The Impact of Presidential Impeachment on the Financial Markets in South Korea

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ABSTRACT
South Korean President, Park Geun-hye, was impeached from the National Assembly on 9th December 2016. This impeachment had caused political instability, resulting in depreciation of Korean currency, stock prices and bond prices. This paper tests whether the Presidential Impeachment in South Korea from 2016 to 2017 has an impact on financial markets. Granger, IRF, and Vector Auto Regression are used to test hypotheses. Test results reveal no significant impact of the Presidential Impeachment on currency exchange rate, stock index, and bond price change. It is because the markets are more resilient than expected.

Key Words: Impeachment, Presidential Impeachment, Korea

JEL Classification: G41

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I. Introduction

Financial markets are fluctuating according not only to new internal information such as merger, new CEO, stock split, and dividend announcement, but also to external new information such as Brexit, North Korean nuclear experiment, domestic political events, and so on. Political events as the external information also have a significant effect on financial markets because economy has close relationship with politics. In 2016, there was the Presidential Impeachment in South Korea. The Impeachment was approved by the Constitutional Court. Inviting political instability, the Presidential Impeachment had caused uncertainty in leadership, economic policies, and diplomatic relationship with other countries. Simultaneously it affected Korean financial markets. In this paper I probe an impact of the impeachment on the financial markets.

On Dec. 9, 2016, 234 members out of 300 members in the National Assembly of Republic of Korea voted in favor of the impeachment and the Constitutional Court approved the impeachment by unanimous consent on Mar. 10, 2017. The Prime Minister of South Korea, Hwang Kyo-ahn, became an Acting President. The impeachment was caused by the President's private aide, Soon-sil Choi, who did not have an official position in the government sought donation from the biggest companies such as Samsung, Hyundai, SK, and Lotte. This scandal was revealed by the mass media for the first time on late Oct. 2016. The President, Geun-hye Park, apologized to people for the president's mismanagement of her aid on Oct. 25, 2016. However, demonstrations and protests asking for the president's resignation started and eventually ended after the Constitutional Court's approval of the impeachment. Political instability caused by the presidential impeachment event kept continued from Oct. 2016 to Mar. 2017. In this paper, I explore how presidential impeachment in South Korea from 2016 to 2017 affected the financial markets such as stock, exchange rate, and bond market.

There are many papers that show the relationship between political instability and financial markets. Diamonte et al. (1998) insists that political risk is a more crucial determinant of stock returns in emerging markets than in developed markets. Average returns in emerging markets with decreased political risk is greater than those in emerging markets with increased political risk by 11 percent per quarter. On the other hand, in developed markets, an average difference in returns is 2.5 percent a quarter. Bussiere and Mulder (2000) argue that the less stable election results are, the more economically vulnerable countries are. To measure political instability, they use four factors such as political polarization, political cohesion of the government, electoral indecision, election dates. Lee (2006) investigates the impacts of the news about North Korea's nuclear weapon on the domestic financial markets. He uses IV and GMM methods and concludes that although there is some negative impact on the stock price and the exchange rate, the impact is not statistically significant. Li and Born (2006) suggest that if there is no dominantly leading candidate in the US presidential election, stock market volatility and average returns tend to increase. Roe and Siegel (2011) insist that political instability rooted from long-term inequality impedes the financial development. Chesney et al. (2011) investigate empirically the impact of terrorism on the financial markets. Around two thirds of the terrorist attacks have a significant negative impact on stock market. According to Smales (2014), the higher measure of political uncertainty regarding Australian federal election are, the higher levels of market uncertainty are. Huang

et al. (2014) find that international political risk has a positive and significant relationship with government bond yields. They investigate 34 debtor countries using a database of 109 international political crises from 1988 to 2007. Lehkonen and Heimonen (2015) conclude that less political risk leads to higher returns after testing panel data of 49 emerging markets from 2000 to 2012. They use as a proxy for political instability the ICRG (International Country Risk Group) index that is composed of 11 components like government stability, external conflicts, internal conflicts, ethnic tensions, military in politics, religious tensions, socioeconomic conditions, investment profile, bureaucracy quality, corruption, and law and order. Pyun & Huh (2016) measure the North Korean Risk by using Google SVI (Search Volume Index) of the Google Trend and analyze the response of the financial markets toward North Korean risk with the IRF methods. Huang & Woo (2017) argue that the level of threat that people feels against North Korea's nuclear experiments is declined by the number of the nuclear experiments. They support their argument by showing monthly tourist inflow data and daily currency exchange rate of South Korea Won with a time series model. These papers indicate that there is a close relationship between political instability and financial markets.

Extending the literature, I explore the relationship between the President impeachment and its impact on the financial markets (e.g. stock, exchange and bond markets). But I do not test the efficient market hypotheses (EMH). In this paper, Granger Causality, Vector Auto Regression and Impulse Response Function are used to test the relationship. Test results show no statically significant impact of the impeachment on the financial markets. However, it is found that a negative impact of the impeachment announcement quickly disappears over one or two days. Overall, financial markets show good resilience.

This paper has some contributions to academia for the following reasons. First, this paper is contributable to the academia because there were a very few cases of presidential impeachments and are little literature regarding the relationship between presidential impeachment and financial markets. Recently, using an event study, Batista et al. (2018) explore three major events in the 2016 Brazilian presidential impeachment. They find no significant impact of those events on the stock market at a 5% level. Because only one paper regarding the relationship between presidential impeachment and financial markets is available, this paper will contribute to the financial economics literature.

Second, this paper introduces SVI (Search Volume Index) to measure the political instability in Korea. SVI shows how many times people search for the words over a time period. SVI possibly indicates a potential level of people's attention and relevant political instability. I show how SVI associated with the impeachment relates to the financial markets.

Third, this paper uses the Granger Causality test and VAR & IRF (Vector Auto Regression & Impulse Response Function) model in order to reveal the relationship between the presidential impeachment and the financial markets. The Granger Causality test reveals whether the lagged impeachment variable contains information to help predict the price change in the financial markets. If the presidential impeachment has some information for predicting the financial markets, the presidential impeachment will indicate the future behavior of the financial market. The test is measured by F-test because one variable in time series data has some lagged variables. VAR & IRF model analyzes the impact of the impeachment on the financial markets according to time. The impulse is the level of the presidential impeachment and the response is the level of the return in financial markets.

With VAR & IRF model and Granger Causality test, this paper shows how the impact of the presidential impeachment on financial markets is significant and daily changing.

Finally, this paper compares the impacts of the presidential impeachment on three different stock, currency exchange rate, and bond market. Models in this paper have possibility of endogeneity problems because of omitted variable bias and measurement errors. However, by checking robustness over results on three different markets, I confirm significance of the test results.

II. Method

1. Data Description

Table 2.1 Summary Statistics

	Variable	Observation	Mean	Std. Dev.	Min	Max
I.V.	imp	182	1.86	10.71	0.01	100.00
D.V.	exr	126	1157.06	26.80	1108.50	1212.50
	kospi	126	2053.07	53.92	1958.38	2178.38
	bond	182	110.12	1.06	108.81	112.93
C.V.	cloud	182	4.18	3.09	0.00	9.90
	hum	182	55.79	12.83	31.90	90.30
	pressure	182	1023.04	5.68	1007.50	1035.60
	avetemp	182	4.80	7.22	-8.90	22.70
	wind	182	8.20	2.63	4.30	15.10
	daylight	182	6.65	3.54	0.00	11.20
	day	182	4.00	2.01	1.00	7.00
	month	182	6.55	4.59	1.00	12.00

In this paper, Presidential Impeachment Index (imp) is used as an independent variable measured by the Searching Volume Index (SVI) on words, “Park Geun-hye Impeachment.” The SVI data is from Naver Data Lab. Naver is the biggest South Korean portal and also provides a service similar to the Google Trend. Naver Data Lab has daily data to more finely estimate the event study. During certain period of time, the index indicates how many times the words are searched. The maximum value of the SVI is 100 and the minimum value is 0.

Three dependent variables such as exchange rate, KOSPI, and bond are considered. Exchange rate (exr) is using unit of won per dollar from KRX (Korea Exchange). KRX is the sole securities exchange operator in South Korea. Bond Price Index (bond) is a changing price index for all the weighted bonds that are listed in KRX. KOSPI (kospi) is from the KRX. The KOSPI refers to the stock composite price index for the KRX main board, like the S&P 500 in the United States. KOSPI is calculated based on the market capitalization-weighted with its base index at 100 on January 4, 1980. Each industrial stock index is also from KRX.

This paper uses daily data, and thus there are some missing data due to holidays. The estimated period is from 10/01/2016 to 03/31/2017.

For control variables, I use weather, day and month variables often found significant in explaining the markets in the behavior finance literature because my research relates to human behavior during the period of the impeachment. Those weather, day and month control variables are from the Korea Meteorological Administration. The data includes cloud, humidity, air pressure, average temperature, wind speed, and daylight. The cloud data measurement is from 0 to 10. When it is clear, the index is 0 and when it is completely cloudy, it is 10. The humidity data measures relative humidity. When it is dry, the index is close to 0. When it is humid, the index is going to 100. The air pressure data records at noon and its unit is "hPa". The average temperature data is averaged temperature during a day and its unit is "℃". The wind speed data is also averaged wind speed in a day and its unit is "m/s". The daylight data measures duration of sunshine in a day and its unit is "hours". The day variable is from 1 to 7 because there are 7 days in a week. Thus, Monday is 1, Tuesday is 2, Wednesday is 3, and so on. For the month variable, since there are 12 months in a year, the data is from 1 to 12.

However, there are so many other control variables that affect the financial markets, but it is hard to find or measure all the control variables. Thus, this method has some possibility of endogeneity problems such as omitted variable bias and measurement error. In order to resolve the endogeneity problems, this paper checks robustness through comparing the impeachment's impacts on the stock, currency exchange rate, and bond market.

Table 2.2 Shock Events and Financial Returns

Date	Shock Event	Presidential Impeachment	KOSPI Return	Currency Exchange Rate	Bond Return
10.25.2016	President's apology	100	-0.52	0.04	-0.14
10.26.2016		68.25	-1.14	0.18	-0.06
11.22.2016	Fail to pass	15.81	0.89	-0.21	-0.06
11.23.2016	impeachment motion	2.64	0.23	0.00	0.05
12.09.2016	Impeachment from the	74.67	-0.31	0.95	-0.36
12.10.2016	National Assembly	5.12	.	.	0.00
03.10.2017	Approval of the	25.75	0.30	-0.39	-0.21
03.11.2017	impeachment from the Constitutional Court	1.07	.	.	0.01

According to Table 2.2, there are four shock events associated with the Presidential impeachment and the percentage changes of the Presidential impeachment index, the exchange rate, the KOSPI, and the bond price. On the event periods of the President's apology and the impeachment from the National Assembly, the negative marginal stock price, positive marginal exchange rate, and negative marginal bond price are noticed. On the event period of failing to pass impeachment motion and approval of the impeachment from the Constitutional Court, the negative marginal exchange rate and positive marginal stock price are found. However, marginal bond prices have different directions. Therefore, financial markets respond positively if political instability decreases in the event of fail to pass impeachment motion and approval of the impeachment from the Constitutional Court,

whereas financial markets respond negatively if political instability increases when the events of president's apology and impeachment from the National Assembly happen.

Figure 1. SVI for the Presidential Impeachment

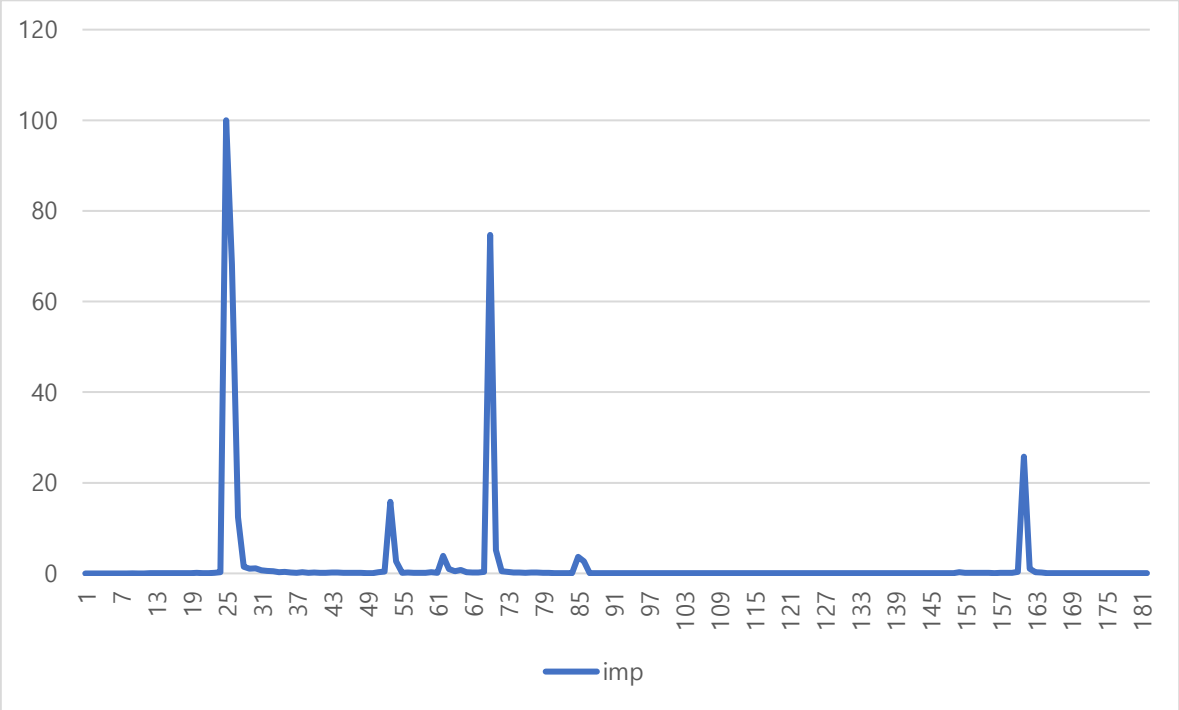


Figure 1 shows us the SVI for the impeachment. The maximum value of the SVI is 100 and the minimum value is 0. The horizontal line shows the numbers of days. The number of 1 is 10/01/2016. The number of 181 is 03/31/2017. The highest peak is caused by the president's apology on mismanagement of her entourage. The second highest peak happens due to the impeachment by the National Assembly. The third highest peak occurs because of the approval of the impeachment by the Constitutional Court. The fourth highest peak is due to failing to pass impeachment motion at the National Assembly. This SVI can be used as an indicator of political instability because the more instable the politics is, the more searching for the words on the Internet.

2. Model

The following equations are used to test a related hypothesis.

$$Return_{i,t} = (Fin_{i,t} - Fin_{i,t-1})/Fin_{i,t-1} \times 100 \quad (1)$$

$$Return_{i,t} = \alpha_{i,0} + \sum_{j=1}^{l} \beta_{i,j} Return_{i,t-j} + \sum_{k=1}^{m} \gamma_{i,k} Impeachment_{i,t-k} + \sum_{q=1}^{n} \delta_{i,q} Controls_{i,t-q} + \varepsilon_{i,t} \quad (2)$$

The dependent variable, $Return_{i,t}$, is a return of the KOSPI (Korea Composite Stock Price Index), the exchange rates (won/dollar), or the bond yield across time. Equation (1) is used to measure dependent variables. The independent variable, $Impeachment_{i,t}$, is the Searching Volume Index of the words on "Park Geun-hye impeachment" in Korean at Naver Data Lab. The control variables, $Controls_{i,t-q}$, include humidity, air pressure, average temperature, wind, and daylight. The $\varepsilon_{i,t}$ is the error term that this model cannot explain. The dependent variables like $Return_{i,t}$ is the variables to control the autocorrelation.

This paper will do the "Granger Causality Test" to test whether past value, presidential impeachment, contains information that helps to predict future financial market prices. Equation (2) is used for Granger Causality test. If the "Prob > chi2" is less than 0.1, then we can reject the null hypothesis that impeachment does not Granger-cause to the financial market. And Equation (2) is also used to measure Impulse Response Function (IRF) and Vector Auto Regression (VAR).

III. **Data Analysis**

1. Unit Root Tests

Table 3.1 Augmented Dickey Fuller & Phillips-Perron Tests

Variable	Augmented Dickey Fuller (Phillips-Perron) Z(t)	
	Level	1st Difference
Impeachment	-6.971***(-9.184***)	
KOSPI Return	-6.486***(-12.436***)	
Exchange Rate Return	-4.631***(-8.610***)	
Bond Return	-10.147***(-16.024***)	
Humidity	-4.679***(-8.040***)	
Pressure	-5.074***(-7.216***)	
Average Temperature	-2.392(-2.776)	-8.460***(-12.050***)
Wind	-8.847***(-11.528***)	
Daylight	-5.369***(-12.367***)	

Note: *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level

If time series variables are not stationary, then regression estimation is spurious. Each

time series variable should be stationary. To test stationarity, two types of stationary tests (unit root tests), Augmented Dickey Fuller test and Phillips-Perron test are used. As shown in Table 3.1, our test results and related F- tests reveal that all the time series variables are stationary except the variable of Average Temperature. Therefore, only the variable of Average Temperature uses the 1st difference, whereas the others use the level.

2. Granger Causality

Table 3.2 Granger Causality

	KOSPI (F-statistics)	**Exchange Rate** (F-statistics)	**Bond** (F-statistics)
Lag 1	0.83	0.13	0.85
Lag 1~2	0.05	0.59	1.05
Lag 1~3	.	.	1.17

Note: *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level

Granger Causality tests collective significance in time series. Since time series variables have lagged variables, significance of coefficients of lagged variables (by at least one day) indicates causal relationship with dependent variables. Significance test is measured by F-statistics. If the null hypothesis, $\gamma_{11} = \gamma_{12} = \gamma_{13} = \gamma_{14} = \cdots = 0$ (Equation 2), is rejected, then we can say Presidential impeachment Granger causes movements in the financial markets. Table 3.2 shows that we cannot reject the null hypothesis of no impact. In other words, the Presidential impeachment has no significant impact on the financial markets.

3. VAR and IRF

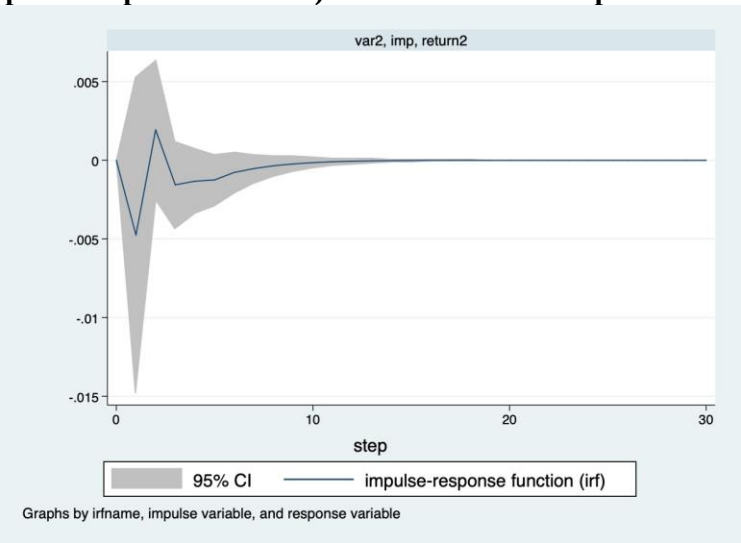
In the previous section, no collective significance of Granger causality is found. In this section, Vector Auto Regression (VAR) is used to explore significance at lagged variables by only 1 day.

Table 3.3 VAR regarding KOSPI Return

Dependent Variable	Independent Variable	Coef.	Std. Err.
KOSPI return			
	Lagged KOSPI return	-0.3595***	0.1015
	Lagged imp	-0.0047	0.0051
	Lagged Wind	-0.0619*	0.0319
	Lagged avetemp	0.0009	0.0280
	Lagged pressure	-0.0248*	0.0135
	Lagged hum	-0.0145**	0.0072
	Lagged cloud	-0.0565	0.0401
	Lagged daylight	-0.0585	0.0357
	_cons	27.3557*	14.0976

Note: *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level

Figure 2. IRF (Impulse Response Function) from Presidential Impeachment to KOSPI Return



According to Table 3.3, the KOSPI return is significantly correlated with itself, wind,

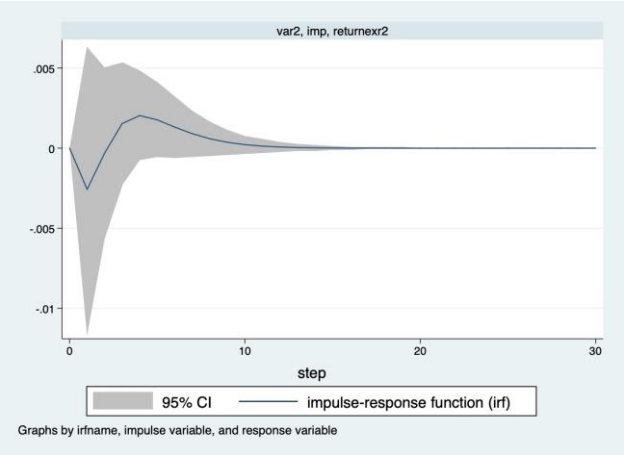
air pressure, and humidity. Although the Presidential impeachment has a negative impact on KOSPI return, it is not statistically significant. Interestingly, IRF (Impulse Response Function) in Figure 2 also graphically shows a potential reason of no significance. Negative response on an event day 0 tends to quickly diminish on the following days. Overall, IRF implies good resilience of KOSPI. Thus, the impact of the Presidential impeachment on the stock market is relatively low.

Table 3.4 VAR regarding Exchange Rate

Dependent Variable	Independent Variable	Coef.	Std. Err.
Exchange Rate Return			
	Lagged Exchange Rate Return	0.0014	0.1068
	Lagged imp	-0.0026	0.0045
	Lagged wind	0.0208	0.0294
	Lagged avetemp	-0.0285	0.0254
	Lagged pressure	0.0153	0.0120
	Lagged hum	0.0123*	0.0064
	Lagged cloud	-0.0085	0.0360
	Lagged daylight	-0.0411	0.0319
	_cons	-16.1759	12.5194

Note: *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level

Figure 3. IRF (Impulse Response Function) from Presidential Impeachment to Exchange Rate Return



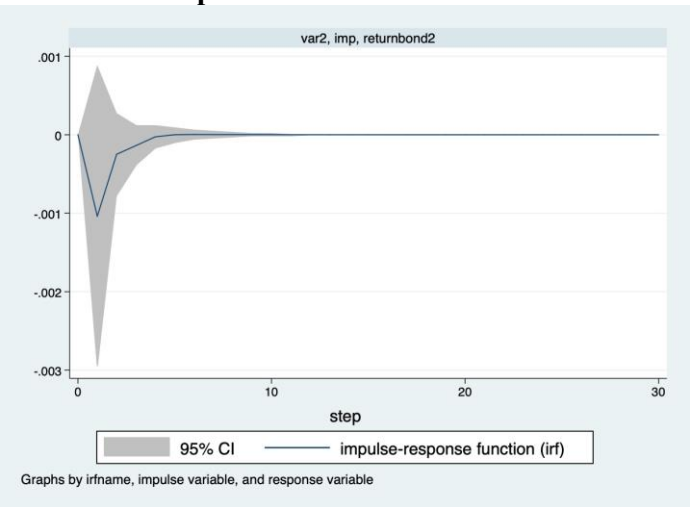
When it comes to Table 3.4, the exchange rate return is significantly correlated only with humidity. Although the impact of the Presidential impeachment after a day is negative, it is not statistically significant. As shown in the previous case of the stock market, IRF (Impulse Response Function) in Figure 3 also graphically shows quick recovery of exchange rate return. Negative impulse quickly disappears after day 0. The impact of the Presidential impeachment on the exchange rate market is not significant.

Table 3.5 VAR regarding Bond

Dependent Variable	Independent Variable	Coef.	Std. Err.
Bond Return			
	Lagged Bond return	-0.2156***	0.0743
	Lagged imp	-0.0010	0.0010
	Lagged wind	-0.0019	0.0051
	Lagged avetemp	-0.0038	0.0046
	Lagged pressure	-0.0009	0.0022
	Lagged hum	0.0005	0.0011
	Lagged Cloud	0.0023	0.0067
	Lagged daylight	0.0041	0.0059
	_cons	0.8637	2.2870

Note: *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level

Figure 4. IRF from Presidential Impeachment to Bond Return



According to Table 3.5, the bond return is correlated only with itself. The impact of the Presidential impeachment on the bond is negative after a day, but it is not statistically significant. As shown in Figure 4 (IRF), the negative impact after two days changes to almost zero.

IV. **Conclusion**

This paper investigates the relationship between the Presidential impeachment and the financial markets such as stock, exchange rate, and bond market. Presidential impeachment inevitably invites political instability, leading to depress the financial markets. There is not enough literature exploring the relationship between political instability and the financial markets. This paper is contributable to academia by adding one research on relationship between the Presidential impeachment and the financial markets in Korea.

This paper uses Granger causality, IRF, and VAR models to test the relationship. The Granger causality tests show that it is hard to say that the Presidential impeachment Granger-causes to the financial markets because all the F-statistics fail to reject the null hypotheses. Moreover, VAR and IRF show us that there are some negative impacts on the financial market, but the impacts quickly disappear during the following days. However, we notice that the impact on the announcement date is the greatest in the stock market (0.47%), and then the exchange rate market (0.26). And the impact is the lowest in the bond market (0.10%).

This paper concludes that the Korean financial markets have good resilience or recovery against the President impeachment news. Its negative impact is very short term and not statistically significant. However, it is not clear whether that resilience or recovery relate to the level of market efficiency or economic policies that might not dramatically change with new leadership. This would be a good research topic in the future.

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