

**How Effective Are Secondary Sanctions?:
The Case of US Secondary Sanctions against North Korea (2001–2020)**

By

MOON, Yechan

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

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Committee in charge:

Professor Rhee, Inbok, Supervisor



Professor Bae, Joonbum



Professor Baek, Ji Sun



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Abstract

Are secondary economic sanctions effective? The United States (US) introduced secondary sanctions to complement sanctions from the United Nations (UN). This paper examines whether the US secondary sanctions are effective by examining the case of sanctions against North Korea by exploiting the variation in implementation of sanctions against North Korea based on the analysis of sanction implementation reports to the UN, and trade volume data at dyadic level for 203 countries between 2001 and 2020. The findings suggest that secondary sanctions are relatively ineffective, while UN sanctions are still a helpful tool. Such findings are robust to the inclusion or exclusion of China into the sample. The implications from the findings suggest that more efforts to convince others to participate in the implementation of the UN sanctions rather than pursuing unilateral secondary sanctions can be more effective in the part of the US.

Keywords: Economic sanctions, Secondary sanctions, Sanctions' effectiveness, North Korea

Acknowledgement

I love you, O LORD, my strength.

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1. Introduction

Are economic sanctions effective? Do some forms of sanctions – e.g. multilateral versus unilateral – more effective than others? Economic sanctions emerged as one primary strategy by which the UN maintains this international order and responds to countries that damage the UN's shared principles, for instance, by violating human rights or using or allowing the proliferation of weapons of mass destruction (WMDs) (Sitt et al., 2010). UN sanction committees have been created to deal with such countries, which have included Iraq, the Democratic Republic of the Congo, Yemen, and the Democratic People's Republic of Korea (hereafter, North Korea).

While the general acceptance of sanctions has grown, guaranteeing all UN member states' participation and consent is difficult, and given that such consent is necessary for the UN to adopt and implement sanctions, pursuing multilateral sanction via the UN has often been ineffective. For example, China and Russia have used their veto power to shut down international responses to the Syrian civil war and the coups in Myanmar (Barber, 2021; Nahlawi, 2019; Adams, 2015). The same two countries also opposed the adoption of a statement condemning North Korea's Intercontinental Ballistic Missile (ICBM) launch in 2022.

To overcome the challenge of securing full member state consent via the UN, the United States (US) increasingly started to use unilateral sanctions. Between 1945-2005, the US is responsible for over 48% of all the sanctions in the world (Morgan et al., 2014). The US have used economic sanctions when the international community is unable to do so due to a lack of consensus. This was characteristic in the case of the US sanctions against Syria (Humud, 2021) or the trade sanctions against Myanmar (Dolven & Smith, 2021).

Most importantly, the US introduced secondary sanctions to complement the UN's weak enforcement of sanction implementation (Han, 2021; Haggard 2016; Boulden & Charron,

2010). Secondary sanctions target third parties that transact with the target of the sanctions (Meyer, 2009), unlike primary sanctions, which only impose restrictions on the target state itself. Some experts suggest that it was the effectiveness of secondary sanctions which persuaded Iran to limit its nuclear program (Forrer, 2018). Yet others raise questions about the effectiveness of secondary sanctions despite their widespread use (Spadoni, 2010; Hufbauer & Oegg, 2003; Haass, 1998; Pape, 1997).

In this paper I examine whether the US secondary sanctions are effective by examining the case of sanctions against North Korea. By analyzing the available empirical data on the implementation of sanctions against North Korea by the UN as well as the US, this paper examines the effectiveness of sanctions, particularly paying more attention to the unilateral secondary sanctions implemented by the US. Departing from some of the previous studies, the paper exploits the variation in implementation of sanctions against North Korea based on the analysis of sanction implementation reports to the UN, and trade volume data at dyadic level, and employ a country-fixed effects model to address any selection effects stemming from country-specific characteristics.

Building upon the theoretical work on secondary sanctions (Han, 2018; Martin, 1992, 1993), this paper extends a large-N empirical analysis to provide evidence of how secondary sanctions affected North Korea's trade with 203 countries between 2001 and 2020. In particular, unlike the extant studies which focused on cases from the 1990s or 2000s, extending the time period analyzed to the recent two decades allow me to directly include into the study sample the US secondary sanctions against North Korea which have gain greater prominence in the recent years.

The findings show that the UN primary sanctions have actually been more effective at reducing trade with North Korea than the US secondary sanctions. In almost all empirical specification, I find that the UN sanctions led to statistically significant reduction in both

exports to and imports from North Korea at the dyadic level. Moreover, I also see that such relationship was even more pronounced in the case of countries which comply to the UN sanction regime to the extent of submitting their implementation reports. Such reports seem to be robust to a number of specifications, including dropping China from the sample.

This study makes important contributions to the existing literature. First, the paper provides one strategy in measuring the effectiveness of the US secondary sanctions on North Korea. For example, the US Government Accountability Office has concluded that the federal government is unable to identify the time when sanctions have an effect, thus it does not conduct agency assessments of the effectiveness of sanctions (Drezner, 2021). More generally, it is difficult to measure the effectiveness of sanctions because of other factors that may have simultaneous and overlapping effects. This paper attempts to overcome the difficulty of measuring the effectiveness of secondary sanctions by comparing their effects with those of UN sanctions, an alternative approach intended to overcome the difficulty of estimating sanctions' impact.

Moreover, this paper empirically examines the important yet under-studied case of North Korea. While the nuclear threat posed by North Korea is considered the third highest in the world after those posed by China and Russia (Department of Defense, 2018, 2022), existing studies of US secondary sanctions have tended to focus on the Iranian case (Ruys & Ryngaert, 2020; Han, 2018; Meyer, 2009). North Korea is almost the only country that has engaged in continuous military provocations of the international community, especially involving WMDs. On this note, examining the effectiveness of the secondary sanctions provides implications for how to improve or change the mechanism of secondary sanctions, and how the international community and the US should set policy toward North Korea.

In the following, I present a brief examination of the relevant existing literature I then describe details of the sanctions on North Korea and assessments of their effectiveness and

their limitations. The final section discusses the findings and includes a proposal for possible future studies.

2. Literature Review

2.1. Why Do Countries Impose Economic Sanctions?

Economic sanctions are a tool of coercive diplomacy intended to change a target's behavior by threatening pain (Feaver & Lorber, 2010; Byman & Waxman, 2002; Schultz, 2001; Schelling, 1981; Snyder & Diesing, 1978). The existing literature has focused on examining the effectiveness of sanctions. This paper bridges a gap in the literature by exploring the effectiveness of secondary sanctions in particular.

Economic sanctions are a longstanding tool. Since ancient Greece, sanctions have been used as coercive measures between countries (Simons, 1999). Athens imposed trade sanctions on Megara in response to its invasion and illegal acts. Before World War II, sanctions were a strategy of economic warfare used to win battles (Wallenstein, 1968). The use of sanctions increased rapidly from the mid-20th century, especially following the end of the Cold War, and the 1990s came to be known as the sanction's decade (Cortright & Lopez, 2000).

Previous papers have focused on measuring the effectiveness of sanctions and trying to answer the question, 'Are economic sanctions successful in changing the targeted state's policy?' The majority have found that economic sanctions are not successful and fail to achieve their objectives (Hufbauer et al., 2007; Pape 1997). However, the use of economic sanctions has steadily increased (Morgan et al., 2014), and studies have turned to examining why sanctions are still being used as a standard tool in modern international relations. For example, while sanctions may not be effective at changing a target country's behavior, they may still have symbolic or political effects, such as securing support for a particular foreign policy

(Whang, 2011).

The existing literature has also investigated the factors that contribute to sanctions' effectiveness, including features of the targeted states (Peksen, 2019; Escribà-Folch, 2011; Pape, 1997), the number of sanctions senders (Drezner, 2000; Martin, 1992), and relations between targeted states and their neighbors (Early, 2012, 2009; McClean & Whang, 2010). Pape (1997) has argued that it is hard to make a policy change in target countries since modern states are not fragile, and nationalism makes target states willing to endure sanctions. In particular, as Escribà-Folch (2011) has emphasized, authoritarian regimes like North Korea respond to sanctions with domestic policy changes, such as increasing repression, because their priority is maintaining power. Peksen (2019) has argued that target countries' domestic policies must be considered for sanctions to work effectively. This is because when external pressures like sanctions are pushed, authoritarian states implement policies that benefit the elite or their core support groups while increasing repression of the public.

As for the number of senders, Martin (1992) found that multilateral sanctions are more efficient than unilateral sanctions because they increase the sustainability of the sanctions by preventing the dropout of participating countries. Drezner (2000) has also argued that multilateral sanctions are more effective than unilateral sanctions. He emphasized that the support of international organizations is essential to multilateral sanctions since a lack of support can render multilateral sanctions less effective than unilateral sanctions due to enforcement difficulties.

The existing literature has also focused on the relations between a targeted state and neighboring states. Early (2012, 2009) has emphasized that if third parties are allied with a sanction-leading country, they will actively participate in sanctions. Trade between a third party and the target country will increase if there is an alliance or a military relation between the two. In addition, if there is no cooperation from significant trading partners of the target,

sanctions are unlikely to be effective. McClean & Whang (2010) have also emphasized the role of neighboring states and have argued that the participation of key trading partners determines whether sanctions are successful or not. The target state's economic disconnection from the international community can offer an opportunity to neighboring trading partners, reducing the effectiveness of sanctions.

The above papers have elucidated the mechanisms of sanctions and described how to maximize their effectiveness. However, general sanctions, that is, primary sanctions, do not seem to have a meaningful impact on target states (Hufbauer et al., 2007; Pape, 1997). On this note, I also review the literature on why countries impose secondary sanctions.

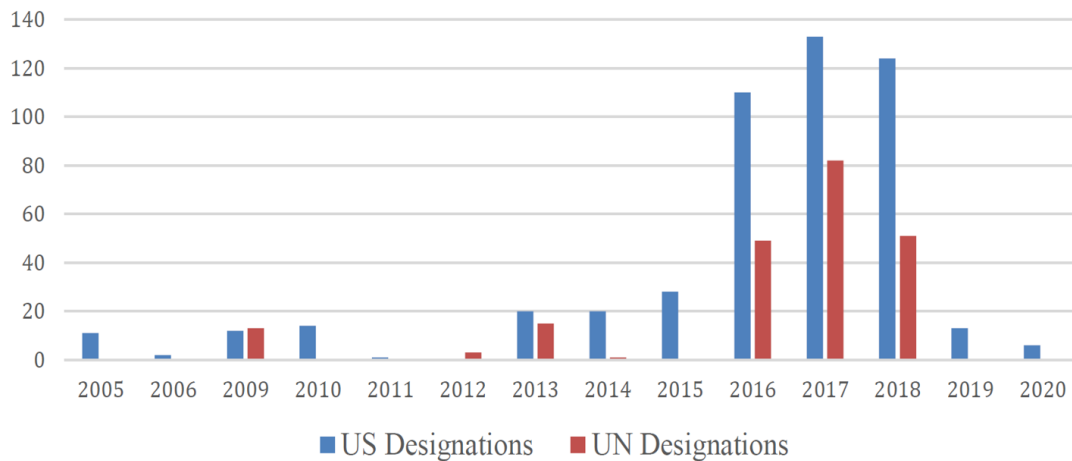
2.2. Why Do Countries Impose Secondary Sanctions?

Secondary sanctions appear to overcome the main limitation of primary sanctions, their lack of effectiveness. As previous findings have shown, economic sanctions typically fail to change target countries' policies (Boulden & Charron, 2010; Hufbauer et al., 2007; Pape, 1997; Baldwin, 1985). Secondary sanctions are an effective way to resolve deadlocked conflicts (Maloney, 2015) and supplement previous sanctions programs (Moon, 2022). These secondary measures are more effective both at deterring third parties from sanction-busting and at imposing direct financial restrictions on the target (Early & Cilizoglu, 2020).

The existing literature has mainly discussed the secondary sanctions against Iran (Katzman, 2022; Geranmayeh & Rapnouil, 2019; Sultoon & Walker, 2019; Han, 2018). This is because Iran is a successful case, in that secondary sanctions led to negotiations over Iran's nuclear program. In contrast, there have been few studies of the secondary sanctions against North Korea. The existing literature has typically only mentioned secondary sanctions as an example of sanctions against North Korea (Aum et al., 2020; Bell & Fattig, 2018). Recently, a

few studies have focused on unilateral US sanctions, including the secondary sanctions, since the US is currently leading the sanctions regime against North Korea (Wertz, 2020).

<Figure 1> Sanctions Designations against North Korea (2005–2020)



Source: Wertz (2020)

Papers that have explicitly addressed the secondary sanctions against North Korea include Han (2021); Min & Han (2020); and Haggard (2016). Haggard (2016) found that the US developed secondary sanctions in order to engage China in the implementation of sanctions against North Korea. Secondary sanctions were successful at moving Iran toward nuclear negotiations. Following the Iran case, Haggard pointed out that secondary sanctions have the potential to limit trade with China. However, since diplomacy related to the Korean peninsula has followed dual tracks (including sanctions but also support), secondary sanctions have been less aggressively pursued.

Min & Han (2020) have also agreed that US-imposed secondary sanctions have forced China to cooperate with the sanction's regime against North Korea. Secondary sanctions are an effective and coercive diplomatic tool that has forced China to restrict its financial interactions with North Korea. Han (2021) has argued that the US secondary sanctions have

coerced China into participating in the sanctions. She proposes a game-theoretic framework to explain the sanction dynamics among a sender, target, and third party. She has examined how the US secondary sanctions have contributed to China's implementation of sanctions against North Korea, showing that these had a dire impact on North Korea's economy, including a substantial reduction in its GNI.

The above papers have focused on China's implementation of sanctions against North Korea. This is because increasing China's participation in sanctions against North Korea has been a high priority internationally (Min et al., 2020; Jones, 2015; Oh & Ryu, 2011; Noland, 2009) since sanctions have not yet been effective at limiting North Korea's nuclear weapons capabilities (Park, & Walsh, 2016; Jeong, & Bang., 2009; Hufbauer et al., 2007). Since 2016, secondary sanctions have been used to present a tough stance toward China's financial interactions with North Korea (Min et al., 2020). However, since the existing literature has focused on China, it is difficult to determine how other countries have responded to the secondary sanctions. <Table 5> shows wide variation in sanction implementation across countries. There are mixed trends, and it is challenging to define the overall tendency. This paper uses large-N data to examine many cases over time and systematically examine variation across countries in their implementation of sanctions against North Korea.

3. Sanctions on North Korea*

The UN and the US have both imposed sanctions on North Korea. The UN enforces its sanctions using Security Council resolutions, and the US implements sanctions using its domestic laws. The UN sanctions are primary sanctions, while the US ones are secondary sanctions. The UN sanctions have been weakly enforced and have suffered from a lack of implementation by some member countries. This section briefly describes the two types of sanctions against North Korea and describes three key examples in which the US enforced secondary sanctions against banks that interacted with North Korea: Banco Delta Asia, Bank of Dandong, and ABLV.

3.1. UN Sanctions on North Korea

The UN has imposed sanctions on North Korea using Security Council resolutions. Resolution 825 was the first UN resolution against North Korea, made in response to the country's withdrawal from the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). However, North Korea continued to develop WMDs, including nuclear weapons, and the UN subsequently adopted resolutions 1540 and 1695 to restrict and condemn the use of weapons of mass destruction. The above resolutions are advisory measures, and the UN has no mechanism by which to coerce its member states to implement these sanctions.

The UN established the North Korea sanction committee to encourage compliance with the sanctions. The UN also requires implementation reports to track how member states have imposed sanctions. Resolution 1718 is the first resolution that required states to submit implementation reports. It expanded the scope of sanctions to include not just military arms

* This section is the modified and developed version of Moon (2020) and Moon (2022).

but also luxury goods. New UN sanctions against North Korea have continued to be developed and have begun to target specific individuals, organizations, and institutions. Resolution 1874 restricted the travel and froze the financial assets of individuals and institutions that have promoted or supported North Korea's WMD development. Resolution 2087 added four individuals and six organizations to the sanctions lists. Newer resolutions have updated the lists, including Resolution 2094, which added three individuals and two organizations and required the mandatory inspection of cargo from North Korea.

The UN has also expanded its sanctions by widening the scope of the items targeted. For example, Resolution 2270 prohibited the supply, sale, and transfer of minerals. Resolution 2321 banned North Korean exports of copper, silver, and zinc. Resolution 2371 restricted seafood exports and limited the number of North Korean workers abroad. Resolution 2375 increased the intensity of the sanctions restricting textile and oil products. This resolution also banned the opening and operating of North Korean financial institutions in UN member states. Resolution 2356 updated the sanctions lists, adding fourteen new individuals and four new organizations. The most recent resolution, Resolution 2397, required the mandatory repatriation of North Korean workers within 24 months. It also banned exports of food and agricultural products, machinery, electronic equipment, lumber, and ships.

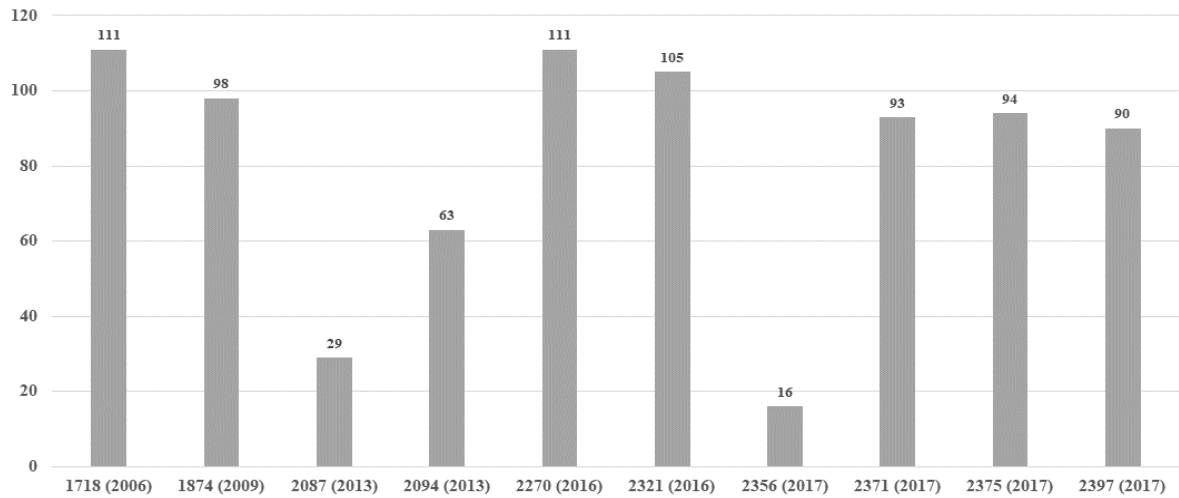
<Table 1> UN Security Council Resolutions on North Korea

Name	Cause of the Sanctions	Main Contents
Resolution 1718 (2006)	Nuclear Test in 2006	Added conventional weapons and luxury goods to sanctions lists
Resolution 1874 (2009)	Nuclear Test in 2009	Prohibited financial transactions related to WMDs
Resolution 2087 (2013)	Launch of Ballistic Missile	Strengthened export controls and catch-all restrictions
Resolution 2094 (2013)	Nuclear Test in 2013	Mandated inspections of all cargo from North Korea
Resolution 2270 (2016)	Nuclear Test in 2016 (4 th Test)	Prohibited the supply, sale, and transfer of minerals
Resolution 2321 (2016)	Nuclear Test in 2016 (5 th Test)	Added copper, silver, and zinc to the sanctions lists
Resolution 2356 (2017)	Launch of Ballistic Missile	Updated sanctions list
Resolution 2371 (2017)	Launch of Intercontinental Ballistic Missile (ICBM)	Restricted seafood exports
Resolution 2375 (2017)	Nuclear Test in 2017	Restricted textile products and the inflow of crude oil
Resolution 2397 (2017)	Launch of Intercontinental Ballistic Missile (ICBM)	Forced the repatriation of North Korean workers

Source: Security Council Committee established pursuant to Resolution 1718.

The UN sanctions have suffered from a lack of participation despite the UN requiring the mandatory submission of implementation reports. One hundred eleven countries submitted reports in the case of Resolution 1718, and the number of compliant countries has decreased since then. Sixty-three countries submitted reports in response to Resolution 2094. As <figure 2> shows, Resolutions 2087 and 2356 produced the lowest level of submissions because the UN did not obligate member states to submit written implementation reports in response to them.

<Figure 2> The Number of Countries that Submitted Implementation Reports



Source: Security Council Committee established pursuant to Resolution 1718

3.2. US Sanctions on North Korea

The US has begun using secondary sanctions to address the threat posed by North Korea. This was a natural move given the success of the US secondary sanctions against Iran. The Comprehensive Iran Sanctions, Accountability, and Divestment Act of 2010 increased the international community's participation in sanctions on Iran to condemn the country's development of nuclear weapons (Han, 2021). Secondary sanctions have been recognized as effective at resolving deadlocked conflicts (Maloney, 2015).

North Korea's fourth nuclear test was a turning point for the US that led it to change its tactics against North Korea (Wertz, 2020). The US Congress passed the North Korea Sanctions and Policy Enhancement Act (NKSPEA), and President Obama signed Executive Order 13722 to implement the secondary sanctions. This type of sanction appears to make up for the limitations of the UN sanctions on North Korea, since the UN has shown weak enforcement of sanctions implementation and the UN sanctions have not yet been effective at convincing North Korea to give up its nuclear program (Han, 2021; Haggard, 2016; Boulden & Charron, 2010).

The US sanctions against North Korea have been significant. Although sanctions against North Korea have mainly been implemented by the United Nations, on a practical level, the United States leads and enforces sanctions (See <Table 2>). The US Congress has enacted laws that create a legal basis for the implementation of sanctions against North Korea, and these laws allow the president to implement sanctions via executive order. Such executive orders have influenced the international community's agenda and have secured extensive support for the implementation of sanctions. For example, following the adoption of Executive Order 13810, the EU Council decided to increase the intensity of its sanctions in all areas except humanitarian support (Lee & Moon, 2020).

<Table 2> US Legislative Basis for Sanctions Against North Korea

Name	Contents
Arms Export Control Act	- Prohibited transactions related to defense supplies or services - Prohibited external support or military aid
Bretton Woods Agreements Act	- Prohibited support from international financial institutions
Department of State, Foreign Operations, and Related Programs Appropriations Act, 2016	- Prohibited bilateral aid - Prohibited economic support funds
Foreign Assistance Act of 1961	- Prohibited external support and the selling of crops
Immigration and Nationality Act of 1952	- Banned transactions with North Korean authorities or Labor Party officials
International Emergency Economic Powers Act	- Froze the assets of designated individuals and institutions connected with the spread of WMDs - Banned transactions with North Korean authorities or Labor Party officials and froze the assets of these individuals
Iran, North Korea, and Syria Nonproliferation Act of 2000	- Prohibited various transactions (weapon sales and exports, dual-use exports, contract procurement, support from international banks)
North Korea Sanctions and Policy Enhancement Act of 2016	- Added human rights violations and money laundering as reasons for the designation of targets of sanctions on North Korea
Otto Warmbier North Korea Nuclear Sanctions and Enforcement Act of 2019	- Imposed sanctions regulations on foreign financial institutions that provided financial services to sanctioned individuals with a focus on blocking financial transactions with North Korea (freezing assets, restricting the opening or maintenance of accounts in the United States)
Trafficking Victims Protection Act of 2000	- Prohibited external support, cultural exchange, and support from international financial organizations
United Nations Participation Act of 1945	- Prohibited transactions with the subjects of UN sanctions and froze the assets of individuals and institutions
USA Patriot Act	- Prohibited transactions with specific commercial banks

Source: Rennack (2016)

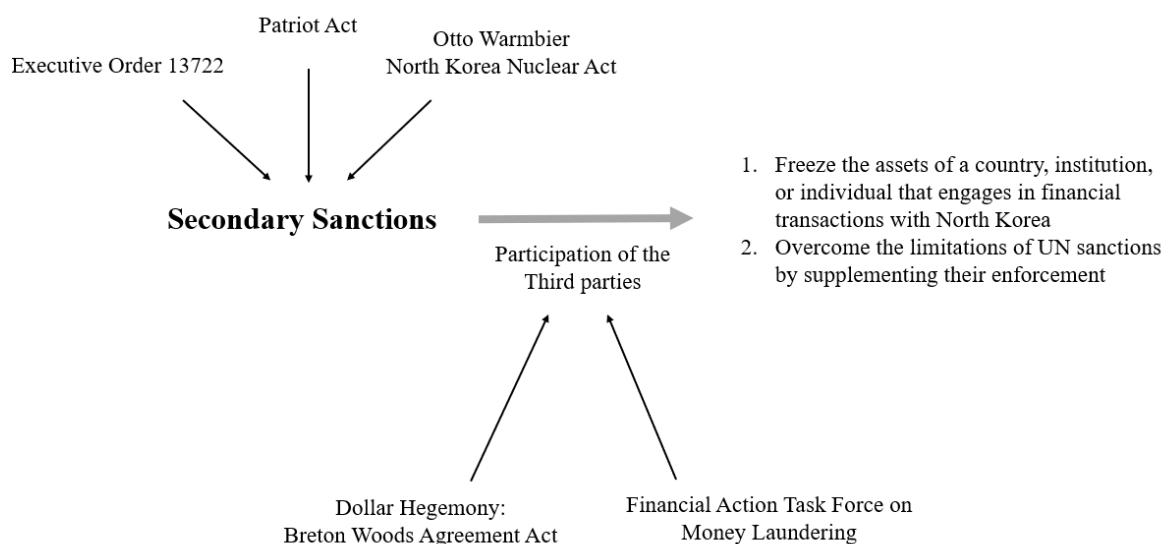
3.3. US Secondary Sanctions on North Korea

The US secondary sanctions against North Korea are imposed on third-party individuals or institutions that interact with North Korea. This paper suggests the mechanism of US

secondary sanctions, which developed and modified the previous finding from Im & Koo (2019). The secondary sanctions are based on the Patriot Act, the Otto Warmbier North Korea Nuclear Act, and Executive Order 13722. Other legislative basic also worked to implement secondary sanctions. (See US sanctions list in <Table 6>)

First, the US Patriot Act targeted financial institutions that interacted with North Korea, restricting their access to the US financial system. The Otto Warmbier North Korea Nuclear Act completely blocked North Korea's access to global financial markets. Finally, Executive Order 13722 imposed sanctions on individuals, companies, and financial institutions in third countries that deal with North Korea, freezing all of their financial resources and property rights in the United States. Within this legal framework, secondary sanctions can enhance the effectiveness of primary sanctions. Third parties are more likely to participate in secondary sanctions since the United States controls the global financial system via the hegemony of the dollar and the country's Financial Action Task Force on Money Laundering.

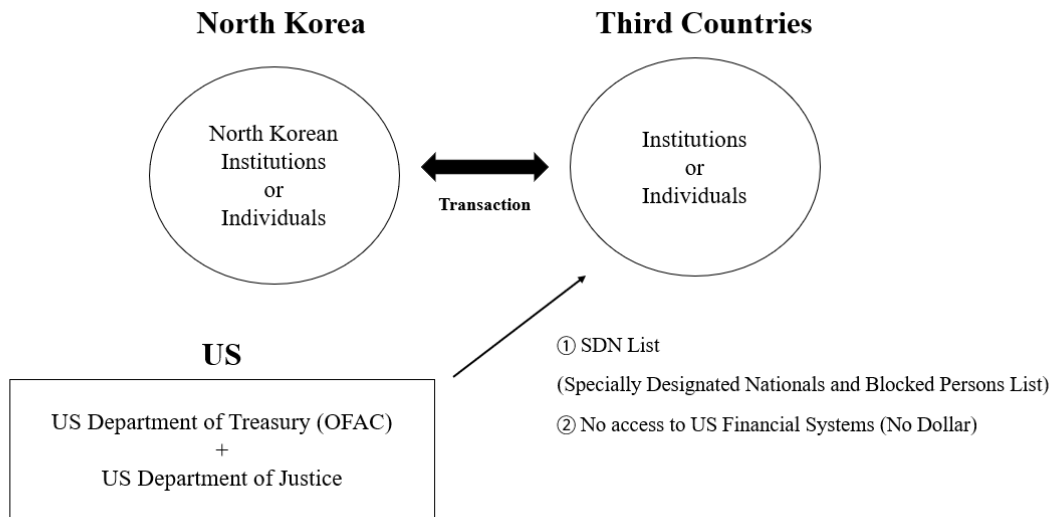
<Figure 3> The Framework of the Secondary Sanctions



Source: Moon (2022)

The US Treasury Department and the US Department of Justice are the leading agencies that enforce sanctions. The Office of Foreign Assets Control (OFAC) in the US Treasury Department finds traces of transactions with North Korea. Department of Justice implements sanctions on North Korea based on domestic laws. The Banco Delta Asia, the Bank of Dandong, and the ABLV cases are prominent examples in which the US has enforced its secondary sanctions.

<Figure 4> Mechanisms of the Secondary Sanctions



Source: Moon (2022)

3.3.1. Banco Delta Asia Case

Banco Delta Asia (BDA), located in Macau, is the fourth-smallest commercial bank in Macau, with about 340 employees and about \$35 million in capital as of 2003. On September 20, 2005, the Financial Crimes Enforcement Network (FinCEN) found a reasonable basis to conclude that Banco Delta Asia was a major financial institution with a risk of money laundering. For more than 20 years, Banco Delta Asia has provided financial services to North

Korean government agencies and companies involved in illegal activity, and it continues to develop these relationships. The bank has also handled North Korea's precious metal sales and traded millions of dollars in secret cash from North Korean agents. After the US Treasury Department posted an official notice on sanctions to Banco Delta Asia in the Federal Register, depositors in BDA began withdrawing their money. Macau's financial authorities froze \$25 million in funds from 52 suspected North Korean accounts. Banco Delta Asia was subject primarily to money laundering concerns, and as a result the US government restricted the bank's access to the US financial system.

3.3.2. Bank of Dandong Case

The Bank of Dandong is a small commercial bank located in Dandong, China. FinCEN was concerned that the Bank of Dandong was serving as a financial channel with North Korea, violating US and UN sanctions. FinCEN found a reasonable basis to conclude that the Bank of Dandong was a financial institution with significant money laundering problems. FinCEN alleged that Dandong Bank served as a gateway granting North Korea access to both the US and the international financial systems. North Korea has engaged in financial transactions using banks in China, Hong Kong, and Southeast Asian countries.

North Korea used Bank of Dandong accounts to make millions of dollars in transactions on behalf of companies procuring ballistic missile technology. In addition, the Bank of Dandong engaged in financial interactions with Korea Kwanson Banking Corporation (KKBC). This North Korean bank provides financial services that support the spread of weapons of mass destruction. The Bank of Dandong also engaged in financial activities with the Korea Mining and Development Trading Corporation (KOMID), which is also subject to US and UN sanctions. The effects of the sanctions in the case of Dandong Bank were as follows. First,

bank accounts of representative offices, subsidiaries, and branches transacting with North Korean financial institutions were prohibited. The opening of new representative offices, subsidiaries, branches, and bank accounts in North Korea was also restricted.

3.3.3. ABLV Bank Case

ABLV Bank (ABLV), located in Latvia, provides banking, investment, and advisory services. ABLV does not make direct transactions with US banks but instead uses the US dollar and financial system when transacting with other foreign financial institutions. ABLV ignored the warnings of the Financial Action Task Force (FATF) urging member states to apply effective countermeasures to protect the financial system from threats of money laundering, terrorist financing, and spread financing by North Korea.

ABLV's business operated without proper risk mitigation policies. This enabled banks to engage with North Korean agencies that are subject to UN and US sanctions. For example, ABLV transacted with the Foreign Trade Bank (FTB), Korea Bank, Korea Credit Development Bank, Korea Mining and Development Trading Corporation (KOMID), and Ocean Marine Time Management Company (OMM). Because of these transactions with targeted institutions, the US government has prohibited US financial institutions from maintaining accounts that transact with ABLV. This prevents ABLV from indirectly accessing US transaction accounts, blocking access to the US financial system.

<Table 3> Cases of the US Secondary Sanctions on North Korea

Case	Sender	Primary Target	Secondary Target	Background of Sanctions	Contents of Sanctions
Banco Delta Asia	US Department of Treasury and US Department of Justice	North Korean Institutions or Individuals	Banco Delta Asia, Macau	1. Fake dollar distribution 2. Drug trafficking	1. Primary Money Laundering Concern under USA Patriot Act 2. No access to US Financial System
Bank of Dandong			Bank of Dandong, China	1. Bridge between NK and the US, International financial System	1. Primary Money Laundering Concern List by FinCEN 2. No access to US Financial System
ABLV Bank			ABLV, Latvia	1. Illegal transaction with NK 2. Procurement of NK ballistic missiles	1. No opening or maintaining accounts in the U.S. 2. Block access to US financial systems.

4. Data and Variables

4.1. Data

This paper explores the effectiveness of the US secondary sanctions by analyzing trade data from the World Trade Organization (WTO) and the International Trade Centre (ITC) trade map. Data on sanctions implementation is available from the online database of the Security Council Committee established pursuant to Resolution 1718. This paper covers all the countries that trade with North Korea or that have imposed sanctions against North Korea. I categorized countries into four categories, ‘Troublemakers’ (that have both traded and sanctioned NK), ‘Oppressors’ (that have only sanctioned NK), ‘Cooperators’ (that have only traded with NK), and ‘Outsiders’ (which have done neither).

<Table 4> Classification Table of Relations with North Korea

		Trade with NK	
		O	X
Sanctions on NK	O	Troublemaker (Trade with NK, sanctions on NK)	Oppressor (Only sanctions on NK)
	X	Cooperator (Only trade with NK)	Outsider (Do not do either)

Source: Own elaboration

This paper covers the period from 2001 to 2020. I gathered data on 203 countries that have traded with North Korea and/or imposed sanctions against North Korea. I used the submission of implementation reports as an indicator of whether a state had implemented sanctions or not.

Since the adoption of Resolution 1718 in 2006, states' implementation reports have been available to review. There is the variation in implementation of sanctions against North Korea. Only 84 countries have submitted implementation reports to the UN describing the extent to which they have implemented sanctions against North Korea, and 28 countries were still trading with North Korea as of 2020 (See <Table 5>)

<Table 5> Classification Table of Relations with North Korea by Year (2001–2020)

Year	Troublemaker	Oppressor	Cooperator	Outsider
2001	0	0	128	75
2002	0	0	126	77
2003	0	0	133	70
2004	0	0	135	68
2005	0	0	138	65
2006	83	28	50	42
2007	87	24	55	37
2008	84	27	49	43
2009	83	30	56	34
2010	85	28	55	35
2011	84	29	54	36
2012	84	29	59	31
2013	84	29	54	36
2014	83	30	51	39
2015	84	29	57	33
2016	91	34	45	33
2017	93	37	43	30
2018	87	43	38	35
2019	83	47	34	39
2020	73	57	28	45

4.2. Variables

Trade with North Korea is the dependent variable in this study. Trade is divided into exports and imports. This paper tracks changes in trade by sanction type. I used two types of sanctions as independent variables, those imposed by the United Nations and those imposed by the United States. The UN imposes sanctions via Security Council Resolutions (UNSCR) while the US uses laws or executive orders to enforce secondary sanctions. In the three cases described above, these secondary sanctions have been used to punish banks that engaged in financial transactions with North Korea.

Characteristics of states, such as their GDPs and population, likely influence their patterns of trade. Therefore, I included characteristics of North Korea and its partners (states with a relationship with North Korea, which may be a trade relationship, a sanctioning relationship, or both) in the regression model. To control for variables that may affect North Korea's imports and exports, I added four control variables: North Korea's GDP, North Korea's population, Partner's GDP, and Partner's population. GDP is a continuous variable, and population is a discrete variable.

<Table 6> Explanation of Variables

Type	Name	Unit	Data Source	
Dependent Variables	Export (Partner's export to North Korea)	US\$ 1000, logged	WTO ITC	
	Import (Partner's import from North Korea)	US\$ 1000, logged	Trade Map	
Independent Variables	UNSC 1718	Dummy Variables	Security Council Committee established pursuant to resolution 1718	
	UNSC 1874			
	UNSC 2087			
	UNSC 2094			
	UN Sanctions UNSC 2270			
	UNSC 2321			
	UNSC 2356			
	UNSC 2371			
	UNSC 2375			
	UNSC 2397			
	NKSPEA (2016)			US Congress
	OWA (2019)			
	13722 (2016)			
US Sanctions 13810 (2017)	Dummy Variables	Federal Register		
BDA (2005)				
BD (2017)				
ABLV (2018)				
Control Variables	North Korea GDP	US\$ 1000, logged	UN Stat	
	North Korea Population	People, logged		
	Partner GDP	US\$ 1000, logged		
	Partner Population	People, logged		

Source: Own elaboration

5. Methodology

This paper aims to examine the effectiveness of the US secondary sanctions against North Korea. The main research question is whether secondary sanctions have affected trade with North Korea. To analyze and estimate the effectiveness of the sanctions, this study examines how 203 countries traded with North Korea under the threat of sanctions from 2001 to 2020. The estimating equation is as follows:

$$Y_{i,t} = \beta_0 + \beta_1 UNSan_{i,t} + \beta_2 USSan_{i,t} + \beta_3 Z_t + \beta_4 C_{i,t} + a_i + \varepsilon_{i,t}$$

where $Y_{i,t}$ is any change in trade (imports and exports) with North Korea in country i , year t , compared to the previous year;

$UNSan_{i,t}$ is the UN sanctions against North Korea (primary sanctions);

$USSan_{i,t}$ is the US sanctions against North Korea (secondary sanctions);

Z_t is North Korea's country characteristics such as GDP and population;

$C_{i,t}$ is the partners' country characteristics such as GDP and population;

a_i represents country fixed effects; and

$\varepsilon_{i,t}$ represents the error term.

UN and US sanctions are dummy variables, with countries that implemented sanctions coded '1' and those that did not coded '0.' In the case of UN sanctions, I used implementation reports to the UN sanction committee as an indicator of whether a state implemented sanctions or not. On the other hand, US sanctions were coded '1' for all states, since US sanctions are enacted via domestic law and all parties must follow these laws when they trade with the United States. Meanwhile, this regression model added a cluster analysis for data correction. Number

of clusters is 183 of total 203 countries. This is because there are 20 countries did not trade with North Korea for 20 years: Chad, Djibouti, Equatorial Guinea, Iceland, Iraq, Kiribati, Libya, Liechtenstein, Marshall Islands, Micronesia (Federated States of), Monaco, Nauru, New Zealand, Panama, Republic of Korea, San Marino, Somalia, South Sudan, Turkmenistan, and Tuvalu.

This dataset uses the intuitions of intention-to-treat (ITT) method to solve the problem of countries that did not implement sanctions. ITT is a statistical concept that provides potential solutions to problems of non-compliance and missing outcomes (Gupta, 2011). It is the method for the experiment, however this paper used the intuitions of ITT to differentiate the results from the two datasets. The first is full data that supposes all 203 countries implemented sanctions against North Korea. In the full data set, all countries are coded '1' for the sanction variable, indicating that sanctions were implemented.

The other dataset consists of complier data. This reflects actual sanction implementation using the UN's implementation report data. Following the UN resolutions, a maximum of 111 countries have implemented sanctions. The second dataset uses the intuitions of Average Treatment Effect on the Treated (ATT) model, referring to the treatment effect for those who received treatment in practice (Garrido et al., 2016). In the complier data, countries are coded '0' if they did not implement sanctions or '1' if they did for each sanction variable. ITT and ATT are the statistical methods used to check whether each country effectively imposed sanctions against North Korea. These are among the most popular methods to study the effect of specific treatment by comparing a treated group and an untreated group (Gupta et al., 2021; Garrido et al., 2016; Armijo-Olivo et al., 2009).

Meanwhile, this paper also used regression models' interaction effects to describe how the countries respond to sanctions. I divided 203 countries into four classes, cooperator, oppressor, outsider, and troublemaker. (See <Table 5>)

6. Findings

<Table 7> shows correlations between sanctions and trade with North Korea. I used four models to check the impact of the sanctions. Column (1) shows how sanctions would affect partners' exports to North Korea supposing that all the states implemented sanctions (full data). Column (2) demonstrates sanctions' influence on partners' exports to North Korea using actual sanction implementation by each state in practice (complier data). Columns (3) and (4) follow the same logic as columns (1) and (2), respectively, except that they address the changes to partners' imports from North Korea.

This model covers four types of trade changes, and it is a useful analytical model to assess sanctions' impact on trade with North Korea. The sanctions' impact could vary depending on their implementation, because some states could maintain trade with North Korea despite the sanctions being imposed. This paper takes this characteristic of sanctions into account and attempts to determine how the sanctions affect North Korean trade by assessing how sanctions are implemented.

The results show that the UN sanctions have been more effective at stopping trade with North Korea. Columns (2), (3), and (4) demonstrate a statistically significant negative association between UN-level sanctions and North Korean trade. Both UN and US sanctions had a negative influence on trade. However, for US sanctions, only Column (1) has a statistically significant result. This result supports previous findings that multilateral sanctions such as UN sanctions are more effective than unilateral sanctions (Drezner, 2000, 2003). Thus, this analysis rebuts past discussions that have implied that unilateral approaches are more effective at achieving the goals of sanctions (Hufbauer et al., 1990). <Table 7> shows that secondary sanctions did not work more effectively than primary sanctions. As previous studies have also found, multilateral sanctions by the UN are effective. Secondary sanctions are limited

in their ability to stop trade with North Korea.

The literature has argued that UN sanctions only have a significant effect on imports (Jung & Lee 2021), however, this study also finds a meaningful impact on exports, as seen in Column 2. Interestingly, Column 2 addresses complier data based on independent verification of states' implementation of sanctions, and among the export data, only Column 2 is statistically significant. This could be interpreted as an indication that tracking the implementation of sanctions is crucial. This was also the case in previous findings that UN sanctions were effective (that is, partners' exports to North Korea decreased) only among states that implemented the sanctions (Jeong, 2019), and as Column (2) demonstrates, sanctions were effective only for the complier data.

Meanwhile, The North Korean population has continued to grow with the time trend. Since this study does not have a year fixed effect, it can be interpreted that the impact of the North Korean population in <Table 7> was reflected because the population itself has a linear time trend. The same applies to <Table 8>.

<Table 7> Correlation Between Trade with North Korea and Sanctions

Fixed-Effect Models				
	Export_Full	Export_Complier	Import_Full	Import_Complier
	(1)	(2)	(3)	(4)
UN Level	-0.042	-0.221**	-0.139*	-0.278***
	(0.058)	(0.070)	(0.054)	(0.072)
US Level	-0.157*	-0.095	-0.019	-0.027
	(0.075)	(0.062)	(0.063)	(0.060)
NK GDP	0.142	0.115	0.485	0.317
	(0.567)	(0.562)	(0.560)	(0.554)
NK Population	-16.379	-11.744	-24.442**	-22.785**
	(8.926)	(7.995)	(8.306)	(7.323)
Partner GDP	0.632	0.586	1.336**	1.362**
	(0.377)	(0.352)	(0.448)	(0.421)
Partner Population	2.542	2.087	3.782*	3.105*
	(1.785)	(1.613)	(1.375)	(1.209)
R ²	0.640	0.645	0.613	0.623
Adj. R ²	0.617	0.623	0.588	0.599
Num. obs.	3181	3181	3181	3181
RMSE	2.322	2.304	2.187	2.159
N Clusters	183	183	183	183

*** p < 0.001; ** p < 0.01; * p < 0.05

A crucial task is to find North Korea's biggest trading partner and determine the impact of sanctions on trade between the two. That is because this third party could greatly increase or decrease the effectiveness of the sanctions depending on whether or not it complies with their implementation. In particular, since North Korea has a massive dependence on China, China's participation could greatly influence whether sanctions are effective (Han, 2021; Haggard, 2016; Jones, 2015; Noland, 2009). Whether China really wants to implement sanctions is a subject of debate (Kim, 2014).

On this note, this paper uses an expanded model to check China's influence. <Table 8> shows how sanctions affect exports and imports with China excluded. There is no significant difference between <Table 7> and <Table 8>, indicating that China has recently taken a tougher position toward North Korea and loosened its protective attitude with regard to UN sanctions, as others have found (Li & Kim, 2020). In addition, this finding strengthens the argument that the China–North Korea relationship is only a lukewarm one, and China has effectively implemented sanctions against North Korea (Xiao, 2015).

These findings contrast with those of previous studies that did find a statistically significant difference when China's trade with North Korea was included versus excluded, which indicated that China's behavior does influence North Korean trade (Jung & Lee 2021). In this analysis, China participated in sanctions against North Korea, and the results from <Table 8> conflict with the argument that China is unwilling to abandon North Korea (Taylor 2013).

There are two probable reasons why the findings in <Table 8> differ from the existing literature. First, the previous findings were based on older data. For example, one study was based on data from 2000 to 2013 (Taylor, 2013) and another on data from 2001 to 2017 (Jung & Lee, 2021), thus both missed the effectiveness of the sanctions implemented since 2018. It is interesting because the UN sanctions in 2017 have been described as the strongest sanctions

to date (United States Mission to the United Nations, 2017; Whang, 2022) while the US secondary sanctions have mainly been enforced since 2016. Given that it may take three to four years to observe whether sanctions succeed (Whang 2016), these past studies would have missed the impact of these particular sanctions.

Second, Covid-19 also affected North Korean trade. China's exports to North Korea in 2020 were valued at 491 million USD, down from over 2.5 billion USD in 2019. China's imports from North Korea in 2020 were worth 48 million USD, down from 215 million USD in 2019. It is difficult to determine the effectiveness of the sanctions because North Korea closed its borders due to the coronavirus. There was a huge trade reduction from all states, including China, which could interfere with assessments of the sanctions' impact.

This paper adds more recent data since 2017 and argues that further discussion of China's implementation of sanctions may be needed. Since 2017, the UN Security Council has increased the level of its sanctions on North Korea (with the UN sanctions in 2017 recognized as the strongest sanctions yet), and the US has begun to enforce secondary sanctions targeting third parties' transactions with North Korea. These factors have contributed to the change in China's attitude and enabled China to implement sanctions actively.

<Table 8> Correlation Between Trade with North Korea and Sanctions (Without China)

Fixed-Effect Models				
	Export_Full	Export_Compiler	Import_Full	Import_Compiler
	(1)	(2)	(3)	(4)
UN Level	-0.046	-0.226**	-0.142**	-0.280***
	(0.059)	(0.071)	(0.054)	(0.073)
US Level	-0.156*	-0.097	-0.014	-0.026
	(0.076)	(0.062)	(0.064)	(0.061)
NK GDP	0.153	0.126	0.475	0.309
	(0.573)	(0.567)	(0.566)	(0.560)
NK Population	-15.735	-11.021	-24.250**	-22.538**
	(8.953)	(8.005)	(8.367)	(7.372)
Partner GDP	0.573	0.513	1.321**	1.331**
	(0.384)	(0.354)	(0.463)	(0.434)
Partner Population	2.630	2.186	3.805*	3.148*
	(1.799)	(1.617)	(1.390)	(1.217)
R ²	0.640	0.645	0.613	0.623
Adj. R ²	0.617	0.623	0.588	0.599
Num. obs.	3181	3181	3181	3181
RMSE	2.322	2.304	2.187	2.159
N Clusters	183	183	183	183

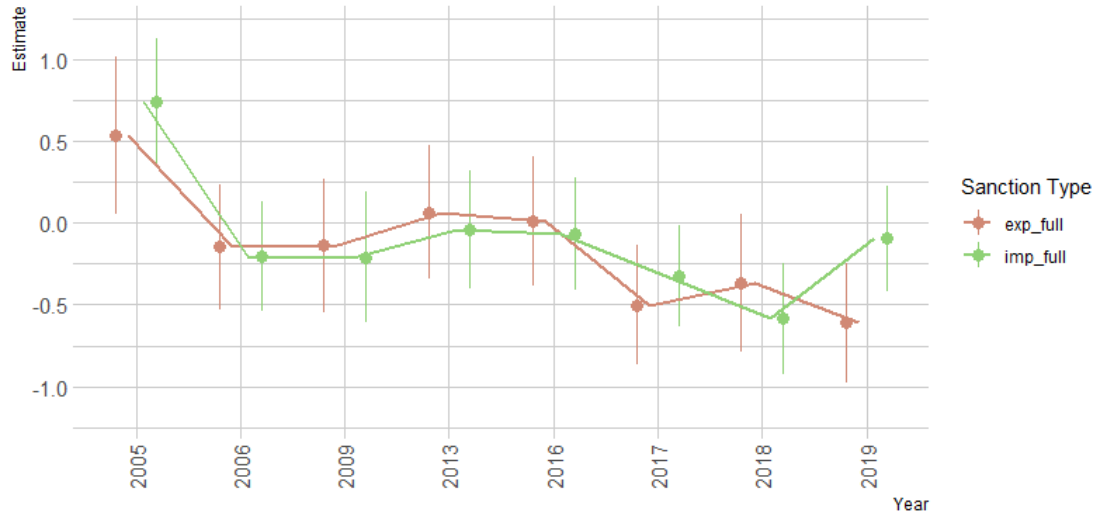
*** p < 0.001; ** p < 0.01; * p < 0.05

<Figure 5> shows how sanctions affected North Korea's annual exports and imports from 2001 to 2020 as successive sanctions were imposed. To show the effectiveness of the sanctions by year, I used full data for <Figure 5>. The full data supposes that all states implemented the sanctions. In <Figure 5>, exp_full stands for partner's export to North Korea within the full data, and imp_full stands for partner's import from North Korea within the full data.

All the sanctions imposed in a specific year showed the same effectiveness. For example, in 2017, the UN Security Council imposed resolutions 2356, 2371, 2375, and 2397, and the US published Executive Order 13810 and implemented secondary sanctions on the Bank of Dandong. In the full data, all the sanctions in 2017 were coded '1' so that each sanction showed an equal value of the coefficient estimate in the regression model. I described the sanctions' effectiveness by year, combining the impact of all sanctions that were adopted in a certain year.

<Figure 5> shows the consistent trend of the sanctions' impact. Since 2005 (when sanctions were first imposed on North Korea), nearly every time new sanctions have been imposed, they have had a more substantial effect than those in years before. However, there was a slight increase in the coefficient estimates in 2013 (when UNSCR 2087 and 2094 were imposed), demonstrating that these sanctions had less of an impact on trade than the previous sanctions. Until 2016, sanctions against North Korea had a greater effect on imports than on exports. However, this trend changed beginning in 2017, and except for 2018, exports have been more affected than imports. The US secondary sanctions that have been actively imposed since 2016 may have affected partners' exports to North Korea.

<Figure 5> Estimation Results of Sanctions' Effectiveness and Trend
(By Year Sanctions Were Imposed)

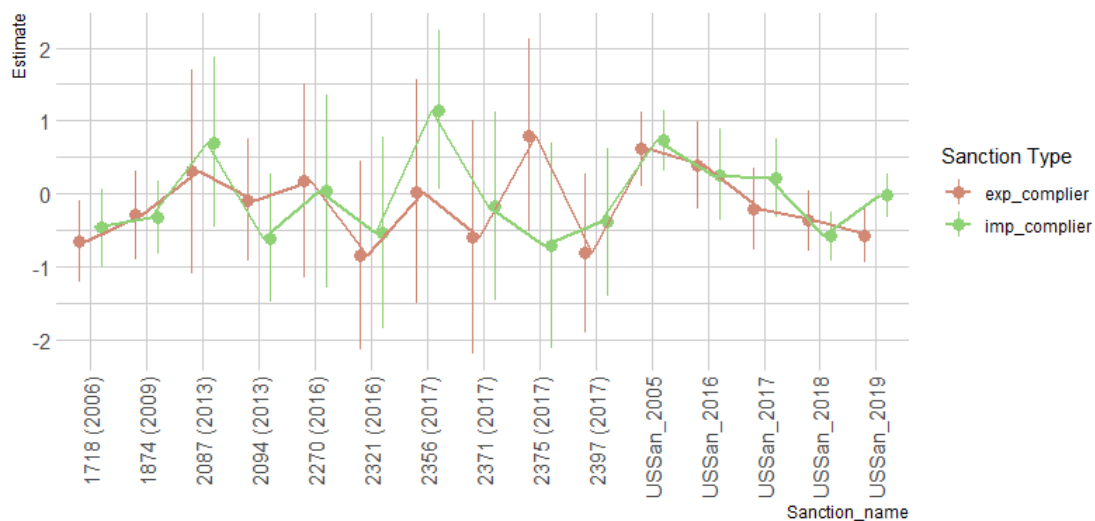


<Figure 6> shows the influence of sanctions on North Korean trade by sanction type. It covers all the sanctions against North Korea and measures their effect on exports and imports. I used complier data for <Figure 6>, exp_complier stands for partner's export to North Korea within the complier data, and imp_complier stands for partner's import from North Korea within the complier data.

The complier data enables the tracking of sanction implementation so that it is possible to capture how individual sanctions have affected trade. In the case of US sanctions, it is not possible to demonstrate the impact of each sanction since they are all enforced under US law, and all states must comply when trading in the US or using the US dollar (on the other hand, the implementation of UN sanctions differs by sanction type, and can be assessed using the implementation reports to the UN committee). On this note, <Figure 6> addresses individual UN sanctions, such as resolutions 1718, 1874, 2087, 2094, 2270, 2321, 2356, 2371, 2375, and 2397. The US sanctions are labeled USSan_2005, USSan_2016, USSan_2017, USSan_2018, and USSan_2019.

<Figure 6> shows the complex trend in sanctions' impacts. In particular, UNSCR 2087 and 2356 were associated with relatively significant changes in the estimate, showing that the sanctions' impact decreased compared to earlier sanctions. This could be related to the implementation of the sanctions. As <Figure 2> shows, the above two resolutions are the sanctions in which the fewest countries participated (29 and 16 countries submitted implementation reports, respectively). Note that <Figure 6> contrasts with the findings from <Figure 5>, which show that secondary sanctions may have affected partners' exports to North Korea. UNSCR 2397 had the greatest influence on exports.

<Figure 6> Estimation Results of Sanctions' Effectiveness and Trend
(By Sanction Name)

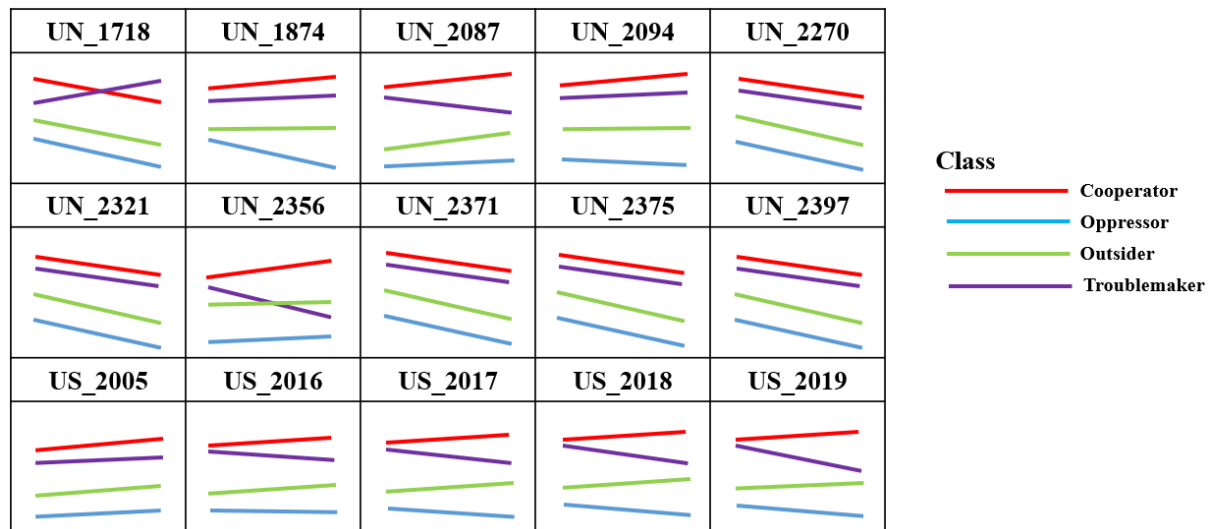


<Figure 7> shows predicted values of partner's export. The trend line stands for how the countries manage their export to North Korea when the sanctions are imposed ('1') compared to the no sanctions ('0'). Appendix 1 describes all the interaction plots and more details. This result is meaningful since it is in line with the previous findings that North Korea wants to lift

sanctions, UNSCR 2270, 2321, 2371, 2375, and 2397 (Lee, 2022).

Although the UN sanctions initially had a large variation, they began to show a consistent decline after UNSCR 2270, indicating that it significantly impacted North Korea. On the other hand, US sanctions affecting troublemaker has been increasing since 2016. That China is a representative troublemaker proves secondary sanctions contribute to China's participation in sanctions.

<Figure 7> Predicted Values of Partner's Export by Class

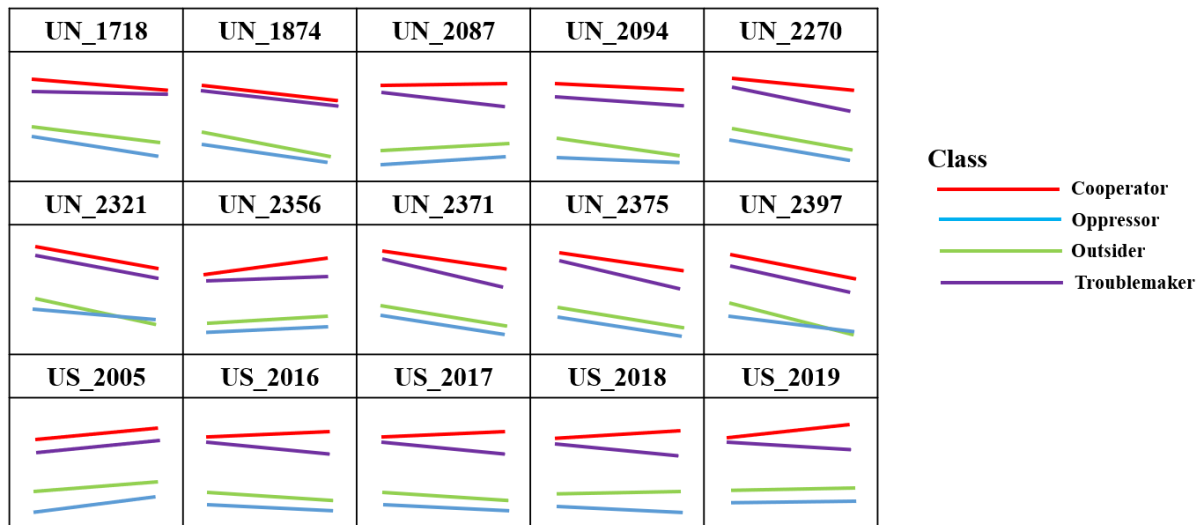


<Figure 8> shows predicted values of partner's import. Appendix 2 describes all the interaction plots and more details. <Figure 8> also proves that UNSCR 2270, 2321, 2371, 2375, and 2397 are effective sanctions, showing that consistent decrease in partners' imports from North Korea. However, it shows different results in US sanctions. Unlike the <Figure 7> showing that US sanctions have contributed to countries' participation in sanctions, there is no significant change in imports.

This result contains two possible interpretations. First, there is no more import to be reduced. Previous sanctions already imposed maximum restrictions on the import, so there is

not enough space for US secondary sanctions to work. Second, US sanctions could not secure effectiveness on imports. As <Figure 7> supports, secondary sanctions affected the partner's export to North Korea. However, <Figure 8> provides evidence of the possibility that secondary sanctions are ineffective to import.

<Figure 8> Predicted Values of Partner's Import by Class

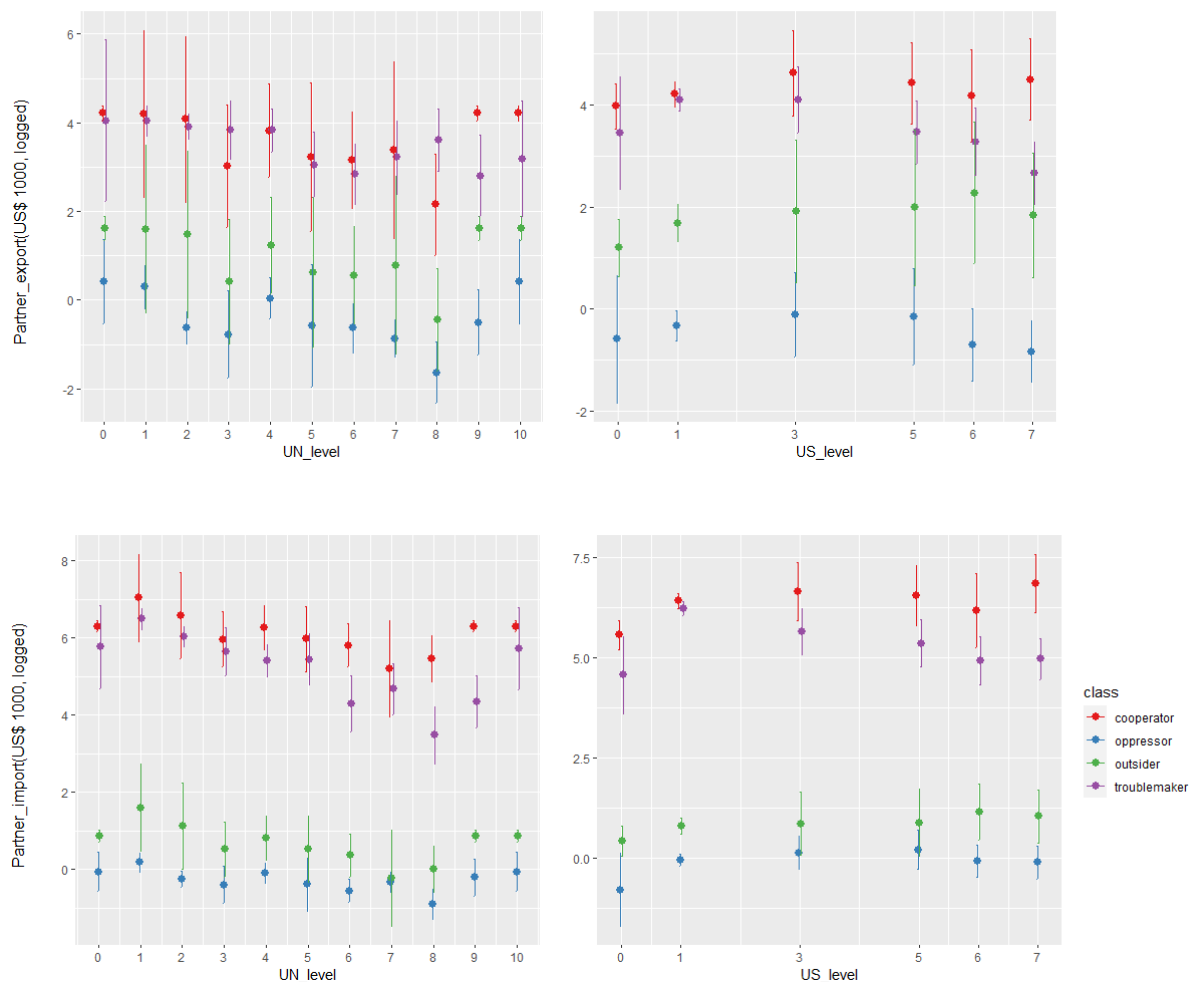


<Figure 9> shows large variation. It is difficult to predict how the countries will respond to the sanctions. This result differs from <Figure 7> and <Figure 8> which showing clear trend. That is because they focused on individual sanctions, not overall ones. It describes the importance of case study of individual sanctions to check their effectiveness more sensitively.

Meanwhile, the level of sanctions did not secure the partner's reduction or pause of trade. The higher the intensity of the sanctions, the more actively they were expected to participate. However, there were no significant relations between sanctions and trade. On the other hand, the partner's import shows a relatively consistent decrease when the sanctions level increases. It provides empirical evidence that partners are more willing to change their attitude toward imports than exports.

There is other evidence to support the previous finding. Import shows a clear gap between classes compared to export. Outsider and oppressor countries are unwilling to trade with North Korea. It shows partners feel a more considerable burden on imports than exports. The reason why this result can come out is a new research design. I divided trade into export and import and compared sanctions effectiveness by class to check the different responses from partners.

<Figure 9> Predicted Values of Partner's Export and Import by Class
(Sanction Level)



7. Discussion and Conclusion

This paper examines the effectiveness of secondary sanctions empirically. It shows that secondary sanctions have not been effective, and UN sanctions are still a useful tool. This is fascinating because the US imposed new sanctions to complement the primary sanctions programs; however, the multilateral sanctions worked more effectively. This paper provides policy implications for the management of sanctions programs by the international community and the US.

Research dealing with sanctions against North Korea and trade faces two problems. The first is the question of the effectiveness of sanctions. Sanctions against North Korea consist of UN sanctions and US secondary sanctions. With UN sanctions already affected, it may be difficult to measure the effectiveness of US sanctions. However, as <Figure 7> shows, it confirmed that US sanctions have a more significant impact over time. Although this study concluded that UN sanctions were more effective, further research will be needed because it takes about four years to observe successful sanctions (Morgan et al., 2000).

The second question is the question of the reliability of trade data. North Korea's trade data is challenging to secure reliability for several reasons. First, there may be countries that submit false data, and there may be cases where trade with North Korea has been conducted more. In this situation, the meaning of this study, which measured the effect of sanctions, is as follows. This study showed that North Korea's trade decreased due to sanctions. If some countries traded more with North Korea, a more significant effect size could be expected because this study has already proved the impact of sanctions on trade.

In 2022, North Korea launched an ICBM and prepared for its 7th nuclear test. Previous experience suggests that the UN will adopt new sanctions following this nuclear test, and the US will propose new types of secondary sanctions. This paper's findings suggest that the

United Nations sanctions are more effective than US secondary sanctions. It is critical that China and Russia be persuaded to agree on the new resolutions. If US sanctions are not effective, the US should convince other states to participate in the implementation of the UN sanctions.

Sanctions are not an all-in-one solution to the problem of North Korea. The country has continued to develop its nuclear weapons under the sanction's regime. It is time to consider other policy tools that may help achieve nuclear nonproliferation. It has been said that "despair gives courage to a coward." Continuing and strengthening sanctions have brought despair to North Korea, but the country shows no sign of backing down from developing nuclear weapons.

This paper has implications for current international affairs. Sanctions are popular economic statecraft in coercive diplomacy. Recently, the United States imposed sanctions against Russia after the outbreak of the Russia-Ukraine war. This study measured the effectiveness of the U.S. unilateral secondary measures through North Korea's case and found that UN sanctions were more effective. This result supports that sanctions are more effective when international organizations are sanction senders. It conveys the need to consider choosing senders when imposing sanctions in the future, as well as sanctions against Russia. Currently, the United States is leading the sanctions because the United Nations has not reached a multilateral agreement. However, a country's unilateral sanctions are not effective. This paper informs that international cooperation on sanctions has become more important.

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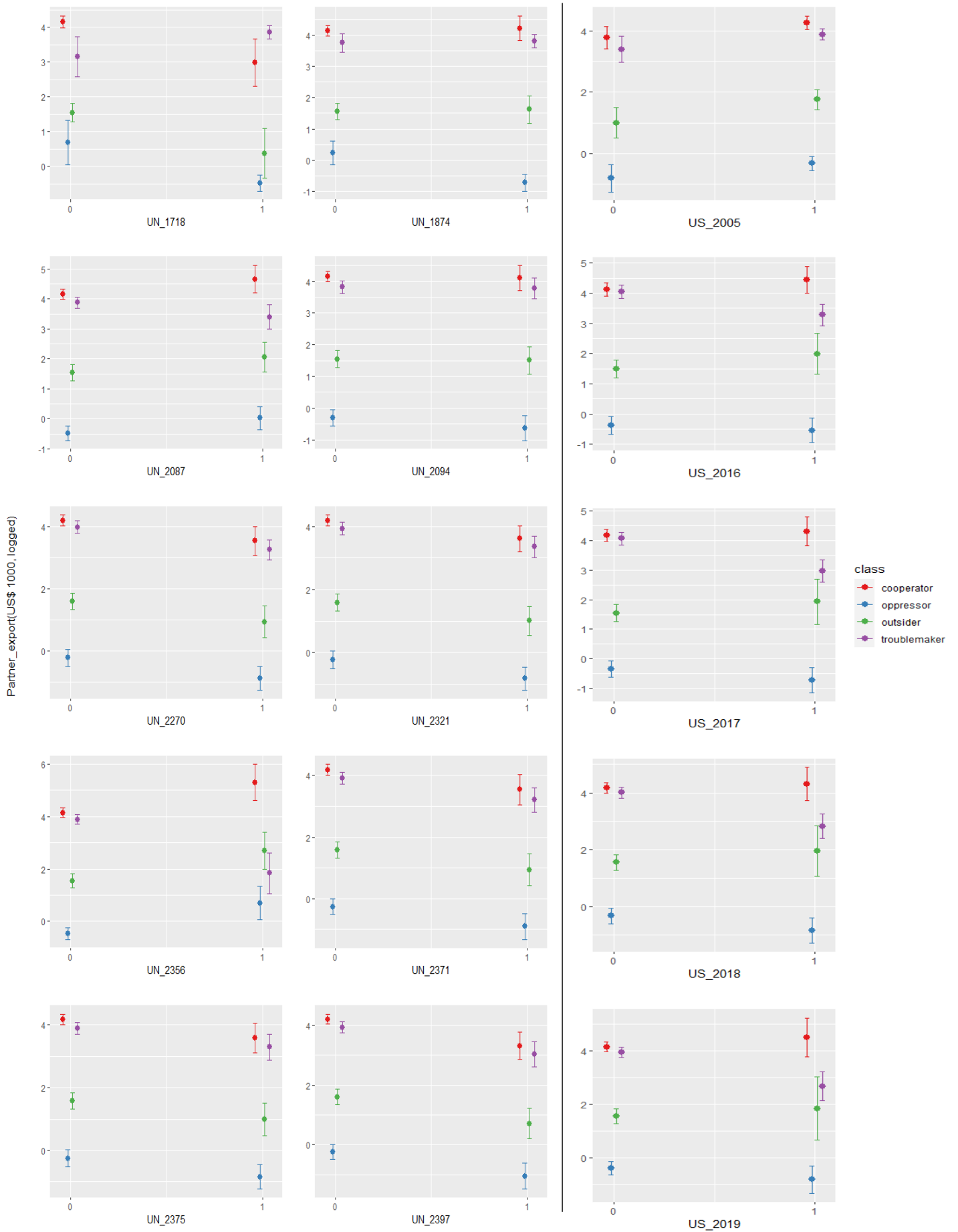
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Appendix 1



Appendix 2

