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Methodology

Several recent studies and investigations⁠¹ have shown that China continues to import sanctioned commodities from North Korea in violation of UN Security Council (UNSC) resolutions. While these investigations have largely corroborated the findings of the UN Panel of Experts (PoE), identifying the networks behind these trades was made more difficult when Chinese shipment-level trade data for North Korea appeared to no longer be commercially available in 2017.⁠²

As a result, much of the trade that appears to be happening between North Korea and China is not being recorded in official documentation available to open-source investigators and other stakeholders interested in upholding UNSC resolutions.

For this report, Project Sandstone attempted to map business networks in the border city of Dandong that were active in 2017, the last year for which this commercial data is currently available. To do so, the team extracted a set of companies from the official 2017 China–North Korean Trading List – sourced from a commercial provider – which contained Dandong in their company name or in their listed address.

This resulted in a set of 150 companies registered as actively trading with North Korea during 2017 – a year in which North Korea accelerated ballistic missile testing and the UNSC imposed wide-ranging sectoral sanctions on the country in response.

As such, these firms represent a set of Chinese companies that continued to trade with North Korea despite increasingly stringent sectoral sanctions levied on the country throughout 2016 and 2017. However, this set of companies is not an exhaustive list of Dandong-based entities trading with North Korea during the year in question and does not include firms that may have conducted cross-border investments.

Using this set of companies as a starting point, the research team designed and built a custom ontology in network analysis software and mapped the network’s directors, shareholders, addresses, websites, business

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². Shipment-level trade data pertaining to China–North Korea trade appeared to no longer be available from commercial providers during parts of 2017 and beyond. This data was previously derived from official Chinese sources.
scope and contact details to discover linkages between companies and individuals. A separate set of North Korean corporate entities registered in Dandong – taken from official Chinese documents published in 2018 – was added into this database to check for network overlap. Additional North Korean entities were also added from Chinese corporate websites. This resulted in a map of over 3,400 entities, including 305 companies, 721 people, 429 addresses and 86 North Korean company branch offices, among several other classes of entities.

Historical shipment-level data for the 150 companies was then collected and analysed to identify the volume, value and type of cross-border trade these entities conducted between September 2014 and December 2017. This shipment-level data was then screened against UNSC resolutions which prohibit the export and import of certain goods. This allowed the authors to assess if any sanctions breaches occurred at the time the shipments took place, and to assess how much of the previously permitted trade would now be prohibited by the UNSC measures at the time of publication.

Further investigation using publicly available information such as court indictments, UN reports, media reporting, including official and third-party Chinese- and Korean-language documents, corporate records, satellite imagery, Automatic Identification System (AIS) data, archived web pages and historical trade data, was then conducted to assess the contemporary activity of these companies.

The identification of individuals, companies, organisations or entities in this report does not imply they have violated the laws of any relevant jurisdiction, or international law or sanctions, unless clearly stated.

**Trade Data Sources**

Shipment-level trade data sourced for this report came from two separate commercial providers and was then cleaned and standardised into one database. While shipment-level trade data is often derived from official sources, there can also be errors in the data. This is especially apparent in trade data for the Korean peninsula, with customs authorities sometimes entering the destination or consignee incorrectly. As a result, we accept no liability for mistakes or inaccuracy in shipment-level trade data derived from these sources.

Historical trade data was sourced for company names as they were listed in the aforementioned 2017 China–North Korean Trading List. One exception was made for Dandong Qiancang, which had changed its name prior to 2017 but was erroneously listed in the trading list under a previously used name. Given the size of its trade footprint with North Korea, which continued into 2017, it was included.

**Caveats and Limitations**

Due to gaps in commercially available databases, the authors were unable to assess the full monetary value of shipments involving these 150 companies between February 2017 and December 2017. The authors were similarly unable to assess the full number of shipments involving these 150 companies between February 2017 and July 2017 where there are some gaps in the data. Additionally, any shipment-level data cited in this report was reported by commercial providers and not generated by the authors of this report or RUSI.

**A Note on Chinese, Korean and English Names**

For this report, Project Sandstone processed a large number of company and individual names recorded in Chinese. In some instances, Chinese companies have registered English versions of their names, while
others have not. In these latter cases, Project Sandstone translated or transliterated the names from Chinese. We accept no liability for mistakes in translations/transliterations of any and all names included within this report.

A Note on Project Sandstone

RUSI’s Project Sandstone is a new effort to systematically analyse and expose North Korean illicit networks. Using open-source data-mining and data-fusion techniques to spot activities of interest without reference to classified data, the project aims to provide open-source intelligence and actionable evidence to those engaged in enforcement and the policy community in general.
Executive Summary

North Korea continues to rely on foreign nationals and companies to evade UN Security Council (UNSC) resolutions imposed on the country as a result of its ongoing pursuit of nuclear weapons and the ballistic missiles with which to deliver them. Many of these individuals and companies are domiciled in China, the country’s neighbour and largest trading partner. Historically, a significant proportion of these have been based in the border town of Dandong, which looks across the Yalu River into North Korea and acts as the primary cross-border trading hub between the two countries.

Using a variety of open sources, including official and third-party Chinese- and Korean-language documents, shipment-level trade data, corporate records, satellite imagery, Automatic Identification System (AIS) data, archived web pages and a number of others, this report – which is the first of two on this topic – analyses North Korea’s trade networks in Dandong and the role these have played in the country’s ongoing attempts to evade multilateral and unilateral sanctions regimes.

A comparison of company-level shipment data and UN International Trade Statistics Database (Comtrade) data shows that – over the course of 2015 and 2016 – a small set of 150 Chinese companies accounted for roughly a quarter of all reported global exports to North Korea. Either North Korean foreign trade in that period has been substantially underreported, with consequences for how to interpret the effectiveness of economic sanctions on North Korea, or a relatively small set of Chinese companies played an outsized role in North Korea’s trade footprint, or possibly both. Whichever is the case, the scale of trade running through these companies highlights the striking importance of Dandong’s logistical, financial and corporate architecture to North Korea. Evidence of Chinese companies involved in various illicit activities includes:

- The brokering, sale and importation of North Korean resources abroad at times when UN sanctions either limited or prohibited such trade.
- The ownership and operation of North Korean-flagged ships engaged in the prohibited export of coal and import of oil.
- Advertising North Korean machine tools likely manufactured by UNSC-designated entities engaged in and supporting North Korea’s WMD programmes.
- Advertising other dual-use goods of North Korean origin on Chinese trade platforms.
- The possible export of dual-use and other prohibited items to North Korea.

These discoveries have implications for regulators, financial institutions and a range of other stakeholders committed to enforcing the multilateral sanctions regime on North Korea. They also raise questions regarding China’s implementation of sanctions it has itself supported at the UNSC. Finally, the sheer scale of activity conducted by these companies suggests the possibility that North Korean foreign trade has been underestimated, at least in the years analysed in this report. Given that this activity is often taken as a proxy for North Korean economic health and the effectiveness of sanctions, further work to determine this either way may well be warranted.

3. UN International Trade Statistics Database (Comtrade) data can be found at <https://comtrade.un.org/>. The Observatory of Economic Complexity (OEC) data can be found at <https://oec.world/en/profile/country/prk/>.
**Figure 1:** Satellite Imagery of the Dandong Border Crossing on the North Korean–Chinese Border

Sources: Maxar Technologies, CNES Airbus, Google Earth. Annotations by Project Sandstone.
PERCHED ON the banks of the Yalu River, China’s border city of Dandong has long functioned as the primary trading hub between North Korea and the wider world. Connected by road, rail, port and pipeline infrastructure, Dandong and the North Korean town of Sinuiju have evolved to handle large volumes of cross-border trade. Dandong has also functioned as a gateway for North Korea’s access to the wider world, providing an entry point into the international financial system and a logistical forwarding hub for international goods moving into the country and North Korean exports destined for global markets.

Plans unveiled in 2019 by Kim Jong-un to upgrade the city of Sinuiju – despite unilateral and multilateral sanctions targeting the country – highlight the city’s importance to North Korea’s trade flows and wider economy.¹

In fact, China remains by far the country’s largest trading partner, accounting for 96% of North Korea’s merchandise trade with foreign countries in 2018, according to the Korea Trade-Investment Promotion Agency.² Estimates released three years earlier in 2015 claimed that 60% of trade between China and North Korea moved through Dandong.³ While many of North Korea’s waterborne exports of resources such as coal, iron ore and copper leave from ports such as Nampo, Songnim or Wonsan, a significant portion of these have historically been organised and brokered by Dandong-based companies.

A survey of Dandong companies doing business with North Korea – conducted in 2012 and 2013 – revealed their counterparts were primarily from the Worker’s Party of Korea (WPK), the Korean People’s Army (KPA), the Cabinet and regional government, indicating that most of this trade is on behalf of military or government entities.⁴ A subsequent survey of Chinese traders with North Korea from Dalian, Shenyang, Dandong, Baishan, Changchun, Hunchun and Yanji over the course of 2013, 2014 and 2015 highlighted the advantages of cultivating powerful North Korean business partners such as senior military and government officers as a mechanism of reducing risk in a precarious environment with few formal avenues for dispute resolution.⁵

The role that ethnic Koreans in China play in facilitating trade with North Korea is also significant. Much as North Korea once made use of the Chongryon in Japan to generate revenue and procure goods abroad,⁶ Pyongyang appears to make use of the Korean diaspora residing in China to aid the country’s ‘economic

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construction’ (경제건설). Corporate records studied for this report indicate that many cross-border trading companies are likely owned and operated by ethnic Koreans.

While North Korea has gradually developed domestic capabilities to manufacture a wide array of materials and goods necessary for its WMD and ballistic missile programmes, the country’s procurement and proliferation agents continue to seek critical components and material from abroad, including dual-use goods and sub-threshold items.7

As a result, Dandong has also functioned as a critical hub for North Korea’s procurement and proliferation networks,8 acting not only as a transhipment node for strategically controlled goods to make their way into the country, but also for illicit goods on their way out. A leaked US diplomatic cable dated October 2008 noted that ‘Chinese firms continue to provide North Korea with sporadic shipments of military and dual-use items with potential ballistic missile applications. These are typically sent by ground, often through Dandong’.9

North Korea’s arms dealers have also used Dandong’s financial infrastructure as a gateway into the international system, operating accounts in local banks and placing banking representatives in the city. In 2017, for example, the US Department of the Treasury sanctioned the Bank of Dandong for facilitating ‘millions of dollars of transactions on behalf of companies involved in the procurement of ballistic missile technology’.10 This included the facilitation of ‘activity for Korea Mining Development Trading Corporation (KOMID) ... As of early 2016, a front company for KOMID maintained multiple bank accounts with Bank of Dandong’.11 The interim 2019 UN Panel of Experts (PoE) report further claimed that two North Korean banks and four bank representatives were operating in the city. A number of these were associated with elements of North Korea’s WMD procurement and proliferation networks.12

Dandong-based firms and individuals have also often found themselves at the centre of both UNSC and unilateral investigations and designations as a result of their illicit activity. The UNSC itself has designated three Dandong-based North Korean bank representatives.13

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Unsurprisingly, the US has taken the lead on unilateral designations pertaining to North Korea. Currently, 10 entities and six individuals – identified as having been based in Dandong – are on the US Department of the Treasury Specially Designated and Blocked Persons (SDN) list. The Dandong branches of North Korea’s Ryugyong Commercial Bank (류경상업은행) and Hana Banking Corporation (하나은행) have also been designated by the US. Japan has listed three Dandong-based entities and eight individuals on their unilateral list, all of which are also on the US SDN list. The EU also has five Dandong-based North Korean individuals on its consolidated list, two of which are not designated by the US.

From brokering and exporting coal, commodities and other North Korean goods to procuring sensitive items for the country’s weapons programme, a number of these sanctioned entities have operated front companies and bank accounts on behalf of their North Korean counterparts, enabling them to trade internationally and successfully evade multilateral sanctions. Additionally, several other Dandong-based companies have been identified in foreign depositions as having moved strategically controlled goods – such as advanced machine tools – into North Korea, or in purported diplomatic cables as having exported technology related to ballistic missiles into the country.

Evidence uncovered over the course of this research indicates some of these activities may still be ongoing.

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17. EU Sanctions Map, ‘North Korea’, <https://www.sanctionsmap.eu/#/main/details/20/?search=%7B%22value%22%3A%22%22%2C%22searchType%22%3A%22%22%2C%22id%22%3A%22%2C%22title%22%3A%22%2C%22From%20FSD%22%2C%22%22%22%22%22%22%22%22%22%22%22%7D%7D>, accessed 1 August 2020.
An Overview of Historical Trade Through Dandong

The 150 companies analysed over the course of this report conducted just over 62,500 individual shipments to or from North Korea during the three-year period assessed between September 2014 and December 2017. This trade represented a minimum value of $2,921,262,114. The true figure is likely considerably higher given the incomplete 2017 data.

Exports from these Chinese companies to North Korea – via 56,795 shipments (91% of all shipments) – represented the bulk of trade-related traffic, while imports from North Korea consisted of only 5,763 shipments (9% of total shipments).

Despite this, the USD value of the collective export shipments from the 150 companies accounted for only 60% of the total value of trade at a reported value of over $1.76 billion. Whereas, largely due to high-value natural resources coming from North Korea, imports accounted for 40% of the total reported value of trade at just over $1.16 billion.

The vast majority (93.4%) of the reported shipments were identified in the data as being delivered via motor vehicle across the border with only 3.4% of shipments moved by railway, 2.7% by ship and 0.5% by other means, a category which includes postage and air freight. Meanwhile, over 97% of all shipments were containerised, which presents possible issues for customs officials required by UNSC resolutions to search all goods going in and out of North Korea.

As shipments by these 150 entities continued throughout 2016 and 2017, so did the expansion of multilateral measures that targeted trade with North Korea. On 22 December 2017, the UNSC adopted Resolution 2397 prohibiting large swathes of trade with the country.

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20. Data collated and analysed by Project Sandstone.
21. Ibid.
22. Ibid.
23. Ibid.
24. Ibid.
25. Ibid.
26. Ibid.
**Figure 2**: Overview of Trade Conducted Between the Top 150 Companies in Dandong (By USD Value) and North Korea from September 2014 to December 2017

Sources: Chinese trade data, Project Sandstone.
In an effort to establish a full listing of goods prohibited for export and import to and from North Korea, the UN PoE published a table in its 2018 report that contained all of the Harmonised System (HS) codes it determined to be banned under existing UNSC resolutions passed in previous years.  

HS codes are internationally standardised codes used to identify products being traded. Cross-referencing these HS codes against those shipped by the 150 companies assessed shows that a significant number of these shipments would currently be prohibited. For example, of all the trade tracked involving these firms in the assessed time period, a total of 61.4% or approximately $1.8 billion would be prohibited by the UNSC if conducted today. Significantly, over 98% or $1.142-billion worth of imports reviewed for this report would also be prohibited, as would over 37% or over $653-million of the exports.  

Hence, nearly all of the goods imported by this set of companies from North Korea would currently be prohibited, as would a large swathe of those exported to the country.

Should China, and the 150 companies assessed, be fully adhering to UNSC sanctions, this would represent a significant hit to North Korea’s ability to generate revenue and procure goods internationally for its weapons programme. It would also represent a significant blow to the Dandong firms whose business dealings and revenue streams predominantly centred on trade with North Korea.

While UNSC resolutions prohibited large sections of trade with North Korea, only 15 companies in the original dataset of 150 appear to have closed since 2017, with the remaining 135 still registered as active on Chinese corporate databases. Furthermore, exhibitor lists from the bi-annual Pyongyang spring and autumn trade fairs in 2019 show that 13 of the companies in the dataset attended these events in North Korea’s capital city, the majority doing so on both occasions.

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28. UNSC, ‘Report of the Panel of Experts Established Pursuant to Resolution 1874 (2009)’, S/2018/171, 5 March 2018, Annex 4. This annex includes a detailed breakdown of the Panel’s interpretation of all HS codes that fall under sectoral bans in Resolutions 2270 (2016), 2321 (2016), 2371 (2017), 2375 (2017) and 2397 (2017). The HS codes that the panel interprets as being banned under these resolutions have been agreed to possibly contribute to the advancement of North Korea’s weapons programmes.

29. Data collated and analysed by Project Sandstone.


31. Pyongyang Trade Fair Brochures, spring and autumn 2019. Held by the authors.
While China is North Korea’s largest trading partner, an analysis of wider trade statistics indicates that the 150 Dandong-based companies analysed for this report played a surprisingly large role in North Korea’s total reported trade footprint.

Averages of figures published by the Observatory of Economic Complexity (OEC) and UN International Trade Statistics Database (Comtrade) show that China reported exports of $2.94- and $2.84-billion worth of goods to North Korea in 2015 and 2016, respectively. Meanwhile, North Korea’s total recorded global imports in those same years amounted to $3.47 and $3.14 billion, respectively.32

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33. Ibid.
The exports to North Korea from the 150 Dandong company dataset accounted for 23% (2015) and 27% (2016) of the value of all UN Comtrade-recorded Chinese shipments to the country.\(^{34}\) Additionally, still using Comtrade data as a comparator, these companies accounted for 20% (2015) and 25% (2016) of the total value of all global exports to North Korea in those years.\(^{35}\)

That nearly a quarter of all recorded global exports to North Korea in 2016 potentially flowed through only 150 Dandong-based companies highlights not only the central importance of Dandong to the North Korean economy, but also a concentration of North Korea's reported trade flows through only a small set of Chinese companies.\(^{36}\)

Although it is unclear why such a large volume of North Korea’s imports and exports were processed by a relatively small set of Chinese companies, the country’s trade flows are controlled by just four institutions – the WPK, the KPA, the Cabinet and regional governments\(^{37}\) – and their subordinate companies following the disintegration of the centrally planned economy and its restructuring in the 1990s.\(^{38}\) As a result, North Korean institutions began trading internationally, both as a means of importing necessary goods and items and as a mechanism to generate foreign currency to pay for these.\(^{39}\) Hence, while the set of possible North Korean trade partners is limited, so are the options for Chinese firms looking to do business with North Korea.

The country’s state-owned companies must also secure trade licences through a system controlled by the North Korean leadership, meaning the number of potential trade partners is limited.\(^{40}\) As mentioned previously, surveys of Dandong and Chinese business trading with North Korea report their primary North Korean counterparts were entities controlled by the WPK, the KPA, the Cabinet and regional governments. For example, out of the 176 Dandong-based survey respondents, 150 firms (85%) stated their partners were affiliated with one of these four state institutions. A total of 105 (60%) firms surveyed indicated they did business with firms represented either by the WPK, the KPA or the Cabinet.\(^{41}\)

The survey also looked at the ethnicity, citizenship and residency of owners of these Dandong firms doing business with North Korea across five categories.\(^{42}\) Of the 176 firms surveyed, 76 were owned by Chinese ethnic owners, 40 by Korean-Chinese, 35 by Chinese-North Korean, 22 by South Korean associates and three firms were categorised as being owned by other ethnicities.\(^{43}\)

\(^{34}\) Data collated and analysed by Project Sandstone.

\(^{35}\) Ibid.

\(^{36}\) As detailed later in the report, there is reason to believe that much of this trade was actually controlled by a relatively small number of individuals who controlled or owned a number of the largest trading companies in the set of entities under study.


\(^{38}\) Ibid., pp. 124–25.

\(^{39}\) Ibid.

\(^{40}\) The licences North Korean trading companies must be granted prior to engaging in business with foreign companies are called *waku*. Aside from granting permission to conduct foreign trade, *waku* also allow the central government to set the allowable amount of goods to be traded. See ibid., pp. 129–30.

\(^{41}\) See Kim, *Unveiling the North Korean Economy*, pp. 136–38.

\(^{42}\) Ibid.

\(^{43}\) Ibid.
In total, therefore, over 50% of Dandong firms surveyed were owned by ethnic Koreans, a fact which highlights the prominence and importance of the Korean diaspora to North Korea’s business interests overseas. This also becomes apparent in some of the selected case studies below, which found ethnic Koreans at the centre of networks closely linked to North Korean financial interests overseas.

Notably, 10 companies in the set of 150 accounted for over 63% or nearly two thirds of all the reported trade conducted over this period. When sorted by value, these included mineral fuel and oils, electrical machinery, apparel and clothing, motor vehicles, plastics and articles thereof, iron and steel and ores, slag and ash, among other goods.
Figure 4: The Top 10 Companies (By USD Value) Importing Goods from North Korea and Exporting Goods to North Korea from September 2014 to December 2017

<table>
<thead>
<tr>
<th>#</th>
<th>COMPANY NAME</th>
<th>EXPORTS</th>
<th>IMPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DANDONG KEHUA ECONOMIC AND TRADE CO., LTD</td>
<td>$216,558,950</td>
<td>$495,734,870</td>
</tr>
<tr>
<td>2</td>
<td>DANDONG TIANPU TRADE CO., LTD</td>
<td>$149,908,288</td>
<td>$68,275,291</td>
</tr>
<tr>
<td>3</td>
<td>DANDONG DONGZHEN TRADING CO., LTD</td>
<td>$123,765,988</td>
<td>$68,244,961</td>
</tr>
<tr>
<td>4</td>
<td>DANDONG XINYANG CHEMICAL RUBBER CO., LTD</td>
<td>$121,288,761</td>
<td>$40,157,921</td>
</tr>
<tr>
<td>5</td>
<td>DANDONG QIANCANG TRADING</td>
<td>$114,913,156</td>
<td>$33,240,472</td>
</tr>
<tr>
<td>6</td>
<td>DANDONG XIANQIAO TRADE CO., LTD</td>
<td>$105,213,200</td>
<td>$32,481,668</td>
</tr>
<tr>
<td>7</td>
<td>DANDONG HONGXIANG INDUSTRIAL DEVELOPMENT CO., LTD</td>
<td>$93,624,318</td>
<td>$29,215,976</td>
</tr>
<tr>
<td>8</td>
<td>DANDONG ZHONGZE TRADE CO., LTD</td>
<td>$69,972,563</td>
<td>$26,503,239</td>
</tr>
<tr>
<td>9</td>
<td>DANDONG HENGFENG TRADING CO., LTD</td>
<td>$53,069,493</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DANDONG CHENGYUAN IMP. &amp; EXP. CO., LTD</td>
<td>$47,970,248</td>
<td></td>
</tr>
</tbody>
</table>

Red indicates a sanctioned company

Sources: Chinese trade data, Project Sandstone.
Figure 5: The Top 10 Groups of Exported Items to North Korea (By USD Value) from the Top 150 Dandong Traders (By USD Value) with North Korea from September 2014 to December 2017

<table>
<thead>
<tr>
<th>HS Code Description</th>
<th>Code No.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes</td>
<td>27</td>
<td>$680,172,217</td>
</tr>
<tr>
<td>Electrical machinery and equipment and parts thereof</td>
<td>85</td>
<td>$304,079,358</td>
</tr>
<tr>
<td>Articles of apparel and clothing accessories</td>
<td>62</td>
<td>$238,411,175</td>
</tr>
<tr>
<td>Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof</td>
<td>87</td>
<td>$227,781,237</td>
</tr>
<tr>
<td>Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof</td>
<td>84</td>
<td>$208,420,577</td>
</tr>
<tr>
<td>Plastics and articles thereof</td>
<td>39</td>
<td>$139,441,061</td>
</tr>
<tr>
<td>Iron and steel</td>
<td>72</td>
<td>$127,267,890</td>
</tr>
<tr>
<td>Filaments and textiles</td>
<td>54</td>
<td>$114,854,108</td>
</tr>
<tr>
<td>Ores, slag and ash</td>
<td>26</td>
<td>$111,690,875</td>
</tr>
<tr>
<td>Rubber and articles thereof</td>
<td>40</td>
<td>$86,024,306</td>
</tr>
</tbody>
</table>

Sources: Chinese trade data, Project Sandstone.
Of these 10 companies, five have been sanctioned by the US Department of the Treasury: Dandong Zhicheng Metallic Material (丹东至诚金属材料有限公司); Dandong Kehua Economic and Trade (丹东科华经贸有限公司); Dandong Tianfu Trade (丹东天富贸易有限公司); Dandong Hongxiang Industrial Development (丹东鸿祥实业发展有限公司); and Dandong Xianghe Trading (丹东祥和商贸有限公司). Dandong Zhicheng and Dandong Hongxiang are also present on Japan’s unilateral sanctions list.

The US Department of the Treasury designated Dandong Hongxiang in September 2016, stating that the company was acting on behalf of Korea Kwangson Banking Corporation (KKBC), which was sanctioned by the US and the UNSC for providing financial services in support of WMD proliferators.

Dandong Zhicheng – along with Dandong Tianfu – was one of three Chinese companies designated by the US on 22 August 2017 for having ‘sold, supplied, transferred, or purchased coal or metal, directly or indirectly, from North Korea, and the revenue may have benefitted the nuclear or ballistic missile programs of the Government of North Korea or the Workers’ Party of Korea’.

Dandong Kehua and Dandong Xianghe were designated together on 21 November 2017 pursuant to Executive Order (EO) 13810, for having engaged in at least one significant importation from or exportation to North Korea of any goods, services, or technology.

49. US Department of the Treasury, ‘Treasury Sanctions Trading, Labor, and Shipping Companies and Vessels to Further Isolate North Korea’. Detailed investigations conducted by the C4ADS on Dandong Zhicheng, Kehua, Tianfu and Hongxiang Industrial have revealed more complete networks behind these entities and shed light on their procurement activities on North Korea’s behalf. See Thompson, ‘Risky Business’.
In the accompanying press release for the designations, the US Department of the Treasury stated that these two companies and Dandong Hongda (also within the 150 list) cumulatively imported over $100-million worth of goods from North Korea between 1 January 2013 and 31 August 2017. It added that the firms were also involved in $650-million worth of exports to North Korea during the same period. These goods have included natural resources such as anthracite coal, iron, iron ore, lead ore, zinc ore, silver ore, lead and ferrous products.54

The natural resource sector as a whole, along with HS codes encompassing the machinery and textile sectors, account for the three most valuable categories of trade – in USD – conducted by the combined 150 companies between September 2014 and December 2017.

Due to the significant value of these three sectors, a closer inspection of goods under the relevant HS codes for each category has been included below to shed more light on the type of shipments conducted.

While trade in many of the HS codes currently falls under UNSC sanctions, the following analysis does not imply sanctions breaches or illegal activity has occurred in any jurisdiction unless explicitly stated.

54. Ibid.
Outsourcing: North Korean Textile Traders

In the period analysed, textile products constituted a significant portion of both North Korean imports and exports, with international trade data showing mainly raw textile materials being exported to North Korea and completed textile products being imported back from the country. As a result, trade in these HS codes flowed both to and from North Korea, likely highlighting North Korea’s role as a textile processing centre. In fact, work by Byung-Yeon Kim has previously indicated that a substantial proportion of Chinese firms trading with North Korea viewed the country as an attractive outsourcing destination with the majority of surveyed companies manufacturing clothes using ‘cheap yet relatively skilled labour from North Korea’. Dandong company shipment data obtained for this report appears to reflect this, showing high volumes of textile imports and exports, with Dandong firms largely exporting raw textile materials to North Korea and subsequently importing finished textile products.

Companies importing goods from North Korea under HS codes pertaining to finished textiles would often – in the same or following months – export the same goods under the same six-digit HS codes to other countries including South Korea, Japan, the US and states within Europe. This potentially indicates that North Korean manufactured clothes and textile products have been, and may still be, present in global supply chains.

While this practice was not prohibited by UNSC resolutions at the time of the trade, such supply chain issues have been a matter of public concern for some time due to human rights issues. Several international companies have come under scrutiny when it was revealed their supply chains might potentially involve North Korean labour and manufactured goods.

The UNSC did move to prohibit the import of North Korean textiles with the passage of Resolution 2375 on 11 September 2017, while Resolution 2397 on 22 December 2017 also acknowledged that the proceeds from the trade, among others, ‘contribute to the DPRK’s nuclear weapons and ballistic missile programs’.

57. Data collated and analysed by Project Sandstone.
58. Ibid.
60. UNSC, Resolution 2375 (2017), 11 September 2017, p. 5, para. 16.
The US Departments of Homeland Security, State and the Treasury continue to be concerned by this phenomenon and potential breaches of Resolution 2375 involving North Korea’s textile industry. In 2018, these bodies co-published a North Korea sanctions advisory which warned of these supply chain issues and also identified 20 North Korean joint ventures involved in the textile and apparel industry, despite UNSC sanctions also prohibiting the operation of joint ventures or cooperative entities with North Korea.62

While human rights concerns regarding North Korea’s textile industry are relatively longstanding, the revenues generated by the industry also present a proliferation finance risk, as North Korean firms involved in the country’s textile trade have also been linked to the country’s military and other illicit actors. Two such firms include the Korea Ponghwa Trading Corporation (조선봉화무역총회사; AKA Korea Ponghwa General Corporation (조선봉화 총회사)) and Korea Daesong Trading Corporation (조선대성무역총회사).63

In 2012, these two firms were reported to collectively operate 37 specialised clothing factories, six specialised knitting factories, two hand-knitting workshops, an expert training centre and a technical preparation centre employing 18,000 workers. Exports were reportedly routed to China, Russia, Japan, South Korea, Europe and the Americas.64

According to the UN PoE on North Korea, Korea Ponghwa is subordinate to North Korea’s External Economic Committee of the Cabinet and is associated with the US-sanctioned Kumgang Group Bank (금강은행).65 Korea Daesong, on the other hand, is a US- and UNSC-sanctioned entity under Office 39 (39호실),66 the agency tasked with generating revenue for the North Korean leadership.67

One of the entities in the dataset trading textiles with North Korea was Dandong Jinxiang Trade (丹东锦祥贸易有限公司). Dandong Jinxiang was sanctioned by the US in January 2018 for reportedly engaging in trade with the Korea Tangun Trading Corporation (조선단군무역회사), an entity subordinate to the US- and UN-designated Second Academy of Natural Sciences and involved in North Korea’s WMD and missile

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64. Ibid.
programmes.68 A number of other US-sanctioned entities – including Dandong Tianfu, Dandong Hongxiang and Dandong Hongda – also traded textiles, albeit at significantly reduced levels than other firms.69

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69. Data collated and analysed by Project Sandstone.
Machinery Exports to North Korea

The most valuable category of exports to North Korea were of electrical machinery, vehicles (HS Chapter Codes 85 and 87, respectively) and other machinery classified under HS Chapter Code 84 (nuclear reactors, boilers, machinery and mechanical appliances; parts thereof). Cumulatively, this total trade was worth around $740 million across close to 17,500 shipments over the assessed period. Of all the shipments pertaining to these HS codes, only around 150 were imports to China from North Korea at a value of $16.5 million. Machinery exports therefore represent 41% of the total export value, while all shipments in the above HS codes represent roughly a quarter of the total trade value assessed.

As such, this analysis reinforces previous assessments that companies in China – and specifically Dandong – have been used to broker and sell North Korean commodities abroad, while using the proceeds to purchase goods for delivery to North Korea.

While it is likely that a multitude of goods with dual-use applications are contained within these HS codes, a more thorough screening of individual shipments against dual-use lists has been conducted for the second of these two reports to assess this in more detail. Furthermore, while control export mechanisms are in place to try to prevent specific dual-use good transfers, trade in the above HS codes was not subject to broad restrictions until 22 December 2017, when UNSCR 2397 banned the export of all items to North Korea covered by HS Codes 84 through to 89.

While identifying dual-use goods depends largely on the granularity of trade data, certain categories immediately stand out as being of potential concern given their destination and apparent re-routing through Dandong.

For instance, according to the trade data assessed, North Korea imported $4,548,747 worth of centrifugal pumps and their parts (HS Code 841370) in over 322 shipments at an average of cost of $14,126.5 per shipment. Centrifugal pumps are power-driven pumps for liquids and have various industrial applications including, potentially, nuclear and other WMD purposes.

Unfortunately, the shipment-level data obtained for this report does not contain details on which North Korean entity or end user was the consignee for the exports to the country. However, given the prominence of North Korean military institutions in the client-base of Dandong companies, some of these exports may well have made their way to entities of concern.

While this consignee data is absent, the ultimate end user may be more apparent in other instances when assessing some categories of goods being exported to North Korea. For instance, also under HS Code 85,

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70. Data collated and analysed by Project Sandstone.
there were a number of high-value shipments of media-related goods that would most likely only be used by significant bodies of the North Korean state. The trade data shows that companies such as Dandong Kehua and Dandong City Hongda Trade Co., Ltd (丹东市鸿达贸易有限公司) were involved in exporting such goods to North Korea.

For example, these two companies exported two shipments each of goods under HS Code 8525.50, which covers transmission apparatus for radio broadcasting or television, at a value of $1.9 million. The value and type of goods involved in these shipments leave little doubt that the end user of these shipments would be involved in North Korea’s state media apparatus.

The very body that oversees North Korea’s media and media controls – the Propaganda and Agitation Department (PAD) – is a UNSC-designated entity as of 11 September 2017 with the passage of UNSC Resolution 2375. The resolution states that PAD ‘has full control over the media’ and its censorship, ‘including newspaper and broadcast censorship’.

In addition to the high-value shipments of goods related to radio and television transmission detailed above, several of the 150 companies assessed were also seen to have sent high-value shipments of camera equipment to North Korea between 2014 and 2017 under HS Code 8525.80.

While the 6-digit HS code format limits the ability to pin down the precise goods within the shipments, they do include broadcast-quality and high-definition television cameras as well as other media-related goods. The total value of the trade comes to $644,003 across only 72 shipments.

An analysis of the trade relationship between Dandong entities and North Korea is ultimately necessary to contextualise further relationships between the two countries, the WMD programmes and other North Korean interests.

While certain North Korean-related shipments going to and from Dandong companies can be indicative of links to organisations within the North Korean state apparatus, North Korean entities themselves have typically required offices and footprints across China from which to operate procurement- and proliferation-related activities. Section two of this report looks at the North Korean company footprint in Dandong and details how the activities of these offices have contributed to advancing North Korea’s illicit programmes.

72. Data collated and analysed by Project Sandstone.
74. Ibid.
Resource Imports from North Korea

UNSC RESOLUTIONS note that North Korea ‘generates a significant share of the funds needed to finance its nuclear and ballistic missile programmes by mining natural resources and selling those resources abroad’. Analysis conducted for this report shows the most valuable traded goods were natural resources (mainly those covered by HS Chapter Codes 26, 27 and 72), at a cumulative value of over $900 million.

Coal has long been identified as one of North Korea’s primary and most valuable exports and is represented as the single most valuable commodity within the shipments analysed. Out of a total of 62,558 shipments, only 340 were imports of North Korean anthracite coal (HS Code 270111) under the broader HS Code 27, yet the minimum value of that trade was approximately $674 million. This represents 58% of the import values and 23% of the total values of all trade analysed for this report.

In addition to providing funds needed to finance North Korea’s nuclear and ballistic missile activities, coal-exporting activities have also been tied by the UNSC to North Korean entities heavily linked to its armed forces, intelligence agencies, munitions industry and Office 39. Mainly owing to its prominence in North Korean revenue generation and links to the WMD programme, coal was one of the first natural resources to be placed under UNSC sanctions with the passage of UNSCR 2270 in 2016.

A total of 20 of the 150 companies analysed here imported North Korean coal within the time period assessed. Among them were Dandong Zhicheng Metallic Material, Dandong Hongxiang Industrial Development, Dandong Tianfu Trade, Dandong Kehua Economic and Trade and Dandong Hongda. All of these firms are now sanctioned by the US, some specifically for trading coal, after the UNSC had first imposed measures on the resource.

75. UNSC, Resolution 2321 (2016), 30 November 2016, Annex II.
76. Data collated and analysed by Project Sandstone.
79. See Office of Foreign Assets Control, ‘Sanctions List Search’.
Figure 6: Imports of Coal from North Korea Made by the 150 Dandong Companies after UNSCR 2270 Which Partially Banned the Export of Coal in March 2016 until January 2018

Sources: Chinese trade data, Project Sandstone.

An analysis of the trading patterns of the 150 firms shows that several appear to have potentially violated UNSC sanctions prohibiting the imports of natural resources.

Starting with the passage of UNSC Resolution 2270 on 2 March 2016, the UNSC sought to expand measures against North Korea in response to its ongoing nuclear and ballistic missile programme. UNSC Resolutions 2321 (30 November 2016), 2371 (5 August 2017), 2375 (11 September 2017) and 2397 (22 December 2017) were then passed following subsequent North Korean nuclear and ballistic missile tests. These resolutions placed a range of restrictions on trade with North Korea, including the trade of a variety of goods classified under certain HS codes. However, as these sectoral sanctions expanded in scope, they also incorporated certain provisions that allowed for exemptions and ‘carve outs’ – that is, they allowed certain trade to take place provided it met specific criteria.

80. UNSC, ‘Security Council Imposes Fresh Sanctions on Democratic People’s Republic of Korea, Unanimously Adopting Resolution 2270 (2016)’.
82. UNSC, Resolution 2371 (2017), 5 August 2017.
84. UNSC, Resolution 2397 (2017), 22 December 2017.
For example, Paragraph 29 of UNSC Resolution 2270 – passed on 2 March 2016 – banned North Korea from exporting coal and decided member states shall prohibit the procurement of North Korean coal unless the shipments were ‘determined to be exclusively for livelihood purposes and unrelated to generating revenue for North Korea’s nuclear or ballistic missile programs or other activities prohibited by resolutions 1718 (2006), 1874 (2009), 2087 (2013), 2094 (2013) or this resolution’.85

In addition, coal that the procuring state could confirm (on the basis of credible information) had originated outside North Korea but was exported from the country’s Port of Rajin would also be cleared for export.86 This provision largely exists for Russia, which had previously used the port to export some of its coal. This, however, required advance notice to the 1718 Committee in addition to a determination that all transactions were unrelated to revenue generating activities for North Korea’s nuclear or ballistic missile programmes or other activities prohibited by prior resolutions and Resolution 2270.87

Trade data obtained for this report showed that out of the 150 companies assessed, 16 companies imported North Korean coal in and after March 2016 across 149 different shipments. A total of 108 of these shipments were dated between March 2016 and November 2016 – a month which saw the passage of Resolution 2321.

Resolution 2321, adopted on 30 November 2016, replaced Paragraph 29 in 2270 and moved to place a global annual import cap on North Korean coal.88 However, the exclusive livelihood and Rajin ‘carve outs’ remained, as did the decision that member states were required to make a determination that the revenue from the imports were unrelated to prohibited activities and programmes.89 It also added that procurements could not involve individuals or entities associated with such activities, or already designated by the UN, as well as anyone ‘acting on their behalf or at their direction, or entities owned or controlled by them, directly or indirectly, or individuals or entities assisting in the evasion of sanctions’.90

A further 10 reported shipments of coal were imported by seven companies in December 2016. Unfortunately, the gap in the data obtained for this report spans from February 2017 until August 2017, meaning that any further shipments during that period are not assessed here.

Following further prohibited tests in 2017, the UNSC passed Resolution 2371 that year, which banned outright any imports of North Korean coal as of 5 August, though the Rajin provision again stayed in place.

Trade data processed for this report shows that 17 shipments of coal were imported from North Korea in the month of August 2017. If any of these 17 shipments took place after 5 August 2017, they represent an explicit breach of UNSC sanctions, unless advanced notice and evidence was provided to show it was non-North Korean coal being shipped and that the shipment took place through Rajin.

Furthermore, according to additional trade data, 9 of the 150 companies also conducted a further 14 import shipments of coal which were listed as arriving in Chinese ports in September 2017. Each of these shipments would represent an explicit breach of UNSC resolutions should the necessary Rajin-related provisions in

86. Ibid., para. 29, section a.
87. Ibid., para. 29, section b.
90. Ibid.
Resolution 2321 not have been met. Unfortunately, the trade data obtained for this report only indicates that the shipments embarked from North Korea and does not identify the specific port of origin.

The companies listed as being involved in these imports of North Korean coal under HS 2701 in September 2017 are:

- Dandong Chengyuan Import and Export (丹东诚远进出口有限公司).
- Dandong Chihai Technology (丹东驰海科技有限公司).
- Dandong Complant Trade (丹东卡姆莱特贸易有限公司); AKA Dandong Kamu Laite Trade.
- Dandong Qiancang Trading Co., Ltd (丹东乾仓贸易有限公司); formerly Dandong Dry Warehouse Aquatic (丹东乾仓水产有限公司).
- Dandong Jinyan Trading (丹东金岩贸易有限公司).
- Dandong Kehua Economic and Trade (丹东科华经贸有限公司).
- Dandong Tianfu Trade (丹东天富贸易有限公司).
- Dandong Yusen Trade (丹东裕森贸易有限公司).
- Liaoning Zhanhong Trade (辽宁展鸿贸易有限公司); formerly Dandong Zhangrong Trade (丹东展荣贸易有限公司).

Irrespective of the potential UNSC breaches above, every one of the 149 coal shipments made after March 2016 required a credible determination that the transactions were purely for livelihood purposes or unrelated to generation of revenue for North Korea’s nuclear or ballistic missile programmes or other activities prohibited by Resolutions 1718 (2006), 1874 (2009), 2087 (2013), 2094 (2013) in addition to the latest resolutions in place at the time of the shipment.

Additionally, 41 of the shipments made after 30 November 2016 required a determination that each of these shipments did not involve individuals or entities associated with such activities, or those already designated by the UN as well as anyone ‘acting on their behalf or at their direction, or entities owned or controlled by them, directly or indirectly, or individuals or entities assisting in the evasion of sanctions’. 92

The challenge of being able to credibly make such a determination is considerable, due to the links between North Korean coal exporters and illicit actors. This is further exacerbated given the opaque nature of the North Korean system that renders it almost impossible to determine that no revenue was used or channelled towards funding sanctioned entities or prohibited activities, unless significant effort was devoted thereto.

The trade data available also shows that the number of shipments involving coal and the value of that trade was not greatly affected by the UNSC sanctions at the time. In total, there were 191 anthracite coal shipments conducted by companies in the dataset of 150 from September 2014 up to and including February 2016 at a value of $399,575,670. This is an average of $2,092,019 per shipment. Yet, from the beginning of coal-related sanctions in March 2016 up to and including December 2017, there were 149 shipments at a value of $274,418,363. In reality, this figure is likely to be higher given both the absence of six months of trade data and of values for 31 of the post-sanctions shipments. The average value per anthracite shipment for the 118 shipments after March 2016 that did have monetary data came in at $2,325,579 – a slight increase on pre-sanctions values per shipment.

91. Data collated and analysed by Project Sandstone.
In addition to coal, imports of iron and iron ore were among the first to similarly be placed under restrictive multilateral measures. North Korean iron and iron ore was prohibited for import by UNSC Resolution 2270 under the same provision as coal with regards to livelihood exemptions. It was also exempt under livelihood exemptions in UNSC Resolution 2321. Furthermore, it received an outright ban in UNSC Resolution 2371, with the following exception added in Paragraph 8 of the resolution that:

For sales and transactions of iron and iron ore for which written contracts have been finalized prior to the adoption of this resolution, all States may allow those shipments to be imported into their territories up to 30 days from the date of adoption of this resolution with notification provided to the committee containing details on those imports by no later than 45 days after the date of adoption of this resolution.

Iron and iron ore products fall under a variety of HS code headers, the predominant ones being HS Codes 2601 (‘Iron Ores’), 72 (‘Iron and Steel’) and 73 (‘Articles of Iron and Steel’). The UN PoE established the HS codes it considered under prohibitions for import from North Korea pursuant to UNSC resolutions within

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Annex 4 of its 2018 report. As seen in the image of that annex below, the import bans pertain to HS Codes 2601, 7201–7229 and 7301–7326.\(^\text{95}\)

**Figure 8:** Excerpt from the UN Panel of Experts (PoE) Report 2018 Highlighting the Sectoral Sanctions Imposed on Imports from North Korea

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**Table 1: HS codes for Sectoral Bans on imports from the DPRK**

<table>
<thead>
<tr>
<th>Item</th>
<th>HS Codes</th>
<th>Description</th>
<th>Resolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>2701</td>
<td>Coal; briquettes, ovoids and similar solid fuels manufactured from coal</td>
<td>Para. 8 of res 2371 (2017)</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>2601</td>
<td>Iron ores and concentrates, including roasted iron pyrites</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>Chapter 72</td>
<td>Iron and steel products (7201-7229)</td>
<td></td>
</tr>
<tr>
<td>Iron and Steel products</td>
<td>Chapter 73</td>
<td>Iron and steel products (7301-7326)</td>
<td></td>
</tr>
</tbody>
</table>


Trade data analysed indicates that 15 companies within the original dataset imported iron and iron ore products from North Korea, under the above HS codes, 99 times between the start of March 2016 and the end of 2017. Of those 99 shipments, 81 took place from March 2016 up to and including January 2017 at a value of $16,365,463. The data for the remaining 18 shipments that occurred beyond January 2017 does not contain information pertaining to their value.

As with coal imports, in order for these to be legitimate, they would have required a credible determination that each shipment conducted prior to 5 August 2017 was exclusively for livelihood purposes and entirely unrelated to generating revenue for North Korea’s WMD programmes, affiliated entities or prohibited activities under existing UNSC resolutions.

The further 18 imports of iron products that took place after January 2017 were conducted by seven companies from the start of August 2017 – the month when iron and iron ore shipments were banned under UNSCR 2371 – to the end of December 2017. According to the trade data, five of these imports arrived in August 2017. If this occurred prior to August 5, then they were entirely permitted with a determination that they were for livelihood purposes.

Under the contract provision within Resolution 2371, an additional four shipments – which, according to trade data, arrived in Chinese ports in September 2017 – would also be allowed if contracts were written

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for these shipments prior to 5 August 2017, if they arrived prior to 5 September 2017 and if notification was provided to the 1718 Committee by 20 September 2017. If these conditions were not met, then these shipments constituted a breach of UNSC resolutions.

According to the trade data analysed for this report, an additional eight shipments of iron products under the aforementioned iron-related HS codes arrived in China within the months of October, November and December of 2017, after the contract exemption period expired.

According to the PoE list in Annex 4 of its 2018 report, and its interpretation of goods prohibited by specific HS codes, these eight shipments constitute an explicit breach of UNSC sanctions and were conducted by the following entities:

- Dandong City Shizhan Trade (丹东市世展贸易有限公司).
- Dandong Jinyuan Trade Limited Company (丹东金缘商贸有限公司).
- Dandong River Trading Company (丹东江河贸易有限公司); AKA Dandong Jianghe Trading Company.
- Dandong Dingrui Trading (丹东鼎瑞贸易有限公司).

Furthermore, in its 2019 report, the PoE – citing Global Trade Atlas data – reported that China imported just over $13 million of iron and steel products under HS Codes 72 and 73 between October 2017 and March 2018.\(^\text{96}\) The panel identified these shipments as breaches of paragraph 8 of Resolution 2371.\(^\text{97}\)

In this section of its report, the PoE included a reply by the Chinese government which was seeking to refute any wrongdoing regarding the shipments stating that “‘relevant data don’t indicate the commodities under the items of HS code 7201’, and that, under Chinese law and regulations, only items with HS codes 7201 are considered as constituting iron and steel and articles of iron and steel prohibited by the relevant resolutions’.\(^\text{98}\)

HS Code 7201, which the Chinese government claims is the only iron-related code prohibited for import, is under the heading ‘Pig Iron and Spiegeleisen in Pigs, Blocks or Other Primary Forms’.\(^\text{99}\) While all of the 99 iron-related shipments reported between March 2016 and December 2017 were under HS codes considered by the PoE to be covered by the UNSC measures, only 27 shipments were under HS Code 7201 and all took place between March 2016 and August 2017.

Of the remaining 72 reported shipments since March 2016, 20 were of HS Code 2601 (‘Iron Ores and Concentrates, including Roasted Iron Pyrites’, two shipments were of HS Code 7207 (‘Semi-Finished Products of Iron or Non-Alloy Steel’), another two were of HS Code 7325 (‘Cast Articles Others, Of Iron Or Steel’) and one shipment was under HS Code 7228 (‘Bars And Rods Of Alloy Steel’).

A total of 47, including all eight shipments that were identified as explicit breaches above, were listed under the 4-digit code of 7202 or ferroalloys. Ferroalloys are essentially iron alloys, and according to Ullmann’s

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97. Ibid.
98. Ibid.
Encyclopedia of Industrial Chemistry, ‘are master alloys containing elements that are more or less soluble in molten iron and that improve the properties of iron and steel. These alloys usually contain a significant amount of iron’.100

While the wording of the provisions pertaining to ‘Iron and Steel’ within UNSC resolutions appears to lack specificity, the Panel did provide guidance on this in Annex 4 of its 2018 report. However, ‘Iron and Iron Ore’ remain the only guiding wording for member states in the resolutions themselves.

While member states do appear to have different interpretations of what constitutes iron and iron ore products,101 China’s insistence that HS Code 7201 alone would cover the totality of iron and iron ore provisions appears narrow considering the range of clear iron products under multiple HS codes, including 2601 (‘Iron Ores and Concentrates’).

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Case Study: Dandong Zhicheng Metallic Material

The largest trader and importer of North Korean resources identified by this study was Dandong Zhicheng Metallic Material. In fact, data collected for this report shows that it ranked as the largest importer of North Korean goods, far outstripping the second-largest importer by over $400-million worth of shipments.

Registered in 2005, Dandong Zhicheng was engaged in brokering North Korean resources abroad while using the dollar proceeds to purchase goods for delivery to the country using a network of front companies across various jurisdictions.\textsuperscript{102} As with several other Dandong companies identified in this dataset, the majority of the value of Dandong Zhicheng’s imports were generated by anthracite, with trade records showing 53 separate North Korean shipments of coal from the beginning of March 2016 to the end of December 2016, worth $206,037,663.\textsuperscript{103}

Sanctioned by the US Department of the Treasury in August 2017, an accompanying press release claimed the company worked with a number of UN-designated entities,\textsuperscript{104} using the proceeds of North Korean coal sales to purchase items for the country’s nuclear and ballistic missile programmes.\textsuperscript{105}

A US Department of Justice complaint filed against the company in August 2017 contains testimony from an individual named as ‘Defector 1’ who described Dandong Zhicheng ‘as a criminal organization, which conducted illegal financial transactions and illegally paid hundreds of millions of U.S. dollars to import three to four million metric tons of anthracite coal from trade companies controlled by the North Korean military every year’.\textsuperscript{106} The defector added that the North Korean military controls coal production volumes and exports, funnelling the revenue back into the ‘military, nuclear missiles and other weapons programs’.\textsuperscript{107}

Meanwhile, a 2017 advisory published by the Financial Crime Enforcement Network (FinCen) detailed how Dandong Zhicheng allegedly laundered money by paying companies in China with natural resources. These companies would then pay front companies who would buy a wide range of goods and transport them to

\textsuperscript{102} Thompson, ‘Risky Business’.
\textsuperscript{103} Trade records held by the authors.
\textsuperscript{105} Ibid.
\textsuperscript{107} Ibid.
North Korea. The shipped items were ‘typically in unrelated industries, such as bulk commodities (sugar, rubber, petroleum products, soybean oil), cell phones, luxury items, or dual-use technology’.

In their 2018 report, the UN PoE identified the *Zhang Hong No 1* as a vessel which exported North Korean coal on behalf of Dandong Zhicheng Metallic Materials in March 2017. Images of the *Zhang Hong No 1* loading coal in North Korea’s port of Nampo were published by Project Sandstone in 2019, in a report which linked the vessel to a Taiwanese national named Chen Mi-hsiang. Chen and her associates were targeted by the US Department of the Treasury in the same year for their involvement in illicit ship-to-ship (STS) transfer operations with North Korean vessels in 2018. One vessel they used to smuggle the oil, the *Shang Yuan Bao*, was subsequently UN-designated in October 2018.

This case illustrated how networks in Dandong and Taiwan both brokered and moved oil and coal on behalf of North Korean entities, providing services along the entire value chain that helped Pyongyang evade multilateral and unilateral sanctions.

However, recent information revealed in a US indictment targeting North Korea’s Foreign Trade Bank (FTB) contains potentially important details about how this revenue was allegedly used by North Korean agents abroad. In May 2020, the US District Court of Columbia unsealed an indictment against over two dozen North Korean individuals and an additional five Chinese individuals who were alleged to be representatives of North Korea’s FTB.

The FTB was designated by the UNSC in August 2017 and is listed as ‘the DPRK’s primary foreign exchange bank and has provided key financial support to the Korea Kwangson Banking Corporation’, a known provider of financial services to North Korean weapons and ballistic missile proliferators.

The indictment also reveals that a number of Dandong companies sat at the heart of FTB networks abroad, further highlighting the city’s importance to North Korea’s foreign trade and payment architecture.

For example, the indictment alleges that the FTB’s chief representative in Moscow also had documentation identifying himself as a deputy general manager at an unnamed Dandong-based trading firm. In addition, a company named Dandong Kehua – the largest exporter of goods to North Korea identified in this report – was also named in the May indictment for receiving payments under instruction from FTB headquarters in Pyongyang, as well as FTB branches in Shenyang and Beijing. The indictment identifies eight payments to Dandong Kehua between March 2013 and August 2015 totaling over $2.1 million.

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111. James Byrne, Joe Byrne, Hamish Macdonald and Gary Somerville, ‘Kaohsiung Cowboys: The Taiwanese Network Facilitating North Korea’s Illicit Activities’, RUSI, Project Sandstone, Report 5, 12 December 2019, p. 15, Figure 7.
As a result, both the largest exporters and importers of goods to and from North Korea identified in this report – Dandong Zhicheng and Dandong Kehua – were named in the indictment as having operated within the FTB financial infrastructure and involved in the procurement of goods on behalf of North Korea.

**From Dandong to the Shores of Tripoli**

According to the indictment unsealed in May 2020, the charges levelled against these individuals include conspiracy to defraud the US government and breach US law, violations of the US’s International Emergency Economic Powers Act, bank fraud and money laundering. The indictment also contains information about how these networks have allegedly operated, publishing details on the financial flows between North Korea’s front company networks that would otherwise be entirely opaque. Using these details, Project Sandstone has uncovered a wider network of individuals and companies linking back to Dandong Zhicheng, Libya and Liaoning’s provincial capital of Shenyang.¹¹⁴

This discovery potentially not only connects revenue generated by North Korea’s coal sales to front company networks operated by its operatives abroad, but also to a wider network of ostensibly ethnically Korean Chinese nationals active in North Africa and Liaoning province.

According to the US indictment, USD revenue generated by Dandong Zhicheng’s sale of North Korean coal was allegedly laundered and used by North Korean and Chinese nationals – named Ku Ja Hyong and Jin Yonghuan, respectively – who operated a covert branch of the FTB in Libya.¹¹⁵

Ku Ja Hyong (구자형) is a North Korean national and chief FTB representative in Libya who was designated by the UNSC on 22 December 2017.¹¹⁶ While there are limited details about Ku Ja Hyong’s Libyan activities, the 2018 UN PoE report shows that he also visited the UAE, Tunisia and Saudi Arabia in recent years.¹¹⁷ Speaking to the press about their 2017 designation of Ku Ja Hyong and a number of other senior North Koreans, a South Korean government official described the group as ‘high-ranking employees who have been linked to North Korea’s nuclear and missile development program as well as the North’s foreign exchange procurement efforts’.¹¹⁸

North Korea and Libya have a long and storied history, with cooperation spanning back to the establishment of diplomatic relations in the 1970s and the subsequent ratification of the North Korea–Libya Treaty of Alliance on Friendship and Cooperation in 1982, which contained a number of military provisions. This

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¹¹⁴. This section does not presume any wrongdoing on the part of individuals, entities or governments unless this is explicitly stated in writing.
included a clause described as the only mutual defence pact that North Korea ever signed with another country outside of China and the Soviet Union.¹¹⁹

The treaty also committed to military exchanges of data, specialists and weapons.¹²⁰ Since then, North Korea has delivered on these commitments, supplying Libya with a variety of weapons later used both by Colonel Muammar Qadhafi’s forces during the civil war in 2011,¹²¹ and since the collapse of the government during the subsequent internecine conflicts.¹²²

In addition to a longstanding conventional military relationship, North Korea–Libya cooperation extended into the fields of nuclear and ballistic missile technologies, with multiple interdictions of apparently Libya-bound missile technology of North Korean origin taking place over the years.¹²³ The US also assessed that nuclear material, such as slightly enriched uranium hexafluoride, found in Libya following its disarmament in 2003, was of North Korean origin,¹²⁴ and likely transferred via the AQ Khan network.¹²⁵

More recently, the UN PoE has continued investigations into North Korean activities in Libya, including weapons sales by four senior Korea Mining Development Trading Corporation (KOMID) officials also active in Uganda, Sudan and Syria.¹²⁶ The 2019 UN PoE report also included information on a Syrian arms trafficker attempting to sell weapons on North Korea’s behalf in Libya,¹²⁷ while noting that investigations continued into multiple attempts at ‘military cooperation between the Democratic People’s Republic of Korea and various Libyan authorities, as well as designated entities and foreign nationals working on their behalf in Libya’.¹²⁸

These attempts include a reported 2015 letter from O Chol Su – deputy minister of the Ministry of Military Equipment in North Korea – to Khalifa Al-Ghwail, the then chief of the Supreme Council of Defence and deputy to the prime minister.¹²⁹ In the correspondence, according to an unnamed member state, O Chol Su stated that North Korea was ‘currently in the process of preparing the sales/purchase agreement for the required defence systems and ammunition needed to maintain stability of Libya’ and further noted that ‘Green Pine Association, a commercial establishment belonging to our ministry’ would provide the draft agreement and additional documentation.¹³⁰

¹²⁸. Ibid., p. 35.
¹²⁹. Ibid.
¹³⁰. Ibid.
North Korean officials based in the Tripoli embassy have also made moves to engage in military-related cooperation with Libyan defence officials in 2017, while various North Korean weapons systems and munitions have been spotted in Libya in recent years.

According to the indictment unsealed in May 2020 indictment, North Korea’s FTB representatives in Libya, Ku Ja Hyong and Jin Yonghuan, used Hong Kong and Chinese front companies to receive USD payments from Dandong Zhicheng and Ruizhi Resources while making others to a variety of Chinese and US companies. On one occasion on 9 November 2016, the indictment alleges that Ku Ja Hyong and Jin Yonghuan ‘caused Hong Kong Yuzheng, the offshore branch of Liaoning Yuzheng, to receive a payment of approximately $994,980.00 from Dandong Zhicheng’ – a transfer which cleared through a US bank. On the same day, Ku Ja Hyong and Jin Yonghuan allegedly used Hong Kong Yuzheng to receive a $100,000 payment from Ruizhi Resources, one of Dandong Zhicheng’s front companies.

132. Several examples of North Korean weapons have been spotted on social media, appearing to show the circulation of these weapons in the Libyan conflict. See, for example, Lost Weapons, ‘Something kinda strange posted on Libyan GNA linked page. Is this a North Korean Bulsae-2 ATGM? Sights labeled PLA-017, missile xLA-197 but looks like a Bulsae. Could China be painting its own markings on North Korean gear to help move and sell it? Then a captured LNA kornet’, Twitter post, 21 June 2019, <https://twitter.com/LostWeapons/status/1141960211990626309>, accessed 1 August 2020; Oryx, ‘Haftar’s Libyan National Army has just bolstered its forces in and around Tripoli with more artillery and AFVs, including 11 North Korean 122mm BM-11 MRLs installed on both the original Isuzu HTW 11 truck and the Brazilian EE-11 APC and two EE-11s with North Korean 14.5mm ZPU-4s’, Twitter post, 21 April 2019, <https://twitter.com/oryxspioenkop/status/1114974329220009986>, accessed 1 August 2020; N R Jenzen-Jones, ‘Optics of the Libyan Conflict – Part III’, 16 February 2012, <https://rogueadventurer.com/2012/02/16/optics-of-the-libyan-conflict-part-iii/>., accessed 1 August 2020.
133. Benner, ‘North Koreans Accused of Laundering $2.5 Billion for Nuclear Program’.
134. Ibid.
While it is unclear what the purpose of these alleged transfers was, others made in 2016 and 2017 by Ku Ja Hyong and Jin Yonghuan from Hong Kong Yuzhen and Liaoning Yuzheng accounts were to US and Chinese companies, including a $499,436 payment to a Chinese oil company on 4 January 2017.135

Hong Kong and Chinese corporate records show the two companies mentioned by the US indictment are Hong Kong Yuzheng Industry (香港宇正實業有限公司) and Liaoning Yuzheng International Trading (辽宁宇正国际贸易有限公司). Located in 55 Shifu Road, Heping District in the Chinese city of Shenyang, Liaoning Yuzheng was established in 2013 and lists Jin Yonghuan (金永焕) and Bai Lexian (白乐贤) as shareholders of the company. In addition, Jin Yonghuan is also listed as Executive Director of the company.136 Meanwhile, registry documents for Hong Kong Yuzheng Industry list the sole shareholder and director as a Chinese national named Jin Yonghuan (金永焕), born on 22 May 1965.137

Chinese-language sources show that an individual named Jin Yonghuan (金永焕) is also listed as a representative of the Shenyang office of North Korea’s Unsong Trading Corporation (朝鲜银星贸易会社沈阳代表处), which was located at the same Shenyang address at 55 Shifu Road.\(^\text{138}\)

**Figure 10:** Network Graph of Chinese Companies Linked to North Korean Entities Active in Libya

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Sources: *US Treasury Indictment; UN PoE Report 2018; Project Sandstone.*

Korean Unsong Trading was previously linked by the UN PoE to North Korea’s Green Pine Corporation, a front company for the country’s primary intelligence agency, the UNSC-designated Reconnaissance General Bureau (RGB).\(^\text{139}\) Another North Korean entity which has used this address is the Korea Natural Resources Development Investment Corporation (朝鲜资源开发投资会社沈阳代表处),\(^\text{140}\) which is listed by the UN as


\(^{140}\)水滴信用 [Shuidi Credit], ‘朝鲜资源开发投资会社沈阳代表处’ ['Korea Natural Resources Development Investment Corporation Shenyang Representative Office'], <https://shuidi.cn/company-c368e7848d8a4ce273ca7acae5d6363.html?from_search=1>, accessed 9 June 2020.
an alias of the Green Pine Corporation.141 While this office appears to have closed, its representative, Jin Yongri (金永日), shares a name with the deputy consul general of North Korea’s Shenyang consulate.142

Jin Yonghuan’s activities in Libya and his possible employment for an RGB-linked North Korean entity in Shenyang highlight how dollar revenues generated by the sale of North Korean coal and other resources by Dandong-based entities are laundered and used for other illicit purposes through a network of front companies registered across various jurisdictions. Since dollar-denominated funds are kept outside North Korea, these can potentially be used by RGB agents for the procurement of goods and services outside the country for shipment back to North Korea.143

In fact, details in the 2018 UN PoE report confirm that Shenyang-based FTB representatives moved money for special organisations and RGB agents located overseas.144 While it is unclear if those FTB transfers were linked to Jin Yonghuan’s activities in Libya, network analysis shows that Jin sits at the heart of a wider personal network of other individuals active in Libya and a company network procuring goods internationally while also exporting items to North Korea.

For example, Chinese court records from the Shenyang District People’s Court of Shenyang City, filed on 21 March 2019,145 show that the local branch of Postal Savings Bank of China sought to retrieve unpaid mortgage charges from Jin Yonghuan,146 one of his companies, and a number of connected individuals identified by the court as ethnic Koreans.147 Notably, the mortgages for the properties the court sought to collect were for the same Shenyang properties at which Jin Yonghuan and his companies are addressed on corporate records, indicating these individuals have likely been using real physical addresses in the city rather than corporate secretaries from which to operate companies.148

142. 水滴信用 [Shuidi Credit], ‘朝鲜资源开发投资会社沈阳代表处’ [‘Korea Natural Resources Development Investment Corporation Shenyang Representative Office’], <https://shuidi.cn/company-c368e7848d8a4ce273ca7ace56d363.html?from_search=1>, accessed 9 June 2020.
144. The Annex of the 2018 UN Panel of Experts report shows that the deputy representative at the FTB branch office in Shenyang, an individual named Choe Sok Min (최석민), was ‘associated with cash transfers from that FTB office to banks affiliated with DPRK special organizations and RGB located overseas’.
146. Shenyang City Civil Court also identifies Jin Yonghuan as an ethnic Korean with the same birthday as that used on Hong Kong corporate documents.
147. Shenyang court documents identify Jin Yonghuan (金永焕) as a Korean male, born on 22 May 1965, and a resident of Hangpu district, the same date of birth as that listed on Hong Kong Yuzheng Industry (香港宇正實業有限公司).
148. 中国裁判文书网 [China Judgements Online], ‘中国邮政储蓄银行股份有限公司沈阳市分行与金永焕、吉红花等金融借款合同纠纷一审民事判决书’ [‘Postal Savings Bank of China Shenyang Branch Vs Jin Yonghuan, Ji Honghua et al., Financial Loan Contract Dispute First Civil Judgement’].
One of the individuals identified alongside Jin Yonghuan is a woman, born on 15 April 1968, named Ji Honghua (吉红花). Cross-referencing this name against the 2018 UN PoE report shows that a Chinese passport holder named Ji Honghua (吉红花) had opened a USD account at the International Arab Bank of Tunisia on 27 November 2013, listing her address as ‘Embassy of Democratic Korea Tripoli Libya’. The passport page published by the UN PoE for Ji Honghua (吉红花) shows the same birthday – 15 April 1968 – as that listed by Shenyang City People’s Court in 2019, indicating that the Ji Honghua active in Libya is the same as that identified alongside Jin Yonghuan in the 2019 Shenyang court filing. Despite using a Chinese passport in her Libyan bank documents, Ji Honghua was also identified as ethnically Korean by the Shenyang district court.

Figure 11: Connections of Ji Honghua, a North Korean Operative in Libya, to Liaoning Yuzheng International Trading


149. Ibid.
151. 中国裁判文书网 [China Judgements Online], ‘中国邮政储蓄银行股份有限公司沈阳市分行与金永焕&吉红花等金融借款合同纠纷一审民事判决书’ [‘Postal Savings Bank of China Shenyang Branch Vs Jin Yonghuan, Ji Honghua et al., Financial Loan Contract Dispute First Civil Judgement’].
152. Ibid.
Both Ji Honghua (吉红花) and another Chinese-passport holder named Jin Huixing (金辉星) – who also separately used the address of the North Korean Embassy in Tripoli – listed a Chinese mobile phone number (+86 134 6401 6209) on the bank documentation they used to open accounts at the International Arab Bank of Tunisia. Chinese-language sources show this is the listed number for Liaoning Yuzheng International Trade, the same Shenyang-based company operated by Jin Yonghuan. In fact, shipment-level trade records show Liaoning Yuzheng International Trade moved a wide variety of goods to North Korea during 2016 and 2017, including instruments and apparatus for physical or chemical analysis, using UV, visible or infrared optical radiations (HS Code 902750) and instruments for physical or chemical analysis, or for measuring or checking viscosity, porosity, expansion or surface tension (HS Code 902780).

An open-source caller-verification app, True Caller, also lists this phone number as used by a ‘Hui Xing Jin China Gold Supplier Shenyang’, while the landline number used by Ji Honghua on this same documentation is the listed number of a company advertised as Shenyang Yuzheng Gold Trading (沈阳宇正金贸有限公司). As a result, it appears likely that all three individuals may have been operating in Libya and in Shenyang.

153. According to the PoE, while Jin Huixing (金辉星) opened a euro denomination bank account at the International Arab Bank of Tunisia, a national of North Korea, Nam Sok Chan, was managing the account. See UNSC, ‘Report of the Panel of Experts Established Pursuant to Resolution 1874 (2009)’, S/2018/171, 5 March 2018, p. 61.

154. Trade records held by authors.

155. True Caller is a smartphone application that features caller identification services in order to identify unknown or spam numbers.


157. Search engine results on Baidu for ‘沈阳宇正金贸有限公司’ return adverts showing the same Shenyang landline number used by Jin Huixing on documentation for opening a bank account in Tunisia.
Figure 12: Details of Jin Huixing, a North Korean Operative in Libya

Sources: UN PoE Report 2018, Annex 45; Corporate Documentation for Go Delight Limited (高博來有限公司); Project Sandstone.

An analysis of Chinese corporate documentation shows that Jin Yonghuan has been listed as a director and shareholder for two other companies based out of 55 Shifu Road, Heping District, named Shenyang Yuzheng Trading (沈阳宇正经贸有限公司) and Shenyang Chengdao International Trade (沈阳成道国际贸易有限公司).158 Meanwhile, UK company records show that Jin Yonghuan also operated a company named Topson International, which was closed in 2014.159

While Shenyang Yuzheng Trading (沈阳宇正经贸有限公司) was closed in 2011, adverts for the company listed it as a state-owned holding,160 and claim it traded with North and South Korea.161 Jin Yonghuan’s other

158. Qichacha corporate database search shows Shenyang Yuzheng Trading (沈阳宇正经贸有限公司) and Shenyang Chengdao International Trade (沈阳成道国际贸易有限公司) both list Jin Yonghuan as a shareholder with the same 55 Shifu Road, Shenyang Address, <https://www.qcc.com/>, accessed 1 June 2020.
company, Shenyang Chengdao International Trade (沈阳成道国际贸易有限公司), remains open with trade records showing it shipping goods internationally up to 2018.\textsuperscript{162}

Notably, the company shipped machine tools for working sintered metal carbides or cements (HS Code 846140) to Myanmar in 2013.\textsuperscript{163} As in the case of Libya, North Korea and Myanmar have a long-running military relationship with several documented and suspected shipments of military materiel taking place since 2010.\textsuperscript{164} In October 2013, Shenyang Chengdao sent a consignment of numerically controlled lathes (HS Code 845811) to North Korea. These records also show imports from Germany, Singapore, Japan, the UK and the US, including items that may have required export authorisation such as spectrometers (HS Code 902730) and measuring instruments and apparatus for measuring or detecting ionising radiation (HS Code 903010).\textsuperscript{165} Goods traded under these HS codes are subject to export controls under EU law,\textsuperscript{166} and potentially have a variety of military or WMD uses, such as for the detection of chemical warfare agents or the detection of radiation in nuclear reactors.\textsuperscript{167}

While China–North Korea shipment-level trade data became unavailable during 2017, records filed by other countries show that Shenyang Chengdao International Trade imported items from the US, Switzerland, Germany and Singapore in 2018. This included machines and apparatus for electroplating, electrolysis or electrophoresis from Singapore (HS Code 854330)\textsuperscript{168} and a variety of other instruments, machinery and industrial goods.

Trade data is also available for several other companies linked to Jin Yonghuan including Liaoning Yuzheng International Trading Co. (辽宁宇正国际贸易有限公司), Shenyang Tianrong Trade Co., Ltd (沈阳天荣贸易有限公司) and Shenyang Yuzheng Technology Co., Ltd (沈阳宇正科技有限公司). An analysis of these records shows that from February 2011 to January 2017, these companies exported $2.7-million worth of goods to North Korea including machines and electrodes for arc welding, thermostats, barometers, rock drilling and earth-boring tools, spherical roller bearings and a wider range of other goods.\textsuperscript{169}

\begin{itemize}
\item \textsuperscript{162} Qichacha corporate database search shows Shenyang Chengdao International Trade (沈阳成道国际贸易有限公司) as still open, <https://www.qcc.com/>, accessed 1 June 2020. Trade data on shipments up to 2018 held by authors.
\item \textsuperscript{163} Trade records held by authors.
\item \textsuperscript{164} There were several reports of North Korean shipments to Myanmar, the most high profile being the voyage of the \textit{MV Light} which turned back to North Korea after being hailed for inspection and was suspected of carrying missile components to Myanmar. See David E Sanger, ‘U.S. Said to Turn Back North Korea Missile Shipment’, \textit{New York Times}, 12 June 2011.
\item \textsuperscript{165} Trade data for Shenyang Chengdao International Trade Co., Ltd (沈阳成道国际贸易有限公司) held by authors.
\item \textsuperscript{167} Trade records held by authors.
\item \textsuperscript{168} Trade data on Shenyang Chengdao International Trade (沈阳成道国际贸易有限公司) held by authors.
\item \textsuperscript{169} Combined data of exports to North Korea by Liaoning Yuzheng International Trading Co. (辽宁宇正国际贸易有限公司), Shenyang Tianrong Trade Co., Ltd (沈阳天荣贸易有限公司), Shenyang Yuzheng Technology Co., Ltd (沈阳宇正科技有限公司) and Shenyang Chengdao International Trade (沈阳成道国际贸易有限公司). Data held by authors.
\end{itemize}
Dandong Zhicheng Shipments Outside China

While revenue generated by Dandong Zhicheng and its front company networks may have been used by North Korea’s FTB and special services based in China and abroad, a closer examination of the company’s historical shipments also reveals trade with a variety of countries outside China.\textsuperscript{170}

For example, shipment-level data also shows that Dandong Zhicheng exported goods to countries such as Vietnam, Malaysia, India, Taiwan and even South Korea. These included exports of anthracite and iron products, goods which Dandong Zhicheng was simultaneously importing from North Korea. While it remains unclear if these exports were physically re-routed from North Korea to China and then abroad, evidence presented by the UN PoE shows that, on at least one occasion, Dandong Zhicheng’s exports went directly from North Korea to Vietnam.\textsuperscript{171}

One of Dandong Zhicheng’s largest customers was South Korea, which imported 44 shipments from the company since 2013 worth $17,417,229. All but around $25,000 of those shipments were products of resources such as coal, iron and graphite.\textsuperscript{172} Many of these resource imports from Dandong Zhicheng took place in 2015, 2016 and 2017 and the coal imports for those years were listed as anthracite (HS Code 2701.11), one of North Korea’s largest exports and the same grade of coal imported from North Korea by Dandong Zhicheng.\textsuperscript{173} South Korea continued to import anthracite from Dandong Zhicheng after March 2016, the month in which the UNSC first imposed sectoral sanctions on North Korea’s coal exports.

\textsuperscript{170}. This section does not presume any wrongdoing on the part of individuals, entities or governments unless this is explicitly stated in writing.
\textsuperscript{172}. Trade records held by authors.
\textsuperscript{173}. \textit{Ibid}. 
Vietnam also imported high-value shipments of coal from Dandong Zhicheng. In 2015 and 2016 respectively, the Southeast Asian country imported anthracite coal valued at $12,589,176 from Dandong Zhicheng.\textsuperscript{174} Taiwan, meanwhile, imported over $1.5-million worth of anthracite coal in 2015 and over $2.3-million worth of iron under HS Code 7201.10 from Dandong Zhicheng across three shipments in 2015 and 2016. Malaysia, in a single shipment in October of 2016, imported $386,100 worth of anthracite coal from Dandong Zhicheng.\textsuperscript{175}

In earlier years, Dandong Zhicheng was also involved in export shipments to Myanmar, Iran and Syria. In 2013 it shipped graphite to Iran, and throughout 2014 it shipped a variety of metal tubes and sheets of iron, aluminum, steel and copper to Syria. All of these shipments were of relatively low value on paper, with the highest-value shipment only $25,065. Dandong Zhicheng similarly shipped a variety of steel tubes and electronics across eight shipments to Myanmar in 2012.

Given that Dandong Zhicheng was later sanctioned after allegedly trading in dual-use goods while laundering money for the North Korean regime, earlier shipments from the company to Iran, Syria and Myanmar potentially further highlight how Dandong-based companies may have been used to make shipments further afield to North Korea’s long-term military customers.

\textsuperscript{174} Ibid.
\textsuperscript{175} Ibid.
Network Analysis: Links Beneath the Surface

Network and open-source analysis reveal high levels of interlinkage between the 150 companies and affiliated individuals through other identifiers such as addresses, phone numbers and emails. In some instances, individuals operated several companies, while in others a closely interlinked network of directors and shareholders appeared to operate and control various corporate entities.

Consequently, while a large volume of North Korean trade was processed by 150 companies, in reality much of this was handled by closely interlinked business networks likely controlled by a small group of people. This finding corroborates analysis conducted by C4ADS, which showed that a small number of interconnected Chinese firms account ‘for vast proportions of the trade’ with North Korea.176 Two C4ADS reports, one of which was done in partnership with the Asan Institute in South Korea, identified several extensive Dandong-based networks helping North Korea to evade sanctions, including at least seven of the companies included in the dataset collected for this investigation.177

As highlighted elsewhere,178 North Korean front-company networks often share business addresses, phone numbers, directors and other identifiers. While this is relatively normal in licit business, in this instance, the location of these networks and a prevalence of other shared specific identifiers raise the probability that various entities in the dataset may be front companies operating on behalf of North Korean interests.179

For example, of the 150 companies analysed, 19 have used an address at 64 Binjiang Middle Road (滨江中路64号). Another 18 have used another at 66 Binjiang Middle Road (滨江中路66号), the same location as the former office of the North Korean consulate.180 These addresses – located in the Jiadi Square area (佳地广场) in Dandong – have been identified as locations used by North Korean front companies.181 Meanwhile, another eight companies of the original dataset of 150 have used an address at 96 Binjiang Middle Road (滨江中路96号), meaning that nearly a third of the total dataset has used an address in Jiadi Square in Dandong.182

An investigation by France24 published in 2020 into the illicit sale of North Korean fishing rights183 also revealed that a senior North Korean sales agent continued to operate from the top floor of this building – in 66 Binjiang Middle Road (滨江中路66号) – and in the same

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176. Thompson, ‘Risky Business’.
177. Ibid.; C4ADS and Asan Institute for Policy Studies, In China’s Shadow.
178. Ibid.
179. Ibid.
182. Data collated and analysed by Project Sandstone.
office as the former North Korean consulate. NK News identified the agent as Choe Un Bok (최은복; 崔銀福), the chairwoman of the General Association of Koreans in China (GAKC).

Figure 14: An Undercover Reporter Negotiates Fishing Rights with Choe Un Bok (최은복; 崔銀福) in the Former North Korean Consulate on the Top Floor of Binjiang Road

Source: Elena Volochine; France 24; Arte G.E.I.E.

GAKC (旅华朝鲜人总联合会) is a pro-Pyongyang organisation based in China that acts as a focal point for ethnic Koreans in China while hosting and organising North Korea-focused events. It appears to function in a similar way to the similarly named General Association of Korean Residents in Japan (在日本朝鮮人総聯合会), more commonly referred to as ‘Chongryon’. While GAKC primarily makes political statements in support of the regime in Pyongyang, it does appear to engage in economic-related work. The state-run Korea Central News Agency (KCNA) itself has reported that Choe Un Bok has called for officials of GAKC and Koreans in China to ‘drive for the prosperity of the country and its reunification, regarding it as the maxim of their life to love the country and the people’.

185. Ibid.
According to a transcript of these conversations shared with Project Sandstone by the authors of the France24 report, Choe Un Bok’s nephew claimed his aunt was working for the ‘Korea 615 Trading Corp’ and for North Korean law enforcement. Chinese corporate records show that Choe Un Bok was also the executive director of a Shenyang-based company named Shenyang Mudan Guan Catering (沈阳牡丹馆餐饮有限公司), itself a joint venture between the Korea 813 Trading Company (朝鲜813贸易会社) and Liaoning Solar Win Industry Co. (辽宁升宜实业有限公司), until February 2018 when Choe stepped down as executive director and Korea 813 Trading pulled out as a shareholder.188

Korea 813 Trading Company appears to be active in the import and export of foodstuffs, including marine products,189 and is reported to have been involved in the operation of a number of North Korea-themed restaurants in China.190 Chinese-language records, adverts and North Korean trade directories also show that the Korea 813 Trading Company has advertised online, while operating a number of other companies and restaurants in China, including the Beijing Okryu-gwan Restaurant (北京玉流馆餐饮有限公司)191 and Dandong Qingliu Food (丹东清流食品有限公司).192 These facts once again highlight the spread of North Korean networks across Liaoning province, where large numbers of ethnic Koreans live and work.

An image taken at the 70th anniversary of the establishment of diplomatic relations between North Korea and China in 2019 shows Choe Un Bok standing next to Ju Yong He, consul general of North Korea’s Shenyang consulate. In the photo is also a former business partner of Jin Yonghuan (金永焕) – the individual identified above as an FTB agent active in Libya – named Ji Jingjia (길경갑), who is also the chairperson and legal representative of the Shenyang Korean Friendship Association (沈阳市朝鲜族联谊会)193 and the North Korea Economic Cooperation Promotion Committee (대북경제협력추진위원회).194 Other photos at this event show Deputy Consul General Jin Yongri (金永日) and an individual called Kim Yong Il (김영일), who shares the same name as the representative of the Green Pine-linked Korea Natural Resources Development Investment Corporation (朝鲜资源开发投资会社沈阳代表处).

While various Chinese companies in the dataset have been registered at 66, 64 and 96 Binjiang Middle Road, at least six North Korean entities have also been registered at 66 Binjiang Middle Road, while two have used an address at the 64 address and another at 96. Interestingly, the third most common address in the dataset was 22 Zhongyang Street (中央大道22号), where another nine companies were located. This address is in the block adjacent to North Korea’s new consulate.

There is also significant overlap in phone numbers across the 150 companies, both on landlines and mobiles. One of the most common landline phone numbers (+86 415 212 1588) is used by six companies in the dataset. Five of these have used an address at 6 Shiwei Road in Dandong (十纬路6号) – three in Room 202, one in Room 201 and one in Room 303. Meanwhile, three of the six have also used an address on the outskirts of Dandong at 52 Huayuan Road (花园路52). Two of the companies have listed a person named Zhang Ling (张玲) – who was identified as being a member of the Chinese Communist Party in the above-mentioned C4ADS investigation – as a director and representative. Compiling the total trade volume of these six companies reveals they reportedly moved at least $52.5-million worth of goods to and from North Korea in over 1,550 shipments from September 2014 to December 2017. Zhang was also a listed shareholder in Dandong Tianfu Trade, the third-largest trader in the dataset, having moved over

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195. Thompson, ‘Risky Business’.
$170-million worth of goods over the period, and was listed as an importer of North Korean coal in September 2017 after sanctions prohibited such shipments.

Furthermore, one of the most common emails (zwgm@ddzwjt.com) links three companies in the dataset that together account for over $100-million worth of trade over 3,000 shipments. These companies are Dandong Chufeng Trade Co., Ltd (丹东楚烽贸易有限公司), Dandong Hengshuo Trading Co., Ltd (丹东恒硕贸易有限公司) and Dandong Zhongwei Industrial Trading Corporation (丹东中威工贸有限公司). The email is also listed by a Dandong textile firm and two large freight agencies based in Liaoning province.

While 2016 and 2017 UNSC resolutions prohibited large swathes of trade with North Korea, only 15 companies in the original dataset appear to have closed since then, with the remaining 135 still registered as active on Chinese corporate databases. Furthermore, exhibitor lists from the bi-annual Pyongyang spring and autumn trade fairs in 2019 show that 13 of the companies in the dataset attended these events in North Korea’s capital city, the majority doing so on both occasions.

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196. Data collated and analysed by Project Sandstone.
**Figure 16:** Network Analysis Graph of Top 150 Companies

**DANDONG NETWORK GRAPH**

- 700+ INDIVIDUALS
- 300+ CORPORATE ENTITIES
- 100+ NORTH KOREAN OFFICES
- 400+ ADDRESSES
- 375+ PHONE NUMBERS

*Source: Project Sandstone.*
Case Study: Dandong Xianghe Trade

A S MENTIONED above, a small number of Dandong companies have historically accounted for significant portions of China–North Korea trade. Some of these operate as part of large vertically integrated businesses with subsidiaries or connected entities engaged in different sectors. Informal networks are connected through shared phone numbers, emails, addresses, shared directors and possible familial connections. These findings suggest that, in many cases, large swathes of bilateral trade flows have historically been controlled by small networks of trusted individuals with close ties to North Korean institutions.

A number of entities studied for this report centred on Dandong Xianghe Trade (AKA Dandong Peace Trade), through a range of formal and informal links that reveal an interlinked network with a larger business footprint than indicated by trade statistics alone. This network contains businesses such as import and export branches, dedicated shipping and freight-forwarding companies, travel agents specialising in guided tours to North Korea and even a local football club that advertises training packages in Pyongyang.

One of the individuals at the heart of this network, Xie Wenqiang (解文强), appears to have traded with North Korea since 1999, and even attended the 2013 celebrations of Kim Il-sung’s birthday.

As in the case of Dandong Zhicheng, Dandong Xianghe and its connected entities exhibited very similar trading patterns, importing large volumes of valuable resources and shipping back a wide variety of goods across a range of HS codes.

For example, over the period in question, Dandong Xianghe reported $137.6-million worth of goods in over 2,500 shipments. The vast majority of these were exports to North Korea, across over 2,400 shipments at a value of over $105.2 million. These exports contained a wide array of goods under many HS codes, including a high number of shipments related to food and food-processing goods – a total of 231 such shipments were exported to North Korea at a value of over $39 million.

Additionally, goods that fall under HS Code 84 – which represents machinery and mechanical appliances – represented a total value of over $9.9 million across 488 shipments, while a total of 317 shipments of electrical machinery and related equipment (HS Code 85) amounted to around $11.5 million. Dandong Xianghe was also involved in high-value textile shipments, which had a combined value of over $7 million for both raw and finished textile goods.


200. Christine Kim and Narae Kim, ‘美韩高度戒备 朝鲜准备庆祝金日成诞辰’ ['The United States and South Korea Are on High Alert, North Korea Prepares to Celebrate Kim Il Sung’s Birthday'], Reuters, 11 April 2013.

201. Trade records held by authors.

202. Ibid.
While exports varied across a large array of HS codes, Dandong Xianghe’s imports were narrower in scope. Some of the company’s highest-value imports were of natural resources, such as $16 million of lead ores, $7 million of zinc ores, $5 million of ferrosilicon and $1 million of silver ores.²⁰³

These collective natural-resource shipments accounted for close to 90% of Xianghe’s import shipments from North Korea. These shipments of natural resources, along with all shipments of machinery under HS Code 85 and textiles shipments are now restricted under UN sanctions.

Figure 17: The Dandong Xianghe Network

Source: Project Sandstone network analysis.

Two of the companies connected to Dandong Xianghe – according to its website – are Dandong Jinyuan Trade (丹东金缘商贸有限公司) and Dandong Xinyang Chemical Rubber (丹东鑫杨化工橡胶有限公司). Both entities are also included in the 2017 dataset of entities trading with North Korea. Together, these three companies accounted for over $330-million worth of trade over around 6,000 shipments, making these companies one of the largest affiliated trading groups in the 150.²⁰⁴

Additional company websites, including one for a company called Dandong Haitong Freight Forwarding, show that these entities are listed as part of the same group with additional identifiers also corroborating their ties.²⁰⁵

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²⁰³. Ibid.
²⁰⁴. Ibid.
²⁰⁵. For example, Dandong Xianghe and Dandong Xinyang Chemical Rubber share addresses at 13 Guomen Avenue, Dandong (国门大道13号) in seemingly adjacent rooms (608-1 and 608-2). Dandong Jinyuan Trade shares phone and fax numbers with Dandong Xianghe and Dandong Xinyang Chemical Rubber, but is listed at a different address at 2 Xingang Road (新港路2号).
While Dandong Xianghe Trade was sanctioned by the US Department of the Treasury in November 2017,\textsuperscript{206} the company remains listed on Chinese corporate databases as active. Dandong Jinyuan is also currently active and was listed as an exhibitor at both the spring and autumn 2019 Pyongyang trade fairs, indicating that the company continues to seek North Korean customers. Meanwhile, Dandong Xinyang Chemical Rubber also appeared resilient in the face of expanding economic measures against North Korea and continued trading with North Korea until late 2017, when China–North Korea shipment-level data appeared to no longer be commercially available.\textsuperscript{207}

**Shipments Further Afield**

Similar to Dandong Zhicheng, historical shipments by the Dandong Xianghe network were made to several countries with which North Korea has maintained military relationships.\textsuperscript{208} For example, in 2012, Xianghe shipped electronics, iron and steel products, machinery and machine tools across 21 shipments to Equatorial Guinea. In 2014 and 2015, it also made 10 shipments to Iran of electronics, machinery and iron products. The company has also sent various shipments of ferrosilicon, iron and steel products to Pakistan and Myanmar since 2011, and has imported almost $100,000 worth of machine tools from Taiwan in 2013 and $16,311 worth of centrifugal pumps from Germany in 2014.\textsuperscript{209}

Dandong Xinyang Chemical Rubber followed a similar pattern of trade overseas. This included shipments of electronics and machinery to Equatorial Guinea and aluminium products to the Republic of the Congo. It also shipped electronics and steel, copper and aluminium tubing to Namibia, another country with contemporary illicit connections to North Korea. Trade data also shows it was involved in four shipments in 2011 and 2012 to Myanmar, consisting of both industrial heating and cooling equipment. Dandong Jinyuan also registered a shipment to Tanzania in 2014, exporting $250,000 worth of heavy vehicles to the country under the same HS code that it was exporting to North Korea.\textsuperscript{210}

While it is entirely possible these shipments were legitimate, the network’s role as a primary North Korean trading partner may provide insights into how North Korean entities and actors moved goods through the international trading system to countries such as Myanmar, Iran, Pakistan and Equatorial Guinea.

**Possible Links to North Korean Entities**

Before the US designation of Dandong Xianghe Trade in November 2017, the company’s registered office was at Room 603, 66 Binjiang Middle Road,\textsuperscript{211} the same room and address used by the Dandong representative office for North Korea’s Okryu Trade Co. (朝鮮玉流贸易会社; 조선옥류무역회사). A 2012 report by the

\begin{itemize}
  \item \textsuperscript{206} US Department of the Treasury, ‘Treasury Sanctions Trading, Labor, and Shipping Companies and Vessels to Further Isolate North Korea’, section 102, para. D, 4, C.
  \item \textsuperscript{207} Dandong Xinyang Chemical Rubber Trade data held by authors.
  \item \textsuperscript{208} This section does not presume any wrongdoing on the part of individuals, entities or governments unless this is explicitly stated in writing.
  \item \textsuperscript{209} Trade records held by authors.
  \item \textsuperscript{210} Ibid.
  \item \textsuperscript{211} 启信宝 [Qixinbao], ‘朝鮮玉流贸易会社丹东代表处’ ['Korea Okryu Trade Co Dandong Representative Office'], <https://www.qixin.com/company/36bd5ff0-668e-47f1-a4f9-d62ab5588aad>, accessed 21 January 2020.
\end{itemize}
South Korean Unification Ministry claims that Korea Okryu Trade is subordinate to the WPK and is affiliated with the country’s Foreign Service General Bureau (대외봉사총국).

The Okryu name has also been used in Dandong for several businesses, including the Okryu Seafood Restaurant in Zhenxing District (丹东市振兴区玉流海鲜馆), Dandong Okryu Services Co. Ltd (丹东玉流服务有限公司) and Dandong Okryu Catering Services Co. Ltd (丹东玉流餐饮服务有限公司). When the latter company was operating, one of its investors was a Dandong-based trading company called Dandong Hongda Trade Co., Ltd, which is listed as among the 150 Dandong-based companies which traded with North Korea in 2017. Dandong Hongda was designated by the US Department of the Treasury in 2017 for allegedly ‘having long standing commercial ties which facilitate North Korea’s revenue generation operations’. North Korea has been known to operate a number of restaurants outside of the country in order to generate revenue, many of which bear the name Okryu-Gwan.

As noted above, Dandong Xianghe was responsible for exporting over $39-million worth of food and food-processing goods to North Korea between September 2014 and December 2017. For a period of six years – from 2011 to 2017 – Dandong Xianghe appears to have shared an office with Korea Okryu Trade in Dandong, an entity ostensibly involved in the operation of restaurants in North Korea, China and further afield. Given the lack of trade statistics after December 2017, it is unclear if Dandong Xianghe Trade continues to import and export goods from and to North Korea. However, the company is still listed on maritime databases as the owner of the UNSC-designated North Korean-flagged Sam Jong 2, a 2,500-tonne oil tanker.


216. Ibid.


The tanker is one of North Korea’s most active vessels,\textsuperscript{220} and has conducted a number of documented STS transfers with foreign-flagged tankers also in violation of UNSC resolutions.\textsuperscript{221} An analysis of commercial satellite imagery indicates that the \textit{Sam Jong 2} has continued to visit North Korean ports or oil terminals after 2017 (see Figure 18).

\textbf{Figure 18:} Activity of the \textit{Sam Jong 2} Captured by Satellite Imagery Over the Period May 2018 to October 2019

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{activity_of_the_sam_jong_2_over_2018_and_2019}
\end{figure}

\textbf{Sources:} \textit{Japanese Ministry of Foreign Affairs; Maxar Technologies; Project Sandstone.}

According to IHS Seaweb, Dandong Xianghe uses a care of address to the UN-sanctioned Korea Samjong Shipping at Tonghung-dong, Chung-guyok, Pyongyang, North Korea.\textsuperscript{222}

Dandong Xianghe’s continuing ownership of an UN-designated oil tanker actively procuring oil products indicates the company maintains an ongoing relationship with North Korea despite unilateral and multilateral sanctions.


\textsuperscript{222} Information for IMO: 7408873 and MMSI: 445078000 can be found at IHS Seaweb, <https://maritime.ihs.com>, accessed 10 July 2020.
Conclusion and Recommendations

Using a wide variety of both official and third-party open sources, this research has detailed Dandong’s crucial role to North Korea’s economy, proliferation revenue-generating activities and its wider sanctions-busting networks. More evidence on North Korea’s proliferation networks will be presented in a future report.

According to the analysis conducted for this report, a significant proportion of North Korea’s total recorded trade flowed through a relatively small set of Dandong companies, highlighting the crucial role the city’s logistical, financial and corporate architecture continue to play for the regime in Pyongyang.

Data obtained for this report indicates that these 150 companies alone were involved in $2.9-billion worth of shipments between September 2014 and February 2017. UN Comtrade data from the same period places the total value of North Korea’s global imports and exports at over $13 billion during that time.²²³ As a result, these 150 companies alone could have accounted for around 20% of North Korea’s total reported global trade value in that time period.

Much of this $2.9-billion worth of trade would now be prohibited by UNSC sanctions. Specifically, as much as over 98% of these imports and 37% of these exports would now be prohibited, a fact which highlights the potential impact UNSC resolutions would have on North Korea’s ability to effectively raise revenue and procure goods if properly enforced. Despite this, it appears that only 15 of the 150 companies are listed as closed in early 2020, a date well beyond the adoption of the sanctions measures, while several of these continued to attend trade fairs in Pyongyang.

Unfortunately, due to the apparent unavailability of China–North Korea shipment-level trade data, it has become more difficult to determine if these companies are abiding by UNSC resolutions. As such, this report recommends that Chinese authorities make efforts to ensure that the availability of this data resumes to enable financial institutions and other stakeholders – such as the UN PoE – to more accurately gauge the trading patterns of entities doing business with North Korea and identify possible instances of multilateral sanctions evasion.

While this data is currently absent, several other sources of evidence – including various official Chinese and North Korean records – show that companies on the border with a history of trading with North Korea continue to operate, with some still potentially evading UNSC resolutions. For example, analysis conducted above shows dozens of companies importing coal and other natural resources after the UNSC first restricted and then prohibited this practice. Others, such as Dandong Xianghe, have ostensibly engaged in other illicit behaviour, such as owning a UN-designated oil tanker.

Recent evidence, detailed in a US indictment, suggests that Dandong companies played an important role in facilitating North Korea’s access to the international financial system and its procurement of foreign goods. The revenue raised by Dandong’s largest cross-border trading company was funnelled to FTB front companies operated by North Korean and Chinese nationals active in China and Libya. Analysis conducted for

²²³ UN Comtrade data can be accessed at <https://comtrade.un.org/data/>.
this report has uncovered a wider network of individuals and entities active in Libya and Liaoning province, including a number of companies that have exported large amounts of machinery and equipment to North Korea. As such, this discovery potentially helps to shed light on North Korea’s money laundering networks and how the dollars generated by the sale of coal and other resources are redeployed and put to use by North Korea’s special services and their procurement and proliferation networks.

That Dandong Zhicheng, a company which imported resources worth nearly $500-million from North Korea over the period in question, also exported goods to Iran, Syria and Myanmar should raise concerns among those seeking to arrest North Korea’s procurement and proliferation activities.

Financial institutions, trading companies, freight forwarders and other members of the maritime supply chain that do business with Dandong-based entities should understand the role of Dandong within the wider geographic patterns of procurement and proliferation finance. Companies domiciled here play a crucial role in the procurement chain and proliferation architecture, sourcing sensitive materials for the country’s nuclear weapons and ballistic missile programmes while also helping Pyongyang export weapons and illicit technology abroad. To do so, various Dandong-based companies have helped North Korean entities construct complex sanctions-evasion networks across various jurisdictions and used these to launder money for the regime in Pyongyang. Given that most natural resources are priced and sold in USD, these networks generally require access to dollar-based services through Chinese banks.

Financial institutions and other stakeholders should be careful about financing Dandong-based trades, as should those that provide correspondent banking services for institutions in the city. Given the role many of these companies play in North Korean trading patterns, their relationships with North Korean entities and their movement of goods in high-risk sectors, providing them with financial services may well fall under the Financial Action Task Force’s definition of proliferation finance.

Findings from this research also show that a significant number of the companies analysed in the original and extended dataset used addresses in an area of Dandong known to host North Korean front companies. Some of these even listed the same addresses as North Korean companies operating in the city. This is a key indicator of front-company activity and one which should also raise serious additional concerns for regulators and financial institutions that may have correspondent accounts with banks in the region or provide trade finance to companies based there. This is made further apparent by recent media reporting that showed Chinese individuals in Dandong brokering sanctioned fishing permits for North Korean waters, allegedly on behalf of North Korean military interests.

Overall, this analysis has made clear the critical role that the city of Dandong has played for North Korea. Faced with a variety of unilateral and multilateral sanctions that seek to restrict North Korea’s access to the international financial, trading and shipping systems, the border city of Dandong effectively acts as a hub through which these can be circumvented.
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