A Case For Rajin Port

Economic Significance and Geopolitical Implications

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1. EXECUTIVE SUMMARY

Let us imagine that sometime in the future, a significant political shift occurs in North Korea such that sanctions are lifted, and full-scale foreign direct investment projects become feasible. In such an environment, which infrastructure projects might fundamentally shift the regional economic landscape? And how might those projects alter the geopolitical dynamics of Northeast Asia? Among a multitude of potential investment opportunities identified, Rajin Port emerges as a particularly compelling case.

The area in and around Rajin holds considerable economic value. Located within the Rason Special Economic Zone – one of North Korea's tentative experiments with Chinese-style marketization – Rajin possesses the region's northernmost ice-free port facility with three piers used year round and a cargo capacity of 3.5 million tons. For this reason, Rajin compares favorably to Russia's Zarubino port to the north, which is comparatively small and is not completely ice-free, and to China's Dalian port, which although a large and important economic hub, cannot adequately service the northeastern provinces of Heilongjiang and Jilin without considerable additional transport costs.

As a result, both Russia and China have jockeyed for access to Rajin as a means of critically necessary economic revival. Indeed, as part of larger regional development initiatives like China's Chang-Ji-Tu plan or Russia's Ministry for the Development of the Russian Far East and Arctic, both countries have sought to establish joint venture deals with North Korea to develop and gain operational rights to Rajin Port. However, due to Pyongyang's continued political volatility, nuclear aggression, and resulting sanctions, neither country has yet realized the fruit of its efforts.

While the economic implications of Rajin's development are clear cut, the de-sanctioned use of the port raises considerable political and security questions. If either China or Russia gains a significant stake in Rajin, their financial leverage could be used to assert dual use rights. For example, as witnessed in Djibouti, Sri Lanka, or Pakistan – China's "string of pearls" ports in the Indian Sea – Rajin may serve as a strategic point from which the Chinese can exert military

dominance over the region. Such a move in the East Sea poses security challenges for South Korea and Japan, while also limiting US military options in the Pacific.

Maximizing the utility of Rajin Port will require simultaneously building logistical capabilities while also preventing operational intervention by any one individual country. In the interest of depoliticization, a multilateral bank would be a good candidate to initiate Rajin's infrastructure development. Institutions such as the World Bank or Asian Development Bank, are "less vulnerable to risks of moral hazard and politicization" (Haggard and Noland, 2017) and could provide a financing and governance structure for the region in a denuclearization scenario. They can also offer critical oversight, safeguards, and resources for capacity building to ensure the port is developed in a sustainable manner.

Although the political conditions surrounding North Korea's economic future are impossible to predict, the persistent jockeying for access to Rajin suggests that it could become a harbinger of the region's economic success. As a trilateral logistics hub, Rajin could invigorate the lagging economies of northeastern China, North Korea and Far East Russia. However, the immense transformative change required in North Korea for such investments to take place could also inflame existing tensions among neighboring states. Multilateral banks, by design, offer the best chance for peaceful mitigation in this context since they can both address Rajin's development needs while still preserving geopolitical stability. As the port's development poses such consequential implications, the international community should devise blueprints for Rajin's future.

2. ECONOMIC OVERVIEW: Rajin Port

Introduction

Rajin Port is located in the far northeast corner of the country, along the trilateral borders of North Korea, China, and Russia. The stretch of land upon which it sits effectively blocks China's northeastern provinces from the East Sea, and although Russia possesses its own port facility in nearby Zarubino, its smaller capacity and geographical limitations limit its demand potential. As a result, Rajin offers the best opportunity to decrease the costs of regional trade for all parties. Conveniently located between two islands (Dea-cho-do and So-cho-do) that serve as a natural seawall, the port possesses three piers and fifteen berths which can accommodate ships ranging from 5,000 to 50,000 tons.[1] At a maximum depth of 12 meters, it is the deepest in the Tumen River region.

Leveraging its neighbors' geopolitical interests, North Korea has been trading long-term development rights of Rajin Port for financial investments in the Rason Special Economic Zone. Piers 1 and 2 have been licensed to Chinese firms since 2012, as per the investment agreement

[1] 이성우, 박성준, 김은우, and 김세원. "북방 물류시장과 나진항 연계 가능성 검토." 연구보고서. Korea Maritime Institute, April 24, 2015. https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE07128503.

signed by Jang Song-thaek and six Chinese construction firms (including China Merchants Group, Shanghai Greenland Group, and China State Construction Engineering Corporation, among others). However, since the purge of Jang-Song-thaek in 2013, North Korea has halted Pier 1's development and operation lease.[2]

In terms of infrastructure development, in 2009 a Chinese construction firm developed Pier 1 to a capacity of 1 million tons, while Russia was set to modernize Pier 3 by expanding its capacity to 7 million tons as part of the Rajin-Khasan project.[3] Currently, the main trade products passing through Rajin include coal, cement, fertilizer, wood, cotton, and steel. (Appendix: Table 1)

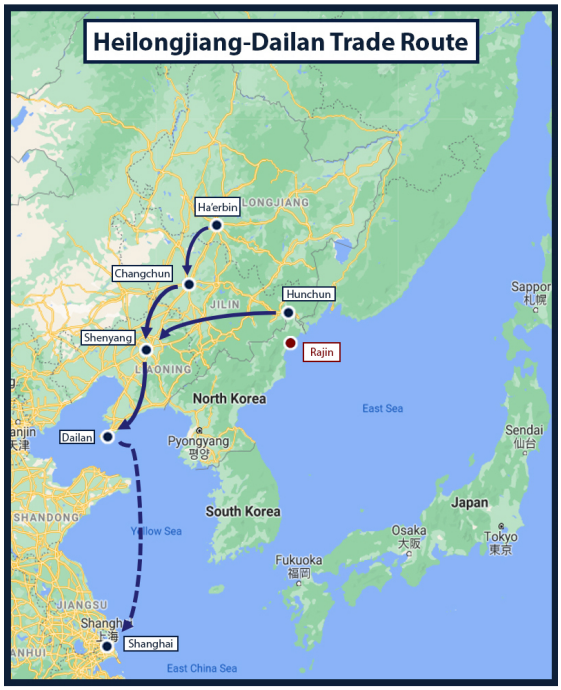
Growth Drivers for Rajin Port Shipping Demand

Once North Korea opens its borders, additional shipping demand for Rajin is expected to rise, subsequently boosting the region's economic development. The demand will stem from Rajin's potential as a regional logistics hub linking the Chinese northeastern provinces, Far East Russia and North Korea. Trade volume in the region is already substantial – Northeast Asia already represents approximately 30% of the world's total freight volume[4] – and has been expanding immensely over the last two decades (Appendix: Table 2). Much of this growth can be attributed to increasingly large Chinese imports of energy and consumer goods, as well as the export of Russian energy and raw materials. However, further analysis indicates that infrastructure development in Rajin will expand the logistics demand even further. (Appendix: Demand projection analysis)

Beyond the current regional trade levels, additional drivers for growth in shipping demand are evident. To the east of Rajin, the Tumen River is advantageously positioned to serve as a regional corridor from the Sea of Japan to China's northeastern provinces, as well as a link to the Trans-Siberian Railway that connects the Korean peninsula to Eurasia. The growing logistical demand from the surrounding economic regions of China, Russia, and North Korea will in turn

[2] Lee Sungwoo, 2015
[3] Lee Sungwoo, 2015
[4] "Rajin (DPRK) – Khasan (Russia) Railway and Port Study Project: Preliminary Forecast on Transport Volumes and Shipping Costs at Pacific End of Tumen Transport Corridor." UNDP Greater Tumen Initiative. GTI, 2015. http://www.tumenprogramme.org/UploadFiles/%E6%96%B0%E5%BB%BA%E6%96%87%E4%BB%B6%E5%A4%B9/UNDP%20GTI_Rajin-Khasan%20Railway%20and%20Port%20Study%20Project_publication.pdf.

facilitate a growth in manufacturing and processing industries in the Tumen River hinterland of all three countries, creating a virtuous cycle of demand growth.



Route	Distance	Cost
Heilongjiang East – Dalian : Truck	1,400 km	71$/T
Dalian – Shanghai : Shipping	939 km	7$/T
Total	**2,339 km**	**78$/T**

Route	Distance	Cost
Heilongjiang East – Hunchun : Truck	560 km	24$/T
Wonjung – Rajin : Tax-free Truck	50 km	20$/T
Rajin – Shanghai : Shipping	1,667 km	13$/T
Total	**2,277 km**	**57$/T**

China - Shifting Demand from Heilongjiang and Jilin

Given that China is the largest trading partner in the region, China's northeastern provinces of Heilongjiang and Jilin are expected to bring in the majority of shipping demand in the short-term. Heilongjiang and Jilin represent two of China's three northeastern provinces (the third being Liaoning) and during Japan's occupation in the 20th century, these two provinces served as the birthplace for China's industrialization. The region fostered the development of industries such as steel, automobiles, shipbuilding and aircraft manufacturing, as well as petroleum refineries. However, due to dwindling resources, legacies of the centrally planned economy, and an extremely rigid bureaucracy, the region eventually became China's de facto Rust Belt. Since the 1990s, it has continued to struggle with brain drain and stagnated growth.[5]

In response to this decline, the central government in 2006 launched a campaign called the Northeast Area Revitalization Plan, which has since allocated billions of subsidies and incentives

[5] The productivity growth of Jilin and Heilongjiang, which in the 1990s ranked 4th and 8th respectively (out of thirty-one provincial divisions excluding Hong Kong and Macau), had slipped by 2018 to positions 27th and 25th. Their populations, additionally, have shrunk by 0.7% and 0.2% in recent years, ranking the worst of all Chinese provinces.

for private investment in the region.[6] However, these economic steroid shots have been of relatively little use, since it was reported by *The Global Times* in 2019 that "Jilin and Heilongjiang have failed to recover".[7] In comparison, while Liaoning's GDP grew by 5.5% in 2019 and the national growth rate reached 6.1%, Heilongjiang grew by only 4.1%, and Jilin by merely 3.0%.[8] Furthermore, while Dalian and Shenyang, two of the biggest cities in Liaoning, attracted FDI projects such as Intel's chip manufacturing plant and a BMW joint venture automobile plant[9], the cities within Jilin or Heilongjiang have never managed to attract any sizable investment projects.

These massive differences in development can be attributed predominantly to geography, and specifically, Liaoning's proximity to accessible shipping. The provinces of Heilongjiang and Jilin had, respectively, a total container shipment demand of 440,000 twenty-foot equivalent units (TEU) and 653,000 TEU whereas Liaoning's two largest ports alone carried a shipment demand of 1,600,000 TEU in 2014.[10] A number of studies have predicted that a sharp bump in shipping demand – up to 10 million TEU by 2030[11] – will occur once Heilongjiang and Jilin gain access to the sea via the Tumen River. What might account for such a large jump in shipping demand? Data from the same study suggests that shipping costs from Heilongjiang to Shanghai, via Rajin, could potentially drop by 36% compared to those via Dalian, the existing trade route (Appendix: Tables 3 & 4). Furthermore, the Korea Transportation Institute (KTI) finds that cost savings via Rajin Port would rise to 34% for Chinese domestic demand, and 42% for import/export demand.[12] (Appendix: Table 5)

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[6] "Update: Xi Focus: Xi Stresses Further Revitalizing Northeast China." *Xinhua*, www.xinhuanet.com/english/2020-07/25/c_139238399.htm.
[7] Times, Global. "Liaoning Grows, but Broad NE China Revival Elusive." *Global Times*, www.globaltimes.cn/content/1159071.shtml.
[8] "China: Gross Domestic Product: Index: by Province: CEIC." *Global Economic Data, Indicators, Charts & Forecasts*, 1 Jan. 1970, www.ceicdata.com/en/china/gross-domestic-product-index-by-province?page=2.
[9] F_127. "China's Old Industrial Base Opens Wider to Foreign Investors." *China's Old Industrial Base Opens Wider to Foreign Investors - People's Daily Online*, en.people.cn/n3/2018/1012/c90000-9507624.html.
[10] Lee Sungwoo, 2015
[11] "Integrated Transport Infrastructure and Cross-Border Facilitation Study for the Trans-GTR Transport Corridors." UNDP GTI. GTI, 2013. www.tumenprogramme.org/UploadFiles/%E6%96%B0%E5%BB%BA%E6%96%87%E4%BB%B6%E5%A4%B9/GTI%20Corridors%20Study%20China%20final%20report%20for%20publishing.pdf. .
[12] Lee Sungwoo, 2015
(안국산, "한중협력을 위한 세미나" 발표자료, 교통연구원, 2015.3)

Russia - Increased Shipping Demand from the Development of Arctic Shipping Routes

In Russia, demand growth comes primarily from the increased use and development of Arctic shipping routes. With the realities of climate change and global warming, the potential for trade through Arctic waters has increased, and for Russia in particular, Arctic trade can significantly reduce shipping costs. Compared to the Suez Canal, shipping via the Northern Sea Route – which stretches along Russia's arctic border from East Asia to Scandinavia – reduces distance travelled from 21,000 km to 12,800 km, and cuts total transit time by 10-15 days.[13] Currently, it is only navigable from June to October with an icebreaker, but the navigable season is expanding rapidly.

The Northern Sea Route will connect Rajin Port to shipping demand primarily from Northeast China and Europe. However, demand increase from these regions is likely to be fairly limited in the short to medium term, as trade volume will shift only gradually to the Northern Sea Route. Kiyeol Lee and Hyunjoo Lee estimate transhipment demand (shipment to one intermediary destination, then another destination) from China and Japan to the Arctic Trade Route will reach 117,000 TEU by 2040[14], a portion of which will go through Rajin. Finally, in the long term, the Northern Sea Route will contribute to a rise in bulk shipment demand due to the increased import of energy and natural resources to East Asia, and export of Russian energy via projects such as Arctic LNG 2 plant.[15]

North Korea - Industrial Export Demand from the Hinterland

As Rajin represents the largest port within the Tumen river region, it is readily positioned to absorb the economic growth in the industrial hinterlands of China, Russia and North Korea in areas such as manufacturing and processing, as well as logistics. Studies predict that Rajin Port will absorb most of the shipping demand from industrial development in the northeastern region of the coast, while Wonsan port in the south will absorb demand from the southern portion. One

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[13] Copenhagen, AP in. "Melting Arctic Ice Opens New Route from Europe to East Asia." *The Guardian*, Guardian News and Media, 28 Sept. 2018, www.theguardian.com/world/2018/sep/28/melting-arctic-ice-opens-new-route-from-europe-to-east-asia.

[14] Lee Kiyeol, and Lee Hyunjoo. "A Study on Cooperation Strategy of Regional Development and Logistics Market for the Growth of the East Sea Rim." *경제인문사회연구회 협동연구총서*, vol. 17, no. 41, ser. 01, Dec. 2017. *01*, www.nkis.re.kr:4445/subject_view1.do?otpId=KMI00053267&otpSeq=0&popup=P.

[15] Foster, Scott. "Asia Connects to Russian Energy." *Asia Times*, 18 Feb. 2020, asiatimes.com/2019/12/asia-connects-to-russian-energy/.

study projects the shipping demand will reach 1.1 million TEU of container demand by 2040,[16] while another projects the long term demand to reach 1.37 million TEU.[17]

All told, the growth drivers for shipping demand in and around Rajin suggest a sizable investment value. (Appendix: Rajin Port Demand Projection, Rajin Port Development Projection)

[16] Lee Kiyeol and Lee Hyunjoo, 2017
[17] *UNDP Greater Tumen Initiative Study Report*, 2015

3. HISTORY AND GEOPOLITICAL IMPLICATIONS

Regional History

Owing to its geostrategic value, Rajin has been at the center of regional conflicts for centuries. The fundamental conflict characterizing the region is a territorial dispute between Russia and China over the Primorye (also known as the Maritime Region in the Russian Far East) that dates back to the Mongol invasion of the Russian Empire in the 13th century.[18] By the 17th century, Russian settlers had begun to populate the area southeast of the Amur River, which, although claimed by the Chinese empire as "Outer Manchuria", had never been effectively controlled. Sporadic local conflicts over the territory continued, and in 1689 the Treaty of Nerchinsk established the first border in favor of the Chinese. However, as the Russian Empire fostered naval ambitions in the Pacific, they took advantage of China's weakened position following the Opium Wars. With the Convention of Peking in 1860, the Russian Empire and the Qing dynasty signed a treaty that annexed the Primorye down to Vladivostok, effectively blocking China from direct access to the Sea of Japan thereafter.[19] The territory south of the Tumen River, meanwhile, has always belonged to Korea and therefore the territorial ownership of Rajin itself was never challenged. Due to this, the annexation of Primorye effectively turned Rajin into a gateway for China to access the Pacific.

[18] Bobo Lo, "The Long Sunset of Strategic Partnership: Russia's Evolving China Policy.," *International Affairs (Royal Institute of International Affairs 1944-)* 80, no. 2 (2004): 295–309.
[19] "BBC News | Analysis | Russia and China End 300 Year Old Border Dispute," news.bbc.co.uk, November 10, 1997, http://news.bbc.co.uk/2/hi/world/analysis/29263.stm.

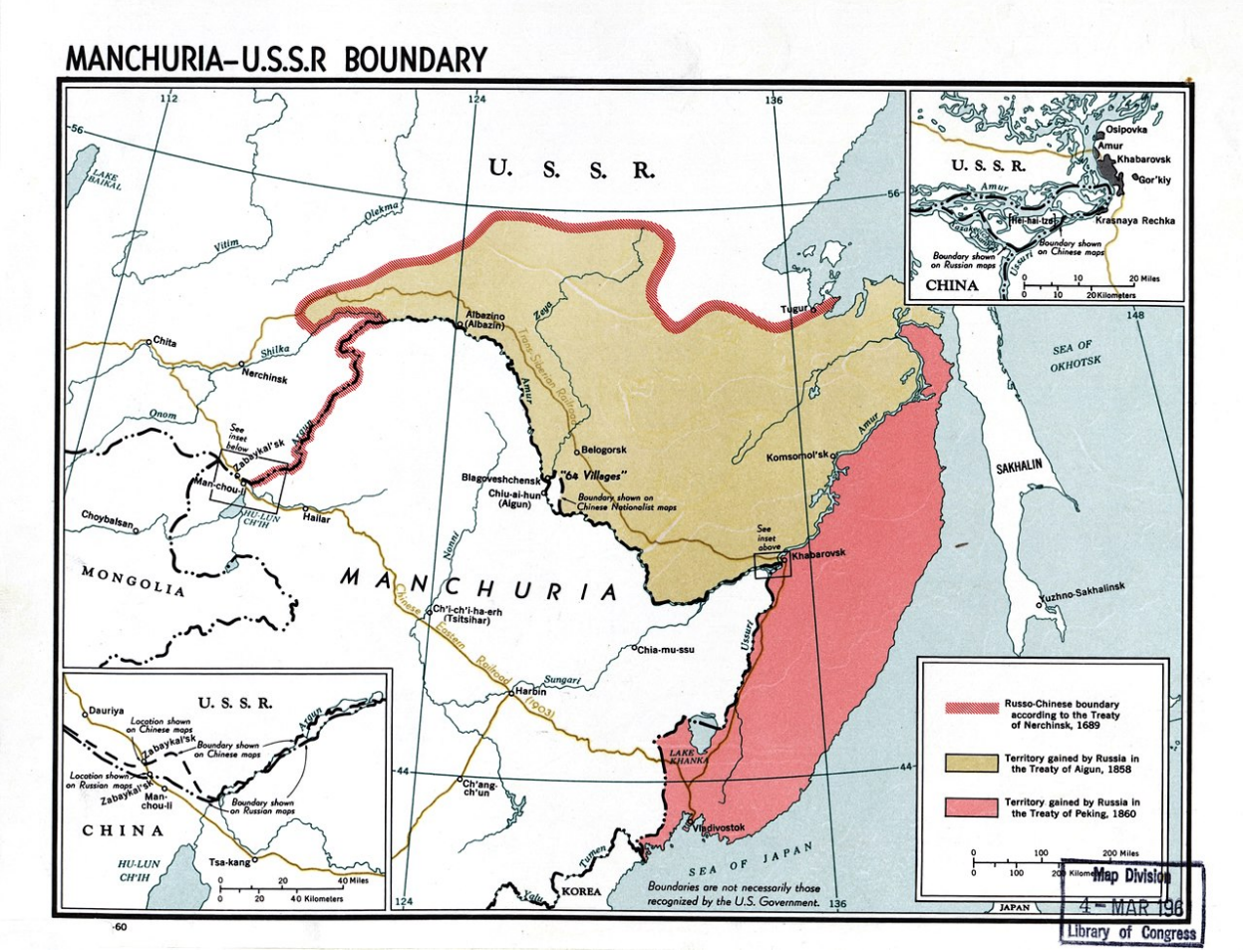

Image Source: Library of Congress[20]

North Korea sought to take a full advantage of these circumstances. In 1991, Pyongyang established the Rason Special Economic Zone (SEZ) with aims to replicate the success of China's Shenzhen Special Economic Zone and its ability to attract foreign direct investment. The "Free Economy and Trade Zone"[21] was built around the neighboring cities of Rajin and Sonbong (the names later combined to create Rason) and signalled an initial willingness on the part of North Korea to embrace Chinese-style marketization.

[20] "Manchuria-U.S.S.R. Boundary." The Library of Congress. Accessed February 6, 2021. https://www.loc.gov/resource/g7822m.ct002999/?r=0.065%2C0.168%2C0.96%2C0.59%2C0.

[21] Sung-Hoon Lim and Kang-Taeg Lim, "Special Economic Zones as Survival Strategy of North Korea.," *North Korean Review* 2, no. 2 (2006): 47–61.

In addition to Rajin Port –which was perfectly positioned to serve as the region's logistical hub – Rason also possessed two other port facilities in Sonbong and Chongjin, that were originally built during Japan's occupation of Manchuria.[22] The Sino-Mongolian Railroad and Trans-Siberian Railroad, had they been completed, would have also situated Rason at the terminus of the Trans-Eurasian Railway.[23] All this, plus the advantage of an abundant and inexpensive local labor supply, and the initial creation of Rason appeared to be a legitimate step towards economic opening.

At the same time, a promising multilateral initiative aimed to encourage regional infrastructure development and cooperation. The United Nations Development Programme (UNDP), in 1991, formally put its support behind the Tumen River Area Development Programme (TRADP), and included China, the Soviet Union, Mongolia, and both North Korea and South Korea as member countries.[24] The TRADP, and its successor, the Greater Tumen Initiative (GTI) encouraged greater economic cooperation in developing transport, trade, agriculture, tourism, and energy within Northeast Asia.[25] The Rason SEZ was perfectly positioned to serve as the project's transport and logistics hub, and regional development at that time seemed promising.

Unfortunately, it was never quite so simple. The very month Rason opened its doors to the world, the Soviet Union officially collapsed, resulting in Russia being unable to commit the necessary resources to TRADP development efforts.[26] Within North Korea, Soviet communism's failure was portrayed as a direct result of their shift towards political and economic openness, and by the time Kim Jong-il took power in 1997, cooperation from Pyongyang with regards to TRADP had waned considerably.[27] Due to an additional lack of clear

[22] Clement, 2016.
[23] Lim and Lim, 2006.
[24] Théo Clément, "The Rajin-Sonbong Economic and Trade Zone: A Geoeconomic Perspective" (Sino NK, December 2016).
[25] Andray Abrahamian, "Tumen Triangle Tribulations: The Unfulfilled Promise of Chinese, Russian and North Korean Cooperation" (US-Korea Institute at SAIS, November 2015).
[26] Clement, 2016.
[27] Clement, 2016.

project objectives and conflicts of interest among members[28], the program ultimately failed to attract any major investments, leading to North Korea's withdrawal in 2009.[29]

Following North Korea's withdrawal, policies governing the status of the Rason SEZ were amended multiple times, resulting in confusion and reluctance on the part of international investors.[30] Tax incentives, property rights, private management permissions, and the deferment of regulatory authority from the central government to the local Rajin Sonbong City People's Committee were all trialed, but political interference from Pyongyang persisted.[31] As a result, the Rason SEZ has to date enticed only 250 foreign ventures and a total of $500 million USD in investment, primarily from China.[32] Despite Rajin's clear economic potential and international interest, North Korea's political volatility has ultimately hindered the port's development.

[28] 김 천규. "The Strategic Suggestions on Cross-Border Cooperation Projects in the Tumen Region." 국가정책연구 포럼. KRIHS. 2019. https://www.nkis.re.kr:4445/researchReport_view.do?otpId=KRIHS00031328#none.
[29] 조 명철, and 김 지연. "GTI(Greater Tumen Initiative)의 추진동향과 국제협력 방안." KIEP, December 30, 2010. http://www.kiep.go.kr/sub/view.do?bbsId=search_report.
[30] Babson, Bradely O. "Will North Korea's Plans for Foreign Investment Make It a More Prosperous Nation?" 38 North, May 2, 2012. http://www.38north.org/2012/05/bbabson050212.
[31] Babson, 2012.
[32] Byrne, Thomas, and Jonathan Corrado. "Making North Korea Creditworthy: What Will It Take to Finance Its Post-Nuclear Development." Korea Society, April 2020.

Development Plan	Initiation Country	Started In	Progress
Greater Tumen Initiative (GTI)	China, Mongolia, Russia, ROK	1991 (TRADP), 2006 (GTI)	• Established GTI EXIM Bank in 2012
Chang-Ji-Tu Development Plan	China	2010	• Built Pier 1 infra, modern roads (Wonjung–Rajin), border bridge, and a cement factory in Rajin area
Khasan – Rajin Project	Russia, DPRK	2008	• Built modernized railway (Rajin-Khasan), a bulk terminal and infra at Pier 3
Primorye Corridor I/II	China, Russia	2017	• Currently refurbishing railways and roads (Hunchun–Zarubino) • Installed an international customs center at border

China

Since the creation of the Rason SEZ, China has by and large provided the vast majority of its capital investment.[33] However, by the time North Korea withdrew from TRADP (or GTI) in 2009, it had become clear that China's efforts in driving additional international support were

[33] Lim and Lim, 2006.

failing. As a result, that same year China announced the "Tumen River Regional Cooperation and Development Plan" in order to stimulate development within its lagging northeastern provinces. The Chang-Ji-Tu Plan was part of this initiative, with aims to develop a transport and logistics infrastructure linking the cities of Changchun, Jilin, and Tumen, and additionally to link this area with the Sino-Mongolian and Sino-Russian Corridor.[34]

One major component of the plan was the 1 billion RMB ($141 million USD) development of Hunchun International Port, an inland port adjacent to 10 Russian and North Korean seaports[35]. With only 71 km to Zarubino and ~100 km to Rajin, connecting the inland port to the rest of the seaport network became a Chinese priority. Hence, in early 2011, China and North Korea agreed on a comprehensive plan for the joint development and management of the Rason area[36], which led to investments in Pier 1 and the construction of a border bridge to Rajin.[37] However, no further development took place following the 2013 purge of Jang Song-thaek (Kim Jong-un's uncle), who had been leading the project.

In 2019, when the Hunchun International Port was inaugurated, the mayor of Hunchun described the project as "a pivotal node in Northeast Asia for the Belt and Road Initiative (BRI)"[38]. This statement is noteworthy considering the recent development of China's "string of pearls" ports in

[34] 김 천규. "The Strategic Suggestions on Cross-Border Cooperation Projects in the Tumen Region." 국가정책연구 포털. KRIHS. 2019.

[35] Desk, Business Reporting. "Hunchun International Port Inaugurated." Belt & Road News. Belt & Road News, August 25, 2019. https://www.beltandroad.news/2019/08/26/hunchun-international-port-inaugurated/.

[36] "North Korea - China Agreement on Joint Development of Rason Special Economic Zone and Golden Triangle Bank Economic Zone (2011-2020)"

[37] Hunchun Chuangli Shipping and Logistics Ltd., a state-owned enterprise of Hunchun City, acquired the operation rights via renovating Rajin's Pier 1 in 2009. (김 천규, 2019.)

[38] The One Belt, One Road initiative (later known as the Belt and Road Initiative, or BRI), launched in 2013, proposed infrastructure development projects totalling up to $1.4 trillion and aimed to shift the world's economic center of gravity to Eurasia and forge new diplomatic and financial partnerships. (Edna Curran, "China's $US1.4 Trillion Silk Road Extends Beijing's Might across Asia to Europe," Australian Financial Review, August 7, 2016, http://www.afr.com/policy/economy/chinas-us14-trillion-silk-road-extends-beijings-might-across-asia-to-europe-20160808-gqn8nz.)

Djibouti[39], Pakistan[40], and Sri Lanka.[41] In these ports, China has been accused of leveraging BRI investments to "bolster the People's Liberation Army Navy's ability to operate further afield", harnessing the ports' capacity for not just commercial, but also military functionality.[42] In a denuclearization scenario where political restrictions on FDIs are lifted, China will have new, significant incentives to seek investment opportunities in Rajin. Militarizing Rajin Port will greatly empower China's naval posture in the East Sea, potentially at the cost of its neighboring countries' collective security.

Russia

For Russia, the battle for influence in East Asia has been a cause of some concern for centuries. Much like China's Dongbei, the Russian Far East suffers from dire economic conditions. However, due to the lingering wariness of Chinese occupation, the local government is concerned about increasing economic dependence on China, as well as the growing population of local Chinese residents.[43] In order to revive the region, Moscow has pursued development plans for the Far East to be centered around Vladivostok, with major transportation and logistics projects in the works including the Baikal-Amur railway and Siberian Railway modernization.[44] The renewed economic vitality promised by these projects would bolster Moscow's ability to defend its geopolitical stake against China, but further integration with the Korean peninsula would be pursued.[45]

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[39] "China's Strategy in Djibouti: Mixing Commercial and Military Interests," Council on Foreign Relations, April 13, 2018, http://www.cfr.org/blog/chinas-strategy-djibouti-mixing-commercial-and-military-interests.
[40] Iwanek, Krzysztof. "No, Pakistan's Gwadar Port Is Not a Chinese Naval Base (Just Yet)." The Diplomat, April 24, 2020. http://thediplomat.com/2019/11/no-pakistans-gwadar-port-is-not-a-chinese-naval-base-just-yet.
[41] Lauren Frayer, "In Sri Lanka, China's Building Spree Is Raising Questions About Sovereignty," NPR, December 13, 2019, https://www.npr.org/2019/12/13/784084567/in-sri-lanka-chinas-building-spree-is-raising-questions-about-sovereignty.
[42] Samuel Locklear and Daniel Russel, "The Diplomat – The Diplomat Is a Current-Affairs Magazine for the Asia-Pacific, with News and Analysis on Politics, Security, Business, Technology and Life across the Region.," The Diplomat, October 22, 2020, http://www.thediplomat.com/2020/10/china-is-weaponizing-the-belt-and-road-what-can-the-us-do-about-it.
[43] Xiaochen Su, "The Myth of a Chinese Takeover in the Russian Far East," The Diplomat, June 20, 2019, http://thediplomat.com/2019/06/the-myth-of-a-chinese-takeover-in-the-russian-far-east.
[44] 조 영관. "북중러 교통물류 협력과 신북방정책에 대한 시사점." *Issue Report* 2019, no. 지역이슈-2 (October 2019). https://eiec.kdi.re.kr/policy/domesticView.do?ac=0000151048&issus=.
[45] Lo, 2004.

Russia sought to leverage North Korea's initial economic opening by painting a picture of Eurasian trade that linked South Korea to Europe, and for which Russia's Far East would become its central transport hub. In pursuit of this vision, Russia, in 2002, opened negotiations with Kim Jong-il to link the Inter-Korean rail system with the Trans Siberian railway.[46] In early 2008, North Korea and Russia also agreed to launch the Rajin-Khasan Project[47], a joint venture for the development and operational rights of Rajin's Pier 3 as well as the construction of logistics infrastructure[48] linking Rajin and Khasan, a Russian border city. The joint venture turned Pier 3 into a bulk terminal, underscoring Rajin's potential as an export hub for Russian natural resources.[49] However, following North Korea's 2016 nuclear tests and resulting sanctions, all projects have been largely put on hold.

Running out of means to fund the Far East's revitalization through projects on the peninsula, Russia turned to China for development funding. At the Belt and Road Initiative (BRI) forum in 2017, the two states signed an agreement to develop the Primorye International Transport Corridors[50] aiming to shift the shipping demand of inland cities to Russian ports. Thus far, however, the shipping volume through the Primorye Corridor has been negligible.[51] Part of this is a practical limitation, as the ports are already running at full capacity.

On the surface, China and Russia share similar requirements for the economic development of their northeast regions, and their cooperation with regards to these requirements would bolster the success of cross-border logistics projects such as Primorye 1 and 2 or Rajin Port. However, against a backdrop of a regional power competition, neither country has moved substantially to share transportation infrastructure with the other. Russia, whose economic challenges are the more pronounced of the two, is particularly reluctant to allow the Far East to become

[46] Buszynski, 2010.
[47] The project established a joint venture, 70% owned by Russia and 30% North Korea. In 2013, Russia sought to sell 49% of its stake to ROK, turning the project into a Russia-ROK-DPRK JV. (김 천규, 2019)
[48] The project modernized a 54km railway between Rajin and Khasan, enabling trains from both countries to directly access both cities. (김 천규, 2019)
[49] Russia exported 4.8 million tonnes of coal to China through Rajin from 2013 to 2017 (조 영관, 2019)
[50] "Russia and China Sign Agreement on Development of Primorye 1 and Primorye 2 International Transport Corridors." PortNews, July 5, 2017. https://en.portnews.ru/news/241731/.
[51] Interview with an official at Korean Ministry of Unification

economically dependent on Chinese capital, thus constituting a hard political limit to the region's development potential. Practically speaking, however, Russia lacks the economic resources to commit to any substantial economic or political endeavors in the Far East.[52]

Ultimately, the historical tensions present within the region present a challenge to Rajin's development in a post-denuclearization scenario. Both China and Russia need Rajin to meet their economic goals, however, their cooperation in reaching those goals should not be assumed. Most importantly, should either Russia or China gain a significant stake in Rajin, that leverage could be used to assert dual use rights, causing a critical security reorientation within the region. A military base in the East Sea could be perceived as an immense security threat to South Korea or Japan, extending China's ability to influence naval power dynamics in the Pacific.

[52] Andray Abrahamian, "Report on Rason Special Economic Zone, Democratic People's Republic of Korea" (Chosen Exchange, September 2011).

4. FINANCING

Financing North Korea

North Korea's economy, much like its political regime, is currently neither adequate nor inviting of international financial engagement. Although foreign direct investment has been intermittently sought, sanctions, political hazard, and the immense risk of doing business in North Korea has severely limited any form of financial engagement that might support sustained development. However, in the event that North Korea one day commits to denuclearization and a normalization of relations with the international community, the most likely and effective path to sustained development will be through engagement with multilateral financing institutions.

Thomas Byrne and Jonathan Corrado have recently examined the steps North Korea must take in order to establish creditworthiness in a post-denuclearization scenario. They note that in order to sustain development, the state will eventually need to turn to global private markets, as Official Development Assistance (ODA) and committed financial support from South Korea will not be sufficient in the long term.[53] However, in order to tap into global markets, they contend that the state will first need to restructure external debt, seek assistance for capacity building, and – critically – join and engage with the International Monetary Fund (IMF) and World Bank.[54] As they put it, "their seal of approval would go a long way toward allaying the concerns of private investors".[55]

In *Hard Target* (2017), Marcus Noland and Stephen Haggard articulate the benefits of using the mechanisms of multilateral banks for political and economic engagement with North Korea. They contend that organizations like the IMF and World Bank are "less vulnerable to risks of moral hazard and politicization" and can easily accommodate the technical assistance North Korea requires.[56] Noland and Haggard propose that once denuclearization occurs, "the legal and procedural barriers to incorporating the country into international financial institutions [will] be

[53] Byrne and Corrado, 2020.
[54] Byrne and Corrado, 2020.
[55] Byrne and Corrado, 2020.
[56] Stephen Haggard and Marcus Noland, *Hard Target : Sanctions, Inducements, and the Case of North Korea* (Stanford, California: Stanford University Press, 2017).

much less of a problem than commonly thought."[57] Thus, while it may seem lofty to imagine a denuclearization scenario in the near future, multilateral financing institutions can play an early and critical role in the state's economic integration into the international community.

Comparative Case Study: Funding Schemes in Pakistani Port Developments

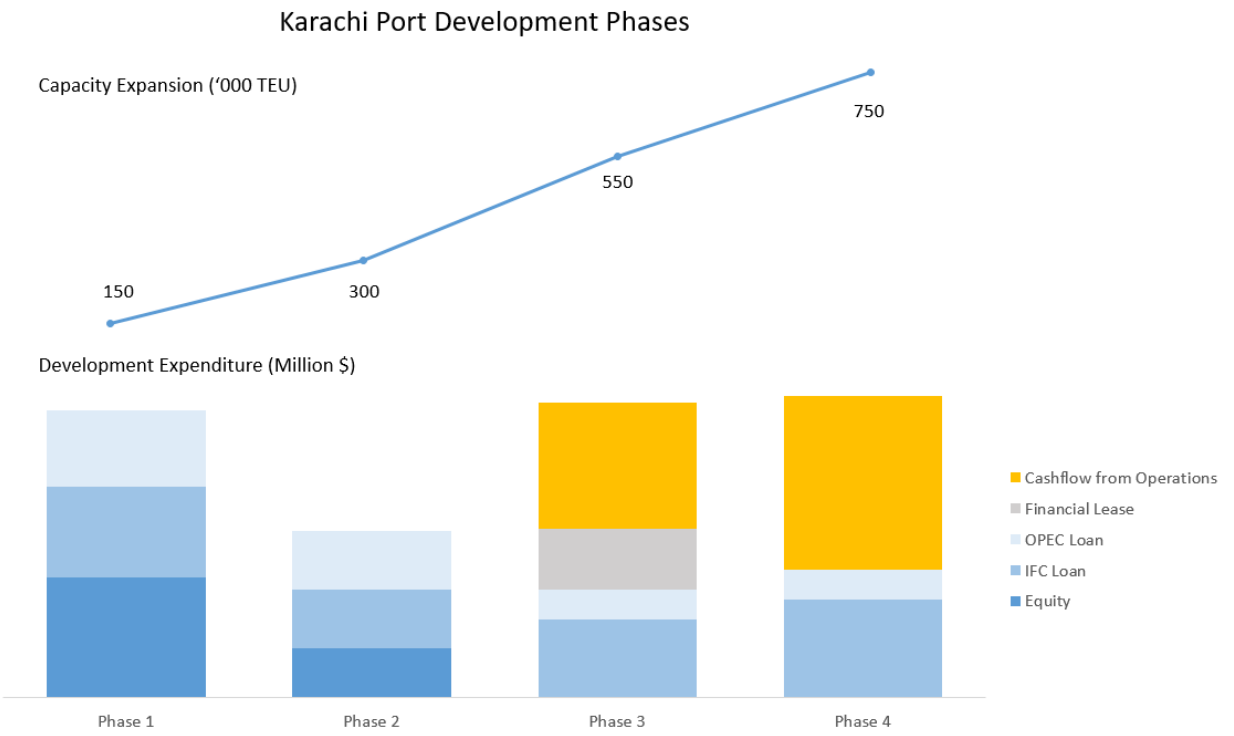
In order to elucidate exactly how multilateral financing might support Rajin's development, some comparative examples, in the form of Pakistan's Karachi Port and Gwadar Port, may prove illustrative. Due to its geostrategic value, Karachi Port has also faced historical controversies concerning land and maritime frontiers. In fact, Karachi is the largest deep sea port in South Asia, and since Alexander the Great's reign has provided important strategic access to Central Asia, India, and the Middle East. After Pakistan's independence in 1947, Karachi – a trade hub for a majority of Pakistan's shipping demand – handled approximately 2.5 million tonnes of cargo. Recognizing the growth potential of Karachi as a regional trade hub, the Karachi Port Trust (KPT)[58] was formed to invite multilateral banks to lead the project financing. Since 2002, KPT received a $53 million loan (49.6% of the total investment), from the International Finance Corporation (IFC) and the Organization of Petroleum Exporting Countries (OPEC) in the range of 10 years, within which time long-term financing was not available in Pakistan.[59]

Karachi Port Development Phases

[57] Haggard and Noland, 2017.

[58] In 2002, Karachi Port Trust possessed two main container port operators; Pakistan International Container Terminal (PICT) and Karachi International Container Terminal (KICT), two private companies operating with Build, Operate, and Transfer (BOT) concessions. At the onset, PICT was awarded a twenty-one year BOT concession by KPT to develop and operate a container terminal from berths 6 to 9 in the east wharf. The twenty-one year Implementation Agreement (IA) between KPT and PICT outlined a development plan in four phases, for which PICT was entitled to revenues generated by the terminal, and for which KPT would receive royalties and lease payments. (Source?)

[59] Amlaiky, Said. IFC's Experience in Financing Ports – IFC's Financing of Pakistan International Container Terminal, Cairo, Egypt, 12 April, 2010, International Finance Corporation, https://www.icafrica.org/fileadmin/documents/ICA_sponsored_events/IFC_PPP_Ports_Cairo_2010/IFCs%20Financing%20of%20Pakistan%20International%20Container%20Terminal%20SAmlaiky.pdf



Development Phase	Total Investment (Million $)	Development Projects
Phase 1	29.3	Two ship-to-shore gantry cranes (STS), and four rubber-tired gantry cranes (RTG)
Phase 2	17.0	One additional STS, two additional RTG
Phase 3	30.0	One additional STS, four additional RTG
Phase 4	30.7	General infrastructure development

In KPT's four phase development plan, by Phases 3 and 4, the port's operations were generating sufficient cash to supplement additional development. Currently, Karachi handles approximately 27.5 million tons of bulk cargo, equating to approximately 60% of import and export for

Pakistan.[60] More recently, relative stability in trade activity has also been shown in PICT's 2019 Annual Report, despite Pakistan's fiscal challenges.[61] (Appendix: Table 14)

All told, the Karachi port project appears to have been a relative success. The IFC, in this instance, provided both critical long-term financing as well as political risk mitigation. The multilateral presence effectively de-risked the project via "halo" effect, in that the organization's involvement disincentivized the local government away from unlawful activities or discriminatory practices. Here, the Public-Private-Partnership (PPP) became catalytic, attracting investors and lenders who may otherwise have avoided participation due to perceived risk tolerance. On top of this, the IFC was able to share valuable in-house expertise in relation to engineering and lawful practice, as well as provide recommendations for environmental and social responsibility, aligning each stakeholder with their environmental and social safeguards. These standards – which also consider labor conditions, resource efficiency, pollution prevention, community health, indigenous land, and cultural heritage – assist the project developers in anticipating and avoiding adverse impacts.

In comparison, Pakistan developed Gwadar Port in a completely different manner – specifically, via direct funding by Chinese State-Owned Enterprises (SOEs). Originally a small fishing town, Pakistan had ambitions for Gwadar to develop into a modern deep-sea port, able to facilitate industrialization by attracting forgein investments in the surrounding free trade zone (FTZ). As a critical part of BRI, China dolled out over $50 billion USD worth of funding for the China-Pakistan Economic Corridor (CPEC) in order to capture Pakistan's value as an energy import route linking adjacent Iranian oil wells to the Himalayas. Gwadar Port – the closest port to the Iranian border – became a cornerstone project for CPEC "with proposed energy pipelines, and road and rail links connecting it to China's Xinjiang province."[62] In 2013, Gwadar's local government transferred the leasing rights to China Overseas Ports Holding Company, an SOE that holds many of BRI's port assets. In 2015, the SOE assumed control over the newly installed

[60] "Brief History." Karachi Port Trust, KPT History, http://kpt.gov.pk/pages/Default.aspx?id=48#page-heading. Accessed 31 Oct. 2020.
[61] Ramirez-Rigo, Ernesto, and Olga Stankova. "Transcript of the Conference Call on the Release of the IMF Staff Report on the Extended Fund Facility Arrangement for Pakistan." *International Monetary Fund*, 8 July 2019, www.imf.org/en/News/Articles/2019/07/12/tr070819-pakistan-conference-call-on-the-release-of-the-imf-staff-report-on-the-eff-arrangement.
[62] https://www.crisisgroup.org/asia/south-asia/pakistan/297-china-pakistan-economic-corridor-opportunities-and-risks

Gwadar FTZ and in 2017, Gwadar granted the Chinese SOE 91% of the financial rights for the profit generated by port operations over 40 years.

Despite rosy prospects for the port city's industrialization, Gwadar's development is facing multiple challenges. Most importantly, there have been growing local suspicions concerning China's intentions, with some questioning whether they are truly rooted in economic development or merely intent on extracting dual use rights. Some Pakistani security analysts have proposed that "China is less interested in developing a road and logistical network that would enable access to the Arabian Sea and Persian Gulf from Xinjiang via Gwadar than in using the port for military purposes"[63]. Others expressed concerns that Gwadar may serve as a "string of pearls" port, "intended to outflank China's nuclear-armed rival for supremacy in Asia: India.[64]". Additionally, the local community is concerned about the lack of transparency and accountability exercised by the foreign SOE's operations. Instead of contributing to local job creation and development, the firm was accused of importing skilled labor from China and starving local enterprises of resources.

The development paths of Karachi and Gwadar ports illustrate a clear dichotomy. In the case of Karachi, multilateral banks offered transparency, regulatory standards, and resources with which to develop in a sustainable manner. On the other hand, foreign SOE-led development in Gwadar port failed to set transparent and sustainable development standards, resulting in an inability to secure political as well as local support for the project. Lessons from these projects with conflicting geopolitical interests should be applied to the development of Rajin. Multilateral institutions that have political neutrality, operational transparency and focus on sustainability would be ideal leads for the project.

[63] "China-Pakistan Economic Corridor: Opportunities and Risks." Crisis Group, October 25, 2018. https://www.crisisgroup.org/asia/south-asia/pakistan/297-china-pakistan-economic-corridor-opportunities-and-risks.

[64] Saeed, Saim. "China's Plans to Rule the Seas Hit Trouble in Pakistan." POLITICO. POLITICO, August 19, 2017. https://www.politico.eu/article/china-plans-to-rule-seas-hit-trouble-in-pakistan-balochistan/.

5. CONCLUSION

Due to the political uncertainties surrounding North Korea, it is easy to dismiss any effort towards targeted economic or geostrategic planning. However, Rajin Port and the Rason Special Economic Zone have attracted regional attention despite decades of North Korea's volatile political whims. In a situation where denuclearization does occur, the port is a strong candidate to become a locus of international activity.

Over the last two decades, neighboring countries have sought to realize Rajin port's deep economic value. As a trilateral logistics hub, Rajin could invigorate the lagging economies of northeastern China, North Korea and Far East Russia. In order to seize this opportunity, China and Russia have been attempting to secure long term operational and development rights to Rajin's individual piers, road, and rail lines. In fact, entire regional development initiatives – like China's Chang-Ji-Tu plan – hinge on the eventual full-scale operational success of Rajin.

However, North Korea's current politics represent only the first hurdle in the port's development. The immense transformative change required in North Korea for investments like this to take place may inflame deep-seeded historical tensions among neighboring states. In particular, the centuries-old territorial dispute between China and Russia over Primorye, Russia's Far East, could re-emerge in the contest for development rights and influence over the port. On top of this, a disproportionate stake in the port's development may cause additional geopolitical tension; if any one state were to gain a significant stake in Rajin, that financial leverage could be used to assert dual use rights – a move which may raise security concerns in the East Sea and the Pacific.

Due to such concerns, the development of Rajin must be depoliticized. Doing so will require simultaneously building logistical capabilities while also preventing operational intervention by any individual country. Multilateral institutions, by design, offer the best chance for peaceful mitigation by promoting sustainable regional development while also preserving geopolitical stability. Given the consequential implications of Rajin, the international community should devise blueprints for Rajin's future.

APPENDIX

Table 1: Key Stats of Rajin Port[65]

Index	Content		
Total Area	380,000m2		
Depth	9~9.5m: Pier 1&2 12m: Pier 3		
Pier Length	2,515m		
Docking capacity	14 ships		
Annual cargo handling capacity	7,000,000T		
Storage capacity	100,000T		
Pier	Length	Docking capacity	Annual cargo handling capacity
Pier 1	970	Two 5,000T Three 10,000T	500,000T
Pier 2	965	Two 5,000T Three 10,000T	1,500,000T

[65] Lee Sungwoo, 2015

Pier 3	580	Two 5,000T Two 50,000T	5,000,000T

Table 2: Trade Volume Among South Korea, China, Japan and Russia in Dollars (Bn)[66]

Index		Trade volume in dollars (Mn)		Trade volume in ton (Mn)	
Export	Import	2000	2016	2000	2016
Korea	China	24.5	122.0	22.1	36.8
	Japan	17.6	32.7	20.5	13.0
	Russia	0.4	6.9	0.5	1.1
China	Japan	49.3	191.0	53.1	31.6
	Korea	17.8	98.1	44.1	43.4
	Russia	1.2	41.3	1.6	9.0
Japan	China	43.6	157.9	14.1	28.7
	Korea	55.3	65.5	12.9	27.2
	Russia	0.5	7.3	0.1	0.6

66 Lee Kiyeol, and Lee Hyunjoo, 2017

Russia	China	9.2	40.9	20.8	101.7
	Japan	8.3	14.8	11.5	36.5
	Korea	4.3	10.0	9.6	31.0

Table 3: Trade Volume Among South Korea, China, Japan and Russia in Dollars (Bn)[67]

Index		Trade volume in dollars (Mn)		Trade volume in ton (Mn)	
Export	Import	2000	2016	2000	2016
Korea	China	24.5	122.0	22.1	36.8
	Japan	17.6	32.7	20.5	13.0
	Russia	0.4	6.9	0.5	1.1
China	Japan	49.3	191.0	53.1	31.6
	Korea	17.8	98.1	44.1	43.4
	Russia	1.2	41.3	1.6	9.0
Japan	China	43.6	157.9	14.1	28.7
	Korea	55.3	65.5	12.9	27.2

67 Lee Kiyeol, and Lee Hyunjoo. 2017

	Russia	0.5	7.3	0.1	0.6
Russia	China	9.2	40.9	20.8	101.7
	Japan	8.3	14.8	11.5	36.5
	Korea	4.3	10.0	9.6	31.0

Table 4: Estimation of Container Shipment Demand of Jilin and Heilongjiang (thousand TEU, Lee Sungwoo, 2015)

Year	Jilin	Heilongjiang	Total
2020	5,160	1,960	7,120
2025	6,030	2,390	8,420
2030	7,050	2,980	10,030

Table 5: Logistical Cost Estimation (Lee Sungwoo, 2015)

Trade Route	Distance	Cost (USD)
Dalian Route		
Heilongjiang East - Dalian (truck)	1,400km	71/ton
Dalian - Shanghai (shipping)	939km	7/ton
Total	2,339km	78/ton

Rajin Route		
Heilongjiang East - Hunchun (truck)	560km	24/ton
Wonjung - Rajin (tax-free / truck)	50km	20/ton
Rajin - Shanghai (shipping)	1,667km	13/ton
Total	2,277km	57/ton

Table 6: Analysis of Potential Cost Savings via Rajin (Lee Sungwoo, 2015)

Trade Route	Shipping Time	Shipping Cost (RMB)
Domestic trade		
Hunchun - Yingkou - Shanghai (railway & shipping)	6 days	120/ton
Hunchun - Rajin - Shanghai (road & shipping)	4 days	80/ton
International trade		
Yanji - Dalian - Niigata (railway & shipping)	8 days	6,160/TEU
Yanji - Longjing - Chungjin - Niigata (road & shipping)	2 days	3,600/TEU

Appendix: Rajin Port Demand Projection

The studies by Lee Sungwoo and Lee Kiyeol highlight the significant cost savings associated with eliminating inland transportation within China. In addition to the cost saving effects, several studies have since projected additional demand from Jilin and Heilongjiang once Rajin Port can be properly utilized.

First, China's Ministry of Transport, in considering the use of Rajin Port, has projected that total container shipping demands from Heilongjiang and Jilin to Japan and Korea will increase to 3 million TEU in 2020.[68] Taking into consideration this estimation for total demand for 2020, the numbers provided by KMI suggest that Rajin Port will be able to absorb up to 1.5-1.8 million TEU.[69]

Table 7: Jilin and Heilongjiang - Rajin Container Shipment Demand (thousand TEU)

Region	2014	2020 (conservative case)	2020 (optimistic case)
Jilin	235	1,530	1,800
Heilongjiang	326		

Secondly, Lee Kiyeol and Lee Hyunjoo projected that the potential demand for trade via the Tumen river area could reach 1.5 million TEU by 2020.

Table 8: Jilin and Heilongjiang Container Shipment Demand through Tumen River Area (thousand TEU)

Year	Jilin	Heilongjiang	Total
2020	1,270	250	1,520
2030	1,480	310	1,790
2040	1,730	38	2,110

What these studies indicate is that Rajin will absorb approximately 17% ~ 25% of total container demand from Heilongjiang and Jilin. Based on these estimates, we project that the total shipping demand in

[68] *Greater Tumen Initiative Individual Country Report-China*, 2013
[69] Lee Sungwoo, 2015

Heilongjiang and Jilin will rise gradually, and that the portion of the demand Rajin will absorb will also increase over the long term.

Table 9: Container shipping demand from industrial zones of Rajin and Wonsan

Index	2025	2030	2040
Wonsan	474	526	570
Rajin	829	933	1,060
Total	1,303	1,459	1,630

Table 10: Estimated Total Container Shipment Demand of Three Key Regions (thousand TEU)

Index	2020[70]	2030	2040[71]	LT Conversion %[72]	
				Bullish	Base
Jilin	5,160	7,050	7,790	25%	10%
Heilongjiang	1,960	2,980	3,290	13%	10%
Far-East Russia	1,670	1,840	1,840	9%	5%

In the table below, we project the total container shipment demand for Jilin, Heilongjiang, Russia's Far East, and Rajin Port's hinterland within North Korea over a 20 year time frame. We estimate a long term conversion ratio to Rajin to calculate Rajin Port's total addressable market.

Table 11: Estimated volume to Rajin (thousand TEU)

[70] Note: 2020 estimates of Jilin and Heilongjiang are KRIHS research estimates that are based on Chinese transportation ministry's publication; Russia's 2020 demand is based on GTI 2015 research

[71] Note: Long-term growth rate: for China, the first 10 years is based on average GDP growth rate of the last three years and the following ten years is adjusted to 1%; For Russia, the second decade is estimated at 0%

[72] Note: Conversion ratio: for China, the estimated ratio is based on KRIHS research using the Huff Gravity Model; Russia's estimate is derived from GTI research

Index	2020		2030		2040	
	Bullish	Base	Bullish	Base	Bullish	Base
Jilin	258	155	1,057	536	1,947	779
Heilongjiang	98	59	387	217	428	329
Far-East Russia	50	50	110	91	166	92
NK Hinterland	150	150	348	233	567	362
Total	560	414	1,900	1,099	3,110	1,561

In both cases, the long term growth rate used for the first ten years for both China and Russia is a three year average year-on-year GDP growth rate. For the following decade, we then adjust to a 1% growth rate for China, and a 0% growth rate for Russia. For the bullish case scenario, the conversion ratio for demand from Jilin and Heilongjiang is estimated using the Huff Gravity Model.[73] For the base case scenario, we applied the lower end of GTI's estimate for China.[74] And for Russian shipping demand, the conversion estimate from the GTI study is applied directly to the bullish case, with a 50% haircut applied to the base case.

Based on these numbers, and the potential conversion rate for Rajin, we project a convex demand curve for Rajin Port over a twenty year time frame. The maximum addressable market for Rajin is estimated at 1.5 to 3.1 million TEU by 2040.

Appendix: Rajin Port Development Projection

Despite Rajin Port's natural competitive advantages, it will nevertheless require considerable infrastructural developments in order to effectively meet these projections. In order to fully service this demand and facilitate further regional economic growth, we predict the following initial development phases to be most likely and advantageous.

First and foremost, the existing piers within Rajin Port will require significant modernization. The first step will be to modernize Piers 1 and 2 to a point where they are able to accommodate container cargo up to 20,000 or 30,000 TEU. Sungwoo Lee has argued that by extending the quay between Piers 1 and 2 and installing container cranes, the space between the piers can be utilized as a multi-purpose area handling

[73] Griffith, Daniel A. "A Generalized Huff Model." *Wiley Online Library*, John Wiley & Sons, Ltd, 3 Sept. 2010, onlinelibrary.wiley.com/doi/pdf/10.1111/j.1538-4632.1982.tb00062.x.
[74] Note: GTI estimate: 11% - 20%

moderate container volume.[75] Securing space for this additional TEU container capacity can serve as a testing ground to synchronize the demand and capacity expansion, before further investment is made.

Once investors have observed a suitable surge in container demand, the port would then require a second phase of development. This second phase of expansion would entail the development of additional piers (4 through 6), adding warehouse and cargo handling facilities in the hinterland, and expanding the Rajin-Wonjong road. In 2017, Sungwoo Lee conducted preliminary in-person due diligence on the feasibility of additional piers in Rajin, and concluded that the southern side of Pier 3 holds the potential for four new berthing locations.[76] Dr. Lee estimates that these new piers could add up to 2 million TEU of additional capacity.

We estimate that phase one would take between 6-12 months, and phase two between 12-24 months to complete. They would require investment of $55-$110 million USD and $300-$400 million USD, respectively.

Table 12: Cost Estimation in Previous Studies

Index	Project scope	Cost Estimation
KMI-18	Quay wall Renovation and Dredging of Pier 1/2	136.1 billion KRW (~116 million USD)
	Expansion of four new berthing places in Rajin Port	331,6 billion KRW (~283 million USD)
	Development of a logistics hub in Rajin hinterland	105.9 billion KRW (~90 million USD)
GTI 2015	Expansion of Rajin Port	200 million USD
	Completion of transport infrastructure (road and railway)	200 million USD
Interview[77]	Quay extension between Pier 1/2 and container crane replacement	~55 million USD

[75] Lee Sungwoo 2018 presentation
[76] Interview
[77] Mr. Go Interview.

	Development of new pier	~180 million USD

Based on the current loading/unloading rate in East Asia, and the estimated range of demand, the annual total revenue for Rajin Port could reach a potential $95-189 million USD by 2040. As a result of Rajin's natural advantages and its low labor costs, the development projects are expected to yield a considerably high return on invested capital.

Table 13: Annual Revenue Projection for Rajin (million USD)

Annual Revenue	2020	2030	2040
Bullish Case	23	95	189
Base Case	17	55	95

Once sufficient infrastructure is established through projects related to Phases 1 & 2, focus can turn to the development of the broader economic region. Indeed, the success of Rajin Port will not only increase the movement of goods and capital through the port itself, but will also increase the necessity for a more robust infrastructure in the surrounding areas. Considerable upgrades to roads, rail, and services will be required in the hinterlands of all countries to support the increased economic activity. This vital connectivity will increase trade activity as a whole and support the once lagging economies of northeastern China, Russia, and North Korea. However, as we will see, navigating this increased level of connectivity will require a concerted multilateral effort.

Table 14: PICT 2019 Annual Report[78] and 2020 Half Yearly Report [79]on Trade Activity[80]

	June 30, 2020	**December 31, 2019**	**December 31, 2018**
Revenue	Rs 4,115 or USD 24.60	Rs 7,927 or USD 51.30	Rs 8,250 or USD 59.00
Gross Profit	Rs 1,833 or USD 10.96	Rs 3,459 or USD 22.30	Rs 3,751 or USD 26.83
Profit before taxation	Rs 1,650 or USD 9.86	Rs 3,011 or USD 19.40	Rs 3,290 or USD 23.53
TEU Handled	175,925	366,347	427,118

*Rs and USD in millions

[78] Rep. *2019 - Annual Report*. Pakistan International Container Terminal Limited, December 31, 2019. https://pict.com.pk/en/investor-center/financial-statements.

[79] Rep. Half Yearly Report - June 30, 2020. Pakistan International Container Terminal Limited, June 30, 2020. https://pict.com.pk/en/investor-center/financial-statements.

[80] "XE Currency Charts: USD to PKR." XE Currency Charts: PKR to USD. XE, December 31, 2019. https://www.xe.com/currencycharts/?from=USD&to=PKR&view=1Y.
(1 USD to 154.47 Rs conversion).

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