

# What the Estimates of the Balance of Foreign Exchange of North Koreans Would Tell Us

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## Abstract

We first introduce and summarize preceding research on the balance of foreign exchange (BFE) of North Koreans (1991–2017) based on the method used by Zang (2009, 2013) and Zang and Kim (2019). Then, we present new estimates for the BFE of North Koreans in 2018 (including North Korea's earnings from cyberattacks). Combining all of the results, we present a new estimate of the current foreign exchange holdings of North Koreans at end-2018. We also discuss how to estimate the foreign exchange holdings of North Koreans in the unofficial sector. Finally, we could present some guidelines to understand the responses from the North Korean authorities on international sanctions as well as North Korea-US dialogues.

**Key Words:** North Korea, Foreign Exchange Holdings, Cyberattacks, North Korea-US Dialogues

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## I . Introduction

Zang (2009) first estimated the balance of foreign exchange (BFE) of North Koreans for 2000-2008,<sup>1</sup> and obtained quite striking results that reveal that North Korea had experienced no problems in procuring foreign exchanges that were well over their import requirement of over USD 9 billion for the period from 2000 to 2008.<sup>2</sup> This could have been done even without resorting to selling mainly arms and illegal goods such as opium, counterfeit US 100 dollar notes (so-called “super-notes”), drugs, cigarettes, and medicine.<sup>3</sup> Moreover, North Korea had accumulated a significant amount of foreign exchanges at least since 2000 (the first inclusive year of Zang, 2009).

On top of Zang (2009), Zang (2013) incorporated updated methods to estimate North Korea’s BFE for 1991-2012.<sup>4</sup> North Korea had suffered from severe foreign exchange drains since the collapse of the former Soviet Union in late 1989. To make matters worse, a series of historic natural disasters in the early 1990s had pummeled the already shattered North Korean economy. As a result, North Korea had to make an unprecedented appeal for international humanitarian assistance in 1995, and declared the “Arduous March.” Thanks to the international assistance, North Korea experienced a surplus in its BFE in 1997-2002, which fluctuated in accordance with the evolution of the North Korean nuclear issues. The BFE worsened in 2003-2006 after the eruption of the 2<sup>nd</sup> North Korean nuclear crisis in October 2002; recovered in 2007-2008 with the Six-Party Talk agreements in February 2007 reinitiating North Korea’s foreign exchange earnings and; again worsened in 2009-2010 after the breakdown of the Six-Party Talks in 2009. The “May 24 Measures” of the South Korean government’s sanctions<sup>5</sup> put some pressure on North Korea’s BFE in 2010, but North Korea had instead recorded a significant balance of foreign exchange surplus in 2011-2012 due to a surge in mineral product exports, especially coal and iron ore, and remittances from workers

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<sup>1</sup> Zang, “Balance of Foreign Exchanges of North Korea for 2000 through 2008,” *Bigyo Gyeongje Yeongu*, December 2009, in *Korean*.

<sup>2</sup> North Korea’s “official” balance of foreign exchanges had been very likely to be on the surplus side for almost every year for the estimation period except 2006.

<sup>3</sup> Zang (2009) also claimed that since 2003, when the international community’s economic sanctions against North Korea were being strengthened, it would have reduced the number of arms trade deals, drug sales, counterfeiting of US dollars, and other illicit activities. For the survival and sustainability of the North Korean regime, Pyongyang probably had little incentive to rely on high-risk illicit activities when there were other safe sources to earn foreign exchange.

<sup>4</sup> Zang, “Estimation of and Analysis on the Balance of Foreign Exchanges of North Korea for 1991–2012,” *Tongil Jeongchaek Yeongu*, December 2013, in *Korean*.

<sup>5</sup> The May 24 Measures in 2010 refer to economic retaliatory measures that the South Korean government imposed against North Korea after a ROK navy corvette, *Cheonan*, sank in a North Korean torpedo attack on March 26, 2010. South Korea severed all economic ties with North Korea, except for the Gaeseong industrial complex’s maintenance of existing investments.

abroad.

The United Nations Security Council Resolutions (UNSCRs) began to negatively affect North Korea's BFE from early 2017. The US will gain leverages in North Korea-US denuclearization talks by strengthening international sanctions on North Korea, and North Korea should need to find ways of evading the sanctions. Zang and Kim (2019) first estimated North Korea's BFE during the Kim Jong-Un Regime (2013–2017) in addition to Zang (2013), and drew some interesting observations.<sup>6</sup>

The primary purpose of this paper is to introduce the analysis of North Korea's BFE in English, which was previously published only in Korean. Second, as North Korea-US dialogues appear to re-start sooner or later, we believe it is now time to share the analysis on the BFE and foreign exchange holdings of North Koreans with the global audience. This paper presents new estimates for 2018 in terms of North Korea's BFE, including cyberattacks. Based on this, a rough range of estimates is presented on North Korea's foreign exchange holdings of North Koreans at end-2018. Third, the paper also discusses how to estimate the foreign exchange holdings of North Koreans in the unofficial sector. Indeed, the issue of how much foreign currency the North Korean authorities can source from the general public has long been a subject of keen interest among researchers. Finally, we could present some guidelines to understand the responses from the North Korean authorities on international sanctions as well as North Korea-US dialogues.

## **II. Why Do We Talk About the BFE of North Koreans and Not the Balance of Payments of North Korea?**

The balance of payment (BOP) of a country is the record of all economic transactions between the residents of the country and the rest of the world. When we roughly classify the elements of the BOP as the balances of ① trade in the goods accounts; ② service accounts; ③ factor income accounts; ④ current transfers accounts, ⑤ capital accounts; ⑥ changes in the official foreign exchange reserves; and ⑦ errors and omissions, they must total zero. Items ①

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<sup>6</sup> Zang and Suk-Jin Kim, "Estimation of the Balance of Foreign Exchanges and Foreign Exchange Reserves of the Kim Jong-Un Regime and Implications for North Korea-US Denuclearization Negotiations," *Hyeondae Bukhan Yeongu*, April 2019, in Korean.

to ⑥ are estimated by the central bank of ordinary countries. Errors and omissions are a residual item balancing the BOP equation—a sum of unknowns—which are probably comprised of smuggling, capital flight, administrative errors, and omissions, etc. That is, it is supposed that what is not captured by ①-⑥ is encompassed in the balancing item ⑦ by the definition of the BOP.

Although we are able to estimate items ①-⑤, we have no idea of knowing the changes in the official foreign exchange reserves of North Korean authorities. Thus, our estimates on North Korea's BFE can be seen as the sum of the official foreign exchange reserves increases, and errors and omissions of North Korea using the concepts of the BOP. Furthermore, the BFE of North Korea is actually the BFE of North Koreans living both inside and outside of its territory. Without borrowing the knowledge of the central bank of North Korea, we cannot know how foreign exchange flows across its national borders.<sup>7</sup> It is also unclear how centrally Pyongyang can monitor the sources of foreign exchange earnings. We cannot differentiate the changes in the official foreign exchange reserves, or how much of the foreign exchange that is earned by North Koreans abroad is actually controlled by Kim Jong Un.

In this paper, foreign exchange transactions by North Korea (individual North Koreans) are estimated by item, and then the differences in the estimated balances are referred to as the "BFE." A positive BFE value means that foreign exchange earnings exceed its spending, indicating that North Korean's foreign exchange holdings increased in the year, or there was foreign exchange spending unknown to the outside world (or both). This paper's BFE includes both changes in the foreign exchange reserves and errors and omissions in traditional BOP statistics.

### III. Major Items Estimated to Approximate BFE of North Koreans<sup>8</sup>

We introduce here only items that would have affected our BFE estimation results in a somewhat significant way. Further discussions will be presented on the estimated items, explicit and implicit assumptions used, and unhandled items as we discuss specific estimated items. We have classified North Korea's BFE into eight categories: goods trade (excluding South

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<sup>7</sup> For example, it would be much more difficult to estimate how much foreign exchange a North Korean restaurant in China sends back to Pyongyang and/or reinvests in China than it is to estimate how much the restaurant could earn.

<sup>8</sup> For more detailed explanations, see Zang (2009), Zang (2013), and Zang and Kim (2019).

Korea), commercial trade with South Korea (including processing-on-commission), services, factor income, current transfers, capital account, arms trade, and illicit activities.

In this paper, inter-Korean foreign exchange transactions will be treated separately from North Korea's foreign exchange transactions with countries other than South Korea for two pragmatic reasons. First, the two Koreas are considered to have special relations that differ from country-to-country relations. As such, the South's statistics on international trade do not include inter-Korean trade. Second, it is more efficient to separate inter-Korean foreign exchange transactions because information on North Korea's transactions with South Korea is more specific and accurate than that with other countries.

## 1. Goods Trade Account

Data on the balance of North Korea's trade with the world (excluding South Korea) are from the Korea Trade–Investment Promotion Agency (KOTRA), which collects trade data from all over the world using a mirror statistics method, and makes adjustments. Notably, KOTRA excludes unreliable data points from its original collection of the data set, to eliminate errors, where imports from South Korea are mistakenly reported as those from North Korea. Although KOTRA's statistics are relatively more accurate, the scope of countries included in its statistics is much smaller than the mirror statistics released by the UN and IMF.

This paper is firstly based on KOTRA's trade statistics because the benefits outweigh the shortcomings. Countries not included in the statistics are mostly located in the Middle East, Africa, and Latin America. North Korea's transactions with these countries are marginal in terms of official trade, but this is not the case for unofficial trade such as arms exports. The exclusion of North Korea's trade with these countries—whose statistical accuracy is doubtful at best—from our BFE estimates will make the statistics less comprehensive. That said, when North Korea's unofficial trade balance, including arms exports, is reflected in the BFE as a separate item, the likelihood of the goods trade balance being double-counted is dramatically reduced. Specifically, this refers to some of North Korea's trade with countries in the Middle East, Africa, and Latin America who are likely to be involved in arms trade with North Korea. Thus, it is reasonable that the KOTRA data set would not capture most of the arms trade and illicit activities. We are entitled to maintain the data for arms trade and illicit activities as different categories from the KOTRA trade data set.

Moreover, a study conducted by Korea Development Institute (KDI) attempted to reconstruct North Korea's trade statistics by excluding trade that diverges significantly from the trading patterns with the three major Asian countries—South Korea, China, and Japan.<sup>9</sup> The reconstructed statistics are more reflective of real-world situations than statistics published by KOTRA. Accordingly, we used KDI's adjusted trade statistics to estimate North Korea's BFE for 1998–2008 as additional trade statistics other than KOTRA statistics.

North Korea's balance of trade data are from partner countries' customs data (mirror statistics, excluding South Korea) and contain both goods and part of services, such as transport and insurance. As exports are a value of free on board (FOB) and imports are a value of cost, insurance, and freight (CIF), if no adjustments are made in the partner countries' customs data, North Korea's exports (partner's imports) tend to be overestimated due to the inclusion of transport and insurance costs.

However, in the case of North Korea's trade data, estimation errors resulting from the difference between the CIF and FOB basis appear to be relatively small, as North Korea's foreign trade is unlikely to involve trade credit insurance. Moreover, most of North Korea's trade is shipped by North Korea itself. Accordingly, the difference between the FOB and CIF values of North Korea's foreign trade is estimated to be much smaller than the levels seen in other countries. Generally speaking, the difference between the FOB and CIF basis resulting from the use of mirror statistics is estimated to account for 5-10% of the total trade value; which could be 5% or lower for North Korea.

Misappropriation of the difference between down-reported and actual exports by North Korean exporters could be another possibility as in the case of most developing countries. Both North Korean exporters and partner countries' importers have an incentive to do it as importers pay less in customs. In this case, North Korea's exports would be underestimated, and so would the BFE.<sup>10</sup> On the other hand, misappropriation of the difference between over-reported and actual imports could be another possibility. For this to be feasible, North Korean importers need to send rebates to partner countries' exporters to compensate for the exporters' overvalued sales. In this case, North Korea's imports would be overestimated, and thus, the BFE would be

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<sup>9</sup> Lee, et al, *Analyzing and Restructuring the DPRK Trade Statistics of 1990–2008*, Research Monograph, 2010-07, Korea Development Institute, 2010, in Korean.

<sup>10</sup> Kyoochul Kim, "A Study of North Korea-China Trade of Anthracite Coal: With a Focus on Anthracite Coal Prices," *KDI Review of the North Korean Economy*, Volume 19, Issue 2 (February 2017), pp.18-19.

underestimated more than our estimates.

If so, how much misappropriation by North Korean trading companies would contribute to the overstatement of North Korea's trade deficit and the resulting errors in BFE estimates? The key clue lies within the amount of bribes that Chinese companies reported to have paid to their North Korean counterparts. According to a survey of Chinese companies conducted during 2012 and 2013, more than half of those surveyed (54%) said they had paid bribes, and most respondents said the bribes were equivalent to 3-5% of the sales value.<sup>11</sup> Estimation errors on the BFE caused by the misappropriation at North Korean trading companies are possibly 5% or lower of the total value of North Korea's trade. Accordingly, it makes sense to assume that the difference between the FOB and CIF basis and the amount of misappropriation offset each other.

## 2. Commercial Trade and Processing-on-Commission with South Korea

Since much of the inter-Korean transaction data is relatively well recorded and accessible, we separate them from other countries' data. We focus on the two Koreas' commercial trade and processing-on-commission,<sup>12</sup> as other assistance-type transactions are included in the trade account and current transfers/capital account in exactly the same amount but with an opposite sign, and thus, would have been canceled out without affecting the BFE. Items that are not captured here will be reported in other categories, such as services and current transfer accounts.

## 3. Services Account

North Korea's main sources of service income are transport, tourism,<sup>13</sup> ship chartering,<sup>14</sup>

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<sup>11</sup> Byung-Yeon Kim, and Seung-Ho Jung, 2015, *China's Trade and Investment with North Korea: Firm Surveys in Dandong*, Seoul National University Press, pp.82-84.

<sup>12</sup> For processing-on-commission trade, North Korean companies process raw and subsidiary materials imported from South Korea and re-export them to South Korea in the form of finished goods.

<sup>13</sup> The World Tourism Organization (WTO) released statistics on North Korea's tourism income until 2002 (no publications since 2003). However, we used our own estimates as the WTO's statistics tend to be overestimated. North Korea's annual tourism income is estimated at USD 70 million-USD 90 million in the post-2012 period. Its tourism income does not show a steady trend, but high volatility, hinging on one-off events such as the Ebola outbreak, the organization of a large-scale concert (*Arirang*), and international events.

<sup>14</sup> North Korea utilizes the flags of convenience system to evade international sanctions. See United Nations Security Council, Report of the Panel of Experts Established Pursuant to Resolution 2050 (2012), S/2013/337 (June 11, 2013), pp.44-45.

reinsurance compensation,<sup>15</sup> overflight fees,<sup>16</sup> fishing fees from Chinese fishing vessels in the West and East Sea,<sup>17</sup> and salaries of North Korean workers in the Gaeseong industrial complex (closed in early February 2016).

The data collected by South Korea's Ministry of Unification provides an accurate picture of North Korea's foreign exchange income from inter-Korean projects (i.e., the Mount Kumgang tourism program and Gaeseong industrial complex). This paper estimated North Korea's income from the Gaeseong industrial complex based on the Ministry of Unification's statistics on the average wage (including social insurances), number of employees, visitors, and corporate income tax. North Korea earned between USD 80-120 million annually from the Gaeseong industrial complex until the complex closed in February 2016.

Other sources of foreign exchange include expenses from those working at diplomatic missions, such as the embassies for the UK and Sweden in North Korea, international organizations such as the United Nations Development Programme (UNDP) and foreign aid organizations such as the Swiss Agency for Development and Cooperation (SDC); labor expenses related to North Koreans employed by these establishments and; the acquisition of foreign currency related to administrative work. North Korea's services expenditure is marginal compared to its services income.

#### 4. Factor Income Account

This includes remittances from overseas workers, overseas investment income from restaurants, and trade companies. Normally, about 200-300 North Korean trade companies from around the world send their profits (if there is any) back to North Korea mostly in the form of goods exports—purchased locally—than through the remittance of foreign currency. The remittances from overseas workers have been a major source of North Korea's foreign exchange earnings.<sup>18</sup> Some news reports estimate North Korea's foreign exchange acquisition

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<sup>15</sup> For instance, North Korea received EUR 39.2 million through a reinsurance claim in December 2008. It filed an insurance claim with reinsurers including UK-based Lloyds after a North Korean helicopter crashed in July 2005 and destroyed a Pyongyang warehouse containing emergency relief goods. The reinsurers refused to follow the North Korean court's order to pay EUR 40 million in insurance payments, arguing that the property damage claim was not credible as the paperwork provided by North Korea on the exact extent of the damage was presented less than 10 days after the accident, which is a suspiciously short time. The reinsurers took the case to the international court but eventually agreed to pay EUR 39.2 million in a settlement, which amounts to roughly 95% of what North Korea had originally demanded.

<sup>16</sup> For instance, in 2010, North Korea received about USD 1,000 per airplane flying over its airspace—approximately 135 commercial airline flights flew over North Korea per week.

<sup>17</sup> For instance, the total amount of fishing fees, paid by Chinese fishing boats in North Korean waters to North Korea, increased from USD 100 million in 2011-2013 to USD 170 million in 2014-2016.

<sup>18</sup> The North Korean authorities normally receive 70% of the income earned by workers sent out to more than 40 countries,

through remittances annually at more than USD 1 billion, which we believe has been quite overestimated. We present more reasonable estimates based on the National Intelligence Service's off-the-record briefing to the National Assembly's Intelligence Committee.<sup>19</sup>

## 5. Current Transfers Account

This contains mostly overseas private remittances,<sup>20</sup> grant aid from international organizations and foreign governments, and “denuclearization aid” (based on the Geneva Agreement and Six-Party Talk agreements). The South Korean conglomerate Hyundai's cash payments of about USD 400 million for business rights in North Korea and cash totaling USD 100 million sent from the South to the North before the historic South-North Korea Summit in June 2000 are also included.

We believe that a significant amount of foreign exchange is hand-delivered to North Koreans during their visits to relatives in China (ethnic Koreans living in China) and to an estimated 20,000 ethnic Chinese living in North Korea. We do not believe foreign exchange remitted from North Korean defectors living in China to their relatives and family members living in North Korea is significant. North Korean defectors living in China would find it difficult to remit money to North Korea given their legal status and economic conditions. However, a significant amount of remittance flows into North Korea from more than 30,000 North Korean defectors who have settled in South Korea and about 100,000 South Koreans who have estranged family members in North Korea.

The international aid to North Korea consists of multilateral humanitarian aid through UN organizations such as the World Food Programme (WFP) and bilateral aid from China, the US, Japan, and the EU. The UN's humanitarian aid to North Korea was initiated in 1995 when North Korea asked the UN for emergency relief aid after severe flooding and drought. The UN provided USD 1.5 billion in aid to North Korea from 1995 to 2004 through the Consolidated Appeals Process (CAP). It has also provided support to North Korea since 2005 through individual aid organizations.<sup>21</sup> Meanwhile, the total amount of aid provided by respective countries includes shipping and management expenses, and when the support is provided via international organizations, the amount transferred to North Korea is that

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including China, Russia, Mongolia, Poland, Kuwait, and some African countries. About 20% of the income has to be used for living expenses locally and the remaining 10% is sent to the worker's home.

<sup>19</sup> The total annual income of North Korean expatriates surged from an average USD 130 million in 2012-2014 to USD 200 million in 2015-2017.

<sup>20</sup> Overseas private remittances come from the pro-Pyongyang federation of Korean residents in Japan (Chosen Soren), North Koreans living in China, separated families, and North Korean defectors residing in Japan, China, and South Korea. Since 2002, however, when Japan's economic sanctions against the North got strengthened, Chosen Soren's remittances have dropped significantly.

<sup>21</sup> Statistics on the international community's humanitarian aid to North Korea include South Korea's aid through the UN, as the flow of in-kind aid is accounted under North Korea's foreign trade, not under the exchange of inter-Korean goods.

minus the organizations' labor and management expenses.

The construction of light water reactors, which was initiated by the Geneva US-DPRK Agreed Framework (Oct. 1994) was overseen by the Korean Peninsula Energy Development Organization (KEDO). A total of USD 2.6 billion was received in aid from 13 countries including South Korea, Japan, the US, and the EU. However, most of the aid provided to North Korea through KEDO went to the Korea Electric Power Corporation (KEPCO) of South Korea for the production of two turbines for the light water reactor project. Accordingly, we believe it was the heavy fuel oil aid program (through which the US and EU annually provided North Korea with 500,000 tons of heavy oil until November 2002) that had the biggest impact on North Korea's BFE.<sup>22</sup>

## 6. Capital Account

The main items of North Korea's capital account are China's crude oil aid, concessional loans from international organizations, foreign direct investment (FDI), and North Korea's overseas investment. We assume that China supplied crude oil to North Korea on concessional loans and has not been reimbursed as North Korea has not made any debt repayments to creditors since the 1980s. This assumption is critical for the accuracy of our estimates on North Korea's BFE as the total value of China's virtual aid to North Korea is significant.

The official data on the FDI into North Korea is from the Chinese Ministry of Commerce. The accuracy of the data was heavily questioned in the early 2000s, and improvements were made in the 2010s. Additionally, there are no official estimates on how foreign investors retrieve their investment proceeds from North Korea. The path in which China's FDI flowed into North Korea could be called unconventional as Chinese firms first export digging machinery to North Korea, utilize them in mining, and then, import a certain amount of their mining output to China as investment proceeds—the remaining output is considered North Korea's export earnings. Chinese firms are assumed to retrieve their investment proceeds during the five years following the original disbursements.

Dispatching workers abroad requires the establishment of local companies. Initial capital investments are utilized to create legal entities such as restaurants and trading subsidiaries. The capital investments made overseas are included in North Korea's capital account balance for the corresponding year.<sup>23</sup>

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<sup>22</sup> For more about the US provision of heavy oil through KEDO and denuclearization aid, see Manyin and Nikitin, *Assistance to North Korea*, CRS Report R40095, Washington, DC: Congressional Research Service, 2009.

<sup>23</sup> According to China's Ministry of Commerce, North Korea's investments in China amounted to USD 94 million in 2005 on

## 7. Arms Trade and Illicit Activities Accounts

We use data from the Stockholm International Peace Research Institute (SIPRI) to estimate North Korea's foreign exchange earnings through the arms trade.<sup>24</sup> North Korea acquired an annual USD 500 million in the late 1980s through the export of conventional arms based on Soviet designs, which accounted for approximately 20% of its foreign exchange earnings. However, North Korea's arms exports began to decline in the early 1990s with the end of the Cold War. According to SIPRI, North Korea's arms exports rose from USD 100 million in 2001 to USD 216.5 million in 2002, and then fell to USD 173 million in 2003 and USD 56.5 million in 2004. North Korea's arms trade has been on a downturn since 2003 due to the implementation of the Proliferation Security Initiative (PSI), a US-led multilateral effort to deny overflight to aircrafts suspected of carrying weapons, and increased international scrutiny in the wake of the nuclear test in 2006. We estimated North Korea's arms exports in 2005 and onwards reflecting SIPRI's projections. North Korea's arms imports also showed a similar pattern.<sup>25</sup>

It is reasonable to assume that North Korea's foreign exchange earnings from illicit activities are much smaller than media speculations. Insightful discussions on North Korea's dealings with drugs, super-notes, counterfeit cigarettes, etc. are found in Haggard and Noland (2007),<sup>26</sup> Asher (2006),<sup>27</sup> and Chestnut (2007).<sup>28</sup> They showed logically that North Korea's foreign exchange earnings from illicit activities were much smaller than the public would expect. In contrast to this, however, North Korea's production of counterfeit cigarettes and pharmaceuticals seems to be active.

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a cumulative basis.

<sup>24</sup> SIPRI's statistics on arms trade are not based on actual arms transactions or customs clearance, but on the estimated changes in the arms trade volume converted into dollar terms (based on the 1990 constant price). This paper used the GDP deflator growth rate to convert the 1990 constant-dollar price for the value of arms imports and exports into the current price.

<sup>25</sup> According to SIPRI, North Korea's annual arms imports marks USD 8 million-USD 42 million as of 1999 when it purchased fighter jets from Kazakhstan for more than USD 200 million.

<sup>26</sup> According to Haggard and Noland (2007), a total of USD 50 million of counterfeit notes was seized by 2005. The production of counterfeit notes should be large enough to generate economies of scale, as printers, special paper, and ink sophisticated enough to produce and distribute counterfeit bills are expensive imports. Haggard and Noland, *North Korea's External Economic Relations*, Working Paper 07-7, Peterson Institute for International Economics, 2007.

<sup>27</sup> According to Asher (2006), North Korea may earn as much as 40% of the face value of all notes counterfeited. Assuming that North Korea was the source of the counterfeit dollar bills, its foreign exchange income is estimated at USD 20 million (40% of USD 50 million). Asher, "The North Korean Criminal State: Its Ties to Organized Crime, and Possibility of WMD Proliferation," Nautilus Institute Policy Forum Online 05-92A, 2006.

<sup>28</sup> Further, many experts believe North Korea's counterfeit bills have not been in circulation since 2006 due to the increased scrutiny from the international community. See Chestnut, "Illicit Activity and Proliferation: North Korean Smuggling Networks," *International Security*, Vol. 32, No.1, 2007.

Nonetheless, North Korea's foreign exchange earnings from illicit activities surged from 2017 as the stronger international sanctions began to take a toll on its BFE. Before the imposition of sanctions, North Korea did not have to participate in illicit activities and earned its foreign exchange through legal means. However, once the sanctions took significant effect, North Korea had no choice but to engage in such activities to supplement the shortage. Indeed, while North Korea waged cyberattacks on overseas financial institutions and took part in cryptocurrency exchanges prior to 2017, the former appears to have become a significant source of foreign exchange to North Korea since 2017.

#### **IV. Summary of What the Previous Estimates on North Korea's BFE (1991–2012) Tell Us**

The main estimates from Zang (2013) are summarized in tables 1, 2, and 3. A deficit in a country's trade balance requires measures to counterbalance the shortfall. For example, it could be supplemented by funds earned from foreign investments; by running down foreign exchange reserves or; by receiving loans from other countries. From 1991 to 2012 (22 years), North Korea saw significant losses in its total trade balance, which totaled roughly USD 17.9 billion (Table 3). However, it earned about USD 20.3 billion in foreign exchange during the same period in the form of China's crude oil aid (approx. USD 4.2 billion),<sup>29</sup> commercial trade surplus from South Korea (USD 4.0 billion), services account surplus (USD 3.9 billion), current transfers (USD 5.2 billion), and factor income such as remittances (approx. USD 1.3 billion), FDI (approx. USD 0.7 billion), and other routes. The shares of the arms trade and illicit activities are each estimated at less than USD 0.6 billion.

As shown in tables 1 and 2, North Korea's BFE, on average, has maintained positive figures of about USD 200-230 million per year since 1996. As a result, North Koreans have accumulated about USD 2.8 billion worth of foreign currency and assets in and outside of North Korea since 1991; in addition to what they already had at the end of 1990. This must be a surprise to those who believe that North Korea should have suffered from a chronic shortage of foreign exchange under the series of international sanctions since 2002. So, what does it tell us?

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<sup>29</sup> From 1990 to 2012, North Korea received about 650 thousand metric tons of crude oil per year from the Daqing Oilfield Company through oil pipelines. In total, this would have cost North Korea about USD 4.2 billion.

| Table 1 | Estimates on North Korea's BFE (1991–2001)

(Unit: USD 1 million)

Balance of /Years	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Trade	-694	-689	-666	-384	-580	-523	-367	-324	-450	-851	-970
Trade (w/o crude oil)	-555	-550	-526	-296	-449	-404	-302	-275	-419	-775	-861
Commercial trade with South Korea	100	154	165	156	188	136	146	60	72	89	116
Services	45	48	50	52	56	61	65	72	288	728	130
Factor income	10	12	13	15	18	20	23	27	30	35	37
Current transfers	38	39	40	42	105	219	394	425	504	320	559
Capital account	135	135	146	93	137	127	73	69	54	100	137
Capital account (w/o crude oil)	-2	-2	6	6	6	8	8	21	23	24	28
Foreign exchanges	-363	-299	-249	-22	-74	43	337	331	500	423	10
Arms trade	-99	91	48	-12	-132	-51	46	89	-159	48	59
Illicit activities	7	9	12	15	18	23	29	37	45	55	50
Total foreign exchanges	-247	-198	-188	-19	-188	15	413	458	386	527	119
Cumulative foreign exchanges	-247	-445	-634	-654	-843	-828	-414	43	429	957	1,077

Source: Zang (2013), &lt;Table 1&gt;, p. 181.

| Table 2 | Estimates on North Korea's BFE (2002–2012)

(Unit: USD 1 million)

Balance of /Years	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Trade	-788	-837	-817	-1005	-1102	-1103	-1555	-1288	-1147	-740	-1051
Trade (w/o crude oil)	-711	-716	-677	-807	-855	-821	-1140	-1049	-821	-221	-473
Commercial trade w/ South Korea	193	206	182	222	319	476	454	331	237	3	0
Services	134	122	150	204	192	259	252	243	215	272	301
Factor income	43	47	53	60	72	84	116	127	137	165	193
Current transfers	389	197	230	213	104	243	443	181	109	175	194
Capital account	108	152	180	270	335	321	492	281	372	555	613
Capital account (w/o crude oil)	32	31	40	72	88	39	77	43	46	37	36
Foreign exchanges	82	-110	-19	-32	-78	280	204	-123	-73	433	253
Arms trade	201	176	54	22	23	23	24	24	31	31	31
Illicit activities	48	33	28	26	26	15	16	16	16	16	16
<b>Total foreign exchanges</b>	<b>341</b>	<b>99</b>	<b>63</b>	<b>15</b>	<b>-29</b>	<b>320</b>	<b>245</b>	<b>-82</b>	<b>-26</b>	<b>480</b>	<b>300</b>
Cumulative foreign exchanges	1,418	1,517	1,580	1,595	1,566	1,886	2,131	2,049	2,023	2,503	2,803

Source: Zang (2013), &lt;Table 2&gt;, p.182. The last row (Cumulative foreign exchanges) numbers are calculated and added by the author.

Firstly, by developing nuclear and ballistic missile programs, the North Korean regime may be aiming to accumulate a “sufficient” amount of foreign exchange to survive potential

comprehensive economic sanctions in the near future. This scenario is somewhat feasible and persuasive.

Secondly, North Korea may have actually had not-so-little expenditures that were not captured by the public trade data used in Zang (2013). For example, nuclear and ballistic missile programs require a certain amount of foreign exchange. We do not disregard this possibility, but as most specialists have consistently argued, figures cited in the media could be highly exaggerated. North Korea's spending in the form of foreign exchanges on developing nuclear and ballistic missiles program is likely to be much smaller than the figures reported.<sup>30</sup> Unfortunately, North Korea's ballistic missile programs seem to need not much outside help.<sup>31</sup>

Lastly, the North Korean authorities may not be able to control all of the foreign exchange earned by its people. This scenario is evidenced by the wide-spread use of the US dollar and Chinese yuan in Pyongyang and other major cities. Some of the earnings accumulated by private hands could have laid the groundwork for the "dollarization" of North Korea. These suggest that the North Korean regime will not collapse in the near future merely due to a shortage in foreign exchange. In other words, it is very unlikely that North Korea is suffering such a severe shortage that the regime is at risk in the near future.

## **V. Recent Estimates on the BFE of North Koreans (2013–2018) and the Implications**

<Table 3> summarizes the recent estimates on the BFE of North Koreans for 2012-2018. Following the May 24 Measures, which costs North Korea about USD 300-350 million in foreign exchange per year, the export of mineral products, such as coal and iron ore, and remittances from workers abroad rapidly increased, resulting in a significant BFE surplus for North Korea in 2011-2012. A similar trend can also be seen in 2013 with a surplus of USD 387 million, which is almost equivalent to the average surplus for 2011 and 2012 (USD 390 million).

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<sup>30</sup> In general, researchers unfamiliar with North Korea first use their country as a benchmark to estimate the expenses needed to develop nuclear and missile programs and then convert the value in the local currency to the US dollar. However, the North Korean economy is fundamentally different from that of a typical developed country which has much higher labor costs and sophisticated technology.

<sup>31</sup> South Korea's navy retrieved and investigated debris from the North's three-stage, long-range rocket. Contrary to expectations, the key components used in the fuel container of the first-stage rocket were mostly produced in North Korea. Ten items that North Korea reportedly imported from five countries, including China and those in Europe, were all auxiliary devices which are widely available in the market. The South Korean military evaluated that North Korea has the technology and ability to procure core components to independently develop intercontinental ballistic missiles (ICBMs). North Korea is also known to independently produce fuel for its long-range rockets.

During the three years (2011-2013), North Korea is presumed to have accumulated about USD 1.2 billion in foreign exchange earnings; mainly driven by the soaring export of coal and iron ore. <Table 4> shows that North Korea's coal exports to China increased to more than USD 1 billion in 2011-2016, which is over a 500% increase compared to the years before 2010. North Korea's anthracite exports to China surged from USD 200 million in 2008 to USD 390 million in 2010, and then to USD 1.14 billion in 2011. It remained at between USD 1.05 billion and USD 1.39 billion until 2016. Thereafter, the North's anthracite exports to China recorded USD 400 million in 2017—in accordance with the cap set by the UN Security Council (UNSC)—and zero from 2018. The export of iron and iron ore to China shows a similar pattern.

North Korea's BFE turned red upon entering 2014, and this trend essentially continued until 2016. A deficit of USD 114 million was incurred in 2014, followed by a small surplus of USD 50 million in 2015 and again a deficit of USD 116 million in 2016. The international community decided to strengthen its economic sanctions after the third nuclear test in 2013. And, one could argue that the sanctions were effective to the extent that the BFE began to deteriorate from the same year.

However, having examined the BFE of North Korea for 2014-2016 item by item, we assert that the worsening of the BFE could be the outcome of North Korea's choice rather than that of "effective" sanctions. Firstly, North Korea's balances of services, factor income, and the current transfers account did not show a significant decrease overall during the period, although South Korea blocked the inflow of the salaries of North Korean workers at the Gaeseong industrial complex, which was shut down in early February 2016. Second, the decline in mineral exports after 2013, especially that of iron and iron ore, was not countered with a cutback in imports. North Korea's import needs in 2014-2016 were expanded and sustained. In fact, in the midst of a deteriorating external environment, North Korea "chose" to import what was needed, and this pattern continued surprisingly into 2017 and 2018.

In 2017, the BFE of North Koreans fell into a deep deficit as previously planned imports continued but planned exports were, in most part, suddenly suspended due to the highly reinforced UNSC sanctions. Indeed, while exports plunged from USD 2.82 billion in 2016 to USD 1.77 billion in 2017, imports slightly increased from USD 3.72 billion to USD 3.77 billion during the same period. As a result, North Korea's trade deficit more than doubled from USD 900 million to USD 2 billion.

| Table 3 | Estimates on North Korea's BFE (2012–2018)

(Unit: USD 1 million)

Balance of /Years	2012	2013	2014	2015	2016	2017	2018
(Exports)	2,880	3,218	3,164	2,697	2,821	1,772	243
(Imports)	3,931	4,126	4,446	3,555	3,726	3,778	2,601
Trade	-1,051	-908	-1,282	-858	-905	-2,006	-2,358
Trade (w/o crude oil)	-473	-310	-783	-578	-675	-1,726	-2,048
Commercial trade with South Korea	0	0	0	0	0	0	0
Services	301	263	309	287	204	194	240
Factor income	193	176	208	247	262	243	237
Current transfers	194	170	81	80	86	66	125
Capital account	613	636	492	245	187	234	302
Capital account (w/o crude oil)	36	38	-7	-35	-43	-47	-8
Foreign exchanges	253	335	-195	-4	-170	-1,270	-1,410
Arms trade & illicit activities	47	50	49	49	50	254	535
Total foreign exchanges	300	387	-144	50	-116	-1,019	-919
Cumulative foreign exchanges (end-year)—the lowest estimates*	2,803	3,191	3,047	3,097	2,981	1,989	1,070

Note: \*) This paper adopts a conservative estimation approach to the BFE of North Koreans throughout.

Source: First column for 2012 is from Zang (2013), <Table 2>, p. 184. Estimates for 2013–2017 are extracted from Zang and Kim (2019), <Table 3>, p.20. The last column for 2018 is newly estimated by the author.

| Table 4 | North Korea's Coal Exports to China (2006–2017)

Unit /Year	Export value USD 1 million	Growth rate %	Export volume 1,000 metric tons	Growth rate %	Unit price USD per metric tons	Growth rate %
2006	97	-10.4	2,480	-11.3	39	1.0
2007	163	68.2	3,740	50.8	43	11.6
2008	203	24.5	2,540	-32.2	80	83.6
2009	256	26.5	3,600	41.9	71	-10.8
2010	391	52.8	4,600	27.9	85	19.4
2011	1,140	191.2	11,050	140.0	103	21.3
2012	1,206	5.9	11,800	6.8	102	-0.9
2013	1,388	15.1	16,480	39.7	84	-17.6
2014	1,140	-17.9	15,420	-6.4	74	-12.3
2015	1,053	-7.6	19,570	26.9	54	-27.2
2016	1,183	12.4	22,390	14.4	53	-1.8
2017	409	-65.4	4,900	-78.1	84	58.2

Source: Zang and Kim (2019), <Table 2>, p. 18.

North Korea's foreign exchange earnings declined further in 2018 from the previous year. UNSCR 2371 and 2375 started to be effective in early 2018. More loss in foreign exchange earnings came from exports of mineral, fishery, and textile products. Exports dropped from USD 1.77 billion in 2017 to USD 243 million in 2018, but imports maintained a modest level of USD 2.6 billion despite the unfavorable conditions due to the intensified sanctions. Nonetheless,

this modest figure is a sharp decline from the USD 3.78 billion posted in 2017 as sanctions took a toll on North Korea's imports; although those of non-sanctioned items appear to have continued. As a result, North Korea recorded an unprecedented trade deficit of USD 2.36 billion in 2018. Although this was the result of the choices made by the regime, it was made possible because North Korea's foreign exchange reserves were at reasonable levels.

North Korea's service and capital account (excluding crude oil) balances, and current transfer and income account balances slightly decreased in 2018. Meanwhile, there was significant growth in tourism revenue which is not under UN sanction. It is expected that the ban on joint ventures with North Korea, which took effect in January 2018, and that on extending contracts for North Korean workers diminished factor income during the same year. On the other hand, North Korea's capital account (excluding crude oil), which is determined by China's new investments and divestments, made a recovery as divestments decreased due to the suspension of anthracite exports.

The final major contributor to North Korea's BFE is its illicit activities. Until 2017, there were no incentives for North Korea to participate in illegal export activities as trade sanctions were ineffective. Since then, however, illegal trade has become a key variable in estimating North Korea's BFE. The UNSC (2019a) revealed that North Korea violated sanctions and illegally exported almost USD 200 million worth of banned goods, such as iron ore, steel, and anthracite, during the January-September 2017 period.<sup>32</sup> In terms of the whole year, the UNSC estimates that North Korea's illegal exports totaled USD 270 million. If it is assumed that North Korea's unreported imports via illegal ship-to-ship transfers of refined petroleum stood at tens of millions of dollars, its illicit trade surplus is estimated at USD 200 million in 2017.<sup>33</sup>

In a report released in September 2019,<sup>34</sup> the UNSC announced that the Inspection Panel investigated at least 35 reported instances from 17 member countries,<sup>35</sup> and found that North Korea illegally amassed a significant amount of foreign exchange earnings by hacking financial institutions and cryptocurrency exchanges. Some experts suspect that North Korea allegedly

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<sup>32</sup> United Nations Security Council (UNSC), Report of the Panel of Experts Established Pursuant to Resolution 1987 (2009), S/2019/171, March 5, 2019a.

<sup>33</sup> We do not have an estimate for North Korea's illicit trade surplus in 2018 reported by the Inspection Panel. We had to assume the same figure for 2018 as well.

<sup>34</sup> United Nations Security Council (UNSC), Report of the Panel of Experts established Pursuant to Resolution 1987 (2009), S/2019/691, August 30, 2019b.

<sup>35</sup> Bangladesh (2 cases), Chile (2), Costa Rica (1), the Gambia (1), Guatemala (1), India (3), Kuwait (1), Liberia (1), Malaysia (1), Malta (1), Nigeria (1), Poland (1), South Korea (10), Slovenia (1), South Africa (1), Tunisia (1) and Viet Nam (1).

stole as much as USD 2 billion from financial institutions and cryptocurrency exchanges from December 2015 to May 2019 if all instances cited in the report were to be done by North Korean actors and successfully cashed into the hands of them. Although it is difficult to estimate the amount of revenue North Korea has accumulated through cyberattacks, it is even more difficult to estimate when this was monetized. This paper considered both the UNSC estimates and the amount announced by the National Intelligence Service and presents a conservative estimate for North Korea's foreign exchange earnings from illicit activities. Only cases that were reported to be a theft or loss by member countries in UNSC (2019b) were included; which total USD 272 million.<sup>36</sup> This estimate will be adjusted in the future when more accurate data is available.

## **VI. Estimates on North Korean's Foreign Exchange Holdings at End-2018**

Zang (2013) estimated North Korea's cumulative BFE (1991-2012) at USD 2.8 billion as of end-2012 since end-1990 by accumulating the annual BFE surplus in 1991-2012. This figure represents a cumulative foreign exchange surplus over the period, which is quite different from foreign exchange holdings of North Koreans at end-2012. Our estimate on North Korea's cumulative BFEs for 2013-2018 builds on that of Zang's (2013). As shown in <Table 3>, this paper finds that North Korea's cumulative BFEs stood at about USD 2 billion at end-2017 and USD 1.1 billion at end-2018. Then, how much foreign exchange did North Koreans hold both in and outside of North Korea at end-2018? To obtain the answer, this paper combined the estimated cumulative BFE surplus in 1991-2018 (USD 1.1 billion) and the estimated North Korean's foreign exchange holdings at end-1990. Assuming that USD 1.5~2.5 billion was held in foreign exchange at end-1990, North Korean's foreign exchange holdings is estimated at USD 2.6~3.6 billion at end-2018. This figure is the sum of North Korea's total foreign exchange holdings held by the authorities, businesses, organizations, and citizens.

Given that by 1995, when North Korea called on the international community for humanitarian aid, the cumulative BFE deficit for the 1991-1995 period amounted to USD 850

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<sup>36</sup> It is quite likely that North Koreans could get more than USD 272 million. But this paper maintains the position observed also in Zang (2009, 2013) and Zang and Kim (2019) that adopted numbers should be official, pseudo-official, or substantially affirmed. Thus, estimates done in this way would naturally be minimal rather than maximal. Meanwhile, this paper assumes that the whole amount of USD 272 million be obtained by North Korea in 2018 for the sake of simplicity. This assumption does not affect our main results.

million (Table 1), it is estimated that North Korea held at least USD 1.5 billion or more in foreign exchange at the end of 1990. This is the minimum amount needed for the foreign exchange reserves not to become depleted by 1995. In such a case, the nation's foreign exchange reserves is estimated at USD 650 million in 1995; although it is believed that it was larger. North Korea's annual trade deficit, excluding crude oil imports from China, is estimated at USD 400-600 million during the period. If its foreign exchange reserves had become severely depleted, the regime would have seen it as an existential crisis. We do not think North Korea would have allowed its foreign exchange reserves to dwindle to dangerously low levels, as unlike other countries, it does not have easy access to foreign loans or emergency funds from international financial institutions such as the International Monetary Fund (IMF). It is highly unlikely that the North Korean regime, whose top priority is survival, would have put off calling for international aid until its foreign exchange holdings were almost exhausted. Accordingly, the North Korean regime was highly likely to have more than USD 650 million in foreign exchange reserves in 1995. Given this, this paper estimates North Korea's foreign exchange reserves at more than USD 1.5 billion at end-1990.<sup>37</sup> The total foreign exchange holdings of North Koreans would be more than USD 1.5 billion at end-1990.

When estimating North Korea's foreign exchange holdings for 1998-2008, we replaced KOTRA's statistics on North Korea's foreign trade with KDI Class 1 data (statistics reconstructed by KDI), which resulted in a USD 2.2 billion decline in North Korea's cumulative exports and a USD 4.5 billion falls in imports, narrowing the trade deficit by USD 2.3 billion. Accordingly, North Korea's foreign exchange holdings at end-2018 would increase by as much.<sup>38</sup>

Taking the above consideration, <Table 5> shows the estimates for North Korea's foreign exchange holdings which could have ranged from USD 4.7 billion to USD 8 billion at end-2013, a significant scale when compared to both the size of the North Korean economy and trade. If these estimates are true, the regime would have been confident in its foreign exchange reserves

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<sup>37</sup> Zang and Kim (2019), pp. 23–24.

<sup>38</sup> We cannot rule out the possibility that KDI Class 1 data might have misclassified data between the two Koreas or excluded actual transactions with North Korea. Such errors could have been overly reflected in North Korea's imports, which would cause the country's trade deficit to be underestimated. It is possible that North Korea legally imported with the foreign exchange earned through its arms and illegal (undocumented) exports to countries in Southeast Asia, the Middle East, and Africa. Nevertheless, KDI's revised methodology may have excluded these transactions due to their diversion from the trading patterns with Korea, China, and Japan. With these possibilities taken into account, even the use of KDI Class 1 data may result in an upward adjustment of less than USD 2.3 billion in North Korea's estimated foreign exchange reserves. See Suk-Jin Kim, "Analysis of Implications of Statistics Reconstruction 2: Structure and Characteristics of North Korea's Foreign Trade," in Lee et al., *Analyzing and Restructuring the DPRK Trade Statistics of 1990–2008*, Research Monograph, 2010-07, Korea Development Institute, 2010, in Korean.

at the time. We believe this confidence may have been a reason behind why North Korea's goods imports have remained relatively high since 2014. North Korea's foreign exchange holdings are estimated to have steadily declined since 2014 and reached between USD 2.6-5.9 billion at end-2018.

**Table 5** | Estimates on North Korean's Foreign Exchange Holdings (end-2010-end-2018)

(Unit: USD 1 million)

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cumulative FX	2,023	2,503	2,803	3,191	3,047	3,097	2,981	1,989	1,070
KDI series add-up range	0 ~ 2,300	0 ~ 2,300	0 ~ 2,300	0 ~ 2,300	0 ~ 2,300	0 ~ 2,300	0 ~ 2,300	0 ~ 2,300	0 ~ 2,300
End-1990 FX holdings range	1,500~ 2,500	1,500~ 2,500	1,500~ 2,500	1,500~ 2,500	1,500~ 2,500	1,500~ 2,500	1,500~ 2,500	1,500~ 2,500	1,500~ 2,500
FX holdings minimum	3,523	4,003	4,303	4,691	4,547	4,597	4,481	3,489	2,570
FX holdings maximum	6,823	7,303	7,603	7,991	7,847	7,897	7,781	6,789	5,870

Note: Cumulative FX (2010–2012) series are from Zang (2013). Cumulative FX (2013-2016) series are from Zang and Kim (2019). Cumulative FX for 2017, 2018, and 2019 are by the author. FX holdings minimum = Cumulative foreign exchanges + KDI series add-up excluded + end-1990 FX holdings minimum; FX holdings maximum = Cumulative foreign exchanges + KDI series add-up included + end-1990 FX holdings maximum

North Korea's foreign exchange earnings will decline in 2019 from 2018 because UNSC sanctions mandated that North Korean expatriates were to return to North Korea by the end of 2019. There is no doubt that North Korea's foreign exchange earnings (excluding that from illegal activities) will decline to the lowest level in 10 years in 2019. Nevertheless, its goods imports maintained previous levels in 2019. Based on preliminary statistics compiled by China's General Administration of Customs (GAC), the Korea International Trade Association (KITA) estimated that North Korea's imports from China increased year-on-year to USD 1.25 billion in the first half of 2019. As a result, North Korea's trade deficit with China stood at USD 1.04 billion in the first half alone, and if the current trend continues through end-2019, North Korea's annual trade deficit with China is likely to remain almost flat in 2019. The key point to watch in 2020 is how long its goods imports remain at the current level. How North Korea responds to the situation in 2020 could be the "moment of truth."

## VII. Suggestions for Estimating North Korea's Foreign Exchange Held Unofficially by Individual North Koreans

A breakdown of the official and private transactions of North Korea's foreign exchange is needed to fully understand the possible responses to the international sanctions. Since the early 1990s, Pyongyang has strongly encouraged the Workers Party and military to earn foreign currency in order to respond to the crisis caused by the breakdown of the former Soviet concessional trade system. As a result, regulations have weakened and Pyongyang lost some of its ability to centrally monitor its foreign exchange earnings. This suggests that the North Korean economy has various routes of income that the regime is not fully aware of. In order to estimate the effects of sanctions on the North Korean economy, we would need to have a clear idea of how the private sector could be involved in the dealings of North Koreans' foreign currency.

Major contributors to the foreign currency held by individual (unofficial) North Koreans include misappropriation by those working for North Korean trading companies,<sup>39</sup> wages paid directly to North Korean expatriates,<sup>40</sup> labor expenses paid to North Koreans working for North Korea's overseas ventures (e.g., restaurants), remittance from overseas (e.g., South Korea), tour guide tips, and unreported foreign currency that is hand-delivered to North Koreans by foreign visitors. The sum-up of these items is the maximum amount of foreign exchange held by individual North Koreans in the unofficial sector.

The North Korean regime—faced with a chronic shortage of foreign exchange—has continued its efforts to siphon foreign currency from the unofficial sector. Indeed, the primary objective of the currency reform at end-2009 was to ban the circulation of foreign currency in the unofficial sector. North Korea's early launch of wireless telecom service in 2008 in partnership with Egypt-based mobile operator, Orascom Telecom, was a move to tap the pool of foreign currency held by individual North Koreans. Indeed, the regime has been quite successful in sourcing foreign currency from the general public. Wireless service users have to purchase handsets sold exclusively by the authorities and pay a subscription fee using only

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<sup>39</sup> Most of the funds misappropriated by employees at North Korean trading companies were probably used to grease the palms of those high up in the Workers Party or to bribe their way out of problems at work. In addition, the chances are that money pocketed by employees would have been kept outside North Korea, such as in China, with only a minimal amount being repatriated.

<sup>40</sup> It is no secret that only a small portion of the wages earned by North Korean expats actually goes to them.

foreign currencies.<sup>41</sup>

In addition, North Korean stores dealing in foreign goods, which are imported by the regime, sell their products in foreign currency. Official currency exchange bureaus exchange foreign currencies for North Korean won. As such, foreign currency held by the general public is periodically retrieved by the North Korean regime through various channels.

## VIII. Outlook for North Korea's Policy Responses

Facing sanctions on all fronts, North Korea was expected to reduce its trade deficit in 2019. Surprisingly, however, it seems to have flattened or even increased. So, what does this mean? In its dealing with the US, North Korea appears to have sought a significant easing of sanctions with a piecemeal approach towards denuclearization; even before complete denuclearization is achieved. However, the US has taken a firm stance that it will not comply unless substantial progress has been made in denuclearization. The US seems to believe that time is on its side, as tighter sanctions will soon take effect, increasing the pressure on the North Korean regime. President Trump declared on several occasions that the US will not rush, even if talks with North Korea reach a stalemate. In response, North Korea will demonstrate its ability to cope with the sanctions to maintain as much bargaining power as possible. The more visible the negative effects of sanctions are, the more convinced the US will become about their effectiveness, motivating it to force unfavorable conditions on North Korea and undermine its negotiating power.

North Korea now stands at a crossroads. The first option is to continue importing as initially planned using its foreign exchange holdings to delay the potential consequences of sanctions in order to conclude the negotiations with the US on equal footing. North Korea took this course throughout 2019. Unless negotiations conclude within the timeline originally expected by North Korea, the nation's foreign exchange reserves will run out, leading to an abrupt end to imports and towards an economic recession.

The second option focuses on the possibility that negotiations are extended. That is, North Korea could hold out as long as its foreign exchange reserves and the BFE allow while it slashes

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<sup>41</sup> Mobile subscription fees stood at USD 140, and handsets, whose production cost was USD 80, sold at an average USD 300 per unit in 2012. See Zang (2013), p.187.

unnecessary imports. If North Korea's goods imports are sharply reduced from the present level, it will take a toll on the economy. However, the North Korean economy has been gradually recovering, albeit at a slow pace, over the past two decades, and food sufficiency has improved. Accordingly, the North Korean economy is expected to survive the shock.

According to our estimates, foreign exchange holdings of North Koreans would not be adequate enough to sustain massive trade deficits and more than USD 2 billion of imports beyond 2020. In 2019, North Korea will likely source a certain amount of foreign exchange from smuggling, tourism, and cyberattacks as well as basal amounts of petrochemicals. However, UNSCR 2371, 2375, and 2397 have blocked most channels through which North Korea legally generates its foreign exchange earnings, and therefore, BFE conditions will inevitably deteriorate over time. In addition, expat workers returned home country at end-2019. As a result, unless sanctions are relaxed in the near future, North Korea's foreign exchange earnings are set to decline by a fair amount. Smuggling will become more prevalent, but the magnitude will be constrained by North Korea's marine capacities and surveillance under the UNSCRs. If North Korea's imports remain at about USD 2 billion annually from 2020 onwards, its foreign exchange holdings will likely dwindle to near depletion. On the other hand, if North Korea scales back its imports at some point, the depletion of its foreign exchange reserves will be further delayed.

Taking into consideration North Korea's responses related to the BFE, we could argue that it is set to somehow conclude negotiations on denuclearization and security assurances by end-2020. On the other hand, North Korea could urge the US to lift sanctions in return for significant denuclearization measures. The primary goal of the Kim Jong-Un's regime appears to be to conclude negotiations without having to succumb to US sanctions. If North Korea begins to scale back its goods imports from around 2020, it will signal changes in the timetable and a switch to a 'muddling through' tactic. In such a case, the conclusion of negotiations between the US and North Korea could be further pushed back to beyond 2020.

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