China. It is clear that all items exported to China from North Korea have suffered a sharp downturn in 2017. North Korea's top export item to China is HS code 62, or articles of apparel and clothing accessories, not knitted or crocheted. While the export volume for this commodity group was USD 497 million, this is a year-on-year decline of 18.8 percent. The absolute quantity has fallen, but as seen in Table 4-2, the share of this commodity group to the total of North Korea's exports to China has in fact grown compared to the previous year, accounting for 30 percent. The second most exported commodity group was HS code 27 (mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), which includes anthracite coal. Up until 2016, before the sanctions restricted exports of coal, this commodity group was North Korea's largest export source and took up approximately 45 percent of North

Korea's total exports to China. However, in 2017 the export volume dropped year-on-year by 65 percent, recording only USD 413 million. Consequently, the share of this commodity group to total exports in 2017 plunged to 25 percent, proving that the sanctions strongly affected coal exports.

HS code 26 (ores, slag and ash), ranking third in export volume, exported USD 187 million in 2017, a year-on-year decline of around 17 percent and also far behind the second largest commodity group. This commodity group accounts for approximately 11 percent of North Korea's exports to China.

Exports of fish and crustaceans, molluscs and aquatic invertebrates, which belong to HS code 62, also declined by 16 percent compared to the previous year; the export volume to China recorded a mere USD 163 billion (5 percent of total exports to China). Meanwhile, a notable development is that the export of edible fruit (HS code 08) has grown year-on-year by 55 percent, although the absolute volume was low at USD 79 million. HS code 61 (articles of apparel and clothing accessories, knitted or crocheted) was also hit by the sanctions, exporting USD 65 million, a year-on-year decline of 42 percent. This figure accounts for approximately 4 percent of North Korea's exports to China.

**<Table 4-1> Performance of North Korea's Key Export Items to China (HS-2)**

(Unit: USD thousand, %)

| | Classification | | 2014 | | 2015 | | 2016 | | 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Item | HS | Export volume | Increase Rate | Export volume | Increase Rate | Export volume | Increase Rate | Export volume | Increase Rate |
| 1 | Articles of apparel and clothing accessories (not knitted or crocheted) | 62 | 622,034 | 24.6 | 633,206 | 1.8 | 611,500 | -3.4 | 496,741 | -18.8 |
| 2 | Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes | 27 | 1,146,386 | -17.5 | 1,057,042 | -7.8 | 1,187,115 | 12.3 | 412,722 | -65.2 |
| 3 | Ores, slag and ash | 26 | 339,349 | -18.3 | 204,662 | -39.7 | 225,351 | 10.1 | 187,493 | -16.8 |
| 4 | Fish and crustaceans, molluscs and other aquatic invertebrates | 03 | 143,257 | 25.9 | 108,476 | -24.3 | 190,094 | 75.2 | 162,822 | -14.3 |
| 5 | Edible fruit and nuts; peel of citrus fruits | 08 | 111,277 | 243.3 | 43,033 | -61.3 | 50,833 | 18.1 | 78,893 | 55.2 |
| 6 | Articles of apparel and clothing accessories (knitted or crocheted) | 61 | 118,985 | 35.4 | 166,097 | 39.6 | 111,872 | -32.6 | 65,254 | -41.7 |
| Total exports | | | 2,841,476 | -2.4 | 2,483,944 | -12.6 | 2,634,400 | 6.1 | 1,650,670 | -37.3 |

*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

**<Table 4-2> Share, by Item, of Exports to China (HS-2)**

(Unit: USD thousand, %)

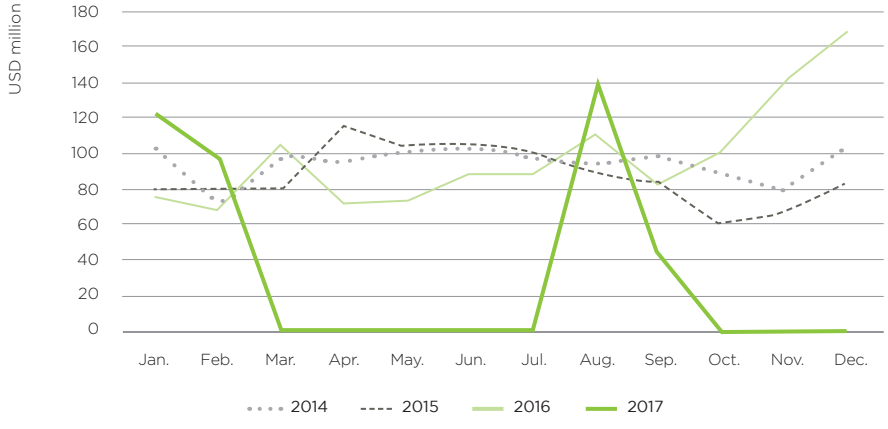
| | Classification | | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|
| | Item | HS | | | | |
| 1 | Articles of apparel and clothing accessories (not knitted or crocheted) | 62 | 22 | 25 | 23 | 30 |
| 2 | Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes | 27 | 40 | 43 | 45 | 25 |
| 3 | Ores, slag and ash | 26 | 12 | 8 | 9 | 11 |
| 4 | Fish and crustaceans, molluscs and other aquatic invertebrates | 03 | 5 | 4 | 7 | 10 |
| 5 | Edible fruit and nuts; peel of citrus fruits or melons | 08 | 4 | 2 | 2 | 5 |
| 6 | Articles of apparel and clothing accessories (knitted or croche--ted) | 61 | 4 | 7 | 4 | 4 |

*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

### ① Anthracite Coal

Imports of coal (HS code 270111) from North Korea were completely suspended from March 2017 by UNSCR 2321 (November 30, 2016) and Announcement No. 12 by China's Ministry of Commerce (February 17, 2017). As seen in Figure 4-3, exports of coal surged from the latter half of 2016, with North Korea exporting a total of USD 1.18 billion to China in 2016. Coal played a crucial part in North Korea's exports, accounting for 45 percent of the total export volume. However, after peaking in 2016, North Korea's coal exports to China plummeted rapidly, and in 2017 recorded USD 400 million in volume, which is a year-on-year 66 percent decline. Aside from January, February, August and September, zero coal was exported to China.

**[Figure 4-3] Comparison of North Korea's Coal Exports to China**




*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

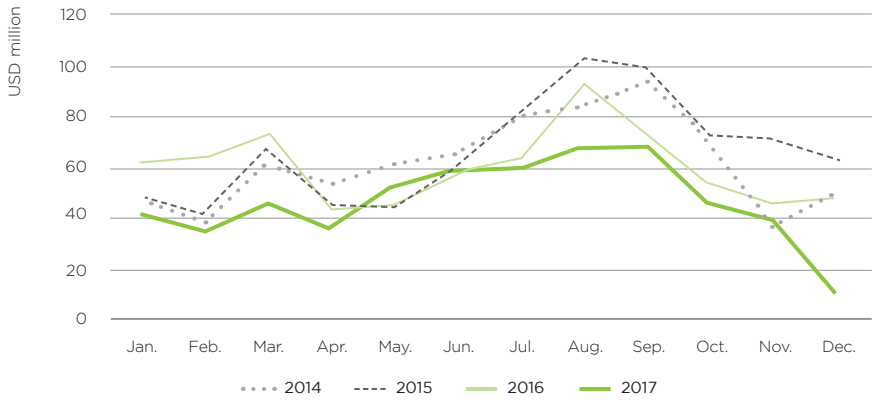
### ② Apparel

Imports of articles of apparel (HS codes 61, 62) from North Korea were banned by UNSCR 2375 (September 11, 2017) and Announcement No. 52 by China's Ministry of Commerce (September 23, 2017).[2]

As seen in Figure 4-4, North Korea's exports of apparel to China in 2015 reached approximately USD 800 million. This fell by 22.3 percent in 2016, to USD 720 million, and in 2017 the sanctions on apparel caused exports to drop sharply from October, resulting in an annual export volume of USD 560 million. Despite the decline in exports, apparel accounted for 34 percent of North Korea's exports to China due to the shrinkage in the absolute volume of exports as a whole.

2. Certain subcategories under HS codes 61 and 62 UNSCR are not subject to restriction by the sanctions.

**[Figure 4-4] Comparison of North Korea's Apparel Exports to China**

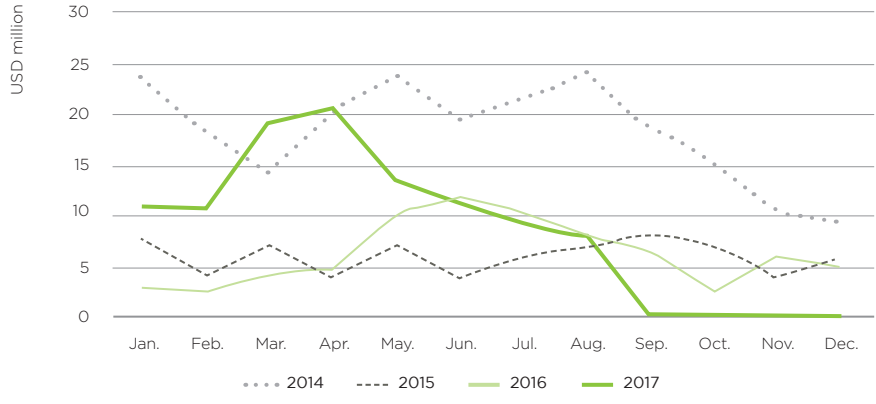



*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

### ③ Iron Ore

Imports of iron ore (HS code 72, 2601) from North Korea were completely banned from September 2017 by UNSCR 2371 (August 5, 2017) and Announcement No. 40 by China's Ministry of Commerce (August 14, 2017). The share of North Korea's iron ore exports to China is not particularly large compared to other mineral resources (as of 2016). North Korea exported USD 73 million worth of iron ore to China in 2016. In 2017, iron ore exports jumped to 2014 levels, shifting to a downturn from April and falling sharply from September when the sanctions were implemented. In terms of overall volume, North Korea's iron ore exports to China rose to USD 100 million, which is a 43 percent increase compared to 2016(Figure 4-5).

**[Figure 4-5] Comparison of North Korea's Iron Ore Exports to China**

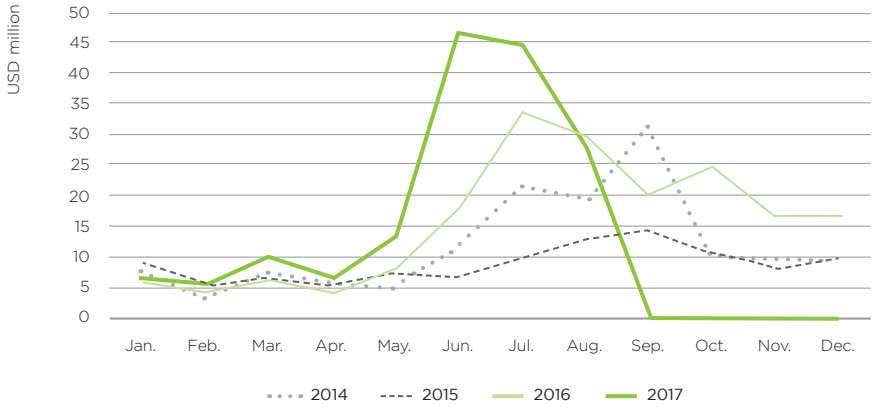



*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

### ④ Seafood

Imports of seafood (HS code 03) from North Korea were banned by UNSCR 2371 (August 5, 2017) and Announcement No. 40 by China's Ministry of Commerce (August 14, 2017). In 2016, approximately USD 190 million worth of seafood from North Korea was exported to China and accounted for 7.2 percent of North Korea's total export volume. The sanctions caused seafood exports to decline in 2017, with the export volume to China dropping to USD 160 million, but the share of seafood to total exports rose to 9.9 percent(Figure 4-6).

**[Figure 4-6] Comparison of North Korea's Seafood Exports to China**




*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

### 2) Key Import Items

North Korea's imports from China recorded USD 3.33 billion, recovering the average of the past five years.

Table 4-3 below is a comparison of imports from China by item. The top five items account for 38 percent of North Korea's imports from China. Unlike how the top five export items took up 85 percent of North Korea's total exports to China, imports from China are shown to be less concentrated on certain items in comparison. The most imported commodity group from China is electrical machinery and equipment and parts thereof (HS code 85); imports of these items recorded USD 340 million. This commodity group has lately been a constant leader in terms of import volume, accounting for approximately 10 percent of North Korea's imports from China. The second most imported commodity group was HS code 84, which consists of nuclear reactors, boilers, machinery and mechanical appliances. The import volume for this group in 2017 was USD 270 million, a marginal decrease (-0.4 percent) from the previous year. Ranking third was imports of plastics and articles thereof (HS code 39), which grew significantly compared to the previous year by 13.1 percent.

This commodity group accounted for roughly 7 percent of North Korea's total imports from China.

The fourth largest commodity group of imports, man-made filaments, strip and the like of man-made textile materials (HS code 54), accounted for approximately 7 percent of total imports from China, recording USD 220 million in 2017. The year-on-year import volume of this commodity group rose greatly, by 17 percent.

Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof (HS code 87) were the fifth largest commodity group of imports, accounting for 6 percent of total imports from China. The import volume for these items was a little over USD 200 million, recording a 20.6 percent decline compared to the previous year.

**<Table 4-3> Comparison of North Korea's Key Import Items (2014-17)**

(Unit: USD thousand, %)

| | Classification | | 2014 | | 2015 | | 2016 | | 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Item | HS | Import volume | In-crease Rate | Import volume | In-crease Rate | Import volume | In-crease Rate | Import volume | In-crease Rate |
| 1 | Electrical machinery and equipment and parts thereof; sound recorders and reproducers, and parts and accessories of such articles | 85 | 419,769 | 65.3 | 38732,361 | -20.8 | 315,479 | -5.1 | 338,133 | 7.2 |
| 2 | Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof | 84 | 310,260 | 17.9 | 252,094 | -18.7 | 268,607 | 6.6 | 267,599 | -0.4 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Plastics and articles thereof | 39 | 193,431 | 36.2 | 168,037 | -13.1 | 204,533 | 21.7 | 231,388 | 13.1 |
| 4 | Man-made filaments; strip and the like of man-made textile materials | 54 | 166,278 | 14.2 | 151,664 | -8.8 | 187,042 | 23.3 | 218,834 | 17.0 |
| 5 | Vehicles other than railway or tramway rolling stock, and parts and accessories thereof | 87 | 210,517 | -12.2 | 196,189 | -6.8 | 254,802 | 29.9 | 202,422 | -20.6 |
| Total exports | | | 3,522,515 | -3.0 | 2,946,464 | -16.4 | 3,192,031 | 8.3 | 3,328,032 | 4.3 |

*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

**<Table 4-4> Comparison of Exports to China by Item (HS-2, 2014-17)**

(Unit: %)

| | Classification | | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|
| | Item | HS | | | | |
| 1 | Electrical machinery and equipment and parts thereof; sound recorders and reproducers, and parts and accessories of such articles | 85 | 12 | 11 | 10 | 10 |
| 2 | Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof | 84 | 9 | 9 | 8 | 8 |
| 3 | Plastics and articles thereof | 39 | 5 | 6 | 6 | 7 |
| 4 | Man-made filaments; strip and the like of man-made textile materials | 54 | 5 | 5 | 6 | 7 |
| 5 | Vehicles other than railway or tramway rolling stock, and parts and accessories thereof | 87 | 6 | 7 | 8 | 6 |

*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

Table 4-5 shows a list of items imported from China to North Korea that have experienced a significant change in import volume in 2017. The largest difference can be witnessed in imports of frozen Alaska Pollock (HS code 030367), which jumped by 62 percent from the previous year. Imports of seafood under HS code 03 also grew by 37 percent.

Imports of ceramic products (HS code 69) witnessed a year-on-year increase of 41 percent, while furniture (HS code 94) rose by 24 percent. This can be interpreted as a result of the rise in demand incurred by policy measures encouraging construction as an economic stimulus, implemented since Kim Jong-un took power. Overall, textiles (HS codes 54, 55, 56, 60) and apparel (HS code 60) witnessed a roughly 20 percent increase by item compared to the previous year. While this could be interpreted to be raw materials imported on the back of domestic demand, part of the imports was reprocessed and exported back to China. Due to the sanctions against the export of textiles from North Korea, apparel (HS code 61) exports to China in 2017 fell year-on-year by 13 percent.

The commodity group that witnessed the sharpest decline compared to 2016 was mineral oils (HS code 27: mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes), the import of which fell by 50.9 percent; a direct impact of the sanctions, as mentioned above. Imports of iron and steel (HS code 72) and vehicles (HS code 87) also fell by 26 percent and 21 percent, respectively. The second largest decline was witnessed in edible fruit and nuts (HS code 08), the import of which declined by 33 percent. Imports of rubber and textiles also fell significantly.

**<Table 4-5> Comparison of Items Imported from China to North Korea (2014-17)**

(Unit: USD thousand, %)

| | 2014 | | 2015 | | 2016 | | 2017 | |
|---|---|---|---|---|---|---|---|---|
| | Import volume | In-crease Rate | Import volume | In-crease Rate | Import volume | In-crease Rate | Import volume | In-crease Rate |
| Alaska Pollock (HS 030367) | 12,167.1 | 70.2 | 19,303.1 | 58.6 | 23,253.6 | 20.5 | 37,647.8 | 61.9 |
| Ceramic Products (HS 69) | 48,082.9 | 41.5 | 49,589.4 | 3.1 | 46,589.5 | -6.0 | 65,788.4 | 41.2 |
| Seafood (HS 03) | 73,290.8 | 12.8 | 84,833.5 | 15.7 | 74,343.3 | -12.4 | 102,154.7 | 37.4 |
| Furniture (HS 94) | 56,313.1 | 59.5 | 42,980.0 | -23.7 | 48,608.8 | 13.1 | 60,439.5 | 24.3 |
| Fat and Oils (HS 15) | 112,761.7 | 30.8 | 104,627.0 | -7.2 | 99,498.1 | -4.9 | 121,549.5 | 22.2 |
| Textiles (HS 56) | 55,749.0 | 12.8 | 41,138.9 | -26.2 | 50,101.5 | 21.8 | 60,103.8 | 20.0 |
| Textiles (HS 60) | 89,706.2 | 35.8 | 75,468.3 | -15.9 | 84,494.5 | 12.0 | 101,041.8 | 19.6 |
| Apparel (HS 60) | 89,706.2 | 35.8 | 75,468.3 | -15.9 | 84,494.5 | 12.0 | 101,041.8 | 19.6 |
| Textiles (HS 54) | 166,277.7 | 14.2 | 151,664.2 | -8.8 | 187,042.4 | 23.3 | 218,834.3 | 17.0 |
| Plastics (HS 39) | 193,430.8 | 36.2 | 168,037.3 | -13.1 | 204,533.3 | 21.7 | 231,388.5 | 13.1 |
| Textiles (HS 55) | 96,174.9 | -1.8 | 62,764.6 | -34.7 | 71,183.5 | 13.4 | 79,650.5 | 11.9 |
| Apparel (HS 61) | 114,717.8 | 34.8 | 96,104.8 | -16.2 | 134,823.4 | 40.3 | 117,119.4 | -13.1 |
| Vehicles (HS 87) | 210,516.5 | -12.2 | 196,188.9 | -6.8 | 254,801.7 | 29.9 | 202,422.3 | -20.6 |
| Rubber (HS 40) | 85,970.5 | 4.3 | 75,296.4 | -12.4 | 79,040.5 | 5.0 | 59,522.1 | -24.7 |
| Iron and Steel (HS 72) | 108,900.5 | 17.7 | 111,789.6 | 2.7 | 115,288.5 | 3.1 | 85,189.0 | -26.1 |
| Fruits and Nuts (HS 08) | 31,944.8 | 74.2 | 54,384.7 | 70.2 | 99,629.1 | 83.2 | 66,973.7 | -32.8 |
| Mineral Oils (HS 27) | 191,430.6 | -74.2 | 147,294.5 | -23.1 | 141,569.0 | -3.9 | 69,506.2 | -50.9 |

*Source:* KITA(http://www.kita.net, Last access date: 24. February, 2018).

## 3. Closing Remarks

This paper examined North Korea's foreign trade in 2017 with a focus on

trade between North Korea and China, comparing statistics from recent years. As mentioned above, sanctions imposed by the international community on North Korea in 2017 began making a marked impact on North Korea's exports to China. Stronger repercussions are forecast for 2018 if sanctions continue to be imposed at the current level. Up until recently, the worlds' economic sanctions against North Korea only reinforced China's leverage over the country; thus, the sanctions were not have much impact unless China joined the international community in its goal of putting North Korea in a tighter spot. Statistics show that as of now, China was a faithful participant when it came to sanctions imposed against North Korea in 2017. If China's efforts continue in 2018, the North Korean economy is expected to suffer in the following aspects.

To begin with, sanctions against North Korea by the international community, including the United States, are expected to become more stringent in 2018. China holds the key to whether the sanctions will be truly effective, for it has an undeniable influence on North Korea's trade. If China continues to impose its sanctions against North Korea, based on the announcements made by China's Ministry of Commerce in 2017, North Korea's trade volume in 2018 is expected to fall significantly compared to the previous year. As the top five commodity groups that account for over 80 percent of North Korea's exports to China are designated as items restricted under sanctions, North Korea's export volume to China is forecast to witness a particularly sharp decline.

The impact of sanctions on North Korea's imports from China do not appear to be statistically significant. This is because the scope of restricted import items is not as extensive as it is for exports. Items prohibited from being exported to North Korea, such as luxury goods, only account for around 6 percent of North Korea's total imports.[3]

Thus, tougher sanctions on imports by North Korea are required to maximize the impact of sanctions overall, albeit excluding the minimum goods necessary

3. Jeong, Hyung-gon and Bang, Hokyung (2017)

for livelihood purposes. Since most of the prices of daily necessities in North Korea are determined by the market, sanctions on imports by North Korea will serve to intensify the vulnerability of the North Korean economy. If the international community as well as China continue to impose sanctions, North Korea's foreign trade and overall economy in 2018 will be affected as follows.

First of all, North Korea's foreign exchange earnings will decline significantly. It is highly probable that North Korea's trade deficit will soar, while dollar earnings from North Korean nationals working overseas will plummet from 2018. The country is already suffering from a decline in foreign exchange earnings, which will bring about a decrease in the import of capital goods and energy, in turn affecting North Korea's industrial production as a whole. The reduction of foreign assets will also lead to less imports of food and consumer goods, which will make the livelihoods of the North Korean people even more difficult.

North Korea is also expected face more challenges in operating businesses overseas, due to the decline in normal trade transactions, and the prohibition against normal trade between foreign financial institutions or businesses and North Korean institutions or trading companies. Foreign assets are already declining due to sanctions freezing the foreign assets and bank accounts of North Korean companies, and non-trade transactions including remittances by the pro-Pyongyang General Association of Korean Residents in Japan to North Korea are also projected to fall considerably.

In conclusion, in 2018, the impact of the sanctions will become clearer, and North Korea's foreign trade conditions will consequently worsen. Thus, the economic decentralization that Kim Jong-un has pursued since taking power, and the corresponding diverse policy attempts in terms of economic management, are certain to face great challenges in 2018.

However, it is clear that sanctions by the international community are insufficient to solve North Korea's nuclear threat. On the other hand, North Korea cannot be persuaded to dismantle its nuclear program through

appeasement. The wisest option we have at hand is to impose tough sanctions on North Korea, while at the same time offering carrots as incentives for nuclear dismantlement. The international community, including the United States, must put forward stringent sanctions strong enough to assure North Korea that giving in to the incentives will be much better than facing further economic sanctions or other forms of military pressure in the future. The key here is that the international community must present comprehensive incentives acceptable by North Korea. It is vital to convince North Korea that such incentives, offered by the international community and the United States, will be provided without fail. What North Korea wants most is to improve its relations with the United States and to engage in negotiations. As a key party concerned with the North Korean nuclear threat, the United States should enact a legal framework on incentives to be provided to North Korea, as in the Cooperative Threat Reduction Program based on the Nunn-Lugar Act[4]; to guarantee the predictability and transparency of compensation and to explicitly prescribe the content, period, scale and effect of assistance. The United States must also clarify the political, security and diplomatic rewards that would be provided if an agreement with North Korea is concluded, so as to avoid using sanctions for sanctions' sake. In political terms, the United States could offer to establish diplomatic ties with North Korea and build a peace regime; in economic terms, options could include humanitarian assistance to or investment in North Korea. However, most importantly, such political and economic rewards must be accompanied by extremely tough sanctions as enforcement mechanisms that will take immediate effect upon any violation of the denuclearization pledge by North Korea.

4. The Nunn-Lugar Act was initiated in the early 1990s by US Senators Sam Nunn and Richard Lugar. Through the Cooperative Threat Reduction Program based on this Act, the US outlined its commitments to support funds, technology, equipment and labor to assist the dismantling of weapons of mass destruction from the Former Soviet Union, inherited by Russia, Ukraine and Uzbekistan, etc.

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# CHAPTER 5

## 2017 Review of North Korea's Market and 2018 Outlook

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## 2017 Review of North Korea's Market and 2018 Outlook

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### 1. Introduction

No outstanding changes were observed in the North Korean economy in 2017. This came as a surprise, considering that international sanctions against North Korea have continued to strengthen in response to the regime's continual provocation. Several interpretations have been proposed in this regard. The first view is that the crisis-management capability of the North Korean authorities has been exercised effectively. The idea here is that North Korea had secured reserves of major commodities in advance, in anticipation of growing sanctions by the international community, and that it effectively exerted strong administrative authority in order to control price increases in its economy. The second explanation is that the North Korean economy has improved rapidly, resulting in a level of tolerance that could withstand modest external shocks. As the North Korean economy continue to expand, the size and scope of its marketplaces, which are operated independently under the government-led planning system, also have grown, and have done so in a more systematic and efficient manner mostly depended on the so-called "red capitalist" idea. Lastly, a third explanation is that the international sanctions on North Korea do not apply to sectors

connected to the livelihood of the people, and that, as such, most of the products traded into the market are not directly affected by the sanctions. Rather, some argue that as North Korean exports have halted, certain commodities, such as coal, and marine products, are flowing into North Korean domestic marketplaces and driving down prices. Taken together, all these perspectives suggest that it will take more time for effects of the sanctions on the North Korean economy to become observable.

Throughout 2017 economic sanctions against North Korea were imposed more severely than ever. The North Korean economy was surely expected to take a hit, given the independent sanctions by the U.S. and China on top of the four United Nations Security Council resolutions. Experts also have kept an eye on price changes in North Korea's markets as economic sanctions are typically positively correlated with inflation. However, the North Korean markets do not seem to have undergone much of a shock. Experts put their heads together to figure out why and came to the conclusion that the effects of the recent sanctions have not yet been fully realized due to factors mentioned above, such as North Korea's ability to cope with crises, the market's shock-absorption capacity, and the exclusion of items that pertain to the livelihood of the people in the application of sanctions.

It is difficult to say for sure how long such factors can play their role in holding the effects of the sanctions at a distance. The influence of these measures has accumulated as the sanctions continue to get stricter, especially since China's sanctions appear to have taken off in earnest in early January 2018. As such, the situation of the North Korean economy in 2018 may be drastically different from in 2017. This is because the authorities can manage only so much, and the impact on the market is anticipated to be greater.

## 2. North Korea's Market Price: Relationship with Sanctions

### A. UN Sanctions Against North Korea and China's Follow-Up

### 1) UN Security Council Resolutions on North Korea in 2017

Last year's UN Security Council resolutions imposing sanctions on North Korea and its economy can be said to have begun with the adoption of Resolution 2321 (November 30, 2016), which corresponds to North Korea's fifth nuclear test (September 9, 2016).[1] The main components of this resolution, which is understood to be stronger than prior ones, are the establishment of the limit in coal exports to USD 400 million, or 7.5 million metric tons per year, and the ban on exporting North Korean minerals such as silver, copper, zinc and nickel. The limits on coal exports are not considered to have a direct effect on the market, but there are many individuals engaged in the trade, and considering that they spend their earnings in purchasing necessary goods from the market, the country's economy is likely to be impacted modestly, both directly and indirectly.

In 2017 four UN Security Council sanctions were added. Resolution 2356 (March 2, 2017), which corresponds to North Korea's test of medium-range ballistic missile launches, is not considered to include noteworthy measures.

Resolution 2371 (Aug. 5, 2017),[2] is focused on blocking the regime's sources of foreign currency, with stipulations prohibiting North Korea from exporting of its major commodities, including coal, iron and iron ore, lead and lead ore, and seafood. With the ban on seafood in addition to that on coal, a sector in which a significant number of North Koreans work, this sanction may not have a meaningful impact on the market in the short term or may even serve as a cause for price declines; however, in the mid to long term, production would decline, which is likely to have negative effects on the market. In addition, the resolution bans new joint ventures with North Korean businesses and restricts additional investments in existing joint ventures, as well as banning additional (new) overseas employment of the North Korean labor force. With fewer opportunities for North Korean people to earn income from overseas, this could become a factor in bringing about a recession in market.

1. Ministry of Foreign Affairs (2016).
2. Ministry of Foreign Affairs (2017).

The UN Security Council adopted Resolution 2375 (September 11, 2017)[3] in response to North Korea's sixth nuclear test (September 2017), and in this resolution for the first time includes a measure to limit the supply of oil to North Korea.[4] It is also worth noting that the resolution bans sale of textiles, which are North Korea's main source of foreign money, and prohibits new work authorizations from Member States to its nationals, effectively limiting foreign money sources as much as possible.

The ban on oil supply is expected to be a sensitive issue in that it would restrict the mobility of North Korean market, and the ban on textile exports was anticipated to have a significant impact on the market as textile is a large, labor-intensive industry.

The UN Security Council adopted Resolution 2397 (December 22, 2017) in response to North Korea's launch of a ballistic missile called "*Hwaseong*-15" (November 29, 2017). This resolution, among other things, decided a restriction in the supply of oil; limited imports of refined petroleum to 500,000 barrels; limited crude oil supply to 4 million barrels; mandated all Member States providing oil to provide a report to the Committee; laid out potential for additional restrictions in the case of further provocations; called for a repatriation of all labors earning income abroad to North Korea within 24 months (originally banned signing of new contracts and extending exiting contracts); prohibited export of industrial machinery, transportation vehicles and metals; and prohibited import of supply of food and agricultural products, machinery and wood. More concrete sanctions were imposed on North Korean imports of petroleum products; most of the country's subsidiary materials and equipment crucial to its economy were banned from being exported, and most of the country's foreign currency imports were added to the sanctions. It can be said that essentially all sanctions possible against the country had in fact been exercised as of the end of 2017, with the exception of an outright ban on all oil

3. Yonhap News (12. September, 2017).
4. The sanction cuts off supply to North Korea and prevents exports from exceeding 4 million barrels (current average export volume). The cap on exports of refined products was changed from 4.5 million barrels (current average export volume) to 2 million barrels. The sanction prohibits exports of liquefied natural gas and condensate (light volatile liquid hydrocarbonds mixed with natural gas). As such, crude oil supply to North Korea is expected to drop by about 30%.

sources.

### 2) China's Follow-Up

On January 25, 2017, the Ministry of Commerce of China—jointly with five departments including the Ministry of Industry and Information Technology, the China Atomic Energy Authority and the General Administration of Customs—published the <Announcement No. 9 of 2017> on a comprehensive list of goods that cannot be exported to North Korea, including certain dual-use items. This action was aimed at implementing the UN Security Council's Resolution 2321 and includes bans on exports of products such as ammonium nitrate, centrifuges, aeronautical and marine equipment that could be used to contribute to North Korea's nuclear and chemical weapons programs.[5]

On February 8, the MOFCOM and the GACC jointly announced <Announcement No. 12 of 2017>, stating that the import of coal from North Korea will be suspended until Dec. 31, 2017, based on <Announcement No. 81 of 2016> which announced by the Foreign Trade Law of the People's Republic of China and the MOFCOM and GACC.[6] This was to execute Resolution 2321 of the UN Security Council.

On August 14, China published its <Announcement No. 40 of 2017>, which forbids import of North Korean coal, iron and aquatic and marine products.[7] The announcement, made by the MOFCOM and GACC, this measure for the purpose of the implementation of the UN Security Council Resolution 2371, and included on the prohibited list are North Korea's major export items, such as iron, iron ore, lead, lead ore and aquatic and marine products. These items, as of 2016, accounted for 61.7% of North Korea's exports totaling USD 2.63 billion.

On August 25 the MOFCOM published its <Announcement No. 47 of 2017>, which enforces the prohibition of the opening of new joint ventures or

5. KONASnet (26. January, 2017).
6. Yonhap News (18. February, 2017).
7. Yonhap News (14. August, 2017).

cooperative entities with North Korean entities.[8] The enforcement prohibits North Korean entities and individuals from opening new Sino-foreign cooperative entities, equity joint ventures or wholly foreign-owned enterprises in China, or from expanding existing joint ventures through additional investments. This is expected to hit North Korean restaurants operating in China particularly hard.

The MOFCOM published its <Announcement No. 52 of 2017> on September 22, enforcing a ban on export of condensate oil and liquefied natural gas to North Korea and prohibiting import of textiles.[9] This was to implement the UN Security Council Resolution 2375 and states that all exports of condensate oil and liquefied natural gas shall be prohibited starting September 23. An exception was made for crude oil. In addition, the enforcement capped exports of petroleum products to the North Korea from October 1 to December 31, 2017, to 500,000 barrels (60,000 metric tons). It also prohibited import of all North Korean textile products.[10]

On September 28, China announced any Sino-foreign ventures established in the territory of China by an entity or individual from North Korea shall be shut down within 120 days. This announcement, made jointly by the MOFCOM and the State Administration for Industry & Commerce in an implementation of UN Security Council Resolution 2375, stipulates that any Sino-foreign joint ventures and cooperative joint ventures, as well as foreign-owned enterprises shall be shut down by January 9, 2018.

In summary, Chinese sanctions on the North Korea progressed with a ban on coal in early 2017; followed by a ban in August on the import of North Korean coal, iron and marine products; followed by a ban on the establishment of enterprises and expansion of investment. In September, China placed restrictions on exports to North Korea of liquefied natural gas and on imports of North Korean textiles, along with an order to shut down North Korean-established

8. Yonhap News (26. August, 2017).
9. Yonhap News (23. September, 2017).
10. The ban on imports of North Korean textile products will take effect on September 22. Imports for which transactions have been completed previously must be completed by December 10.

entities within 120 days. As a result, prohibition on coal export took effect starting in February, marine products in August, and petroleum products and textile imports in September.

## B. Changes in Food and Oil Prices

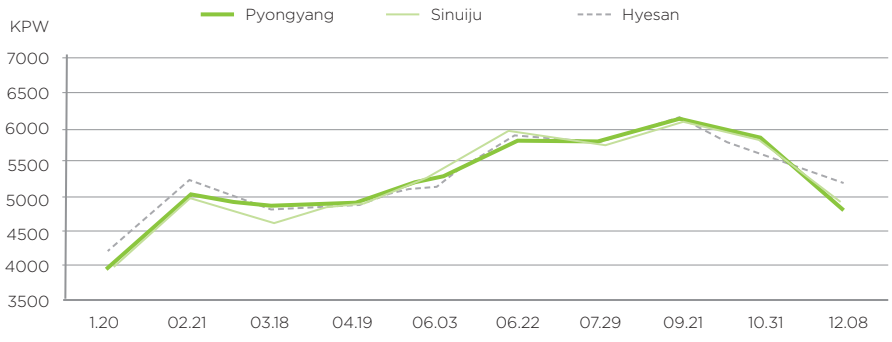
### 1) Changes in Food Prices and USD Exchange Rates

The price of rice has been key price index managed by the North Korean authorities. So, it is particularly important to the government to maintain the stability of rice prices in the marketplace. A look at 2017 data, excluding seasonal factors as shown below in the graph, indicates a slight upward trend, but there is no meaningful change as the commodity has maintained a price range of between 5,000 and 6,000 won (KPW).[11] In particular, considering that the sanctions by the international community, including China, have accumulated throughout the year and only gotten stronger by the end of 2017, it is difficult to conclude that rice prices have been affected by such sanctions on the North Korean market.

A similar interpretation is possible in the trend of the U.S. dollar exchange rate in North Korea, in that the dollar has maintained a relatively stable range between KPW 8,000 and KPW 8,100. This stabilization may mean that North Korea's foreign reserve deficit has not reached a serious level, or that the generalization of foreign exchange transactions there—that is, dollarization—has progressed considerably over time. Otherwise, it can be said that the economic sanctions have not yet had a significant impact on the foreign exchange market of the North Korea.

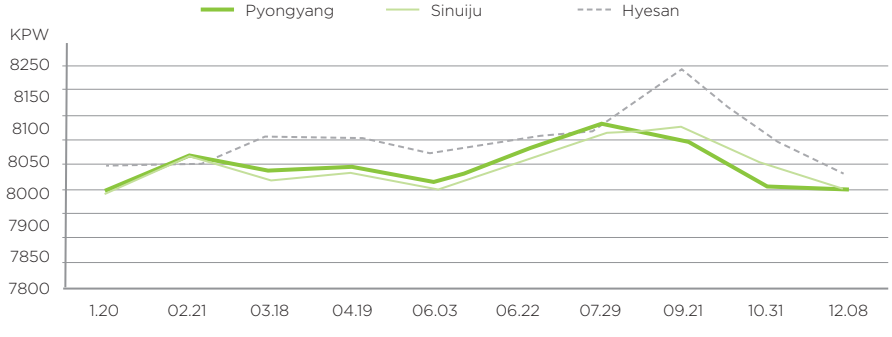
11. Lim, Kang-Taeg (2017), the rice prices observed here are weekly averages, and the dates shown in the coordinates are observation start dates.

**[Figure 5-1] Rice Price Trends in North Korea in 2017**




*Source:* DailyNK, North Marketplace Trends (www.dailynk.com, Last access date: 11. February, 2018).

**[Figure 5-2] Exchange Rate Trends in 2017**




*Source:* DailyNK, North Marketplace Trends(www.dailynk.com, Last access date: 11. February, 2018).

### 2) Changes in Oil Prices

A product in the North Korean market that has seen a particular rise in price is petroleum product. It is notable that petroleum prices began to soar in April, well before oil-related sanctions from other countries took effect in September. As of May 10, the average market price of oil in the Yanggang-do and North Hamgyeong provinces is KPW 18,000 per liter of gasoline and KPW 12,000 per

liter of diesel.[12]

This is triple the amount as of March 10, and the reason what has caused this increase is attracted attention. Various explanations have suggested, but no concrete evidence has been found. One strong argument is the authorities took measures in preparation for oil sanctions to pre-emptively reduce consumption and to stockpile supply, leading to a steep increase in prices.

Oil prices in North Korea have been steadily on the rise since May, while more recently exhibiting sharp rises and declines since the implementation of international sanctions on oil supply in September. In particular, following restrictions of oil exports, oil prices peaked at the end of October but fell subsequently, until December.[13]

**<Table 5-1> Changes of Oil Prices in North Korea in 2017**

| Date of Observation | Gasoline | Diesel | Location |
|---|---|---|---|
| End of Feb, 2017 | KPW 6,000/1L | - | North Hamgyeong Province |
| 10. May, 2017 | KPW 18,000/1L | KPW 12,000/1L | Yanggang/North Hamgyeong Province |
| 31. May, 2017. | KPW 16,000/1kg (KPW 22,000/1L) | KPW 9,000-10,000/1kg | - |
| 18. Sept, 2017 | KPW 18,750/1kg | KPW 12,500/1kg | - |
| 6. Oct, 2017 | KPW 17,000/1kg | KPW 10,000/1kg | - |
| 25. Oct, 2017 | KPW 21,780/1kg | KPW 15,700/1kg | - |
| 16. Nov, 2017 | KPW 18,450/1kg | KPW 9,840/1kg | Pyongyang/Yanggang |
| 1. Dec, 2017 | KPW 15,990/1kg | KPW 6,765/1kg | Yanggang |
| Early Jan, 2018 | KPW 26,000/1kg | KPW 17,000/1kg | Yanggang-do/North Hamgyeong Province |

*Source:* RFA (18. November, 2017), other articles have been written, including on the following dates: 6. March, 13. May, 3. June, 2. December, 2017; 9. January, 2018.

12. RFA (13. May, 2017), in Pyongyang, gasoline prices have surged since April, and there have been cases in which gas stations restrict sales or halt operations.
13. However, it appears to be showing a sharp rise again in early 2018.

## C. Relationship Between Economic Sanctions and Market Prices in North Korea

In order to understand the impact of economic sanctions on market prices, it is imperative to identify the specific characteristics of these sanctions against North Korea. This is because the impact is expected to be more sensitive for imports than for exports in market,[14] and the market is expected to respond differently depending on how the sanctioned items will affect the market in the near and long term. In this regard, it should be noted that exports of the country's industrial machinery, transportation vehicles and metals, as well as imports of food, agricultural products, machinery and wood products, have been prohibited in accordance with the adoption of Resolution 2397 (Dec. 22, 2017). This is notable because these sanctions serve to limit the production and supply capacity of commodities traded in the North Korean market and to weaken the purchasing power of consumers, ultimately hurting the expansion structure of the country's economy, which has been established through these markets over the past 20 years. Therefore, it is highly probably that the international sanctions will affect the North Korean market in earnest from 2018 on. In order to overcome these anticipated difficulties, North Korean authorities are emphasizing a system of "self-reliance" in an effort to sustain itself with independent provisions of raw materials, fuel and equipment necessary for production.

Sanctions having to do with coal, seafood and textiles—North Korea's major sources of foreign currencies—are expected to affect the market differently. This is because each of these items has a unique impact on market supply and consumer purchasing power. First, sanctions on coal exports are projected to have no direct impact on the market because such exports are controlled by the planning sector or by authorities such as the party or the military. On the other hand, the indirect impact of the sanctions on coal, which makes up a significant share of total export amount and size, is not expected to be small, considering the fact that many people work in the field and use their income from this work to purchase necessary goods in the market. Also, if the export of coal is stopped

14. In particular, certain goods that are difficult to replace, such as gasoline and diesel, are highly likely to impact market prices immediately.

immediately, some of the products can be sold within the domestic market, which could lead to a decrease in the commodity's price. However, in the mid- to long-term, production will decline due to a decrease in revenues, and this could likely hurt the livelihood of the country's citizens working in this sector. In other words, the export ban on coal may have little or no effect, or even a positive effect, on the market in the short term, but a longer-term view would indicate a likely decrease in production, resulting in a decline in market liquidity and potentially serving as a factor that leads to a market downturn.

The ban on textile exports is likely to have a different impact on the market from that of the ban on coal exports. Importantly, most of the textile production in the country is made in the form of processing, meaning a discontinuation of overseas orders is likely to make production itself challenging. Production aimed at domestic demand is indeed possible, but the demand is limited. Therefore, the ban on textile exports is highly likely to threaten the livelihood of many workers in the field and act as a factor accelerating an economic downturn.

The ban on marine products exports is expected to have a similar effect on the market as would the ban on coal exports. It should be noted, however, that marine products are more likely to convert into market supply, since inventory control tends to be more difficult and ultimately lower market prices. But if a decrease in market price leads to lower profitability, production of such goods is likely to slow down over the medium to long term.

In sum, in order to observe the effects of this series of recent sanctions on the North Korean economy, it is necessary to approach each industry and product with careful consideration of the characteristics of the sanctioned goods, and it is important to pay attention to both short- and long-term implications. In this regard, it is inappropriate to conclude that the sanctions of the international community have not had much of an impact based on the observation of the price of one commodity over one year—rice prices in 2017—and it is basically premature to analyze the sanctions' effects on the market.

## 3. Changes in the North Korean Market in 2017

### A. The Emergence of New Market Activities

New industries are emerging in North Korean marketplaces as North Korea's marketization continues to develop. As state-owned enterprises are actively engaging in the market, authorities in 2017 have brought various public services to realization at market-price levels in an effort to supplement their finances.

#### 1) Automobile-Related Commercial Activity Soaring

There has been a rapid increase in driving, resulting in new business activities, and what were once unusual phenomena have become generalized, reflecting a market system that is changing and expanding. For instance, gas stations and car-wash have been on the rise. Gas stations have been growing quickly along major thoroughfares of large cities such as Pyongyang. Car-wash services also have been noted as a promising new business.[15]

According to an outside observer, at least 10 car-washes were observed within Pyongyang in 2017.[16] Car-wash services began to emerge in early 2010. It is said that there are machine-based car-washes equipped with state-of-the-art facilities and operated by a company earning foreign money, and hand-wash car-washes that operate with professional car-washers. The hand-wash services in particular have grown fast along with speculation that profit margins are high. It's been said that these operations have recruited attractive 20-something females and improving the quality of their service in line with growing competition.[17]

15. It is reported that recently the restrictions on oil imports have led to gas stations halting operations.
16. Yonhap News (25. August, 2017).
17. DailyNK (18. September, 2015).

**<Figure 5-3> Images of Vehicles on Pyongyang Streets and Carwashes**


*Source:* Professor Rudiger Frank; Yonhap News (25. August, 2017)

The increasing number of places that charge parking fees also is a new phenomenon surfaced in recent years. This concept of a parking fee started with trucks operating in coal exports when they would stop at restaurants or bath houses.[18] The drivers when making a stop would pay for parking agents in order to prevent theft of vehicle parts, and this cost would be in the form of a "parking fee." Today, authorities collect parking fees in major cities such as Pyongyang, particularly at places such as stations, restaurants and roads close to residential areas. In the past, such fees would be directly collected by the places of business, like a restaurant, but today a committee would hire a manager and collect a fee of about KPW 100 per hour.[19]

18. DailyNK (9. June, 2014).
19. DailyNK (31. October, 2017).

### 2) Increase in Advertising and PR Activities to Attract Consumer Interest

As the quality of life for North Koreans improves in line with the country's growing economy, competition for securing consumers is intensifying among providers of goods and services. A result is an increase in aggressive tactics including advertising and public-relations activities aimed at consumer preferences.

An example is the emergence of 'chasers,' who fetch customers for taxis. Recently, as demand for private taxis has increased in large cities, taxi drivers would hire workers, paying them on a daily basis, to attract customers.[20] The increase of the taxi business was made possible by the increase in the number of merchants for whom time is money. State enterprises also have bought taxis and compete with private operators, which only heightened the competition and led to measures such as employment of these 'chasers.'

Additionally, various advertising and marketing activities have become more prominent in line with growing competition in the market. For instance, female merchants might dress up and promote their products in the marketplace, or fashion retailers might utilize young and attractive females to promote their products.[21]

## B. Continued Expansion of Marketplaces

According to Curtis Melvin, a researcher at the U.S.-Korea Institute at Johns Hopkins University, the number of official markets in North Korea confirmed by satellite images as of February 2018 is 482, up from 436 in March 2017 and 468 in August, indicating a steady rise over the past year totaling a growth of 46.[22]

20. DailyNK (1. November, 2017).
21. DailyNK (1. September, 2016).
22. RFA (3. February, 2018); RFA (10. August, 2017).

A growth in number is not all; there have been accounts of expansions and improvements of existing marketplace in order to enhance the market environment.

**<Figure 5-4> A Satellite Image of Newly Expanded Official Market in Gwanhun-dong, Kaesong-si**


*Source:* RFA (3. February, 2018).

### C. North Korean People's Response to Sanctions

How do the North Korean living based on market view the international sanctions? The North Korean marketplace can be divided into three categories from the perspective of a participant in market: authorities, businesses and the general population. From the standpoint of the authorities seeking to supplement the scarcity of planning sector by providing an institutional environment for market activities, the economic pressures imposed by the international sanctions will most directly be perceived. The biggest issue is that would make it difficult to achieve the current economic objectives. From the perspective of North

Korean businesses, which would closely experience the effects of the sanctions on trade and production, they would concentrate on finding ways to survive and avoid the damages of the sanctions. In this process, these businesses are likely to try to maximize the marketplaces to their benefit. And to this end, they would likely utilize the autonomous management rights granted by the authorities in recent years.

On the other hand, the perspective of the general citizens estimated to be slightly different from the abovementioned categories. This is because these sanctions do not directly touch the civilian sector and products that could not be exported due to the sanctions will flow into the domestic market at lower prices. For instance, when the export of marine products and coal were banned, those products were funneled into the domestic market, and the price of coal was reduced to half of its cost last year.[23]As such, it seems the sanctions have had a relatively small impact on the general public. In fact, with an increase in supply and a drop in prices, consumers are likely to have less concern about these sanctions than might the authorities and businesses. More importantly, food prices had remained relatively stable throughout 2017. But it seems that prices are overall on the rise moving toward the end of the year, and concerns have been raised on the challenges of market activity, especially around the border area. The observation is that the general public, too, is beginning to see the effects of the international sanctions hitting home.

Another noteworthy phenomenon is a growing resistance and negative feelings brewing among the people of North Korea against China starting in the second half of 2017, as China began to more actively participate in these sanctions against North Korea.[24] It is said that the increase in such sentiments is in part facilitated by the North Korean government.[25] The authorities have been publicizing that the damage to the country's economy due to the sanctions is "because of China's betrayal" and holding special lectures that criticize China.

23. RFA (December, 2017); RFA (19. December, 2017).
24. RFA (9. October, 2017).
25. RFA (4. January, 2018); RFA (22. January, 2018).

## 4. 2018 North Korean Market Outlook

### A. Expected Response from North Korean Market

Assuming the current sanctions on North Korea will be maintained throughout 2018,this year's international sanctions are anticipated to have a significant impact on the entire North Korean economy. Most importantly, trade with China, which has accounted for more than 90% of the country's foreign economic relations, is cut off, and it is expected that only the goods corresponding to the livelihood of the people will be cleared to trade. Therefore, the implications of sanctions on the North Korean economy going forward is likely to be quite different from what they have been so far.

First, most of the major foreign-currency imports would be blocked, and imports of raw material, except crude oil, and equipment are banned, which would cause the North Korean economy to gradually become depleted. Certainly, the authorities could turn to stockpiles to resolve issues for the time being, but this isn't likely to hold the economy for long. As a result, production and supply in various industries are expected to decline gradually, worsening the shortage of materials available to the country. This phenomenon will also affect the marketplaces, which is likely to see a recession as a result of a decline in supply and weakness in purchasing power.

Prices of goods are expected to be impacted in varying degrees depending on the nature of the product; prices will fall if a decrease in demand is greater than the decrease in supply, and vice versa. As such, it is difficult to predict now whether prices will rise or fall, but overall, the decrease in production is expected to outpace the decrease in demand, leading to a potential uptrend in market prices.

In sum, the North Korean economy in 2018 is likely to experience a rise in prices, mainly due to recessionary trends and specific items that could react particularly sensitively to sanctions. This will be most burdensome to the general public, who do not have much in the way of protection against such economic

turns, with potential for those in poverty getting hurt the most.

### B. Market Policy Outlook by North Korean Government

North Korea, through a 2018 New Year's address by Jong-un Kim, presented the core objective of its economic policy as "strengthening the self-reliance and independence of the people's economy and improving the people's lives." The emphasis here on "self-reliance and independence" can be understood to mean that the country aims to build an independent economic structure capable of withstanding any challenges rising from international sanctions. It is expected that domestic production and conservation of goods will continue to be stressed.

The authorities are likely to put price stabilization high on their list of priorities in market policy. They could encourage normalization of light industry and greater production, as well as emphasize an increase in the food sector. In addition, they are expected to control price increases of major commodities such as rice by using administrative power.[26] But in the case the gap between "actual market value" and "values controlled by the government," it may be difficult to manage prices consistently.

The response of state enterprises to sanctions also could affect the market. Trading companies that are faced with closures of their existing partnerships will likely shift their focus to imports of items that are not sanctioned in order to help the company's earnings. For example, they could try to import agricultural products and household good—which are considered goods for the livelihood of the public—from China and sell them in the domestic market. This sort of activity is likely to be received well by the government since it could contribute positively to the stabilization of market prices. The problem, however, is that the livelihood of people who have been supplying these products to the market, especially those who depend on small plots of paddy fields, will likely be threatened.[27]

26. RFA (11. December, 2017).
27. RFA (14. November, 2017).

In sum, North Korean authorities are likely to try to minimize the impact of the enforced sanctions on the economy and to prevent the people from being too anxious. This is because public concern and economic difficulties have the potential to lead to complaints against the Kim regime.

### C. Increase in Share of Marketplaces in North Korea

It seems North Korea will not be able to avoid an overall downturn in its economy in 2018 in light of the international sanctions. The downturn is likely to negatively affect the country's marketplaces. However, throughout this process, it is expected that the country's efforts to utilize the market to solve its overall economy will strengthen, and that the role of the marketplaces will expand. In other words, although marketplaces will experience a slowdown, its relative share of the overall economy is expected to increase.

As the state sector's utilization of the markets increases, there is a possibility that the marketization in the country will be further promoted in combination with the institutional strengthening of the autonomy seen in recent years of enterprises and cooperative farms. The expansion of autonomy in the management of enterprises, which is being institutionalized, has broad coverage, including production items, transaction prices and foreign trade. Since this system is still in the early stages of implementation, North Korean businesses aren't yet able to exercise their rights to the fullest. In order to withstand the effects of sanctions, these companies need to exercise their management independence more actively, and the need for marketplace utilization will increase in this process, thereby leading to further promotion of the country's marketization.

Experts are also raising the possibility that North Korea may be facing the second "arduous march,' or the 'march of suffering.' This was a period of severe economic hardship in the late 1990s during which hundreds of thousands of North Koreans were estimated to have died from starvation. It was during this time the people themselves built a marketplace to help revive their livelihood. What was thus established has constantly grown and evolved into the current

market system. Today's sanctions on North Korea are likely to bring the country into another economic trial, but this may even be an opportunity for the country's marketplace to take yet another step in growth and development. To be clear, in order for this prospect to be realized, it is necessary for the government to support the notion that these changes are not a threat to the future of the North Korean regime.

## 5. Concluding Remarks

The international sanctions against North Korea in 2017 was estimated to be severe enough to put the North Korean economy under substantial pressure. North Korea's marketplace has remained stable throughout 2017, but the situation is expected to change in 2018.

The main questions in our outlook into the North Korean market in 2018 are: "How will the effects of sanctions play out in the future?" and, through this, "Will the North Korean market change?" We need to distinguish the three major actors in the marketplace: the authorities, enterprises and cooperative farms, and the general public. The nature and degree of the impacts of the sanctions experienced by each of the three categories will vary, which means their responses also will vary greatly. In addition, these responses will likely come together to appear as an integrated response by the North Korean market as a whole.

It is important to note that there are significant differences in specific indicators, such as prices, used to gauge market responses. As such, it is necessary to distinguish between goods that are directly related to current sanctions and those that are only indirectly related. Different products will respond differently depending on the nature of the target items. In the case of the price of rice, which is a commonly used indicator, it certainly serves as an important price index referred to by the government, but for this reason it may also become more intentionally managed by the authorities. Therefore, it will be necessary to identify market prices of goods that are on the import-ban list—as well as the prices of products derived from those goods and of their substitutes—and to analyze them in a comprehensive and systematical manner.

Moreover, we should pay attention to the lives of the general public who will suffer the most when the market economy turns, pressured by the sanctions. North Koreans who have made their living on working at marketplaces are likely to be low-income earners and likely to be hurt by an economic slowdown. Therefore, measures should be taken to minimize the negative impact reaching the general public. It will be necessary to find means to support the marginalized in a humanitarian way, without undermining the framework of the sanctions imposed on North Korea by the UN Security Council.

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# CHAPTER 6

## The Trend of Agriculture in North Korea in 2017 and Short-Term Outlook

# CHAPTER 6

# The Trend of Agriculture in North Korea in 2017 and Short-Term Outlook

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## 1. Preface

As in previous years, North Korean leader Kim Jong-un emphasized the importance of agricultural policy in his new year's address in 2018. Pyongyang's agricultural policy, as illustrated in the New Year's address, was aimed at achieving significant growth in the agricultural and fisheries sectors, embracing high-quality breeds, high-yielding farming methods and efficient agricultural machinery, accomplishing the grain production target through scientific and technological approaches, and increasing the output of livestock products, fruits, greenhouse vegetables and mushrooms. Although North Korea announces various key points of its agricultural policy every year in pursuit of boosting agricultural output, the country has yet to overcome its food shortage.

In 2017, North Korea failed to achieve its food production target. The Rural Development Administration (RDA)[1] in South Korea assumed that the slight drop in grain output in North Korea in 2017 was attributed to unfavorable

1. As of late February 2018, international organizations have not conducted any research or estimation of food production in North Korea in 2017. This report uses statistics estimated by the RDA.

weather conditions. While the decrease in 2017 does not necessarily suggest that food supply will continue to decline in 2018, it is at least difficult to expect better supply of food and agricultural products in North Korea in 2018.

Meanwhile, the key factors in short-term forecasting for the agricultural industry in North Korea include economic sanctions against North Korea and their impact. Since agricultural production and food supply are associated with humanitarian issues unlike other sectors, there will be no direct sanction imposed on the agricultural industry, although the country may see an indirect impact. If a decrease in overall exports leads to a foreign currency shortage, or if restrictions are placed on overseas transactions and shipping, the country may find it challenging to import agricultural products and resources. Moreover, humanitarian aid from the international society may decline by a certain extent.

This report examines the recent agricultural trend across North Korea from two aspects: i) the overall drop in food production in North Korea in 2017, and ii) the impact of international sanctions on North Korea's agricultural sector, as shown in the relevant data.

## 2. Recent Supply of Food and Outlook

### A. Grain Production in North Korea in 2017

The RDA in South Korea estimates and releases statistics on the grain output in North Korea at the end of each year by comprehensively analyzing various conditions for agricultural production.[2] The estimated grain output in 2017 was announced on December 21, and it can be summarized as follows.

North Korea's grain output in 2017 was estimated to reach 4.71 million tons based on the figure of milled grains, a 2-percent decrease from 4.81 million

2. Various conditions include weather, blight, demand and supply of fertilizers, harvest-related data provided by domestic and overseas research institutes, analyses of remote sensing using satellite imagery, etc. (RDA, 21. December, 2017).

tons in 2016. With regard to the most important grains in the country, 2.19 million tons of rice and 1.67 million tons of corns were produced, while 0.85 million tons of roots and tubers, wheat and barley, pulses and other cereals were produced (Table 6-1).

**<Table 6-1> Grain Output in North Korea in 2017**

| Category | | Total | Rice | Corn | Roots and tubers | Wheat and barley | Pulses | Other Cereals |
|---|---|---|---|---|---|---|---|---|
| Cultivation area (1,000 ha) | | 1,869 | 571 | 711 | 343 | 85 | 131 | 28 |
| Volume (kg/10a) | | - | 384 | 246 | 160 | 187 | 122 | 70 |
| Output in 2017 (10,000 tons) (A) | | 471 | 219 | 167 | 53 | 15 | 15 | 2 |
| Output in 2016 (10,000 tons) (B). | | 481 | 222 | 170 | 55 | 17 | 15 | 2 |
| Compared to 2016 | Year-on-year change (10,000 tons) (A-B) | △10 | △3 | △3 | △2 | △2 | - | - |
| | Ratio (%) | △2 | △1 | △2 | △4 | △12 | - | - |

*Source:* RDA (21. December, 2017).

Among a range of indicators examined to estimate the actual output of food crops, the RDA report highlighted weather conditions in explaining the changes in the output (RDA, 21. December, 2017).

Rice output dropped by 1 percent from 2016. Weather conditions were generally favourable during the rice cultivation period in 2016, but the country experienced a drought during the rice planting period in spring 2017, which caused a slight decrease in the output.

Corn output also declined by 2 percent, mainly due to the insufficient rainfall during the key growth period from May to September.

The output of roots and tubers (mostly potatoes) dropped by 4 percent, which is assumed to be attributed to a drought during the spring cultivation period and excessive precipitation during the summer cultivation period.

The output of wheat and barley dropped sharply by 12 percent, although the category occupies a small share in the total grain production and did not make a significant impact. The drop in the output of wheat and barley is assumed to be attributable to the continued drought and high temperatures during the key growth period.

Overall, the decrease in the grain output appears to have resulted from the shortage of precipitation during the key growth period for major crops (rice, corn) from May to September.

### B. Outlook on the Demand and Supply of Food

In North Korea, the market price of major grains in the second half of 2017 was on a gradual increase, compared to the same period in 2016. It can be surmised that the reduced grain output in the country was immediately reflected in the market price. However, it may be imprudent to assume that a drop in production directly leads to a decrease in supply. The reported 2-percent drop is only an estimated figure, which is not a sufficiently major volume to be able to affect the demand and supply of food in 2018. Such a decrease can be compensated with the increase in imports or by other methods that are not included in official statistics. There will be no substantial difference in the demand and supply of food in North Korea in 2018 compared to previous years, despite the food shortage, in the absence of other negative factors.

The key aspect is that grain production in North Korea has remained stagnant in the recent five years.[3] This implies that the Farmland Responsibility System, which was introduced in 2012 to motivate farmers in collective farms

3. The annual grain output in North Korea in 2013 and 2014 was 4.8 million tons (RDA, 23. December, 2014), and the figure in 2016 and 2017 remained almost unchanged at less than 4.8 million tons (RDA, 21. December, 2017).

across the country, has had almost no discernible effect as a reform measure. This adds to the dismal prospect of the growth of agricultural production. This trend can be explored in depth by analyzing the limitations of the country's agricultural reform measure, which has been in effect since 2012.

The additional incentive system for collective farms, reportedly introduced in the agricultural sector of North Korea in 2012, has been described in a host of documents and media coverage. This implies that the incentive system was officially adopted systemically, although it seems unlikely to be applied practically for the following reason. North Korea requires over 6 million tons of grains every year to allow its entire population to consume grains to the level satisfying or nearly satisfying standard food consumption (260 kg per capita). Considering that the country annually produces less than 5 million tons of grains, resulting in insufficient supply, it will be difficult to accept a policy measure under which only certain farmers are eligible to benefit from incentives.

In practice, only part of the yield that exceeds the target is provided to farmers in collective farms in North Korea. In addition, when farms produce a surplus exceeding the standard food consumption level (260 kg per capita), it is possible for collective farms to apply pressure on farmers to agree to provide the surplus for government purchase as surplus grains or unconsumed grains in accordance with the grain monopoly policy.

In short, even if the incentive as a reform measure can be partially implemented in the yield distribution process in collective farms, farmers may be forced under social pressure to return the additionally-distributed yield to the government in consideration of the absolute food shortage, and therefore, the effect of differentiated distribution may not lead to an increase in productivity. Since the 1990s, the agricultural infrastructure in North Korea has not been sufficiently improved, while the country remains unable to overcome the issue of the insufficient supply of essential agricultural resources. North Korea has clearly encountered limitations in increasing its agricultural productivity by improving the relevant institutions alone.

Since 2012, the growth rate of agricultural production, particularly grain production, has slowed down significantly in North Korea. In the short term, it is difficult to expect a marked increase in agricultural production and a subsequent upturn in the demand and supply of food. The country cannot expect a favourable future in agriculture in the medium- and long-term either, unless its agricultural reform is backed by capital provided by the international community.

## 3. Impact of Sanctions against North Korean Agriculture and Outlook

### A. Sanctions against North Korea and North Korean Agriculture

The sanctions placed by the international community against North Korea in response to the development of nuclear weapons and long-distance missile tests entered into substantive effect with United Nations Security Council Resolution 2270 in 2016. The sanctions have since been tightened, and their impact has gradually become reflected in North Korea's economy and international trade. In order to verify the effect of the sanctions on North Korean agriculture, the appropriate indicators must be selected and utilized. The indicators employed in this report include changes in the volume of imports of agricultural products and resources from China, changes in the market price of major agri-food products, and changes in support from the international community to North Korea.[4] The indicators are comprised as follows.

The volume of imports from China included grains, fruits, vegetables, fat and oil, cigarettes, and other agri-food commodities. The imports of agricultural resources from China were estimated based on imports of chemical fertilizers, including nitrogen, phosphorous, potash, and urea. The price of rice was used

4. Several points should be considered for the selection of measurement indicators to estimate the impact of sanctions on the agricultural sector: i) Quarterly or monthly data precede annual data for the short-term analysis; ii) even in quarterly and monthly data, seasonal characteristics in farming must be considered; iii) both the monetary value and volume data of international trade should be considered, but such quantitative data face limitations, since data for each commodity is more useful.

as the representative figure for the market price of major agri-food products. The data annually released by the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) were utilized for the indicator of support from the international community to North Korea.

The UN sanctions against North Korea, as determined by Resolution 2270, were officially adopted in March 2016. Changes in various indicators around that time may explain the impact of the sanctions on North Korean agriculture. This report focuses on the changes in indicators before and after the imposition of five UN sanctions from Resolution 2270 in March 2016 to 2375 in September 2017 to illustrate the effects of the economic sanctions on North Korean agriculture.

If the sanctions of the international community against North Korea are tightened further, North Korean imports are expected to drop in various forms (Box 6-1 and 6-2), while the market price of commodities within the country will rise. If indiscriminate sanctions are imposed by the international community, their support for North Korea will also decrease.

**[BOX 6-1] Impact of Sanctions on the Import of Agricultural Products and Chemical Fertilizers**

- Tightened sanctions ⇒ Decrease in North Korean exports of commodities ⇒ Shortage of foreign currencies ⇒ Decrease in the monetary value of imports
- Tightened sanctions ⇒ Decrease in North Korean exports of workforce ⇒ Shortage of foreign currencies ⇒ Decrease in the monetary value of imports
- Tightened sanctions ⇒ Downturn in North Korea's international trade ⇒ Shortage of foreign currencies ⇒ Decrease in the monetary value of imports
- Tightened sanctions ⇒ Downturn in North Korea's international transport activities ⇒ Setback in import ⇒ Decrease in the monetary value of imports

**[BOX 6-2] Impact of Sanctions on Changes in the Market Price of Rice in North Korea**

- Tightened sanctions ⇒ Decrease in rice imports ⇒ Decrease in rice supply ⇒ Increase in rice price
- Tightened sanctions ⇒ Decrease in the import and supply of agricultural resources ⇒ Decrease in rice production ⇒ Increase in rice price

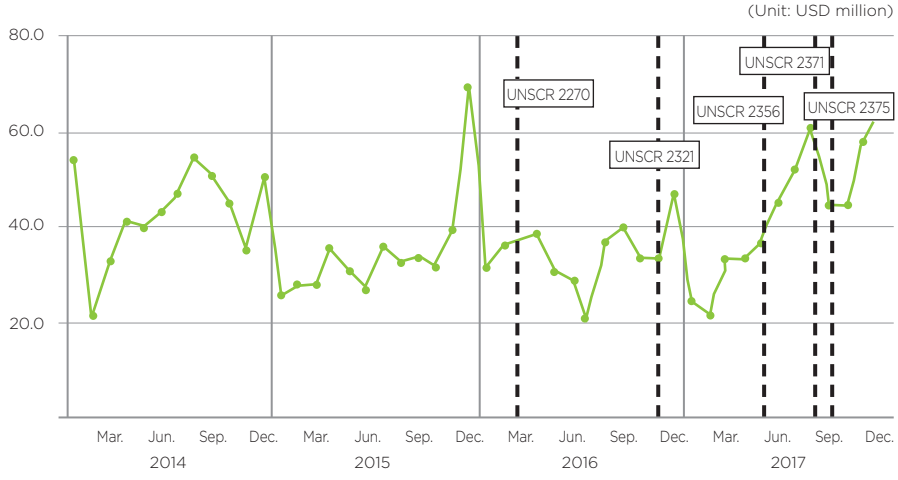
## B. Impact of Sanctions

### 1) Changes in Agricultural Imports

North Korea has seen significant monthly fluctuations in the total monetary value of agricultural imports since 2014, but there has been no major difference in the overall annual trend (Figure 6-1). The amount declined in 2015 and 2016 compared to 2014, but has faced a steady rise from 2017. Despite the implementation of the aforementioned five UN resolutions in 2016 and 2017, the sanctions have shown only a modest impact in the short term. The amount of imports decreased immediately after the implementation of Resolutions 2270, 2321 and 2371, but rose again after Resolutions 2356 and 2375.

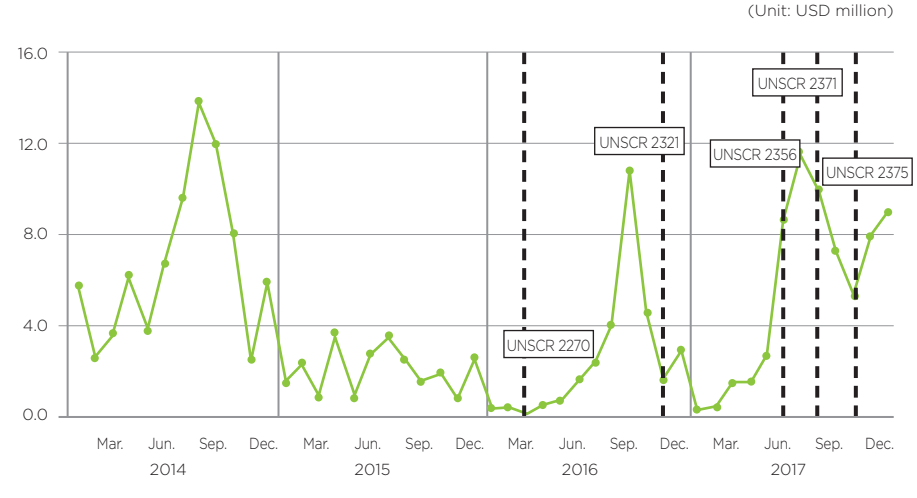
A similar trend was found in the amount of food imports from China (Figure6- 2). The figure dropped in 2015 and 2016, but rose again in 2017. The amount of food imports increased, even in the short-term period after the implementation of the UN resolutions. Given such changes in the indicators, the sanctions against North Korea do not seem to have affected agricultural imports in North Korea in the short term.

## [Figure 6-1] Sanctions against North Korea and Changes in North Korean Imports of Chinese Farm Products




*Source:* Korea International Trade Association, Statistical Data of China, http://stat.kita.net/stat/istat/CtsMain.screen, Last access date: 12. February, 2018.

## [Figure 6-2] Sanctions against North Korea and Changes in North Korean Imports of Chinese Food Products



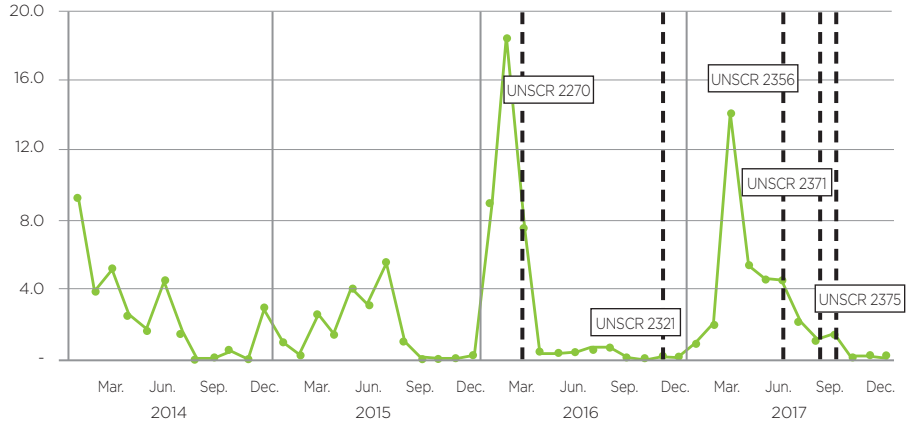

*Note:* Food imports include rice, corn, soybean, barley, flour, etc.
*Source:* Korea International Trade Association, Statistical Data of China, http://stat.kita.net/stat/istat/CtsMain.screen, Last access date: 12. February, 2018.

### 2) Changes in Fertilizer Imports

The amount of fertilizer imports in North Korea have not changed significantly after the implementation of the UN sanctions(Figure6- 3). The only notable changes in 2016-2017 compared to 2014-2015 are linked to strong seasonal characteristics in fertilizer imports, which are assumed to be associated with the seasonality of agricultural production and the conditions for production and supply of fertilizers in the country. In the short term, the UN sanctions had no effect on the import of fertilizers.

**[Figure 6-3] Changes in the Amount of Fertilizer Imports from China to North Korea**

(Unit: USD million)



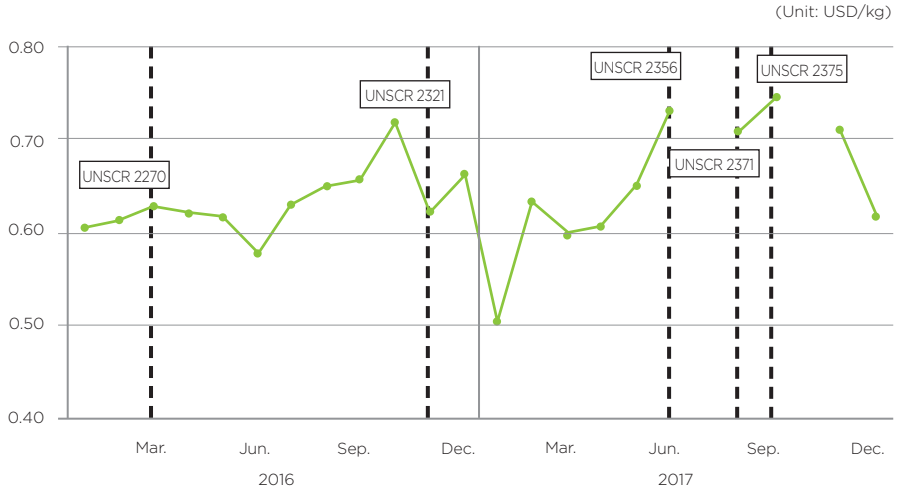

*Note:* Fertilizers include nitrogen, phosphorous, potash, urea, etc.
*Source:* Korea International Trade Association, Statistical Data of China, http://stat.kita.net/stat/istat/CtsMain.screen, Last access date: 12. February, 2018.

### 3) Changes in the Market Price of Rice

In terms of the market price of rice, seasonal changes were observed as in previous years, while no particular change in the market price appears to have been triggered by the UN sanctions (Figure 6-4). The price was higher in mid-2017 compared to 2016, which seemed to result from the decreased supply of

grains harvested in summer. Considering that the market price of major food products rather declined after the sanctions, it appears that the sanctions against North Korea did not affect the supply of agri-food in the market.

**[Figure 6-4] Changes in Rice Price in the North Korean Market**




*Note:* Rice price was converted to dollars based on monthly market exchange rates in the North Korean Market.
*Source:* Daily NK, North Korea's Market Trend, http://www.dailynk.com/korean/market.php, Last access date: 12. January, 2018.

### 4) Changes in Support from International Community

Support from the international community to North Korea was on a steady decline until 2014, reaching USD 33 million a year, but the amount is rising again. Despite the implementation of substantive sanctions against the country in 2016 and 2017, the amount of international support for North Korea rose to USD 46 million in 2016 and USD 55 million in 2017. Such an increase indicates that the international community continues to extend efforts to counterbalance the prolonged shortage of food in North Korea. Indeed, humanitarian aid is not subject to any of the UN sanctions, and the international aid to North Korea has not shrank, even under such stringent sanctions (Table 6-2).

**<Table 6-2> International Aid to North Korea**

(Unit: USD 10,000)

| Year | Amount (pledged) | Amount of aid by country and organization (pledged) |
|---|---|---|
| 2013 | 6,280 | UN CERF 1,510, South Korea 1,208, Switzerland 1,057, Sweden 529, WFP 466, Russia 300, Norway 262, Germany 214, Australia 150, etc. |
| 2014 | 3,322 | South Korea 657, UN CERF 650, Switzerland 504, Sweden 489, Canada 360, Australia 219, Germany 156, France 104, etc. |
| 2015 | 3,544 | Switzerland 1,027, UN CERF 828, Sweden 419, South Korea 400, Australia 229, Norway 218, Canada 215, Germany 115, etc. |
| 2016 | 4,597 (219) | UN CERF 1,305, Switzerland 1,038, Germany 365, Sweden 318, Russia 300, Australia 219 (219), Canada 202, Europe Aid 173, etc. |
| 2017 | 5,538 (122) | WFP 2,243, UN CERF 1,235, Switzerland 502, Russia 300, Sweden 167 (110), Canada 149, U.S. 100, France 49 (11), etc. |

*Note:* Figures in brackets indicate the amount pledged to be provided.
*Source:* UNOCHA, Financial Tracking Database, https://fts.unocha.org, Last access date: 30. December, 2017.

## 4. Conclusion

The food production figures in North Korea in 2017 do not present a positive outlook for the demand and supply of food in 2018. Considering that the country's agricultural policy is designed to overcome food shortage issues by distributing the maximum available resources for food production, it is difficult to identify a positive prospect for the short-term supply of other agricultural products.

Given that agricultural reform has failed to boost agricultural production, the medium- and long-term outlook for the country's agricultural sector is not favourable either. The North Korean government has reportedly implemented reform measures to provide additional incentives for the agricultural production

sector since 2012, but the volume of food production remains on a slight decline as of 2017. This implies that the country has an inadequate material foundation for agricultural reform and immature conditions for expanding agricultural output.

Moreover, concerns have been raised that the international sanctions against North Korea will have a negative effect on agricultural production in the country. According to the comparative analysis of various indicators associated with the impact of sanctions, no clear impact has been observed in the agricultural sector, at least in the short term as of 2017. The monetary value of imports of agricultural and livestock products and fertilizers from China has also not dropped. The price of agri-food in the domestic market has remained stable in most cases or even decreased in some cases. In addition, North Korea continues to be provided with international aid even after the implementation of sanctions. Since 2016, the amount provided in international aid has slightly risen due to emergency relief projects for areas hit by disasters.

It must be noted that all of these analytical outcomes are based on short-term data. The effect of sanctions against North Korean agriculture may be more clearly identified later in the agricultural sector in indirect ways, or negative effects across the national economy may accumulate and manifest in the long term. Therefore, a wider range of data and materials must be studied in the future to re-examine the effect of the UN sanctions on North Korea.

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# CHAPTER 7

## North Korea's Defense Industry_ 2017 Trends and 2018 Outlook

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# North Korea's Defense Industry_ 2017 Trends and 2018 Outlook

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## 1. Introduction

According to a report issued by the BOK in 2017, North Korea's real gross domestic product (GDP) appears to have increased by 3.9% in 2016 from the previous year, which is the highest yearly growth since the 6.1% in 1999.[1]

This notable growth comes as a surprise given the ongoing sanctions against North Korea. It was the manufacturing sector that contributed a great deal to North Korea's GDP growth in 2016, especially the rise in the heavy and chemicals industry's production volume. That is, the 6.7% growth in the heavy and chemicals industry fully compensated for the 1.1% growth in the light industry, bringing an increase in the overall production.[2]

Based on this estimation of North Korea's economic growth, we suspect that North Korea's military industry advanced significantly in 2016 since much of North Korea's heavy and chemicals industry is connected to the country's

1. Joongang Il-bo (22. July, 2017).
2. Bank of Korea (July 2017).

military industry, producing weapons and equipment for the North Korean armed forces. Therefore, if the growth rate of the heavy and chemical industry reached 6.7% in 2016, that of North Korea's defense industry would have recorded a similar level of increase. North Korea's missile tests in 2016 support this reasoning, and it is likely that the development and production of various kinds of missiles in 2016 led to the expansion of the defense industry to expand.

North Korea's defense industry is expected to continue its growth in 2017, maintaining the trend from 2016, as the country actively conducted missile tests in 2017 as it did in 2016. North Korea surprised the world in 2017 by demonstrating its ability to develop nuclear and ballistic missiles through one nuclear test and numerous missile tests. On September 3, 2017, North Korea conducted its sixth nuclear test and showed the world its ability to develop hydrogen bomb-level nuclear warheads with almost 100-150kt yield, and on November 29, tested its Hwasong-15 ballistic missile, proving its potential to strike the U.S. mainland. The rapid advancement in North Korea's nuclear missile capability caused global concern and made clear that North Korea's aerospace and missile production technologies have progressed significantly to enable the production of long-range ballistic missiles.

North Korea's frequent missile tests in 2017 indicate that the country's defense industry has been active, especially concerning the production of missiles, at least from 2016 to 2017. Meanwhile, since missile tests require carriers and electronic measuring equipment, it is highly probable that the defense industry saw activities in the forward and backward linkages of missile production during the 2016-17 period.

The full-fledged economic sanctions against North Korea in 2017 would have considerably affected North Korea's industrial activities, including the defense industry. Of course, as North Korea places top priority on supplying raw materials and energy to the military economy and defense industry, they may have been less affected than other areas of the economy. However, as the sanctions gained strength, their impact on the military economy would have also increased. In particular, considering that the North Korean armed forces takes

up about 30% of the total oil demand in North Korea,[3] the 500,000 tons per year limit on the country's imports of refined oil imposed by the UN Security Council (UNSC) resolution on North Korea sanctions would have struck a heavy blow on the North Korean military's oil consumption.

At the same time, Kim Jong-un's declaration of North Korea's intention to complete its nuclear arms development, which was announced after the successful launch of Hwasong-15, raises questions about the country's future resource allocations. It is not easy to predict whether North Korea will concentrate its resources on the mass production and deployment of missiles in the future as declared or allocate its resources to the economic activities of ordinary people.

This paper will review the status of North Korea's defense industry in 2017 based on the conditions of the country's military economy, then outline its future prospects in 2018 with a focus on North Korea's policy choice mentioned above.

## 2. Sanctions against North Korea in 2017 and North Korea's Military Economy

### A. Sanctions against North Korea in 2017 and North Korea's Military Training

Training is essential for the armed forces, as it is through training that they prepare for potential threats and develop military strategies and tactics for combat. The North Korean military is not an exception to this requirement. Thus, it is not unusual for North Korea to emphasize the importance of training every now and then. In this sense, it is natural for North Korea, which argues that it faces escalating threats from the U.S., to emphasize the need for intensive training amid its nuclear weapons development.

The need for military training was clearly expressed in Kim Jong-un's 2017

3. Hippel et al. (2015).

New Year's Address. In this speech, Kim Jong-un emphasized the need for intensive military training: "In this year of the 85th anniversary of the founding of the Korean People's Army, we should raise the fierce flames of increasing our military capability. The People's Army should conduct the Party's political work in a proactive manner, so as to ensure that it pervaded with the ideology and intentions of the Party alone. It should designate this year as another year of training, another year of perfecting its combat preparedness and ensure that all its units of different arms, services and corps raise a hot wind of perfecting their combat preparedness in order to train all its officers and men as a-match-for-a-hundred combatants, tigers of Mt Paektu, who are capable of annihilating any aggressor force at a stroke."[4]

Yet, what happened in reality seems to have diverged from Kim Jong-un's pledge. Despite 2017 being the 85th anniversary of the founding of the People's Army, the amount of military training conducted in 2017 did not increase from the previous year. Rather, there are assessments that suggest a relative drop in the number and intensity of North Korea's military training in 2017. For example, the Wall Street Journal quoted U.S. officials and experts in its report that North Korea's military's winter training seemed to be smaller than usual.[5] The North Korean armed forces normally conduct winter training from December to March of the following year, but in 2017, their winter training started later than usual and was conducted on a smaller scale.

Meanwhile, Dong-A Ilbo reported that the ROK military seems to have recently obtained information on the smaller scale of the North Korean armed forces night training, quoting South Korean government officials.[6] According to this report, "Based on the information gained through telecommunications technology such as wiretapping, etc., it is being revealed that the North Korean armed forces reported its plan to reduce night time training, mentioning the energy situation, which points to the growing impact of limit on North Korea's gasoline and diesel fuel supply on the North Korean armed forces." In this

4. Yonhap News (1. January, 2017).
5. Yonhap News (30. January, 2018).
6. Dong-A Ilbo (19. September, 2017).

article, the Dong-A Ilbo suggests that this situation is a little unusual because, although North Korea reduced its military training in the early 2000s due to energy shortages, since Kim Jong-un took power in 2011, the country either increased or maintained its former level of military training.

This retraction in North Korea's military training seems to arise from the sanctions against North Korea. According to the Wall Street Journal, U.S. experts believe that the smaller scale of North Korea's military training is due to the international sanctions against North Korea including those imposed by the UNSC, and that, with the UNSC sanctions restricting the exports of oil products and crude oil to North Korea to 500,000 barrels and 4 million barrels per year respectively, the North Korean armed forces was forced to reduce the scale of its military training to reduce oil consumption.[7]

## B. The Impact of North Korea Sanctions on the Economic Activities of the North Korean Military

It was inevitable that the North Korean military would be heavily hit by the UNSC sanctions, as the UNSC adopted several resolutions that affect North Korea's economic activities. Not only will have the oil embargo affected the North Korean military but also the ban on the import of raw materials and export of minerals. Such international sanctions on North Korea could affect the number and intensity of its military training weakening the country's emergency preparedness. The oil embargo is bound to be particularly problematic for the North Korean military.

UNSCR 2270 (March 3, 2016) prohibited the sale and supply of jet fuel (including rocket fuel) to North Korea, with a few exceptions, and UNSCR 2321 (November 30, 2016) agreed to stop providing any more fuel than is necessary for civilian aircrafts arriving from or departing to North Korea from a third country. Meanwhile, UNSCR 2375 (September 11, 2017) stipulated a stronger limit on the supply of crude oil and refined oil products to North

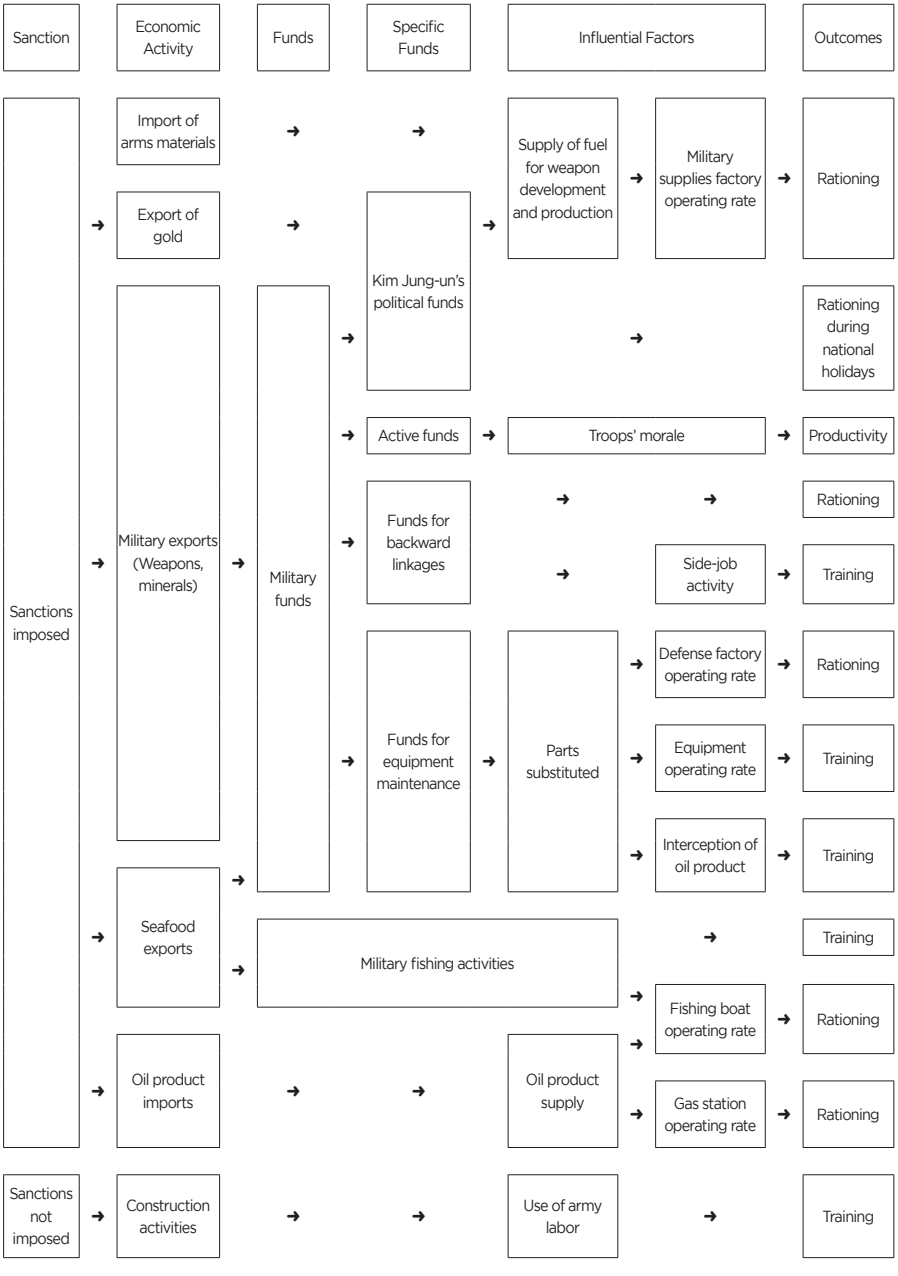
7. Yonhap News (30. January, 2018).

Korea, specifically restricting the export of crude oil to North Korea to the current level and setting a limit on the import of refined oil products from North Korea at 500,000 barrels for the fourth quarter of 2017 and 2 million barrels per year starting 2018, as well as completely banning the export of Natural Gas Liquid (NGL) and condensates to North Korea.[8] UNSCR 2397, adopted on December 23, 2017, further strengthened UNSCR 2375 by setting tougher limits: 4 million barrels per year for the supply of crude oil to North Korea and 500,000 barrels for the import of refined oil products from North Korea.

The international community's focused attention on North Korea sanctions has been sending a shock through North Korea's economy, with no exceptions to its military economy. How the economic sanctions on North Korea can impact its military economy are illustrated in Figure 7-1. What is certain is that, as mentioned above, if the sanctions against North Korea intensify, its military training and distribution of supplies to the military cannot but be affected.

8. Kim, Kyung-sool (2018).

**[Figure 7-1] The Impact of North Korea Sanctions on the Economic Activities of the North Korean Military**




*Source:* Cho, Nam-Hoon et al. (2018).

## 3. The Performance of North Korea's Defense Industry in 2017

The performance of North Korea's defense industry in 2017 is closely associated with the country's simultaneous pursuit of nuclear program and economy, as its frequent missile tests to complete its nuclear armament has had a significant impact on its defense industry. The specific economic and industrial policies that affected North Korea's defense industry in 2017 are those for self-reliance and self-development, the development of science technology, and factory modernization. These economic and industrial policies are stipulated in North Korea's five-year strategy for economic development and the military modernization plan. However, since North Korea has yet to publicize these documents, it is difficult to know their specific contents. For this reason, this paper will examine North Korea's economic and industrial policies for 2017 based on Kim Jong-un's 2017 and 2018 New Year's Address and his speech at the Eighth Conference of Munitions Industry, which have been opened to the public. These policies will then be connected to infer North Korea's policies for its defense industry.

### A. North Korea's Economic and Industrial Policies: Emphasis on Self-Reliance and Self-Development, Science and Technology, and the Modernization of Factories

North Korea announced its five-year strategy for national economic development for 2016-2020 in the General Report on Projects of the Seventh Party Congress, which took place in May 2016. At the time, Kim Jung-un emphasized that "the goal of the five-year strategy for national economic development is to liven the overall people's economy and to secure a balance among the economic sectors, thereby laying the foundations for the continual development of the nation's economy."

In his 2017 New Year's Address, Kim Jong-un highlighted the need to focus on implementing the five-year strategy: "We should concentrate our efforts on implementing the five-year strategy for national economic development. This

year is of key importance in carrying out this strategy. In order to open up fine prospects for the implementation of the strategy and develop the country's overall economy onto a higher plane, while building on the successes gained last year, we should attain the goals for this year's struggle without fail."

At the same time, Kim Jong-un emphasized several key methods for implementing the five-year strategy. The first is "self-reliance and self-development." Self-reliance and self-development refer to the maximization of the self-production of energy, raw materials, parts, and final products for North Korea's economic development. In a sense, the emphasis on self-reliance represents North Korea's struggle to find a breakthrough amid the growing sanctions against North Korea. Reflecting this situation, North Korea stated that "The reality of the more-vicious-than-ever economic blockade demands the higher upholding of the value of self-reliance and self-development to produce the equipment and materials necessary for modernization with our hands, skills, and resources."[9]

On the one hand, self-reliance and self-development are similar to the concept of import substitution, showing North Korea's attempt to procure formerly-imported goods from within the country to bypass the bans on the country's imports imposed by the international community. As Kim Jong-un mentioned in his 2017 New Year's speech, " 'Let us accelerate the victorious advance of socialism with the greate sprit of self-reliance and self-development as the dynamic force!'–this is the militant slogan we should uphold in this new year's march. We should wage a vigorous all people, general offensive to hit the targets of the five-year strategy on the strength of self-reliance and self-development."

The second is 'science and technology.' To achieve self-reliance and self-development, North Korea must be able to produce alternative raw materials and energy domestically. Towards this end, North Korea saw the need to secure the science and technology that is necessary to achieve this, which is why North

9. Ji, Bong-chul (2016).

Korea has recently been emphasizing the development of science and technology. Concerning this goal, Kim Jong-un's New Year's Address in 2017 states the following: "The strength of self-reliance and self-development is that of science and technology, and the shortcut to implementing the five-year strategy is to give importance and precedence to science and technology. The sector of science and technology should concentrate efforts on solving scientific and technological problems arising in modernizing factories and enterprises and putting their production on a regular footing with the main emphasis on ensuring the domestic production of raw materials, fuel and equipment. Production units and scientific research institutes should intensify cooperation between themselves, and enterprises should build up their own technological development forces and conduct a proactive mass-based technological innovation drive, propelling economic development with valuable sci-tech achievements conducive to expanded production and improvement of business operation and management."

The third is the "modernization of factories.' In recent years, North Korea has been devoting its efforts to this end, with Kim Jong-un underlining the achievements in factory modernization in the light and machine industries in his 2018 New Year's Address: "Numerous light-industry factories in such sectors as textile, footwear, knitwear and foodstuff industries raised high banner of Juche orientation and made proactive efforts to propel the modernization of several production lines by means of our own technology and our own equipment. By doing so, they provided a guarantee for making the range of consumer goods varied and improving their quality. The machine-building industry, by upholding the banner of self-reliance and relying on science and technology, creditably attained the Party's goal for the production of new-type tractors and trucks, and thus laid solid foundations for speeding up the Juche orientation and modernization of the national economy and the comprehensive mechanization of the rural economy."

### B. North Korea's Policies for Its Defense Industry and Its Status

North Korea's economic and industrial policies in 2017 applied also to the defense industry. First, concerning North Korea's policy for self-reliance and

self-development, on the occasion of the Eighth Conference of Munitions Industry, Kim Jong-un stressed the need to "keep fighting with all our power for the strengthening and advancement of our self-reliant defense industry" as he introduced the accomplishments made by the defense industry, such as the development of advanced weapons (e.g., unmanned combat equipment) and technological combat equipment.

Meanwhile, the defense industry's advances in science and technology has also been mentioned many times. For example, Kim Jong-un stated at the General Report on Projects of the Seventh Party Congress in May 2016 that "Our military science technology has reached the highest level, and the defense industry has been producing our own style of precise, light-weight, unmanned, and intelligent advanced weapons and equipment as we wish." Kim Jong-un also mentioned in his 2017 New Year's Address, "Officers, scientists, and workers in the defense industry burning thier hearts with the 'Yongil bomb spirit' of the days of the anti-Japanese struggle and the revolutionary spirit of the workers of Kunja-ri of the days of the Fatherland Liberation War, should develop and produce larger quantities of powerful military hardware of our own style. By doing so, they can build up the arsenal of the Songun revolution."

The defense industry's modernization also continues to be highlighted. At present, North Korea is working on building the nuclear strike capability of its army, navy and air force based on its military modernization plan (2014-2018). This plan includes the miniaturization of nuclear warheads and the construction of nuclear submarines, and in order to achieve these goals within the set timeline, North Korea has been spurring the modernization of its military supplies factories and development of new weapons.[10]

Furthermore, Kim Jong-un has been highlighting the goal of factory modernization on all of his visits to military supplies factories, strongly criticizing and censuring those that are insufficiently modernized. Since many of the factories were built long ago, their old facilities naturally lead to low labor

10. North Korea held the mid-term conference (for reporting on the mid-term progress) of the five-year plan for military modernization in Pyongyang on September 15.

productivity. Also, as many of their facilities lack automation, North Korea has been promoting their modernization, such as installing CNC facilities in several factories, since the Kim Jong-il regime.

However, the modernization of the military supplies factories is being more strongly implemented under Kim Jong-un's rule. Many of the factories are still using their old facilities and relying on production by hand, and to overcome this weakness, Kim Jong-un has been stressing the modernization of factories continuously since he came to power. Kim Jong-un's emphasis on modernization can be seen from his consistent orders to modernize during all of his military supplies factory tours, as in the case of his visit to the Tae-sung Machine Factory (March 2, 2016) and Ryongsong Machinery Complex (March 24, 2016).

Meanwhile, on his visit to the January 18 General Machines Factory, which produces parts for missile programs and tanks, as well as major engines, on August 2016, Kim Jong-un highly praised the factory's modernized facilities.[11] This visit to the January 18 General Machinery Plant was a revisit made eight months after his previous visit in December 2015, an evidence of how much attention Kim Jong-un is paying to the modernization of military supplies factories.[12] At the time, Kim Jong-un complimented the modernization of the January 18 General Machines Factory, saying, "The factory has realized a high level of science-based operations, informatization, automation, and unmanned production, establishing a flexible production system, saving effort, and reducing the production cycle while increasing production volume."

Curtis Melvin, a researcher at the US-Korea Institute (USKI) at Johns Hopkins University, analyzes that, "The modernization policy of North Korea's military supplies factories is an extension of the country's policy to concentrate its investment on the military sector. After Kim Jong-un came to power, the North Korean regime has been upgrading and expanding old military bases for the army, navy, and air force." [13]

11. RFA (3. March, 2016).
12. KBS News (10. August, 2016).
13. Yonhap News (20. February, 2017).

As illustrated so far, the modernization of North Korea's military supplies factories seems to have advanced considerably, since Kim Jong-un visited many of these factories in the first half of 2016 and gave orders for modernization – either to begin or complete the upgrade. Kangdong Precision Machines Factory in Pyongyang, January 18 General Machines Factory in South Pyongan Province, and Navy-owned October 3 Factory, which is for vessels repair, have either completed or are in the process of modernization. Also, the Taesung Machine Factory for missile production and Aprokgang Tire Factory for producing the tires for missile carriers are also undertaking the modernization of their facilities as Kim Jong-un instructed during his last visit.[14]

Kim Jong-un has not stopped mentioning the modernization of factories. In his 2018 New Year's Address, he stressed that, "By consistently holding fast to the line of simultaneously promoting the two fronts in accordance with the strategic policy set by the Party at the Eighth Conference of Munitions Industry, the defense industry should develop and manufacture powerful strategic weapons and military hardware of our style, perfects its Juche-oriented production structure and modernize its production lines on the basis of cutting-edge science and technology."

Lastly, North Korea has been emphasizing the development and production of new weapon systems. At the Eighth Conference of Munitions Industry, Kim Jong-un stated that, "The development of new strategic weapon systems, including nuclear and hydrogen bombs and our Hwasong-15 ballistic rockets, using our power and technology and achieving the great goal of completing the nation's nuclear armament mark an enormous historic victory for our party and our people who have sacrificed much and fought with their lives to win this battle. [...] Our Republic, whose military industry and self-reliant national defense is strengthening at an unimaginably extraordinary speed, will become the world's strongest nuclear and military power and continue to move forward and leap towards victory. Let us keep fighting with all our power to the strengthening and advancement of our self-reliant defense industry." Also, he mentions the

14. TV Chosun News (3. December, 2017).

possibility of mass producing ballistic rockets by saying, "The areas of nuclear weapons research and rocket engineering must accelerate the mass production and deployment of nuclear warheads and ballistic rockets, which are already guaranteed in their power and reliability."

### C. North Korea's Missile Tests and Defense Industry in 2017

In 2017, North Korea conducted about 20 ballistic missile tests. Although this is a fewer number of tests than in 2016, the successful launches of Hwasong-12, 14, and 15 confirmed that North Korea's missile development is almost at its completion. Based on these achievements, Kim Jong-un has announced the 'completion of North Korea's nuclear armament' in his special address after the launch of Hwasong-15 and 2018 New Year's Address, saying that "An outstanding success our Party, state and people won last year was the accomplishment of the great, historic cause of perfecting the national nuclear forces."

Table 7-1 shows the number of tests by type of missile conducted by North Korea under Kim Jong-un's regime so far. North Korea has launched about 20 missiles every year since 2014. This is a fairly large number of tests, which allows us to infer that the North Korean military supplies factories and research institutes have been active in developing and producing missiles in 2017.

**<Table 7-1> Missile Tests Conducted under Kim Jong-un's Rule**

| Missile | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| Unha-3 | | 2 | | | | 1 | |
| KN-02 | | | 6 | 4 | 10 | | |
| Scud-A | | | | | | | |
| Scud-B | | | | 4 | | | |
| Scud-B MaRV | | | | | | | 3 |
| Scud-C | | | | 9 | 2 | 4 | |
| Scud-C MaRV | | | | | | | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Scud-ER | | | | | | 3 | 4 |
| Rodong | | | | 2 | | 5 | |
| Musudan | | | | | | 8 | |
| Pukkuksong-1 | | | | | 3 | 3 | |
| Pukkuksong-2 | | | | | | | 2 |
| Hwasong-12 | | | | | | | 6 |
| Hwasong-14 | | | | | | | 2 |
| Hwasong-15 | | | | | | | 1 |
| Unidentified | | | | | | | 1 |
| Total | 0 | 2 | 6 | 19 | 15 | 24 | 20 |

*Source:* NTI, The CNS North Korea Missile Test Database (Last access date: 10. February, 2018)

A missile system is usually made of numerous parts and subsystems: the bodies, warheads, engines, even missile carriers and guidance systems, etc. It is said that one missile is made up of about 100,000 parts. North Korea needs to produce most of these missile parts domestically as the UNSC sanctions have blocked North Korea from importing of most goods related to missile production. Thus, the increase in North Korean missile production is bound to lead to an increase in the domestic production of various related parts.

Let's take a transportable ballistic missile as an example. The production of transportable ballistic missiles will give more work to automobile factories that produce missile carriers, as the missiles need to be transported using these vehicles. Jeffrey Lewis of the Middlebury Institute of International Studies suggests the possibility that North Korea is producing its own missile fuel, UDMH, using its chlorine and ammonia production facilities,[15] and the increase in missile fuel consumption would have increased the operations at North Korea's chemical plants where the fuel is made. In this context, in 2017, the active production of missiles would have bolstered the volume of production in the relevant forward and backward linkages of North Korea's defense industry.

15. Yonhap News (28. September, 2017) .

North Korea has so far developed and produced various kinds of missiles, such as ground-launched ballistic missiles, submarine-launched missiles, anti-aircraft missiles, and satellite-launched missiles, etc. Moreover, North Korea produces both liquid- and solid-fuel missiles. Thus, it is natural for North Korea to have many missile factories, and the capacity utilization of these factories in 2017 would have been quite high. Also, since missiles are made of a considerable number of parts, the production activities of the relevant forward and backward linkages of missile production would have been stimulated. Sanemdong Missile Development and Research Facility in Pyongyang, Chamjin Missile Factory, Kusong Tank Factory, Aprokgang Tire Factory, Hamhung Vinalon Factory, March 16th Factory and No.17 Factory, etc. are all factories that are related to missile production; and it is suspected that in 2017, these factories would have recorded a significant performance in production level.

## 4. Future Prospects of North Korea's Defense Industry in 2018

North Korea's weapon system can be largely divided into two types. The first is the conventional weapons system, comprised of tanks, cannons, aircrafts, and vessels, which are used in conventional warfare. The second is the Weapon of Mass Destruction (WMD). However, WMD is not exactly a weapons system for actual use in combat but rather a political weapons system for deterring war or gaining voice in the international community. Since using nuclear weapons without the second strike capability against a country with the second strike capability would be a suicidal behavior, it is possible to imagine that North Korea's nuclear weapons will be used more as a nuclear deterrence against the U.S. and to add strength to its voice in the international community rather than for actual attacks.

In other words, nuclear weapons are a weapons system that does not help North Korea much in a war situation. A conventional weapon system may be the more important weapons system for warfare. Then the question arises, will North Korea maintain both WMD and conventional weapons after it completes

its nuclear development and secures a tool for deterring the U.S.? The answer to this question will lie in North Korea's strategy. If North Korea maintains its communist unification strategy in the future, North Korea will seek to maintain not only WMD but also its conventional weapons system since conventional warfare requires conventional weapons.

On the other hand, if North Korea abandons its communist unification strategy, it may not need large amounts of conventional weapons since WMD can cover their previous role as a deterrent against the U.S. In other words, in the absence of WMD, North Korea needed a large number of conventional weapons to stand against the U.S., but with nuclear armament, its need to possess conventional weapons diminishes. Therefore, the amount of conventional weapons held by North Korea will depend on whether or not North Korea continues to pursue its communist unification strategy.

With a sufficient defense budget, North Korea may be able to maintain its current level of conventional weapons along with WMD. However, it is not an easy task to maintain so many weapons, especially for countries with an underdeveloped economy such as North Korea, as it requires a huge budget.

North Korea is currently in a very difficult situation due to its prolonged nuclear development and stronger international sanctions. The complaints among its people have also been gradually increasing. It will be tough for North Korea to secure both conventional weapons and WMD. Rather, North Korea may try to allocate resources towards stimulating the economic activities of ordinary people.

However, it seems that North Korea will not easily abandon its communist unification strategy. In fact, North Korea has continued to maintain its communist unification strategy despite removing the stipulation in the Charter of the Workers' Party of Korea that the nation's ultimate goal is to 'build a communist society' during the Third Party Congress in 2010.[16] The preamble to the charter is still "[Our goal is to] build a strong socialist country in the

16. Saegye Ilbo (6. October, 2015).

northern part of the Republic and to carry out the liberation of our people and the task of democratic revolution in the national scale, with the ultimate goal to instill Juche ideology throughout all of our society and realize the full independence of the people." Nevertheless, it is doubtful whether North Korea will continue maintaining its level of conventional weapons amid the shortage of resources, as what is more important that its communist unification strategy is the mid-to-long term stability of its current system.

If North Korea's marketization and the North Korean people's political awareness continue to improve, albeit slowly, it will be impossible for North Korea to maintain stability while pursuing economic policies that ignore the economic needs of its people. Thus, it is possible that North Korea will actually abandon massive acquisitions of conventional weapons and allocate resources to the economic activities of ordinary people, irrespective of whether it changes its stance concerning the unification of the two Koreas. In this case, the conversion of the defense industry to the civilian economy can become an issue in North Korea's policies.

As mentioned earlier, Kim Jong-un publicly announced North Korea's intention to mass produce and deploy its missile force. However, the prospects of North Korea realizing this intention in 2018 seems rather bleak. The reasons are as follows. First, North Korea will not have sufficient resources to allocate towards the mass production of missiles while the sanctions continue. Second, the changing political situations in the Korean Peninsula may reduce the necessity for North Korea to deploy a large number of missiles. In these circumstances, North Korea's defense industry in 2018 is likely to grow at a relatively low rate, especially since the impact of sanctions will appear in earnest in 2018, thereby possibly bringing a downturn of not only North Korea's overall economic situation but even of its military economy.

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# Statistical Appendix

# Statistical Appendix

## 1. GDP

**<Appendix Table 1-1> GDP**

| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BOK (R.O.K Won) | GDP (Billion won) | 24,758 | 27,241 | 28,484 | 29,880 | 32,228 | 33,212 | 33,614 | 33,949 | 34,137 | 36,103 |
| | Per Capita GDP (Ten thousands won) | 104 | 114 | 118 | 124 | 133 | 136 | 137 | 138 | 138 | 145 |
| BOK (USD) | GDP (USD100 million) | 266 | 247 | 223 | 258 | 291 | 295 | 307 | 322 | 302 | 311 |
| | GDP Per Capita (USD) | 1,117 | 1,032 | 927 | 1,069 | 1,197 | 1,207 | 1,251 | 1,307 | 1,218 | 1,250 |
| UN (USD) | GDP (USD100 million) | 144 | 133 | 120 | 139 | 157 | 159 | 166 | 174 | 163 | 168 |
| | GDP Per Capita (USD) | 597 | 551 | 494 | 570 | 638 | 643 | 666 | 696 | 648 | 665 |

*Note:* 1) GDP and Per Capita GDP represent nominal GDP
2) BOK publishes GDP in Korean won only. This table provides GDP in US$.

*Source:* BOK(http://ecos.bok.or.kr/), UN(http://unstats.un.org/unsd/nationalaccount/), Last access date: 22. February, 2018.

**<Appendix Table 1-2> GDP Growth Rate**

(Unit: %)

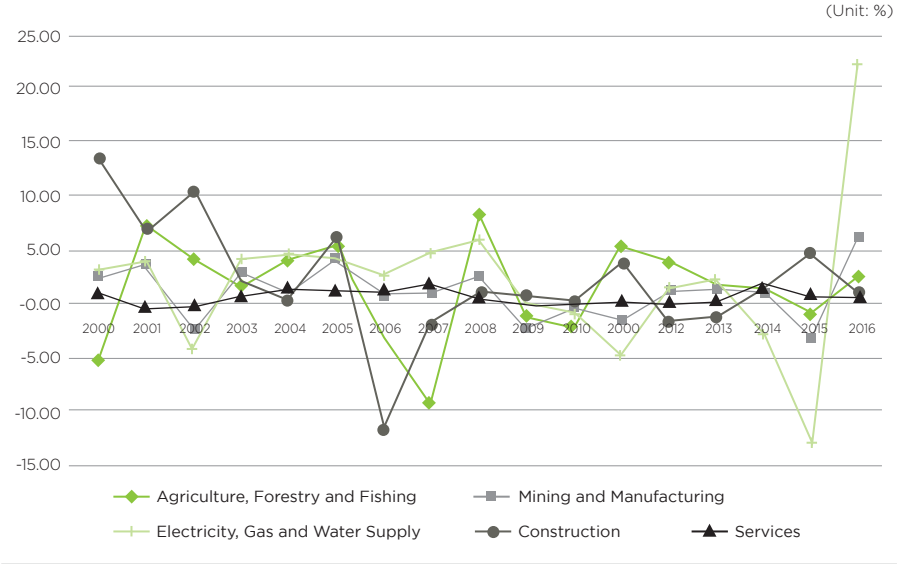
| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | | -1.2 | 3.1 | -0.9 | -0.5 | 0.8 | 1.3 | 1.1 | 1.0 | -1.1 | 3.9 |
| Sector | Agricultural, Forestry and Fishing | -9.1 | 8.0 | -1.0 | -2.1 | 5.3 | 3.9 | 1.9 | 1.2 | -0.8 | 2.5 |
| | Mining and Manufacturing | 1.0 | 2.5 | -2.3 | -0.3 | -1.4 | 1.3 | 1.5 | 1.1 | -3.1 | 6.2 |
| | Electricity, Gas and Water Supply | 4.8 | 6.0 | 0.0 | -0.8 | -4.7 | 1.6 | 2.3 | -2.8 | -12.7 | 22.3 |
| | Construction | -1.5 | 1.1 | 0.8 | 0.3 | 3.9 | -1.6 | -1.0 | 1.4 | 4.8 | 1.2 |
| | Services | 1.7 | 0.7 | 0.1 | 0.2 | 0.3 | 0.1 | 0.3 | 1.3 | 0.8 | 0.6 |

*Source:* BOK(http://ecos.bok.or.kr/), Last access date: 22. February, 2018.

## [Appendix Figure 1-1] DPRK GDP Annual Growth Rate(BOK Estimate)


*Source:* BOK(http://ecos.bok.or.kr/), Last access date: 22. February, 2018.

## [Appendix Figure 1-2] Value Added by Economic Activity, Annual Rate of Growth(BOK Estimate)




*Source:* BOK(http://ecos.bok.or.kr/), Last access date: 22. February, 2018.

# Statistical Appendix

## 2. Trade

### A. Inter-Korean Trade

**<Appendix Table 2-1> Inter-Korean Trade**

(Unit: USD million, %)

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Jan.-Jul. 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inbound | 340 (31.9) | 520 (52.7) | 765 (47.3) | 932 (21.8) | 934 (0.2) | 1,044 (11.7) | 914 (-12.5) | 1,074 (17.5) | 615 (-42.7) | 1,206 (96.1) | 1,452 (20.4) | 186 (-87.2) | - (-100) |
| Outbound | 715 (63.0) | 830 (16.0) | 1,033 (24.4) | 888 (-14.0) | 745 (-16.1) | 868 (16.6) | 800 (-7.8) | 897 (12.1) | 521 (-42.0) | 1,136 (118.3) | 1,262 (11.1) | 147 (-88.3) | 1 (-99.5) |
| Total | 1,056 (51.5) | 1,350 (27.8) | 1,798 (33.2) | 1,820 (1.2) | 1,679 (-7.8) | 1,912 (13.9) | 1,714 (-10.4) | 1,971 (15.0) | 1,136 (-42.4) | 2,343 (106.2) | 2,714 (15.9) | 333 (-87.7) | 1 (-99.8) |

*Note:* 1) Number in parenthesis denotes year-on-year growth rate
2) Ministry of Unification has not released the inter-Korean trade statistics since August, 2016.
*Source:* Ministry of Unification

**<Appendix Table 2-2> Trade Volume by Type of Transaction**

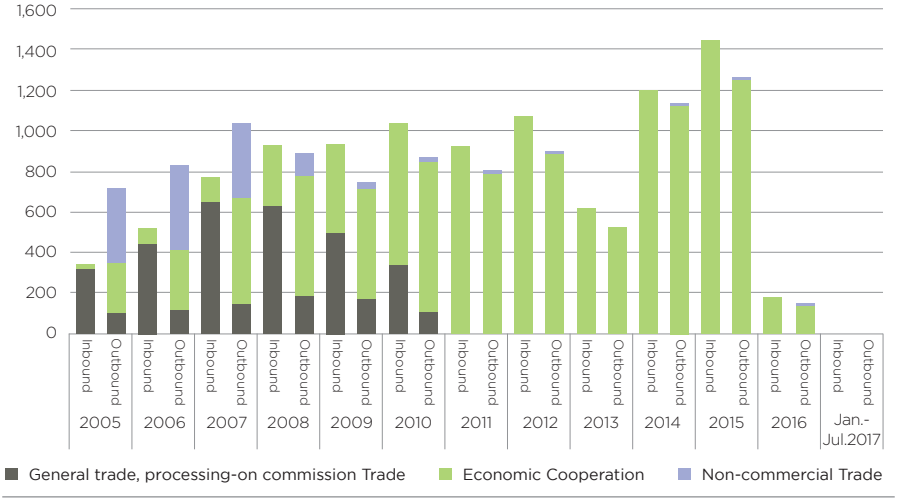
(Unit: USD million, %)

| | Type of Transaction | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Jan.-Jul. 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In-bound | General Trade• Processing-on Commission Trade | 320 | 441 | 645 | 624 | 499 | 334 | 4 | 1 | 1 | 0 | 0 | 0 | - |
| | Economic Cooperation | 20 | 77 | 120 | 308 | 435 | 710 | 909 | 1,073 | 615 | 1,206 | 1,452 | 186 | - |
| | Non-commercial Trade | - | 1 | - | - | - | - | 1 | - | - | 0 | 0 | - | - |
| | Inbound Total | 340 | 520 | 765 | 932 | 934 | 1,044 | 914 | 1,074 | 615 | 1,206 | 1,452 | 186 | - |
| Out-bound | General Trade• Processing-on Commission Trade | 100 | 116 | 146 | 184 | 167 | 101 | - | - | - | - | - | - | - |
| | Economic Cooperation | 250 | 294 | 520 | 596 | 541 | 744 | 789 | 888 | 518 | 1,132 | 1,252 | 145 | - |
| | Non-commercial Trade | 366 | 421 | 367 | 108 | 37 | 23 | 11 | 9 | 3 | 4 | 10 | 2 | 1 |
| | Outbound Total | 715 | 830 | 1,033 | 888 | 745 | 868 | 800 | 897 | 521 | 1,136 | 1,262 | 147 | 1 |

*Note:* Economic cooperation includes GIC, Mt.Geumgang tours, light industry projects.
*Source:* Ministry of Unification

## [Appendix Figure 2-1] Annual Inter-Korean Trade

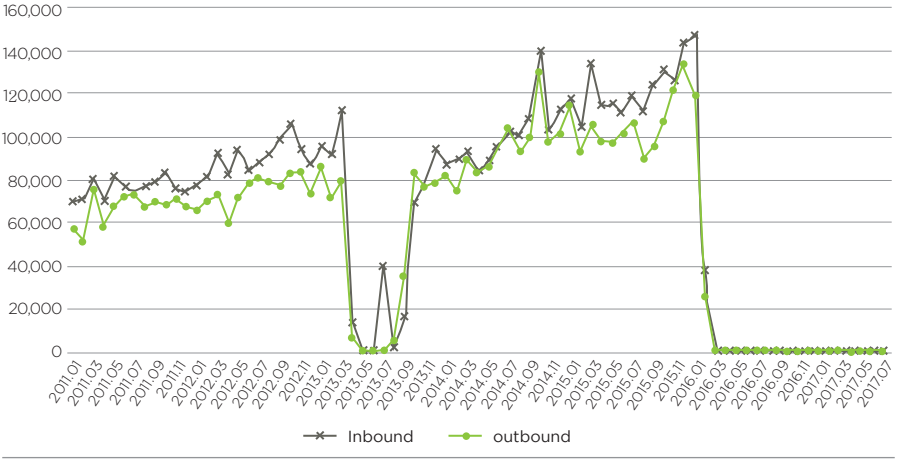
(Unit: USD million)




*Source:* Ministry of Unification

## [Appendix Figure 2-2] Monthly Inter-Korean Trade

(Unit: USD thousand)




*Source:* Ministry of Unification, Last access date: 22. February, 2018.

# Statistical Appendix

## B. DPRK-China Trade

**<Appendix Table 2-3> Annual DPRK-China Trade**

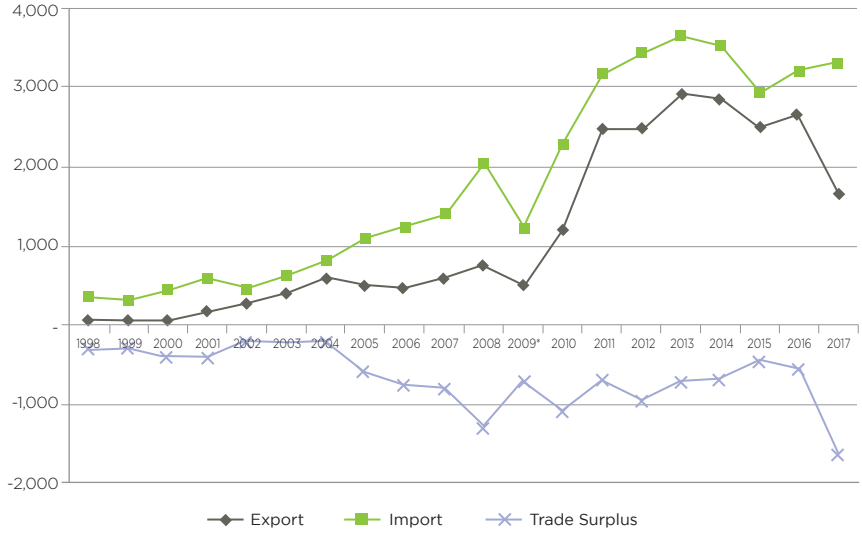
(Unit: USD million, %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Export | 582 (24.3) | 754 (29.7) | 501 (-33.6) | 1,188 (137.3) | 2,464 (107.4) | 2,485 (0.8) | 2,912 (17.2) | 2,841 (-2.4) | 2,484 (-12.6) | 2,634 (6.1) | 1,651 (-37.3) |
| Import | 1,392 (13.0) | 2,033 (46.0) | 1,210 (-40.5) | 2,278 (88.3) | 3,165 (38.9) | 3,446 (8.9) | 3,633 (5.4) | 3,523 (-3.0) | 2,946 (-16.4) | 3,192 (8.3) | 3,328 (4.3) |
| Total | 1,974 (16.1) | 2,787 (41.2) | 1,710 (-38.6) | 3,466 (102.6) | 5,629 (62.4) | 5,931 (5.4) | 6,545 (10.4) | 6,364 (-2.8) | 5,430 (-14.7) | 5,826 (7.3) | 4,979 (-14.5) |

*Note:* Omitted Data between August and November 2009.
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

**[Appendix Figure 2-3] Annual DPRK-China Trade**

(Unit: USD million)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## <Appendix Table 2-4> Monthly DPRK-China Trade

(Unit: USD million, %)

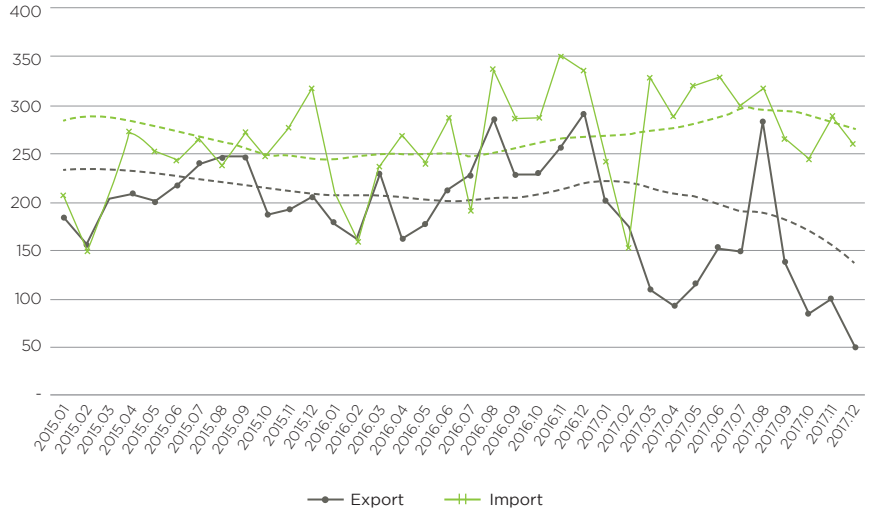
| | Export (year-on-year growth rate) | Import (year-on-year growth rate) |
|---|---|---|
| Jan. 2015 | 184.8 (-16.9) | 208.2 (-35.6) |
| Feb. 2015 | 158.0 (1.3) | 151.1 (52.9) |
| Mar. 2015 | 202.7 (-10.5) | 204.0 (-16.8) |
| Apr. 2015 | 207.8 (-8.0) | 272.2 (-9.6) |
| May. 2015 | 201.0 (-14.0) | 254.4 (-15.9) |
| Jun. 2015 | 217.4 (-11.7) | 243.0 (-21.9) |
| Jul. 2015 | 239.3 (-10.6) | 266.2 (-17.6) |
| Aug. 2015 | 245.4 (-5.2) | 238.0 (-24.0) |
| Sep. 2015 | 245.4 (-18.3) | 270.7 (-18.8) |
| Oct. 2015 | 186.7 (-26.0) | 247.0 (-25.7) |
| Nov. 2015. | 190.9 (-8.3) | 275.0 (-1.2) |
| Dec. 2015 | 204.6 (-16.1) | 316.8 (-12.1) |
| Jan. 2016 | 177.5 (-4.0) | 211.0 (1.3) |
| Feb. 2016 | 161.9 (2.5) | 161.5 (6.9) |
| Mar. 2016 | 229.2 (13.1) | 235.8 (15.6) |
| Apr. 2016 | 161.4 (-22.3) | 268.0 (-1.5) |
| May. 2016 | 175.7 (-12.6) | 239.4 (-5.9) |
| Jun. 2016 | 210.5 (-3.2) | 288.2 (18.6) |
| Jul. 2016 | 227.3 (-5.0) | 192.6 (-27.6) |
| Aug. 2016 | 285.7 (16.4) | 336.6 (41.4) |
| Sep. 2016 | 228.3 (-6.9) | 285.6 (5.5) |
| Oct. 2016 | 229.8 (23.1) | 286.6 (16.0) |
| Nov. 2016 | 256.0 (34.1) | 350.9 (27.6) |
| Dec. 2016 | 291.0 (42.2) | 335.9 (39.2) |
| Jan. 2017 | 201.1 (13.3) | 241.5 (14.5) |
| Feb. 2017 | 172.8 (6.7) | 151.9 (-5.9) |
| Mar. 2017 | 109.3 (-52.3) | 328.0 (39.1) |
| Apr. 2017 | 92.9 (-42.4) | 288.2 (7.5) |
| May. 2017 | 115.89 (-34.0) | 319.8 (33.6) |
| Jun. 2017 | 152.43 (-27.6) | 326.8 (13.4) |
| Jul. 2017 | 150.4 (-33.8) | 299.8 (55.7) |
| Aug. 2017 | 282.9 (-1.00) | 316.0 (-6.1) |
| Sep. 2017 | 137.3 (-39.9) | 266.3 (-6.7) |
| Oct. 2017 | 85.1 (-63.0) | 244.1 (-14.8) |
| Nov. 2017 | 99.73 (-61.0) | 287.8 (-18.0) |
| Dec. 2017 | 50.8 (-82.6) | 257.7 (-23.3) |

*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

# Statistical Appendix

## [Appendix Figure 2-4] Monthly DPRK-China Trade

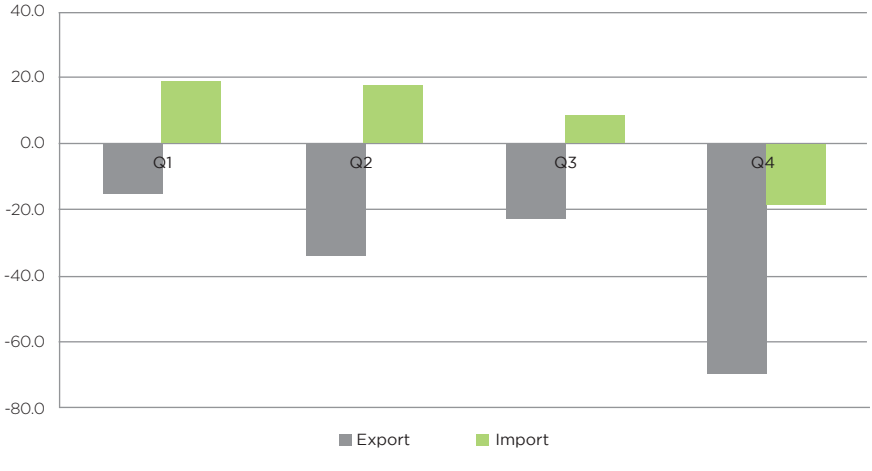
(Unit: USD million)




*Note:* Dotted lines represent 12-months moving average
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-5] DPRK-China Year-on-Year Growth Rate(Quarterly)

(Unit: %)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## <Appendix Table 2-5> Monthly DPRK-China Trade Deficit

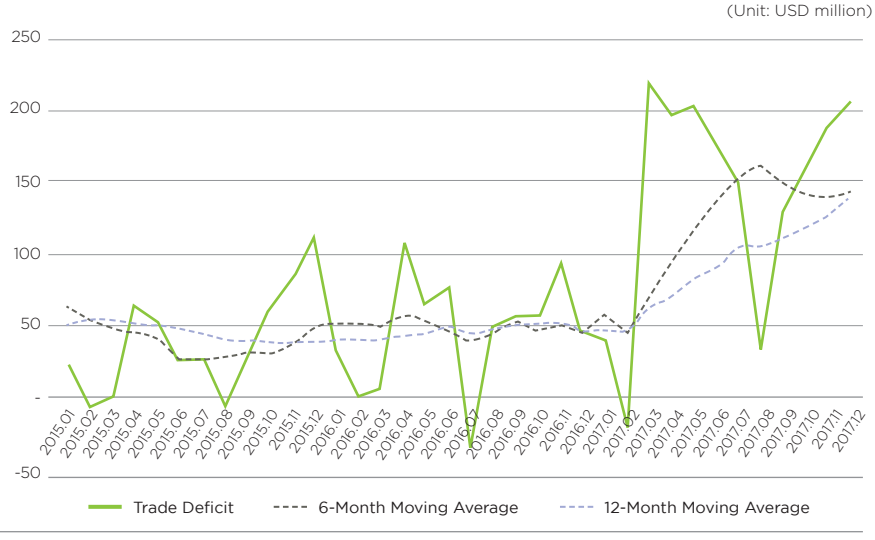
(Unit: USD million)

| | Trade Deficit | 6-Month Moving Average | 12-Month Moving Average |
|---|---|---|---|
| Jan. 2015 | 23.3 | 62.9 | 50.3 |
| Feb. 2015 | -6.9 | 52.7 | 54.5 |
| Mar. 2015 | 1.3 | 47.4 | 53.0 |
| Apr. 2015 | 64.4 | 44.8 | 52.1 |
| May. 2015 | 53.4 | 42.0 | 50.8 |
| Jun. 2015 | 25.6 | 26.9 | 47.6 |
| Jul. 2015 | 26.9 | 27.5 | 45.2 |
| Aug. 2015 | -7.4 | 27.4 | 40.0 |
| Sep. 2015 | 25.3 | 31.4 | 39.4 |
| Oct. 2015 | 60.3 | 30.7 | 37.8 |
| Nov. 2015. | 84.1 | 35.8 | 38.9 |
| Dec. 2015 | 112.2 | 50.2 | 38.5 |
| Jan. 2016 | 33.5 | 51.3 | 39.4 |
| Feb. 2016 | -0.4 | 52.5 | 39.9 |
| Mar. 2016 | 6.6 | 49.4 | 40.4 |
| Apr. 2016 | 106.6 | 57.1 | 43.9 |
| May. 2016 | 63.7 | 53.7 | 44.8 |
| Jun. 2016 | 77.7 | 47.9 | 49.1 |
| Jul. 2016 | -34.7 | 36.6 | 44.0 |
| Aug. 2016 | 50.9 | 45.1 | 48.8 |
| Sep. 2016 | 57.3 | 53.6 | 51.5 |
| Oct. 2016 | 56.8 | 45.3 | 51.2 |
| Nov. 2016 | 94.8 | 50.5 | 52.1 |
| Dec. 2016 | 44.9 | 45.0 | 46.5 |
| Jan. 2017 | 40.4 | 57.5 | 47.0 |
| Feb. 2017 | -20.9 | 45.5 | 45.3 |
| Mar. 2017 | 218.7 | 72.4 | 63.0 |
| Apr. 2017 | 195.3 | 95.5 | 70.4 |
| May. 2017 | 203.9 | 113.7 | 82.1 |
| Jun. 2017 | 174.4 | 135.3 | 90.1 |
| Jul. 2017 | 149.4 | 153.5 | 105.5 |
| Aug. 2017 | 33.1 | 162.5 | 104.0 |
| Sep. 2017 | 129.0 | 147.5 | 110.0 |
| Oct. 2017 | 159.0 | 141.5 | 118.5 |
| Nov. 2017 | 188.1 | 138.8 | 126.3 |
| Dec. 2017 | 207.0 | 144.3 | 139.8 |

*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

# Statistical Appendix

**[Appendix Figure 2-6] Monthly DPRK-China Trade Deficit**




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## <Appendix Table 2-6> DPRK-China Trade by Commodity

### Export – Top 5 Commodity (HS 4-digit)

(Unit: USD million)

| 2008 | | 2009 | | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|---|---|---|
| Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume |
| Coal | 201.3 | Coal | 208.6 | Coal | 390.4 | Coal | 1,140.9 | Coal | 1,198.5 |
| Iron Ore | 172.3 | Iron Ore | 48.5 | Iron Ore | 194.3 | Iron Ore | 324.5 | Iron Ore | 248.6 |
| Molluscs | 36.1 | Pig Iron | 0.6 | Pig Iron | 64.4 | Men's Jacket | 111.4 | Men's Jacket | 95.2 |
| Pig Iron | 35.0 | Molluscs | 19.3 | Molluscs | 53.2 | Pig Iron | 105.8 | Molluscs | 91.4 |
| Ferro-alloys | 31.0 | Men's Jacket | 18.1 | Unwrought zinc | 47.7 | Men's Coat | 85.3 | Men's Coat | 88.8 |

| 2013 | | 2014 | | 2015 | | 2016 | | 2017 | |
|---|---|---|---|---|---|---|---|---|---|
| Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume |
| Coal | 1379.8 | Coal | 1,135.7 | Coal | 1,049.8 | Coal | 1,180.9 | Coal | 401.7 |
| Iron Ore | 298.7 | Iron Ore | 221.9 | Men's Coat | 168.5 | Men's Jacket | 157.7 | Iron Ore | 139.1 |
| Men's Coat | 126.7 | Men's Coat | 157.3 | Men's Jacket | 151.3 | Men's Coat | 152.2 | Molluscs | 136.1 |
| Men's Jacket | 122.2 | Men's Jacket | 152.9 | Women's Coat | 130.5 | Molluscs | 140.7 | Women's Coat | 128.6 |
| Women's Coat | 116.5 | Women's Coat | 137.1 | Women's Jacket | 96.9 | Women's Coat | 135.5 | Men's Jacket | 104.3 |

*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

### Import – Top 5 Commodity (HS 4-digit)

(Unit: USD million)

| 2008 | | 2009 | | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|---|---|---|
| Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume |
| Crude Oil | 414.3 | Crude Oil | 164.2 | Crude Oil | 325.8 | Crude Oil | 518.4 | Crude Oil | 577.9 |
| Petroleum Oils | 120.1 | Petroleum Oils | 46.4 | Petroleum Oils | 104.9 | Petroleum Oils | 192.4 | Petroleum Oils | 161.9 |
| Woven Fabrics | 52.4 | Motor Vehicles for Transport | 41.8 | Motor Vehicles for Transport | 88.3 | Motor Vehicles for Transport | 146.2 | Motor Vehicles for Transport | 141.2 |
| Soy Bean Oil | 45.1 | Woven Fabrics | 33.2 | Woven Fabrics | 71.1 | Woven Fabrics | 99.3 | Woven Fabrics | 120.0 |
| Coal | 44.4 | Soy Bean Oil | 26.1 | Telephone | 62.8 | Fertilizers | 94.2 | Telephone | 93.2 |

| 2013 | | 2014 | | 2015 | | 2016 | | 2017 | |
|---|---|---|---|---|---|---|---|---|---|
| Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume | Commodity | Volume |
| Crude Oil | 598.1 | Petroleum Oils | 154.8 | Woven Fabrics | 138.2 | Woven Fabrics | 175.7 | Woven Fabrics | 205.5 |
| Motor Vehicles for Transport | 143.3 | Woven Fabrice | 152.8 | Petroleum Oils | 116.5 | Motor Vehicles for Transport | 147.2 | Soy Bean Oils | 111.4 |
| Woven Fabrics | 136.8 | Telephone | 112.3 | Motor Vehicles for Transport | 108.1 | Petroleum Oils | 115.0 | Telephone | 87.5 |
| Petroleum Oils | 104.5 | Soy Bean Oil | 112.2 | Soy Bean Oil | 104.0 | Soy Bean Oils | 98.1 | Television Reception Apparatus | 78.8 |
| Soy Bean Oil | 85.0 | Motor Vehicles for Transport | 108.7 | Telephone | 73.5 | Apples, Pears | 82.0 | Motor Vehicles for Transport | 70.1 |

## <Appendix Table 2-7> DPRK Major Export 1: Anthracite(HS270111)

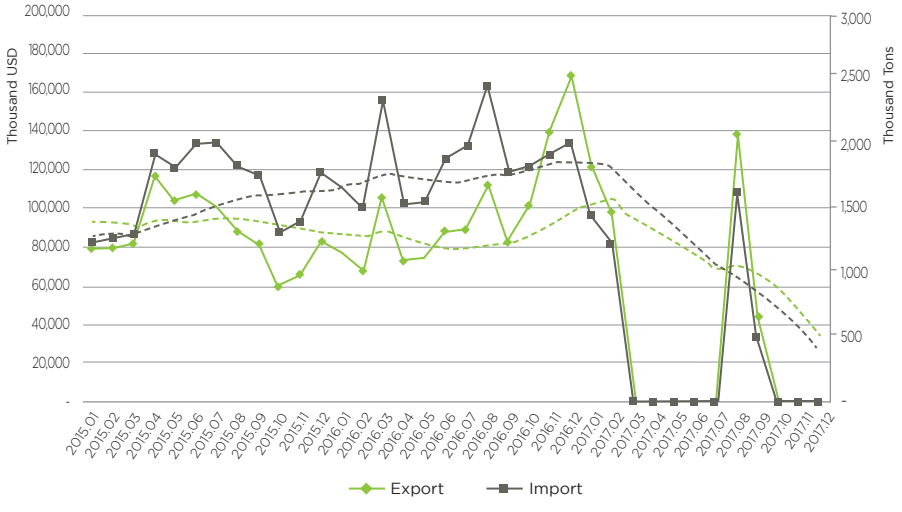
(Unit: USD thousand, thousand tons, USD/ton, %)

| | Volume | (Growth) | Quantity | (Growth) | Price | (Growth) |
|---|---|---|---|---|---|---|
| Jan. 2015 | 79,713 | (-21.5) | 1,227.14 | (-1.4) | 64.96 | (-20.4) |
| Feb. 2015 | 79,595 | (10.4) | 1,269.24 | (37.7) | 62.71 | (-19.9) |
| Mar. 2015 | 80,979 | (-18.0) | 1,297.32 | (0.5) | 62.42 | (-18.4) |
| Apr. 2015 | 116,617 | (22.4) | 1,915.00 | (50.5) | 60.90 | (-18.7) |
| May. 2015 | 103,915 | (3.5) | 1,813.16 | (38.2) | 57.31 | (-25.2) |
| Jun. 2015 | 106,826 | (3.6) | 1,998.53 | (42.9) | 53.45 | (-27.5) |
| Jul. 2015 | 100,869 | (3.4) | 2,008.54 | (53.0) | 50.22 | (-32.5) |
| Aug. 2015 | 87,961 | (-5.8) | 1,821.34 | (41.7) | 48.29 | (-33.5) |
| Sep. 2015 | 81,871 | (-16.9) | 1,757.34 | (26.1) | 46.59 | (-34.1) |
| Oct. 2015 | 59,647 | (-32.6) | 1,312.80 | (3.5) | 45.43 | (-34.8) |
| Nov. 2015. | 65,703 | (-17.5) | 1,392.94 | (19.1) | 47.17 | (-30.7) |
| Dec. 2015 | 82,095 | (-20.6) | 1,765.99 | (13.1) | 46.49 | (-29.8) |
| Jan. 2016 | 76,450 | (-4.1) | 1,660.14 | (35.3) | 46.05 | (-29.1) |
| Feb. 2016 | 68,274 | (-14.2) | 1,509.20 | (18.9) | 45.24 | (-27.9) |
| Mar. 2016 | 105,550 | (30.3) | 2,338.82 | (80.3) | 45.13 | (-27.7) |
| Apr. 2016 | 72,108 | (-38.2) | 1,525.61 | (-20.3) | 47.27 | (-22.4) |
| May. 2016 | 74,540 | (-28.3) | 1,551.17 | (-14.4) | 48.05 | (-16.2) |
| Jun. 2016 | 87,879 | (-17.7) | 1,889.20 | (-5.5) | 46.52 | (-13.0) |
| Jul. 2016 | 89,258 | (-11.5) | 1,981.54 | (-1.3) | 45.04 | (-10.3) |
| Aug. 2016 | 111,991 | (27.3) | 2,458.54 | (35.0) | 45.55 | (-5.7) |
| Sep. 2016 | 82,380 | (0.6) | 1,787.21 | (1.7) | 46.09 | (-1.1) |
| Oct. 2016 | 101,145 | (69.6) | 1,819.94 | (38.6) | 55.58 | (22.3) |
| Nov. 2016 | 139,376 | (112.1) | 1,914.92 | (37.5) | 72.78 | (54.3) |
| Dec. 2016 | 168,056 | (104.7) | 2,001.98 | (13.4) | 83.94 | (80.6) |
| Jan. 2017 | 121,572 | (59.0) | 1,441.99 | (-13.1) | 84.31 | (83.1) |
| Feb. 2017 | 97,400 | (42.7) | 1,229.25 | (-18.5) | 79.24 | (75.1) |
| Mar. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Apr. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| May. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Jun. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Jul. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Aug. 2017 | 137,925 | (23.2) | 1,633.98 | (-33.5) | 48.29 | (-33.5) |
| Sep. 2017 | 43,954 | (-46.6) | 509.49 | (-71.5) | 84.41 | (85.3) |
| Oct. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Nov. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Dec. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |

*Note:* Number in parenthesis denotes year-on-year growth rate
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-7] Monthly Anthracite Export to China

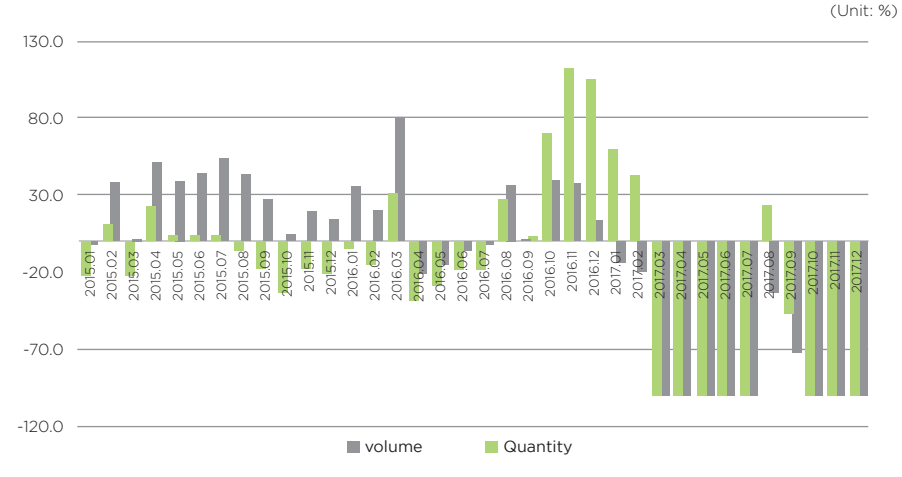
(Unit: USD thousand, thousand tons)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-8] Monthly Changes of Anthracite Export to China(Year-on-Year)

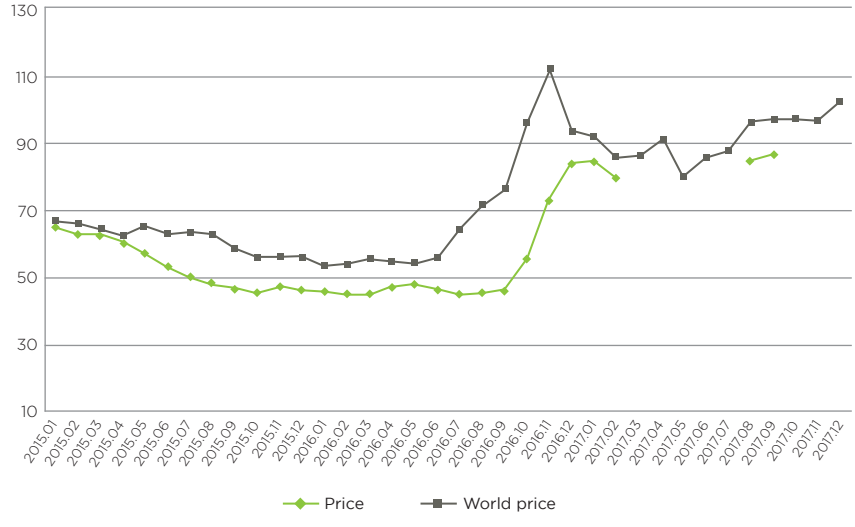
(Unit: %)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

**[Appendix Figure 2-9] Anthracite Export Price**

(Unit: USD/Ton)




*Source:* KITA(http://stat.kita.net/), http://stat.kita.net/), IndexMundi (http://www.indexmundi.com), Last access date: 22. February, 2018.

## <Appendix Table 2-8> DPRK's Major Export 2: Iron Ore(HS 260111)

(Unit: USD thousand, thousand tons, USD/ton, %)

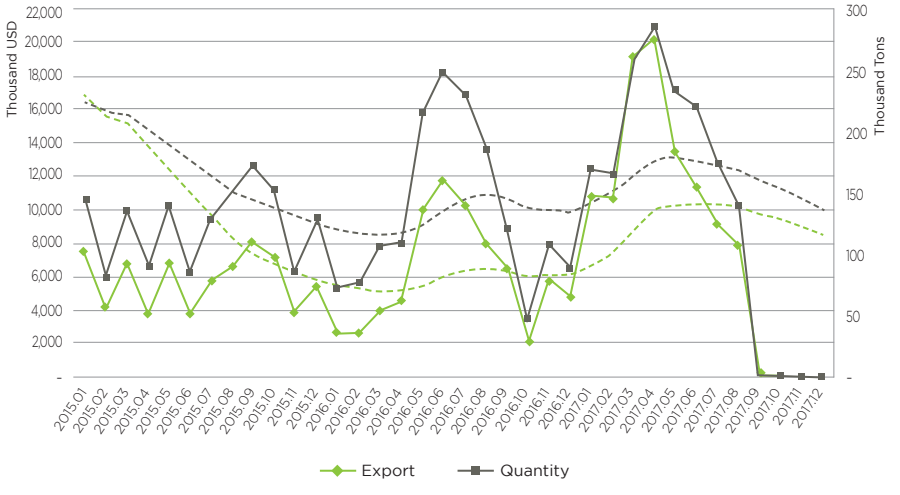
| | Volume | (Growth) | Quantity | (Growth) | Price | (Growth) |
|---|---|---|---|---|---|---|
| Jan. 2015 | 7,568 | (-68.0) | 144.34 | (-40.4) | 52.43 | (-46.3) |
| Feb. 2015 | 4,126 | (-77.3) | 81.50 | (-58.5) | 50.63 | (-45.2) |
| Mar. 2015 | 6,799 | (-52.5) | 134.45 | (-11.1) | 50.57 | (-46.5) |
| Apr. 2015 | 3,752 | (-81.4) | 89.09 | (-61.1) | 42.11 | (-52.2) |
| May. 2015 | 6,822 | (-71.3) | 139.62 | (-50.9) | 48.86 | (-41.6) |
| Jun. 2015 | 3,809 | (-80.4) | 86.94 | (-64.1) | 43.82 | (-45.5) |
| Jul. 2015 | 5,860 | (-72.7) | 128.58 | (-55.6) | 45.58 | (-38.5) |
| Aug. 2015 | 6,640 | (-72.2) | 150.63 | (-50.6) | 44.08 | (-43.8) |
| Sep. 2015 | 8,011 | (-56.6) | 172.91 | (-32.5) | 46.33 | (-35.7) |
| Oct. 2015 | 7,120 | (-54.1) | 153.20 | (-39.3) | 46.47 | (-24.4) |
| Nov. 2015. | 3,913 | (-62.0) | 86.91 | (-49.8) | 45.03 | (-24.3) |
| Dec. 2015 | 5,455 | (-41.8) | 129.50 | (-24.8) | 42.13 | (-22.6) |
| Jan. 2016 | 2,660 | (-64.8) | 72.36 | (-49.9) | 36.76 | (-29.9) |
| Feb. 2016 | 2,645 | (-35.9) | 77.07 | (-5.4) | 34.32 | (-32.2) |
| Mar. 2016 | 3,945 | (-42.0) | 107.02 | (-20.4) | 36.86 | (-27.1) |
| Apr. 2016 | 4,536 | (20.9) | 110.27 | (23.8) | 41.13 | (-2.3) |
| May. 2016 | 9,977 | (46.2) | 216.09 | (54.8) | 46.17 | (-5.5) |
| Jun. 2016 | 11,703 | (207.2) | 248.52 | (185.9) | 47.09 | (7.5) |
| Jul. 2016 | 10,244 | (74.8) | 230.29 | (79.1) | 44.48 | (-2.4) |
| Aug. 2016 | 7,956 | (19.8) | 184.73 | (22.6) | 43.07 | (-2.3) |
| Sep. 2016 | 6,454 | (-19.4) | 121.53 | (-29.7) | 53.11 | (14.6) |
| Oct. 2016 | 2,196 | (-69.2) | 45.47 | (-70.3) | 48.31 | (3.9) |
| Nov. 2016 | 5,821 | (48.7) | 107.70 | (23.9) | 54.05 | (20.0) |
| Dec. 2016 | 4,832 | (-11.4) | 88.07 | (-32.0) | 54.87 | (30.2) |
| Jan. 2017 | 10,77261 | (304.9) | 168.27 | (132.5) | 64.01 | (74.1) |
| Feb. 2017 | 10,722 | (305.4) | 164.32 | (113.2) | 65.25 | (90.1) |
| Mar. 2017 | 19,061 | (383.2) | 258.56 | (141.6) | 73.72 | (100.0) |
| Apr. 2017 | 20,260 | (346.7) | 285.49 | (158.9) | 70.97 | (72.5) |
| May. 2017 | 13,391 | (34.2) | 233.51 | (8.1) | 57.35 | (24.2) |
| Jun. 2017 | 11,311 | (-3.3) | 220.39 | (-11.3) | 51.32 | (9.0) |
| Jul. 2017 | 9,128 | (-10.9) | 174.78 | (-24.1) | 52.23 | (17.4) |
| Aug. 2017 | 7,877 | (-1.0) | 138.58 | (-25.0) | 56.84 | (32.0) |
| Sep. 2017 | 55 | (-99.2) | 3.04 | (-97.5) | 18.00 | (-66.1) |
| Oct. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Nov. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |
| Dec. 2017 | 0 | (-100.0) | 0 | (-100.0) | - | - |

*Note:* Number in parenthesis denotes year-on-year growth rate
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

# Statistical Appendix

## [Appendix Figure 2-10] Monthly Iron Ore Export to China

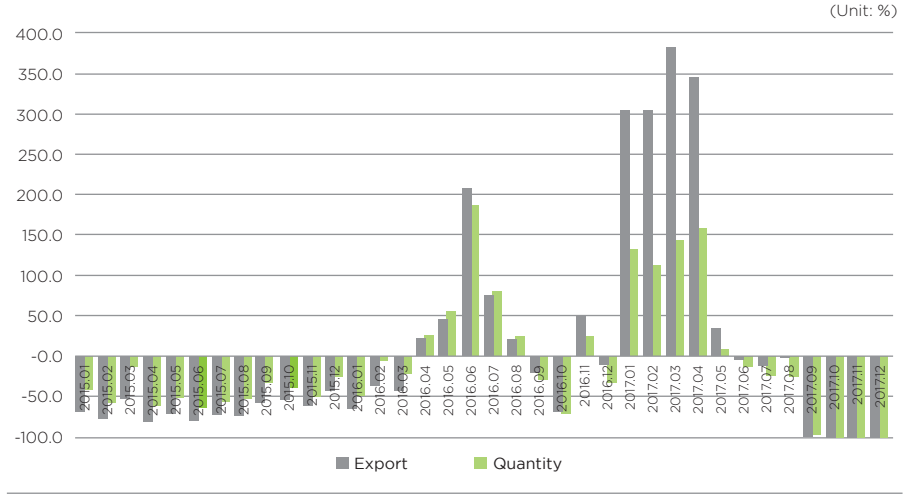
(Unit: USD thousand, thousand tons)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-11] Monthly Changes of Iron Ore Export to China(Year-on-Year)

(Unit: %)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-12] Price of Iron Ore

(Unit: USD/ton)


*Source:* KITA(http://stat.kita.net/), http://stat.kita.net/), IndexMundi (http://www.indexmundi.com), Last access date: 22. February, 2018.

## <Appendix Table 2-9> DPRK's Major Export 3: Clothes(HS 61 & 62)

(Unit: USD thousand, %)

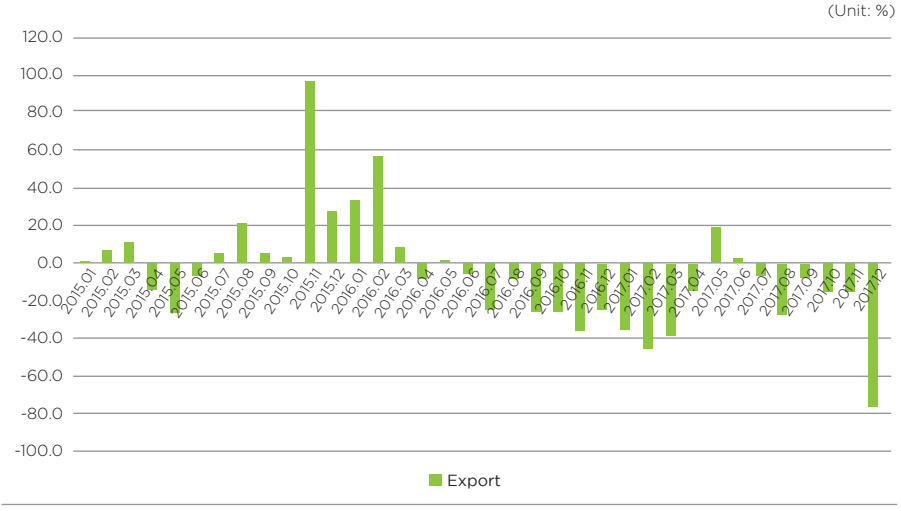
| | HS 61 Volume | (Growth) | HS 62 Volume | (Growth) | HS 61 + 62 Volume | (Growth) |
|---|---|---|---|---|---|---|
| Jan. 2015 | 10,188 | (41.1) | 36,475 | (-7.0) | 46,663 | (0.5) |
| Feb. 2015 | 8,565 | (57.0) | 32,688 | (-2.3) | 41,253 | (6.0) |
| Mar. 2015 | 20,708 | (43.1) | 46,680 | (0.5) | 67,388 | (10.6) |
| Apr. 2015 | 14,562 | (0.2) | 30,991 | (-19.6) | 45,554 | (-14.2) |
| May. 2015 | 12,882 | (35.9) | 31,660 | (-38.2) | 44,542 | (-26.6) |
| Jun. 2015 | 13,133 | (91.6) | 48,035 | (-18.4) | 61,168 | (-7.0) |
| Jul. 2015 | 9,795 | (20.3) | 74,081 | (3.1) | 83,876 | (4.9) |
| Aug. 2015 | 17,390 | (42.7) | 84,943 | (17.7) | 102,333 | (21.3) |
| Sep. 2015 | 18,586 | (22.7) | 80,400 | (2.0) | 98,986 | (5.3) |
| Oct. 2015 | 13,529 | (31.6) | 59,050 | (-2.3) | 72,579 | (2.6) |
| Nov. 2015. | 14,841 | (139.5) | 57,020 | (87.4) | 71,860 | (96.2) |
| Dec. 2015 | 11,917 | (32.2) | 51,185 | (26.3) | 63,102 | (27.4) |
| Jan. 2016 | 10,069 | (-1.2) | 52,380 | (43.6) | 62,449 | (33.8) |
| Feb. 2016 | 16,395 | (91.4) | 48,022 | (46.9) | 64,418 | (56.2) |
| Mar. 2016 | 13,284 | (-35.9) | 59,887 | (28.3) | 73,171 | (8.6) |
| Apr. 2016 | 11,602 | (-20.3) | 30,482 | (-1.6) | 42,085 | (-7.6) |
| May. 2016 | 6,685 | (-48.1) | 38,170 | (20.6) | 44,854 | (0.7) |
| Jun. 2016 | 11,634 | (-11.4) | 45,965 | (-4.3) | 57,599 | (-5.8) |
| Jul. 2016 | 6,005 | (-38.7) | 57,283 | (-22.7) | 63,288 | (-24.5) |
| Aug. 2016 | 7,735 | (-55.5) | 86,143 | (1.4) | 93,878 | (-8.3) |
| Sep. 2016 | 7,578 | (-59.2) | 66,119 | (-17.8) | 73,697 | (-25.5) |
| Oct. 2016 | 8,640 | (-36.1) | 45,602 | (-22.8) | 54,242 | (-25.3) |
| Nov. 2016 | 5,199 | (-65.0) | 40,551 | (-28.9) | 45,750 | (-36.3) |
| Dec. 2016 | 7,046 | (-40.9) | 40,896 | (-20.1) | 47,941 | (-24.0) |
| Jan. 2017 | 7,552 | (-25.0) | 32,944 | (-37.1) | 40,496 | (-35.2) |
| Feb. 2017 | 5,562 | (-66.1) | 29,569 | (-38.4) | 35,131 | (-45.5) |
| Mar. 2017 | 9,066 | (-31.8) | 36,411 | (-39.2) | 45,477 | (-37.8) |
| Apr. 2017 | 5,709 | (-50.8) | 30,310 | (-0.6) | 36,019 | (-14.4) |
| May. 2017 | 7,448 | (11.4) | 45,912 | (20.3) | 53,361 | (19.0) |
| Jun. 2017 | 6,600 | (-43.3) | 52,333 | (13.9) | 58,933 | (2.3) |
| Jul. 2017 | 6,030 | (0.4) | 53,292 | (-7.0) | 59,323 | (-6.3) |
| Aug. 2017 | 6,552 | (-15.3) | 61,914 | (-28.1) | 68,466 | (-27.1) |
| Sep. 2017 | 5,107 | (-32.6) | 63,004 | (-4.7) | 68,111 | (-7.6) |
| Oct. 2017 | 2,425 | (-71.9) | 43,626 | (-4.3) | 46,051 | (-15.1) |
| Nov. 2017 | 2,419 | (-53.5) | 36,667 | (-9.6) | 39,086 | (-14.6) |
| Dec. 2017 | 783 | (-88.9) | 10,758 | (-73.7) | 11,542 | (-75.9) |

*Note:* Number in parenthesis denotes year-on-year growth rate
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-13] Monthly Clothes Export to China(HS 61 & 62)


*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-14] Monthly Changes of Clothes Export to China(Year-on-Year)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

# Statistical Appendix

## <Appendix Table 2-10> DPRK's Major Export 4: Seafood(HS 03)[1]

(Unit: USD thousand, %)

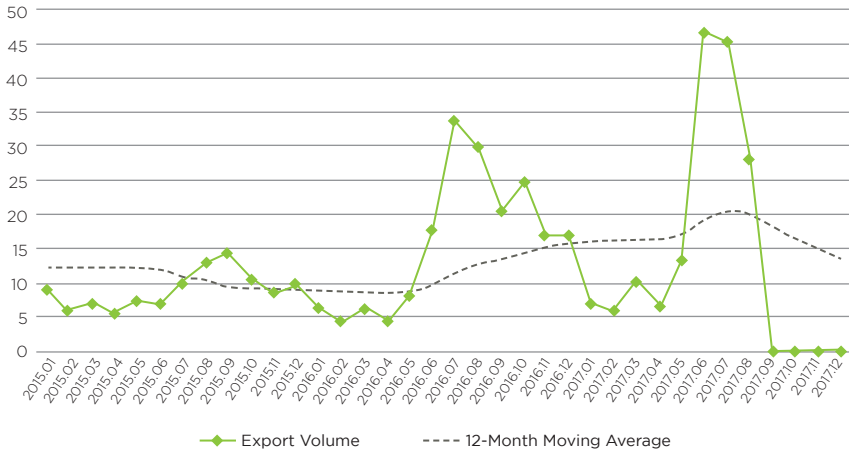
| | Volume (Growth) | 12-Month Moving Average |
|---|---|---|
| Jan. 2015 | 9,269 (24.2) | 12,088 |
| Feb. 2015 | 5,966 (64.3) | 12,283 |
| Mar. 2015 | 6,817 (-7.6) | 12,236 |
| Apr. 2015 | 5,666 (-0.3) | 12,234 |
| May. 2015 | 7,436 (42.7) | 12,420 |
| Jun. 2015 | 6,954 (-39.7) | 12,038 |
| Jul. 2015 | 10,083 (-53.3) | 11,079 |
| Aug. 2015 | 13,066 (-33.5) | 10,530 |
| Sep. 2015 | 14,390 (-54.2) | 9,109 |
| Oct. 2015 | 10,693 (5.8) | 9,158 |
| Nov. 2015. | 8,579 (-14.2) | 9,039 |
| Dec. 2015 | 9,557 (0.1) | 9,040 |
| Jan. 2016 | 6,232 (-32.8) | 8,787 |
| Feb. 2016 | 4,389 (-26.4) | 8,655 |
| Mar. 2016 | 6,196 (-9.1) | 8,603 |
| Apr. 2016 | 4,607 (-18.7) | 8,515 |
| May. 2016 | 8,142 (9.5) | 8,574 |
| Jun. 2016 | 17,883 (157.2) | 9,485 |
| Jul. 2016 | 33,759 (234.8) | 11,458 |
| Aug. 2016 | 29,788 (128.0) | 12,851 |
| Sep. 2016 | 20,525 (42.6) | 13,363 |
| Oct. 2016 | 24,804 (132.0) | 14,538 |
| Nov. 2016 | 16,896 (96.9) | 15,232 |
| Dec. 2016 | 16,872 (76.5) | 15,841 |
| Jan. 2017 | 6,985 (12.1) | 15,904 |
| Feb. 2017 | 5,882 (34.0) | 16,028 |
| Mar. 2017 | 10,075 (62.6) | 16,352 |
| Apr. 2017 | 6,555 (42.3) | 16,514 |
| May. 2017 | 13,433 (65.0) | 16,955 |
| Jun. 2017 | 46,663 (160.9) | 19,353 |
| Jul. 2017 | 45,087 (33.6) | 20,297 |
| Aug. 2017 | 28,141 (-5.5) | 20,160 |
| Sep. 2017 | 0 (-100.0) | 18,450 |
| Oct. 2017 | 0 (-100.0) | 16,383 |
| Nov. 2017 | 0 (-100.0) | 14,974 |
| Dec. 2017 | 0 (-100.0) | 13,569 |

*Note:* Number in parenthesis denotes year-on-year growth rate
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

1. including fish, crustaceans, molluscs and other aquatic invertebrates

## [Appendix Figure 2-15] Monthly Seafood Export to China(HS 03)

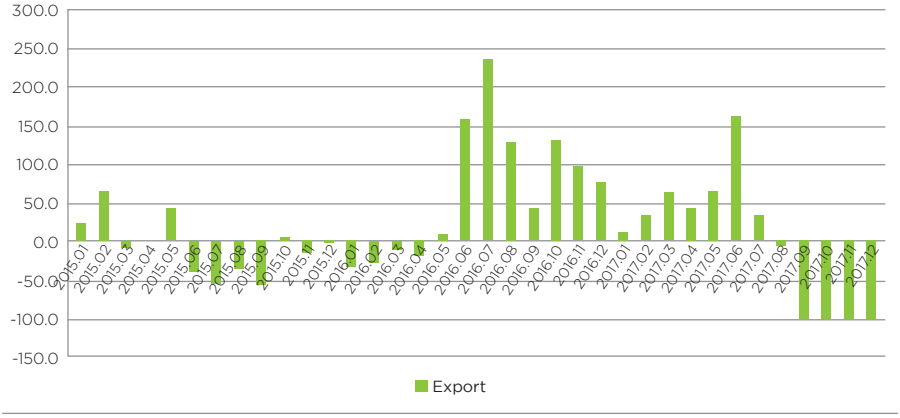
(Unit: USD million)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-16] Monthly Changes of Seafood Export to China(Year-on-Year)

(Unit: %)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## <Appendix Table 2-11> DPRK's Major Import 1: Petroleum(HS 2701)

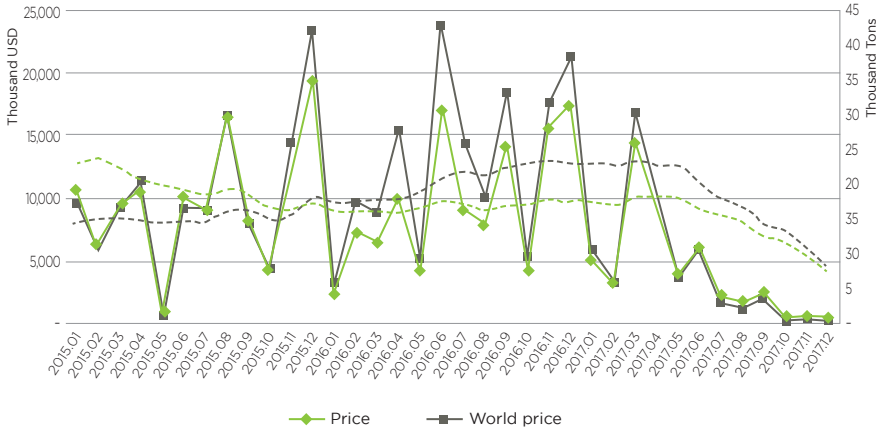
(Unit: USD thousand, thousand tons, USD/ton, %)

| | Volume | (Growth) | Quantity | (Growth) | Price | (Growth) |
|---|---|---|---|---|---|---|
| Jan. 2015 | 10,615 | (-4.5) | 17.26 | (53.3) | 0.62 | (-37.7) |
| Feb. 2015 | 5,829 | (319.3) | 10.70 | (649.6) | 0.54 | (-44.1) |
| Mar. 2015 | 9,419 | (-51.1) | 16.43 | (-13.1) | 0.57 | (-43.7) |
| Apr. 2015 | 10,569 | (-51.4) | 20.23 | (-5.2) | 0.52 | (-48.7) |
| May. 2015 | 760 | (-90.5) | 0.94 | (-88.7) | 0.81 | (-16.7) |
| Jun. 2015 | 9,867 | (-23.4) | 16.58 | (32.0) | 0.60 | (-41.9) |
| Jul. 2015 | 9,097 | (-39.0) | 16.50 | (1.4) | 0.55 | (-39.9) |
| Aug. 2015 | 16,544 | (99.2) | 29.43 | (225.4) | 0.56 | (-38.8) |
| Sep. 2015 | 8,257 | (-43.3) | 14.52 | (-6.8) | 0.57 | (-39.2) |
| Oct. 2015 | 4,230 | (-75.3) | 8.02 | (-58.7) | 0.53 | (-40.1) |
| Nov. 2015. | 11,941 | (-22.2) | 25.60 | (36.9) | 0.47 | (-43.2) |
| Dec. 2015 | 19,329 | (89.8) | 41.89 | (215.1) | 0.46 | (-39.8) |
| Jan. 2016 | 2,242 | (-78.9) | 5.45 | (-68.4) | 0.41 | (-33.1) |
| Feb. 2016 | 7,206 | (23.6) | 17.39 | (62.5) | 0.41 | (-23.9) |
| Mar. 2016 | 6,428 | (-31.8) | 15.87 | (-3.4) | 0.40 | (-29.4) |
| Apr. 2016 | 9,924 | (-6.1) | 27.75 | (37.2) | 0.36 | (-31.5) |
| May. 2016 | 3,997 | (425.7) | 9.29 | (885.0) | 0.43 | (-46.6) |
| Jun. 2016 | 17,074 | (73.0) | 42.67 | (157.4) | 0.40 | (-32.8) |
| Jul. 2016 | 8,977 | (-1.3) | 25.50 | (54.6) | 0.35 | (-36.2) |
| Aug. 2016 | 7,877 | (-52.4) | 17.94 | (-39.0) | 0.44 | (-21.9) |
| Sep. 2016 | 14,112 | (70.9) | 33.21 | (128.8) | 0.42 | (-25.3) |
| Oct. 2016 | 4,248 | (0.4) | 9.62 | (20.0) | 0.44 | (-16.3) |
| Nov. 2016 | 15,640 | (31.0) | 31.56 | (23.3) | 0.50 | (6.2) |
| Dec. 2016 | 17,270 | (-10.7) | 38.15 | (-8.9) | 0.45 | (-1.9) |
| Jan. 2017 | 4,938 | (120.2) | 10.51 | (92.8) | 0.47 | (14.2) |
| Feb. 2017 | 2,999 | (-58.4) | 5.91 | (-66.0) | 0.51 | (22.50 |
| Mar. 2017 | 14,272 | (122.0) | 30.10 | (89.6) | 0.47 | (17.1) |
| Apr. 2017 | 9,095 | (-8.4) | 17.86 | (-35.6) | 0.51 | (42.4) |
| May. 2017 | 3,733 | (-6.6) | 6.41 | (-31.0) | 0.58 | (35.4) |
| Jun. 2017 | 5,944 | (-65.2) | 10.53 | (-75.3) | 0.56 | (41.1) |
| Jul. 2017 | 1,945 | (-78.3) | 2.82 | (-88.9) | 0.69 | (95.8) |
| Aug. 2017 | 1,700 | (-78.4) | 2.21 | (-87.7) | 0.77 | (75.5) |
| Sep. 2017 | 2,395 | (-83.0) | 3.46 | (-89.6) | 0.69 | (62.8) |
| Oct. 2017 | 245 | (-94.2) | 0.21 | (-97.8) | 1.16 | (162.3) |
| Nov. 2017 | 484 | (-96.9) | 0.41 | (-98.7) | 1.18 | (137.4) |
| Dec. 2017 | 480 | (-97.2) | 0.44 | (-98.8) | 1.09 | (141.2) |

*Note:* Number in parenthesis denotes year-on-year growth rate
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-17] Monthly Petroleum Import from China

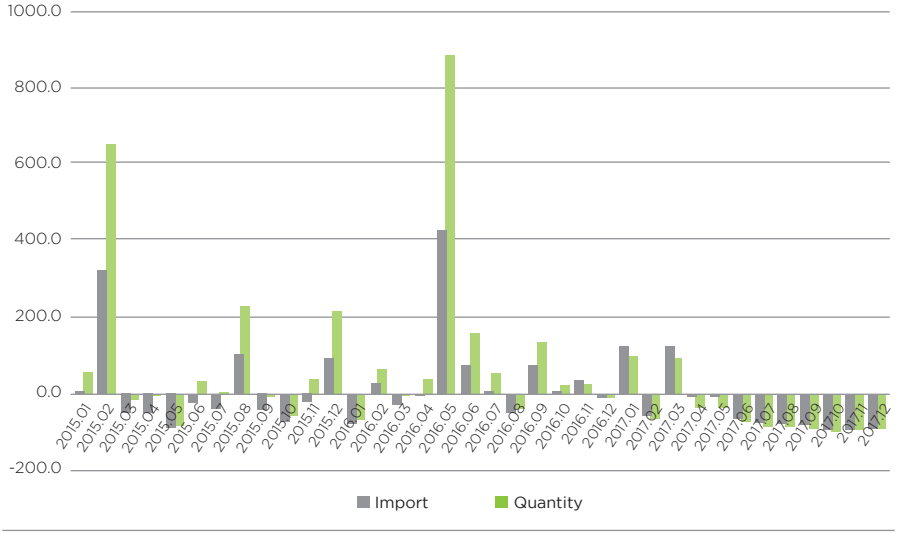
(Unit: USD thousand, thousand tons)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-18] Monthly Changes of Petroleum Import from China(Year-on-Year)

(Unit: %)




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

# Statistical Appendix

**<Appendix Table 2-12> DPRK's Major Import 2: Rice & Maize (HS100630 & 100590)**

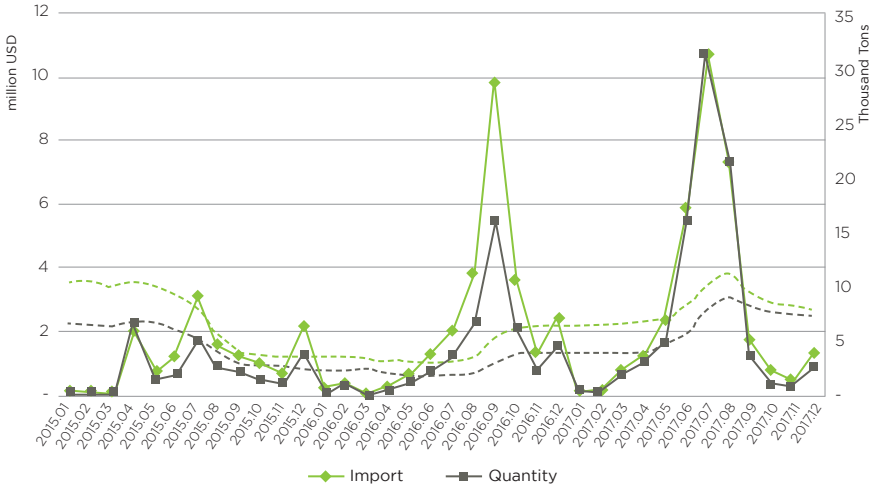
(Unit: USD thousand, thousand tons, USD/ton, %)

| | Volume | (Growth) | Quantity | (Growth) | Price | (Growth) |
|---|---|---|---|---|---|---|
| Jan. 2015 | 94 | (-82.2) | 0.16 | (-83.2) | 596.43 | (5.6) |
| Feb. 2015 | 104 | (-) | 0.18 | (-) | 580.00 | (-) |
| Mar. 2015 | 110 | (-82.3) | 0.28 | (-81.5) | 398.70 | (-3.8) |
| Apr. 2015 | 2,011 | (45.7) | 6.63 | (115.9) | 303.17 | (-32.5) |
| May. 2015 | 640 | (-73.0) | 1.26 | (-67.8) | 508.96 | (-16.2) |
| Jun. 2015 | 1,165 | (-74.9) | 2.05 | (-73.9) | 569.52 | (-3.8) |
| Jul. 2015 | 3,079 | (-60.6) | 5.19 | (-64.3) | 593.71 | (10.4) |
| Aug. 2015 | 1,547 | (-86.6) | 2.67 | (-86.8) | 579.48 | (2.2) |
| Sep. 2015 | 1,206 | (-84.5) | 2.20 | (-85.0) | 547.11 | (3.6) |
| Oct. 2015 | 999 | (-54.7) | 1.42 | (-67.2) | 706.08 | (38.0) |
| Nov. 2015. | 610 | (-8.7) | 1.11 | (-30.3) | 550.22 | (30.9) |
| Dec. 2015 | 2,221 | (-28.1) | 3.90 | (-35.8) | 569.91 | (12.0) |
| Jan. 2016 | 229 | (144.9) | 0.37 | (138.1) | 613.35 | (2.8) |
| Feb. 2016 | 327 | (213.2) | 0.77 | (325.0) | 427.45 | (-26.3) |
| Mar. 2016 | 0 | (-99.7) | 0.00 | (-99.8) | 600.00 | (50.5) |
| Apr. 2016 | 267 | (-86.7) | 0.47 | (-92.9) | 567.34 | (87.1) |
| May. 2016 | 633 | (-1.1) | 1.20 | (-4.5) | 527.10 | (3.6) |
| Jun. 2016 | 1,271 | (9.1) | 2.26 | (10.6) | 561.91 | (-1.3) |
| Jul. 2016 | 2,089 | (-32.1) | 3.60 | (-30.5) | 579.80 | (-2.3) |
| Aug. 2016 | 3,854 | (149.2) | 6.75 | (152.8) | 571.21 | (-1.4) |
| Sep. 2016 | 9,875 | (718.8) | 16.15 | (632.7) | 611.41 | (11.8) |
| Oct. 2016 | 3,614 | (261.7) | 6.27 | (343.0) | 576.46 | (-18.4) |
| Nov. 2016 | 1,293 | (111.9) | 2.41 | (117.0) | 537.13 | (2.4) |
| Dec. 2016 | 2,401 | (8.2) | 4.75 | (22.0) | 505.30 | (-11.3) |
| Jan. 2017 | 109 | (-52.6) | 0.19 | (-49.7) | 578.53 | (-5.7) |
| Feb. 2017 | 142 | (-56.6) | 0.45 | (-41.4) | 316.59 | (-25.9) |
| Mar. 2017 | 739 | (246,344.3) | 1.84 | (367,460.0) | 402.29 | (-33.0) |
| Apr. 2017 | 1,193 | (347.3) | 3.05 | (548.6) | 391.30 | (-31.0) |
| May. 2017 | 2,344 | (270.2) | 4.87 | (305.1) | 481.72 | (-8.6) |
| Jun. 2017 | 5,878 | (362.4) | 16.00 | (607.2) | 367.42 | (-34.6) |
| Jul. 2017 | 10,735 | (413.8) | 31.48 | (773.7) | 340.97 | (-41.2) |
| Aug. 2017 | 7,374 | (91.3) | 21.36 | (216.5) | 345.26 | (-39.6) |
| Sep. 2017 | 1,688 | (-82.9) | 3.56 | (-78.0) | 474.83 | (-22.3) |
| Oct. 2017 | 654 | (-81.9) | 1.06 | (-83.1) | 617.91 | (7.2) |
| Nov. 2017 | 429 | (-66.8) | 0.77 | (-68.0) | 556.45 | (3.6) |
| Dec. 2017 | 1,334 | (-44.5) | 2.68 | (-43.7) | 498.50 | (-1.3) |

*Note:* Number in parenthesis denotes year-on-year growth rate
*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-19] Monthly Rice & Maize Import from China

(Unit: USD million, thousand tons )




*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

## [Appendix Figure 2-20] Rice & Maize Import Price

(Unit: USD/ton)


*Source:* KITA(http://stat.kita.net/), Last access date: 22. February, 2018.

# Statistical Appendix

## 3. Market Exchange Rate and Price

### A. Exchange Rate

**<Appendix Table 3-1> Exchange Rate(Market Rate)**

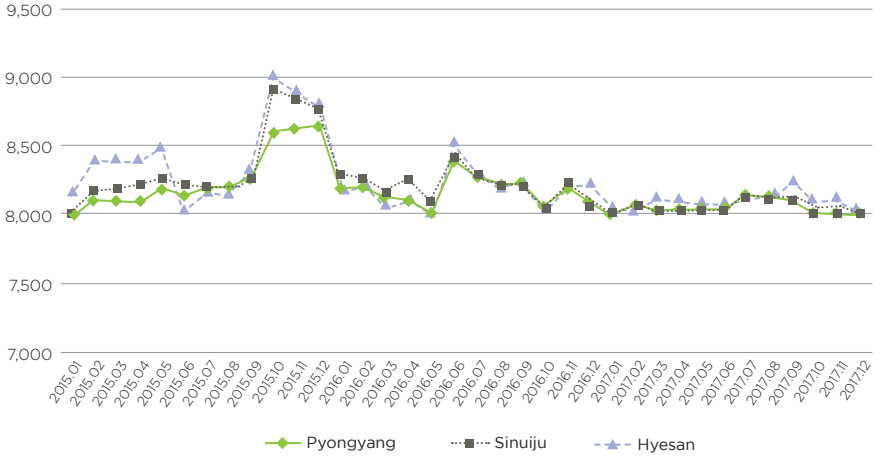
(Unit: North Korean won/USD)

| | Market Price | | |
|---|---|---|---|
| | Pyongyang | Sinuiju | Hyesan |
| Jan. 2015 | 8,000 | 8,000 | 8,150 |
| Feb. 2015 | 8,100 | 8,170 | 8,390 |
| Mar. 2015 | 8,100 | 8,185 | 8,395 |
| Apr. 2015 | 8,100 | 8,200 | 8,400 |
| May. 2015 | 8,180 | 8,250 | 8,490 |
| Jun. 2015 | 8,150 | 8,200 | 8,025 |
| Jul. 2015 | 8,200 | 8,200 | 8,155 |
| Aug. 2015 | 8,200 | 8,200 | 8,155 |
| Sep. 2015 | 8,260 | 8,200 | 8,320 |
| Oct. 2015 | 8,600 | 8,900 | 9,000 |
| Nov. 2015. | 8,620 | 8,830 | 8,900 |
| Dec. 2015 | 8,640 | 8,760 | 8,800 |
| Jan. 2016 | 8,190 | 8,260 | 8,190 |
| Feb. 2016 | 8,190 | 8,260 | 8,210 |
| Mar. 2016 | 8,128 | 8,150 | 8,065 |
| Apr. 2016 | 8,100 | 8,250 | 8,100 |
| May. 2016 | 8,020 | 8,085 | 8,010 |
| Jun. 2016 | 8,400 | 8,417 | 8,515 |
| Jul. 2016 | 8,269 | 8,285 | 8,303 |
| Aug. 2016 | 8,215 | 8,205 | 8,230 |
| Sep. 2016 | 8,215 | 8,205 | 8,230 |
| Oct. 2016 | 8,051 | 8,039 | 8,070 |
| Nov. 2016 | 8,194 | 8,219 | 8,182 |
| Dec. 2016 | 8,081 | 8,050 | 8,228 |
| Jan. 2017 | 8,000 | 8,000 | 8,050 |
| Feb. 2017 | 8,070 | 8,060 | 8,050 |
| Mar. 2017 | 8,035 | 8,020 | 8,105 |
| Apr. 2017 | 8,040 | 8,032 | 8,100 |
| May. 2017 | 8,040 | 8,029 | 8,091 |
| Jun. 2017 | 8,040 | 8,025 | 8,083 |
| Jul. 2017 | 8,130 | 8,110 | 8,125 |
| Aug. 2017 | 8,130 | 8,110 | 8,125 |
| Sep. 2017 | 8,100 | 8,125 | 8,240 |
| Oct. 2017 | 8,005 | 8,050 | 8,110 |
| Nov. 2017 | 8,005 | 8,050 | 8,110 |
| Dec. 2017 | 8,000 | 8,000 | 8,025 |

*Source:* KDI Collection of DPRK Statistics based on DailyNK North Korea' Market Trend (www.dailynk.com, Last access date: 22. February, 2018).

## [Appendix Figure 3-1] Exchange Rate(Market Rate)

(Unit: North Korean won/USD)




*Source:* KDI Collection of DPRK Statistics based on DailyNK North Korea' Market Trend (www.dailynk.com, Last access date: 22. February, 2018).

# Statistical Appendix

## <Appendix Table 3-2> Price of Rice(in North Korean won)

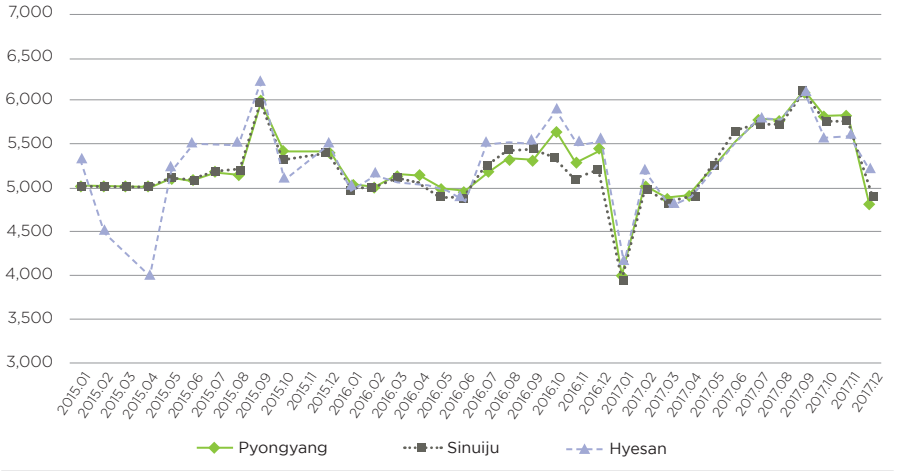
(Unit: North Korean won/kg)

| | Price of Rice | | |
|---|---|---|---|
| | Pyongyang | Sinuiju | Hyesan |
| Jan. 2015 | 5,000 | 5,000 | 5,300 |
| Feb. 2015 | 5,000 | 5,000 | 4,500 |
| Mar. 2015 | 5,000 | 5,000 | 4,250 |
| Apr. 2015 | 5,000 | 5,000 | 4,000 |
| May. 2015 | 5,100 | 5,100 | 5,200 |
| Jun. 2015 | 5,100 | 5,100 | 5,500 |
| Jul. 2015 | 5,150 | 5,200 | 5,500 |
| Aug. 2015 | 5,150 | 5,200 | 5,500 |
| Sep. 2015 | 6,000 | 6,000 | 6,200 |
| Oct. 2015 | 5,400 | 5,300 | 5,100 |
| Nov. 2015. | 5,400 | 5,350 | 5,300 |
| Dec. 2015 | 5,400 | 5,400 | 5,500 |
| Jan. 2016 | 5,019 | 4,970 | 4,980 |
| Feb. 2016 | 5,019 | 5,000 | 5,150 |
| Mar. 2016 | 5,150 | 5,090 | 5,080 |
| Apr. 2016 | 5,120 | 5,050 | 5,050 |
| May. 2016 | 5,000 | 4,900 | 5,000 |
| Jun. 2016 | 4,950 | 4,900 | 4,850 |
| Jul. 2016 | 5,165 | 5,265 | 5,500 |
| Aug. 2016 | 5,315 | 5,420 | 5,520 |
| Sep. 2016 | 5,315 | 5,420 | 5,520 |
| Oct. 2016 | 5,622 | 5,344 | 5,874 |
| Nov. 2016 | 5,270 | 5,100 | 5,508 |
| Dec. 2016 | 5,406 | 5,196 | 5,528 |
| Jan. 2017 | 4,000 | 3,970 | 4,190 |
| Feb. 2017 | 5,000 | 5,010 | 5,205 |
| Mar. 2017 | 4,870 | 4,820 | 4,800 |
| Apr. 2017 | 4,900 | 4,890 | 4,910 |
| May. 2017 | 5,213 | 5,271 | 5,213 |
| Jun. 2017 | 5,525 | 5,653 | 5,515 |
| Jul. 2017 | 5,770 | 5,740 | 5,800 |
| Aug. 2017 | 5,770 | 5,740 | 5,800 |
| Sep. 2017 | 6,100 | 6,085 | 6,100 |
| Oct. 2017 | 5,810 | 5,760 | 5,600 |
| Nov. 2017 | 5,810 | 5,760 | 5,600 |
| Dec. 2017 | 4,800 | 4,900 | 5,200 |

*Source:* KDI Collection of DPRK Statistics based on DailyNK North Korea' Market Trend (www.dailynk.com, Last access date: 22. February, 2018).

## [Appendix Figure 3-2] Price of Rice(in North Korean won)

(Unit: North Korean won/kg)




*Source:* KDI Collection of DPRK Statistics based on DailyNK North Korea' Market Trend (www.dailynk.com, Last access date: 22. February, 2018).

## <Appendix Table 3-3> Price of Rice(in US Dollar)

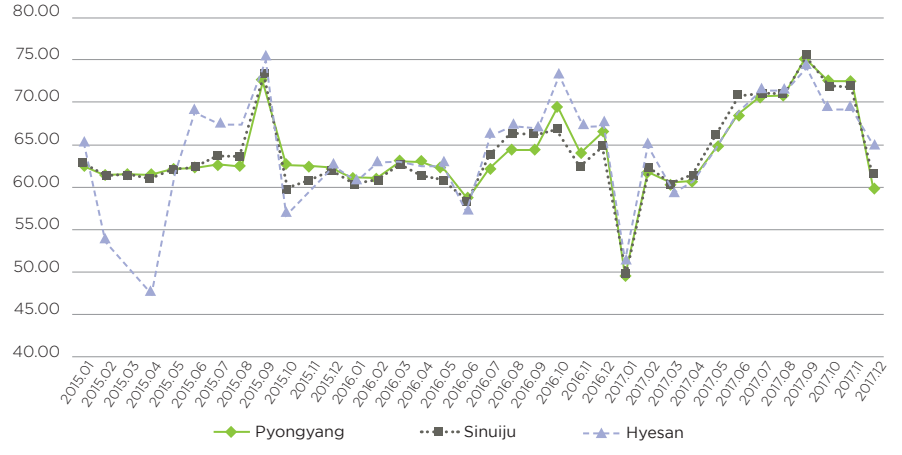
(Unit: USD/100kg)

| | Market Price | | |
|---|---|---|---|
| | Pyongyang | Sinuiju | Hyesan |
| Jan. 2015 | 62.50 | 62.50 | 65.03 |
| Feb. 2015 | 61.73 | 61.20 | 53.64 |
| Mar. 2015 | 61.73 | 61.09 | 50.63 |
| Apr. 2015 | 61.73 | 60.98 | 47.62 |
| May. 2015 | 62.35 | 61.82 | 61.25 |
| Jun. 2015 | 62.58 | 62.20 | 68.54 |
| Jul. 2015 | 62.80 | 63.41 | 67.44 |
| Aug. 2015 | 62.80 | 63.41 | 67.44 |
| Sep. 2015 | 72.64 | 73.17 | 74.52 |
| Oct. 2015 | 62.79 | 59.55 | 56.67 |
| Nov. 2015. | 62.65 | 57.34 | 59.55 |
| Dec. 2015 | 62.50 | 55.33 | 62.50 |
| Jan. 2016 | 61.28 | 60.17 | 60.81 |
| Feb. 2016 | 61.28 | 60.53 | 62.73 |
| Mar. 2016 | 63.36 | 62.45 | 62.99 |
| Apr. 2016 | 63.21 | 61.21 | 62.35 |
| May. 2016 | 62.34 | 60.61 | 62.42 |
| Jun. 2016 | 58.93 | 58.22 | 56.96 |
| Jul. 2016 | 62.47 | 63.54 | 66.25 |
| Aug. 2016 | 64.70 | 66.06 | 67.07 |
| Sep. 2016 | 64.70 | 66.06 | 67.07 |
| Oct. 2016 | 69.84 | 66.48 | 72.79 |
| Nov. 2016 | 64.32 | 62.05 | 67.32 |
| Dec. 2016 | 66.90 | 64.53 | 67.18 |
| Jan. 2017 | 50.00 | 49.63 | 52.05 |
| Feb. 2017 | 61.96 | 62.16 | 64.66 |
| Mar. 2017 | 60.61 | 60.10 | 59.22 |
| Apr. 2017 | 60.95 | 60.88 | 60.62 |
| May. 2017 | 64.83 | 65.66 | 64.42 |
| Jun. 2017 | 68.72 | 70.44 | 68.23 |
| Jul. 2017 | 70.97 | 70.78 | 71.38 |
| Aug. 2017 | 70.97 | 70.78 | 71.38 |
| Sep. 2017 | 75.31 | 74.89 | 74.03 |
| Oct. 2017 | 72.58 | 71.55 | 69.05 |
| Nov. 2017 | 72.58 | 71.55 | 69.05 |
| Dec. 2017 | 60.00 | 61.25 | 64.80 |

*Source:* KDI Collection of DPRK Statistics based on DailyNK North Korea' Market Trend (www.dailynk.com, Last access date: 22. February, 2018).

**[Appendix Figure 3-3] Price of Rice(in US Dollar)**

(Unit: USD/100kg)




*Source:* KDI Collection of DPRK Statistics based on DailyNK North Korea' Market Trend (www.dailynk.com, Last access date: 22. February, 2018).

## 4. Food

**<Appendix Table 4-1> Crop Production**

(Unit: thousand M/T)

| | | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FAO | Rice | 2,186 | 2,244 | 2,370 | 2,583 | 2,479 | 1,870 | 2,862 | 2,336 | 2,426 | 2,479 | 2,861 | 2,901 | 2,626* | 1,945* | 2,536* |
| | Maize | 1,651 | 1,725 | 1,727 | 1,630 | 1,750 | 1,587 | 1,411 | 1,705 | 1,683 | 1,857 | 2,040 | 2,002 | 2,349 | 2,288* | 2,195* |
| | Total | 3,837 | 3,969 | 4,097 | 4,213 | 4,229 | 3,457 | 4,273 | 4,041 | 4,109 | 4,336 | 4,721 | 4,903 | 4,975* | 4,233* | 4,731* |
| KOSIS | Rice | 1,734 | 1,720 | 1,795 | 2,024 | 1,895 | 1,527 | 1,858 | 1,910 | - | - | 2,037 | 2,101 | 2,156 | 2,016 | 2,224 |
| | Maize | 1,636 | 1,710 | 1,674 | 1,630 | 1,751 | 1,587 | 1,544 | 1,301 | - | - | 1,732 | 1,762 | 1,722 | 1,645 | 1,702 |
| | Total | 3,370 | 3,430 | 3,469 | 3,654 | 3,646 | 3,114 | 3,402 | 3,211 | - | - | 3,769 | 3,863 | 3,878 | 3,661 | 3,926 |

*Note:* *denotes unofficial figure.
*Source:* FAO(http://faostat3.fao.org/), KOSIS(http://kosis.kr/bukhan/), Last access date: 22. February, 2018.

# Statistical Appendix

## <Appendix Table 4-2> Food Aid Shipments

(Unit: thousand M/T)

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013* | 2014* | 2015* | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cereals | 1,426 | 1,033 | 892 | 824 | 1,037 | 1.6 | 710 | 339 | 274 | 76 | 75 | 332 | 30 | 16 | 22 | - |

*Note:* *provisional data provided by WFP
*Source:* FAO(http://faostat3.fao.org/), Last access date: 22. February, 2018.