

Why does North Korea Commit Provocations?

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On April 27, 2018, at the third two Koreas summit in South Korea, the president of South Korea Moon Jae-in and the chairman Kim Jong Un promised to open a new path of peace. The two Koreas seemed to successfully handle problems between them. However, based on the previous behaviors of North Korea, we should not be too optimistic. The reason why I write this paper in this peaceful mood is that paying attention to national security is always worthwhile. Many scholars have found several reasons for North Korea's provocations against South Korea. However, there is a lack of empirical support regarding them. I try to test and find the reasons for North Korea's provocations. I use multivariate regression and Prais–Winsten regression to test my hypotheses. Domestic stability and power succession have statistically significant relationships with the number of provocations, but the results are quite mixed.

Keywords: South Korea, North Korea, provocations, USFK, Prais–Winsten regression

Introduction

The United States and South Korea held presidential elections in 2016 and 2017, respectively. In the U.S. presidential election on November 8, 2016, Donald Trump won over Hillary Clinton and was elected the 45th president of the United States with the most votes in Republican presidential history. In May 2017, Moon Jae-in won over Hong Joon-pyo and was elected the president of South Korea.

In the 2016 U.S. presidential election, Hillary Clinton and Donald Trump showed distinct differences in domestic politics; while Hillary had a positive stance on maintaining Obamacare¹ and embracing immigrants,² Trump showed a negative stance on those issues. Trump now runs some of his commitments. Hillary and Trump laid a

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clear confrontation on domestic policies. However, they had a very similar opinion on the foreign policies toward the Korean Peninsula: Hillary insisted on a high-intensity policy against North Korea beyond the Obama administration's strategic endurance; likewise, Trump argued that the United States must review the U.S.–South Korea FTA contract totally by saying “Make America Great Again.” Finally, president Trump and president Moon Jae-in signed a revised version of the FTA in September 2018.³ Moreover, Trump criticized South Korea's security free riding and insisted that South Korea should cover all the expenditures for the United States Forces Korea (USFK).

Trump's hard-line stance, which continued after he was elected as the president of the United States, has changed dramatically since April 2018. The Trump administration, which had even mentioned the assassination of Chairman Kim Jong Un, is trying to denuclearize North Korea through dialogue with it. Trump once described Chairman Kim Jong Un as “Rocket man.”⁴ By using aggressive terms, Trump tried to denounce Kim Jong Un. However, it changed dramatically after the North Korea–United States summit on June 12, 2018. At the UN speech, Trump praised the effort of Chairman Kim Jong Un.⁵ On the other hand, Trump blamed Iran. Moreover, North Korea decided to discontinue its nuclear test and intercontinental ballistic missile (ICBM) tests and to dismantle its northern nuclear test center at the meeting of the Labor Party on April 20.⁶

After the PyeongChang Winter Olympics, the dialogue between North Korea and the United States and the Pyongyang performance of the South Korean artist group may be a signal of a change in the attitude of North Korea. However, North Korea cannot be judged only by superficial actions. For example, North Korea joined the Nuclear Non-Proliferation Treaty (NPT) in 1985 and participated in the denuclearization of the Korean peninsula, but later denied the inspections of the International Atomic Energy Agency (IAEA) and did not implement the Treaty.⁷ North Korea eventually withdrew from the NPT in 2003.

If North Korea possessed a regime that is sensitive to the will of its people, like democratic regimes in other countries, it would be easier to accept denuclearization negotiations with the United States at face value. However, North Korea maintains a dictatorship, not a democracy in which politicians have to follow or listen to the will of the people in order to be re-elected. While the United States and South Korea move to maximize their own interests, North Korea behaves in order to maintain the Kim Dynasty.

Nuclear weapons and ICBM are very efficient weapons for North Korea because they can be used for regime maintenance and negotiation cards. Furthermore, North Korea continued to test missiles in 2016 and 2017.⁸ Given the fact that North Korea conducted its fifth and sixth nuclear tests on September 9, 2016 and September 3, 2017, respectively, North Korea's recent changes in behavior should be judged more carefully.

North Korea's provocations, including nuclear tests, have continued regardless of peace treaties. In this paper, I try to find factors influencing the number of provocations committed by North Korea. In addition, I discuss how South Korea should defend its national security against North Korea even during the peaceful mood among the United States, South Korea, and North Korea

Literature Review

There are various reasons for the increase and decrease in the number of provocations of North Korea. First, the alliance between South Korea and the United States can affect North Korea's provocations. It was during the Korean War lasting from 1950 to 1953 that U.S. troops began to station in South Korea.⁹ The U.S. troops have stayed in South Korea because it can act as a buffer state between the United States and China.¹⁰ The alliance with the United States has played an important role for South Korea to alleviate the security crisis burden since the Korean War. Since the end of the Korean War, the number of the USFK has reduced continuously. As a side effect of the USFK and a series of events, anti-American sentiment has grown. In 2002, the deaths of two students killed by a U.S. tank maximized people's anger toward America and USFK.¹¹ Moreover, in the same year, lots of people attended candlelight vigils to protest against some provisions in South Korea's Status of Forces Agreement (SOFA) with the United States.¹² Such anti-American sentiment negatively influenced the sentiment against the USFK. The residents of Pyeongtaek demonstrated their displeasure when the USFK moved to Pyeongtaek.¹³ The debate on the withdrawal of the USFK has continued steadily since the 1980s.¹⁴ Discussions on the impact of the USFK on North Korea's provocations have also continued. However, there is a lack of statistical evidence about the influence of the USFK on the number of provocations. In this paper, I will check the influence of the USFK on North Korea's provocations by using several statistical models.

Second, the conservative and progressive parties' North Korea policies could also have some impact on North Korea's provocations. Presidents from the progressive party, Kim Dae-jung and Roh Moo-hyun, implemented a policy of appeasement represented by the "Sunshine Policy" against North Korea.¹⁵ The "Sunshine Policy" was started by the Kim Dae-Jung administration in 1998 with the purpose of bringing about North Korea's denuclearization through economic aid and dialogue. For that, President Kim Dae-jung was awarded the Nobel Prize, but there is no consensus about its effectiveness.¹⁶ Roh Moo-hyun also followed the direction of the "Sunshine Policy."¹⁷ On the other hand, President Lee Myung-bak from the conservative party declared "Denuclearization, Openness, 3000 Vision" as his foundation for North Korea policy. "Denuclearization, Openness, 3000 Vision" is that if North Korea preempts its nuclear dismantlement and shows openness, South Korea will provide economic support to North Korea to boost its GDP per capita to around US\$3,000. However, this policy toward North Korea also experienced many challenges.¹⁸ To be specific, the Lee administration opposed rewarding North Korea.¹⁹ The former president Park Geun-hye implemented the "Trust process" which was meant to build trust between the two Koreas as a prerequisite for peaceful reunification.²⁰ The conservative and progressive parties' policies against North Korea have had much controversy centering on their effectiveness. Despite its various policies, North Korea has been working hard to develop nuclear weapons and constantly provoking South Korea.

Despite the above academic efforts from many scholars, there is insufficient statistical evidence supporting the arguments. The previous studies discussed above

mainly discuss the effectiveness of policies toward North Korea on denuclearization. In this paper, I will focus on the effect of the USFK and the ruling party's direction about North Korea policies on the number of North Korean provocations based on the above studies. In addition, I will analyze various other factors that could affect the number of North Korean provocations.

Theory

Since the end of the Korean War, North Korea has continuously provoked South Korea. Some people and news articles argue that this is because North Korea is not a rational actor in international politics. However, if we view North Korea as an irrational actor, it becomes more difficult to predict or analyze its behavior. Therefore, I assume that North Korea is a rational actor and there are always some reasons behind the behavior of North Korea. However, unlike democratic regimes, North Korea is led by Kim Jong Un's dictatorship. Thus, North Korea's first goal in international politics is not to maximize its own interests but to maintain the Kim Dynasty.

Based on this top priority, what North Korea wants to achieve through provocations against South Korea can be summarized as follows. First, the procurement of food that can sustain its military is a possible achievement of using provocations. North Korea suffered wretchedly from famine in the early 1990s and this famine killed nearly five percent of the entire population of North Korea.²¹ This food shortage problem in North Korea has continued and seems to be difficult to solve. The Food and Agriculture Organization of the United Nations included North Korea in the thirty-seven countries that need international aid because of food crises. This food shortage can severely threaten the lives of people in North Korea and lead to the criticism of Kim Jong Un. Therefore, North Korea will try to solve this problem in order to evade that kind of criticism.

Hypothesis 1: The number of provocations of North Korea will increase when it suffers from a food shortage.

Second is the release of economic containment policies. As North Korea continued to develop nuclear weapons in the early 2000s, the United States sought to curb North Korea's nuclear weapons development through isolation policies including economic sanctions.²² Even though China was reluctant to agree with the strategy of the United States because it could cause refugee problems, China agreed to the economic sanctions.²³ In 2017, the maritime blockade was also considered a more effective isolation policy than simple economic sanctions because of the geographical position of the Korean Peninsula. Despite these isolation policies, North Korea is still developing nuclear weapons. Even though the questions of effectiveness have been raised, the economic sanctions at least give pressure to North Korea because China is responsible for most of the North Korean economy. Therefore, the release of the economic sanctions can be a goal of North Korea's provocations.

Hypothesis 2: The number of provocations of North Korea will increase when the number of economic sanctions increases.

Third, a possible purpose of North Korea's provocations is to resolve domestic instability. If there is instability in the country, North Korea can use provocations to bind its people together and direct their attention and blame abroad. A "rally round the flag" effect, which means people give more support to the government when the government is involved in international conflict, is well studied by Lai and Reiter.²⁴ This "rally round the flag" effect can occur in other situations or in other countries. For example, Toyotomi Hideyoshi invaded the Korean peninsula after the unification of Japan to consume military power and resolve complaints in 1592. North Korea can also try to control the complaints of its people by showing the military power of the Kim Dynasty to the people through provocations. Therefore, the resolution of domestic political instability may also be the reason why North Korea uses provocations.

Hypothesis 3: The number of provocations of North Korea will increase when domestic instability in North Korea increases.

Finally, a possible purpose of provocations of North Korea is to stabilize authority after the succession of power. A dictatorship like the one in North Korea is likely to collapse in the power succession phase. The Kim Dynasty secured the legitimacy of the regime by deification of Kim Il Sung, which is so severe that people will face harsh punishment if they do not hang a picture of Kim Il Sung in their house or if dust accumulates on his picture. The deification of Kim Il Sung played an important role in establishing the foundations of the dictatorship in the early days of the Kim Dynasty. However, the deification of Kim Il Sung was a problem after the succession of power to his son, Kim Jong Il. Kim Jong Il changed his style and increased his body weight to resemble his father. Kim Jung Un also displayed the same tradition. Succession of power is accomplished by purging those who follow the former power. The provocation of North Korea can therefore be taken as preventing the division of power at the time of power succession and to emphasize the power of the new dictator.

Hypothesis 4: The number of provocations of North Korea will increase when there is a power succession.

North Korea's provocations may be due to other reasons as well as the reasons above, but in this paper, I will analyze the above reasons because they are often mentioned as the main reasons for North Korea's provocations.

In order to explain North Korea's provocations, it is necessary to consider in what circumstances North Korea will choose provocations as its foreign policy. When countries implement foreign policies, they always weigh the costs and benefits. North Korea also determines its policy through the calculation of costs and benefits of provocations.

North Korea wants to achieve its goals through provocations. However, there is always a huge risk: the collapse of the Kim Dynasty. In other words, even when North Korea provokes to get what it wants, it does not want to be directly attacked by other countries including South Korea and the United States as a result of the provocations. Thus, North Korea will carefully calculate the probability of this kind of attack. North Korea will be most concerned about the possibility of the U.S. military response, because the United States has a powerful military force and technology including missiles and vehicles compared with those of South Korea.

That is why North Korea has no choice but to worry about the USFK because the USFK can be a threat to North Korea and if the United States has an intention to attack or react harshly against North Korea's provocations, the USFK will be the first military force to be used because of the geographical distance from the continental U.S. Therefore, the USFK affects the calculation of North Korea. If many U.S. troops are dispatched to the USFK, the possible subsequent military retaliation will harm North Korea severely. Therefore, North Korea must be sensitive to the number of the USFK.

Hypothesis 5: If the number of the USFK increases, the number of provocations by North Korea will decrease.

In the next data and method section, I will explain the data sources I use for the empirical test for the above hypotheses and method for controlling autocorrelation.

Data

In this section, I will talk about how I operationalize the concepts in the hypotheses, such as provocations, economic sanctions, food shortages, power succession, and the number of the USFK. Moreover, I will deal with the possible datasets and databases that I can use and the reason why I picked those to test my hypotheses.

Dependent Variable: Number of Provocations

In order to test the hypotheses, I have to define what provocation is. There are several types of provocation that North Korea used. First, North Korea used raw criticism and profanity against South Korea and the United States through its own media and presentation to the international community. These types of provocations do not directly cause harm to other countries including South Korea and the United States, but it sometimes promotes unrest in the international community. Second, North Korea commits provocations causing direct conflicts against South Korea and the United States, such as territorial incursion, exchange of fire, infiltration, assault, assassination attempts, hijacking aircraft or ships, bombings, ambush, etc. Those kinds of provocations directly hurt South Koreans and Americans or both. The last type of provocation that North Korea has used is a missile or nuclear test, such as the short-range ballistic

missile launch in 1984, the intermediate-range ballistic missile launch in 1998, the intercontinental ballistic missile launch in 2006, the nuclear test in 2009, etc.²⁵ These North Korean experiments are the main provocations that can infringe upon the United States' national security as well as South Korea's.

In this paper, I will concentrate on the second and third types of provocation. In other words, if the provocations from North Korea can have a substantial effect on the national securities of South Korea and the United States, I will include them in the category of provocations. In addition, it is hard to count the first type of provocation because the intensity of criticism can be different from one word to another. Moreover, data over time is not available.

There are two possible databases that I can use to count the number of the second and third types of provocations. One database is from the Center for Strategic & International Studies (CSIS).²⁶ This data collection counts the number of provocations and the U.S.–ROK Military Exercises from 1958 to 2017. The other is the Militarized Interstate Dispute (MID) data collection version 4.²⁷ It ranges from 1816 to 2010. Military interstate dispute is defined as “the threat, display or use of military force short of war by one member state is explicitly directed towards the government, official representatives, official forces, property, or territory of another state.”²⁸ MID data also fit with the second and the third types of provocation used by North Korea. I will use those two databases together to check robustness because the number of provocations counted by two CSIS and MID databases is quite different.

Independent Variables

I include several independent variables that can influence the number of provocations from North Korea in statistical models. In the following sections, I explain the series of independent variables included in the models.

The Number of USFK

The first independent variable is the number of the USFK. However, it is not accurate. In 2008, South Korea and the United States agreed to maintain the number of the USFK to 28,500 and it is still valid. I use two datasets for getting the information about the number of the USFK in this paper. The first one is a dataset from Christine Ahn and Hyun Lee.²⁹ In their dataset, the number of the USFK is 28,500 from 2006 to 2013, 29,300 in 2014, and 23,468 in 2017. There is no data from 2015 to 2016.

The other dataset is from the Base Structure Report annually published by the Department of Defense. In this dataset, the number of the USFK is 32,422, 29,477, 28,356, 27,968, 26,305, 31,839, and 37,354 from 2006 to 2012, respectively. Except for those years, the number of the USFK from both datasets is the same. There is no data about the number of the USFK after 2013. As such, there are differences in the number of the USFK among datasets. Therefore, I will try to use them separately. I will use the Christine Ahn and Hyun Lee data independently. Secondly, I will use data that replaced

the number of the USFK with the Base Structure Report data since 2006.

Power Succession

The second independent variable is power succession. At the time of power succession, North Korea sometimes tries to do provocations to stabilize the Kim Dynasty. In this paper, I use a dummy variable to test the influence of power succession on the number of provocations. ‘1’ shows that there is a power succession in that year. ‘0’ shows that there is no power succession. Therefore, 1994 and 2011 are represented as 1 because there are power successions in those years.

Domestic Stability

The third independent variable is domestic stability. Measuring the domestic stability of North Korea is hard because of the scarce information about North Korea. There is barely any data that shows the domestic stability of North Korea. To my best knowledge, only V-Dem data version 7³⁰ shows political stability of North Korea. In V-Dem data version 7 “Political Stability” measured by several indicators which measure perceptions of the possibility that the government in power will be destabilized or overthrown by possibly unconstitutional and/or violent means, including domestic violence and terrorism.³¹ I use this dataset because there are no other alternatives and V-Dem data is widely used.

Economic Sanctions

The United Nations Security Council, the United States, and South Korea have imposed economic sanctions on North Korea since North Korea started to develop its nuclear missiles. Economic sanctions against North Korea started in 2006 by the United Nations Security Council. Even though China and Japan also tried to impose economic sanctions individually on North Korea, I do not include those sanctions because in the case of China, there is a close relationship between China and North Korea. Moreover, Japan has a very small share of North Korea’s imports and exports.³² Therefore, I will count economic sanctions against North Korea imposed by the United Nations Security Council, the United States, and South Korea. In addition to this, when counting economic sanctions, I count the number of economic sanctions cumulatively because economic sanctions have not been lifted since the first economic sanctions were imposed by the United Nations Security Council in 2006. When counting economic sanctions in this way, there is a limitation in that their relative ranges and degrees are not reflected. Nonetheless, the reason for counting economic sanctions in this way is that it is difficult to find precise criteria for its ranges and degrees, especially for the relationship between ranges or degrees and the extent of North Korea’s feelings of pressure.

Food Shortage

The last independent variable is food shortage in North Korea. Rice is the main food for Asian countries and North Korea is not the exception. Even though North Korea produces potatoes in addition to rice, rice is the staple food of North Korea. Therefore, I will use food production data provided by the Food and Agriculture Organization of the United Nations (FAO) dataset³³ which was newly published in 2018. It shows the rice production of North Korea from 1961 to 2016.

Control Variables

In order to deal with the omitted variable problem that can create an endogeneity problem, I use three control variables that can affect North Korea's provocations.

The first control variable that I use is GDP growth. Some scholars argue that when North Korea suffers from economic hardship, it uses provocations to control public dissatisfaction. Therefore, I include GDP growth in my dataset. The information about GDP growth in North Korea is quite limited compared with other countries because of the dictatorship. V-Dem data version 7 provides the information by estimating the GDP growth of North Korea. Even though I can use GDP per capita, I selected GDP growth as a control variable because North Korea uses GDP growth to propagate its legitimacy.

In addition to GDP growth, I include economic and food aid from the United States and South Korea as control variables. If North Korea uses provocations to get this kind of support, the aid from the United States and South Korea can influence the number of provocations of North Korea. Information on aid is more reliable than other data related to North Korea because South Korea and the United States publish their figures through government documents. Statistics about the aid from South Korea are obtained through the "Information system about aid for North Korea."³⁴ There is information about aid from South Korea to North Korea from 1995 to 2017 in units of one million Won. Moreover, I use data from the Congressional Research Service,³⁵ which contains aid information to North Korea from 1995 to 2013 in \$ million.

Furthermore, I use the Composite Index of National Capability (CINC) index.³⁶ CINC data combines six categories of important national data: total population of country ratio, urban population of country ratio, iron and steel production of country ratio, primary energy consumption ratio, military expenditure ratio, and military personnel ratio.³⁷ The reason why I include the CINC index as a control variable is that national capabilities can affect the possibility of military disputes among countries. Moreover, CINC data is calculated by considering the level of urbanization, population, and production of military-related resources. Therefore, I use this index as one of the control variables because it controls national capabilities that are not included in my hypotheses. Furthermore, I deduct South Korea's CINC from North Korea's CINC data to consider the relative national capabilities, because relative capabilities are more important than absolute capabilities when one country commits military disputes.

Finally, I add combined military drills of South Korea and the United States as a

control variable because it can influence the number of provocations from North Korea. When there is a combined military drill in or near the Korean peninsula, North Korea does not commit provocations because those provocations during combined military drills can cause the destruction of North Korea. This is because many military troops from the United States participate in combined military drills and state-of-the-art weapons are employed. The number of combined military drills between South Korea and the United States is obtained from the Center for Strategic & International Studies (CSIS).

Table 1 is a descriptive table for all variables that I use in this paper. The time period is from 1950 to 2017. As you can see, the number of observation of The Number of Provocations (CSIS) is 68. The number of observations of other variables fluctuates because of missing data. It is better for researchers to fill the missing data by using reliable sources. However, it is hard to fill the missing data because information about North Korea is quite limited. Moreover, I group The Number of USFK, Difference of CINC, Combined Military Drill, U.S. Aid, ROK Aid, and Economic Sanctions into the International Level, and Succession, North Korea's GDP Growth, North Korea's Rice Production, and Domestic Stability into the Domestic Level.

Table 1. Descriptive Table for Variables

VARIABLES	Number of Obs	Mean	Standard Deviation	Min	Max
Dependent Variables					
The Number of Provocations (CSIS)	68	4.044	5.459	0	25
The Number of Provocations (MID)	61	0.852	0.833	0	3
Independent Variables & Control Variables (International Level)					
The Number of USFK (Ahn and Lee)	65	58.49354	64.6322	28.5	326.863
The Number of USFK (Base Structure Report)	62	60.17421	65.7532	26.305	326.863
Difference of CINC	62	0.00676	0.00343	0.00147	0.0135
Combined Military Drill	67	0.478	1.020	0	3
U.S. Aid	61	21.54	56.15	0	287.2
ROK Aid	62	519.3	1,157	0	4,397
Economic Sanctions	67	0.701	1.907	0	10
Independent Variables & Control Variables (Domestic Level)					
Succession	67	0.0299	0.171	0	1
North Korea's GDP Growth	49	0.313	7.822	-27.19	29.07
North Korea's Rice Production	56	245.9463	63.27178	142.6	478.7
Domestic Stability	57	-0.210	0.275	-1.223	0.536
Unit: The Number of USFK (per 1,000), North Korea's Rice Production (per 10,000 tons). Others are described in the main text.					

Results

By using a multivariate regression model to test my hypotheses, I try to find the relationship between the number of provocations from North Korea and other variables. Moreover, I lag all independent variables by one year to show the causality between provocations and independent variables. By lagging independent variables, I intend to deal with reverse causality problems. For example, the number of USFK can increase because North Korea commits provocations. Also, I use Prais–Winsten AR (1) regression to deal with the autocorrelation problem.³⁸

Figure 1 shows the trends of the number of USFK and the number of provocations. As you can see, the number of USFK declined dramatically after the end of the Korean War. Moreover, recently the number of provocations from North Korea increased. We cannot figure out the relationship between this line graph because it only shows the trends of the number of provocations and USFK. Moreover, it does not take into account the influence of other variables.

Multivariate regression and Prais–Winsten AR(1) regression automatically exclude the year with missing data. Therefore, the number of observations sets to 48 and the time period ranges from 1960 to 2007. Table 2 shows the result of those regressions.

The dependent variable of Model 1, 2, 3 and 4 is the number of provocations (CSIS). Model 1 and 3 use Ahn and Lee’s data to count the number of USFK. On the other hand, Model 2 and 4 use Base Structure Report data.

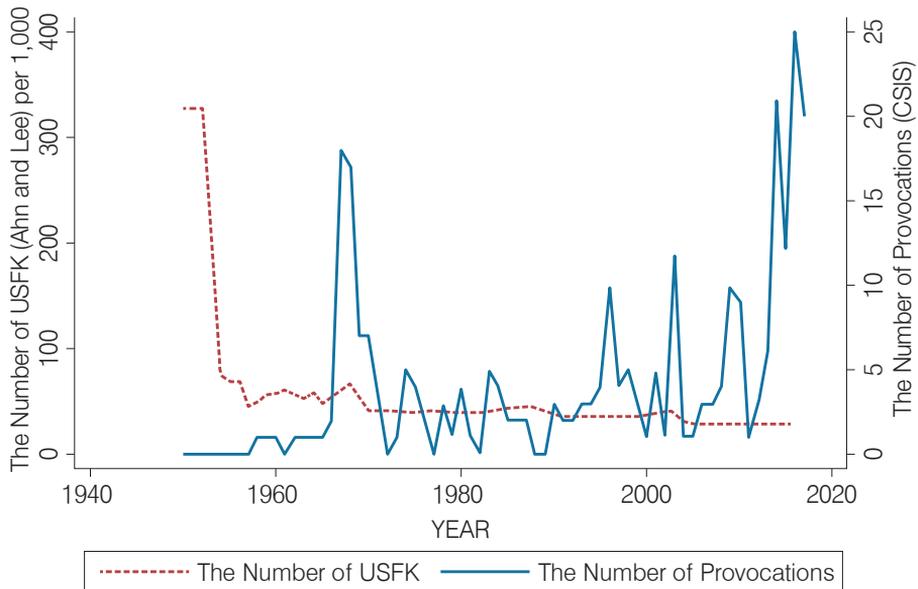


Figure 1. Trends of the Number of USFK and Provocations

Model 1 shows the result of a multivariate regression. The result of Model 1 shows that among international level independent variables, there are not statistically significant relationships between the number of provocations and Difference of CINC and U.S. Aid. Among domestic level independent variables, Succession, North Korea's GDP Growth, and North Korea's Rice Production do not have statistically significant relationships with the number of provocations. Only Domestic Stability has a statistically significant negative relationship with the number of provocations.

Table 2. The Number of Provocations (CSIS) as Dependent Variable

	Multivariate Regression	Multivariate Regression	Prais-Winsten	Prais-Winsten
VARIABLES	Model1	Model2	Model3	Model4
International Level				
The Number of USFK (Ahn and Lee)	0.216**		0.245**	
	(0.958)		(0.112)	
The Number of USFK (Base Structure Report)		0.204**		0.225*
		(0.096)		(0.112)
Difference of CINC	78.44	59.00	-203.1	-232.3
	(449.6)	(453.3)	(464.0)	(468.1)
Combined Military Drill	-4.043*	-4.048*	-4.059**	-4.061**
	(2.373)	(2.395)	(1.864)	(1.892)
U.S. Aid	0.00662	0.00727	0.0203	0.0211
	(0.0148)	(0.0149)	(0.0134)	(0.0136)
ROK Aid	0.00243**	0.00238*	0.00307***	0.00302***
	(0.00118)	(0.00119)	(0.00109)	(0.00110)
Economic Sanctions	8.457*	7.880*	6.264*	5.429
	(4.630)	(4.654)	(3.583)	(3.599)
Domestic Level				
Succession	5.544	5.567	5.466	5.429
	(4.442)	(4.481)	(3.478)	(3.512)
North Korea's GDP Growth	0.171	0.170	0.110	0.109
	(0.106)	(0.107)	(0.0893)	(0.0901)
North Korea's Rice Production	0.012	0.0115	0.0125	0.0118
	(0.009)	(0.009)	(0.010)	(0.010)
Domestic Stability	-11.51**	-11.11**	-11.16**	-10.57**
	(5.304)	(5.363)	(4.805)	(4.878)
Constant	-13.04*	-12.08*	-12.91*	-11.55
	(6.699)	(6.672)	(7.444)	(7.378)
Observations	48	48	48	48
R-squared	0.335	0.325	0.358	0.346
Standard errors in parentheses				
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$				

The Number of USFK (Ahn and Lee) and The Number of USFK (Base Structure Report) have a statistically significant positive relationships with the number of provocations at the level of $p < 0.05$ in model 1, 2, and 3, and at the level of $p < 0.1$ in model 4. A one unit increase in The Number of USFK from Ahn and Lee and Base Structure Report increases the number of provocations by 0.216 and 0.204, respectively. It is hard to say that the influence of the number of USFK is not substantially significant because one unit in the number of USFK is one military personnel in the USFK. Moreover, the provocations are a serious problem to South Korea, even though the coefficients seem too small.

In addition to The Number of USFK, Combined Military Drill has a statistically significant negative relationship with the number of provocations in all four models. However, those relationships are statistically significant at the level of $p < 0.1$ in model 1 and 2, and at the level of $p < 0.05$ in model 3 and 4 after the autocorrelation problem dealt by the Prais–Winsten AR(1) regression. In the case of ROK Aid, it is statistically significant in all models, but it is not statistically significant at the level of $p < 0.05$ in model 2. Three of the four models show that Economic Sanctions has a statistically significant positive relationship with the number of provocations at the level of $p < 0.1$.

Only Domestic Stability shows a statistically negative relationship with the number of provocations at the level of $p < 0.05$ in all four models. One unit increase in Domestic Stability decreases the number of provocations by 11.51 in model 1. The coefficients in the other three models are little bit lower.

Table 3 shows the results of Model 1, 2, 3, and 4. The only difference is the dependent variable. Unlike Table 2, I use MID data for counting the number of provocations from North Korea. As you can see in the tables, the results are quite different from those of table 2.

Only the Succession has a statistically significant positive relationship with the number of provocations at the level of $p < 0.05$. It means that when there is a succession in North Korea in a year, North Korea does 2.302 more provocations. Other dependent variables do not have statistically significant relationships with the number of provocations, except ROK Aid in model 3 and 4 at the level of $p < 0.1$.

To sum up, the results from both tables are quite mixed. Based on the results of table 2, only hypothesis 3 passed the test and other four hypotheses did not pass the test, even though The Number of USFK has a statistically significant relationship in model 1, 2, and 3 at the level of $p < 0.05$, it is not statistically significant at the level of $p < 0.05$ in model 4. Based on table 3, only hypothesis 4 passed the test.

Table 3. The Number of Provocations (MID) as Dependent Variable

VARIABLES	Multivariate Regression	Multivariate Regression	Prais-Winsten	Prais-Winsten
	Model1	Model2	Model3	Model4
International Level				
The Number of USFK (Ahn and Lee)	-0.199 (0.208)		-0.019 (0.018)	
The Number of USFK (Base Structure Report)		-0.196 (0.021)		-0.019 (0.018)
Difference of CINC	3.885 (97.81)	4.150 (97.92)	-25.01 (90.44)	-25.41 (90.41)
Combined Military Drill	-0.471 (0.516)	-0.474 (0.517)	-0.346 (0.533)	-0.347 (0.534)
U.S. Aid	-0.00132 (0.003)	-0.00138 (0.00323)	-0.000145 (0.00305)	-0.000181 (0.00304)
ROK Aid	0.000379 (0.000257)	0.000385 (0.000258)	0.000435* (0.000245)	0.000441* (0.000246)
Economic Sanctions	-0.702 (1.007)	-0.649 (1.005)	-0.912 (1.044)	-0.875 (1.043)
Domestic Level				
Succession	2.302** (0.966)	2.307** (0.968)	2.168** (0.960)	2.172** (0.961)
North Korea's GDP Growth	0.0108 (0.0231)	0.0110 (0.0231)	0.00444 (0.0222)	0.00458 (0.0222)
North Korea's Rice Production	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
Domestic Stability	0.211 (1.154)	0.168 (1.158)	-0.0983 (1.098)	-0.135 (1.100)
Constant	1.449 (1.457)	1.415 (1.441)	1.375 (1.280)	1.364 (1.267)
Observations	48	48	48	48
R-squared	0.380	0.380	0.453	0.453
Standard errors in parentheses				
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$				

Conclusion

On April 27, 2018, at the third two Koreas summit in South Korea, the president of South Korea Moon Jae-in and Chairman Kim Jong Un promised to open a new path of peace. Moreover, the stances Trump take also support the maintenance of this peaceful mood. The reason why I write this paper in this peaceful mood is that paying attention to national security is always worthwhile.

The studies of North Korea's provocations have mainly been conducted through qualitative research. Even though there are various interesting theories and speculations

about the reasons behind North Korea's provocations, scholars cannot reach a consensus on this question. It does not mean, however, that qualitative research is the wrong way to study North Korea's provocations because there is a lack of information about North Korea in many aspects including economic and political situations. It just may be insufficient to study North Korea's provocations only through qualitative research. By adding statistical evidence to this debate about North Korea's provocations, we can reach more meaningful conclusions about this issue.

Through this paper, I try to use the statistical data and database widely used in the studies of international relations about North Korea to reveal the reasons why North Korea commits provocations. I find that when domestic stability decreases and power succession happens, the number of provocations from North Korea increases. These conclusions are supported by statistical models used in this paper. However, there are several limitations in my research. The number of observations is insufficient and there are lots of missing data. Thus, I could not use a more sophisticated model, such as time series analysis. Moreover, it limits the time span that I can include in the statistical models. It is also not negligible that the results of table 2 and 3 are different from each other depending on how the number of provocations is counted.

Despite the above limitations regarding the statistical analysis, the study has revealed valuable findings. Based on table 2, South Korea should put more attention to national security when there is domestic instability in North Korea. Based on table 3, when there is a power succession, South Korea has to be on alert.

The results of my study are mixed. However, this does not mean that the quantitative method cannot be used to study North Korea's provocations. These mixed results can be improved through further research. If more reliable datasets and information about North Korea are published in the future, the quantitative method can be more efficiently and productively used. I hope that this study will contribute to offering different points of view to the deep-seated qualitative research about North Korea's provocations.

Notes

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