Reputation of News Organizations and Bayesian News Consumption

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Abstract

While past research suggests that people demand for politically biased news, surveys show that people also expect the media to play as impartial watchdogs. This paper presents an evidence that in addition to like-mindedness, a major determinant of which news source to choose, people occasionally update their beliefs on news outlets and change their news sources accordingly. I show this claim with the data from South Korean Presidential impeachment in 2017. Using average Facebook share counts as a measure of the reputation of a media organization, I investigate the variation of media outlets' reputation before and after the Presidential scandal period. I find that a news organization's variation in average Facebook counts across the two periods has a significant correlation with how actively the news organization engaged in reporting the scandal. I also find that such correlation is seen across other socio-political topic areas.

1 Introduction

What do people consume from the media? In democracy, people have expected the media to play the role of a watchdog to supply political information to prevent the abuse of power. 68% of Americans agree that it is important for democracy that news media act as a watchdog of the government (Neuseum Institute, 2017), and about equal majorities of Republicans (69%), independents (69%) and Democrats (67%) view news organizations as a check on political leaders (Pew Research Center, 2013).

However, despite the fact that such watchdog role is opposed to the idea of the media being loyal to a particular side of powers, people prefer news that are politically biased to their partisan interests. 60.7% of Americans express a preference for news information that aligns with their own views and 53% say they prefer to get news from outlets aligned with their political views (Neuseum Institute, 2017). Consistent with these surveys, past research findings suggest that partisan media bias mainly originates from the competition between the news organizations that pursue the partisan preferences of their audience (Mullainathan & Shleifer, 2005; Gentzkow & Shapiro, 2010; Gentzkow, Shapiro, and Sinkinson, 2014). That is, the

news organizations write biased news contents because their audience wants biased news contents.

Above two points of view suggest an ironic claim that while people expect the media to play as an impartial watchdog, they also want the media to bias political information to their partisan preference. This paper suggests an evidence to reconcile these two seemingly conflicting perspectives. We hypothesize that people take into account both like-mindedness and truthfulness of a news organization when choosing news sources.

Most of the time people cannot know whether the perspective of a political news report is ultimately truthful or not and thus truthfulness is a characteristic of a news organization that is hardly detectable, and people only have beliefs on truthfulness of news organizations. In turn, these beliefs of news organizations can be seen as their reputation. As the result, given the reputation of news organizations, people mainly care about like-mindedness of a news organization. However, I focus on the fact that occasionally there are political events where truthfulness of political reports is revealed ex post, from which people may update their beliefs on truthfulness of news organizations and change their news sources later on (Bernhardt, Krasa, and Polborn, 2008; Gentzkow & Shapiro, 2006; Xiang & Sarvary, 2007).

For this claim, the present paper suggests an evidence from the Presidential impeachment in South Korea 2017, which is a case of political scandal where truthfulness of different media organizations' political news reports is revealed ex post after prosecutors' investigation and court decisions. I investigate the correlation between the variation in reputation of news organizations and their activeness in reporting suspicion on the President's corruption. Using Facebook counts as a measure of a media organization's reputation among people, I compared the variation of media outlets' reputation across pre-scandal and post-scandal periods. I found that a news organization's variation in reputation has a significant correlation with the news organization's engagement in publicizing the scandal. I also found that this correlation is found across different agenda areas, including politics, economy, crimes, movies, sports, and weather.

2 Impeachment History and Data

2.1 Presidential Impeachment

In South Korea, during President Geun-hye Park's administration from 2013 to 2017, Choi Soon-sil, who did not have an official position in the government, had exploited her private relationship to the President to coerce donations of $60 million from business conglomerates. Choi also took advantage the relationship to have a wide influence over the government, directly interfering with the state council and governmental policies. Widespread coverage of the political suspicion on Choi began in October 2016 and prosecutors began investigation in late October. As prosecutors and media find more evidence on the scandal, a series of mass demonstrations have occurred, calling for the resignation of the President. The President partly acknowledged and apologized for Choi's influence but declined to step down. The mass demonstration developed even larger, and on December 9, the Congress impeached the President, sending the case to the Constitutional Court for the final

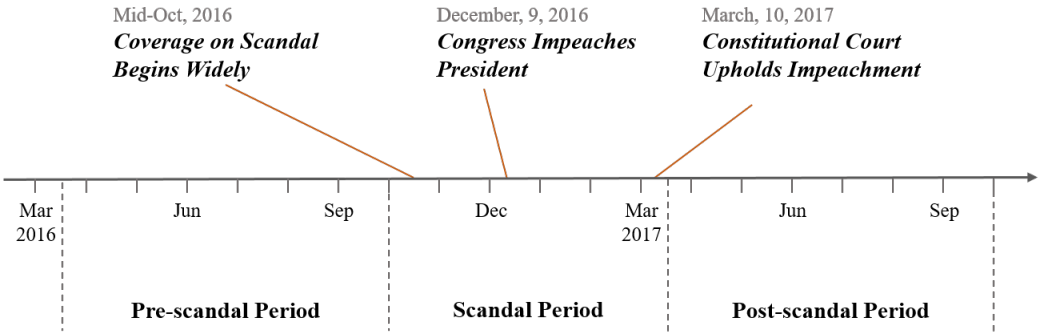

Figure 1: Timeline of the Periods

impeachment. On March 10, 2017, the Constitutional Court ruled to uphold the impeachment and President Park became the first impeached president in Korean history.

2.2 Data

I scraped RSS (Rich Site Summary) feed data to collect the entire 3,309,706 news articles of 14 major news organizations, those that stably provided RSS feed data, from March 2016 to September 2017. Among many, I chose 14 major news organizations that provided RSS news article feed stably throughout the period. The each row in the data contained a news title, date published, content text, and web address (URL), and occasionally the reporter's name. With the web address data, I used Facebook Graph API to count how many times each news article was engaged on Facebook (either liked, shared, or commented). I divided the period into three sub-periods: pre-scandal (Mar 15 - Sep 30, 2016), scandal (Oct 1, 2016 - Mar 14, 2017), and post-scandal period (Mar 15 - Sep 30, 2017).

3 Empirical Finding

3.1 Variation in a News Organization's Reputation

In this paper, I investigate the correlation between a news organization's engagement in reporting the Presidential scandal and the variation in reputation of news organizations. I use the following simple regression model:

$$Variation\ in\ Reputation = \alpha + \beta * (Engagement\ in\ Scandal) + \epsilon.$$

As a measure of a news organization's reputation, I used Facebook counts. Here, a Facebook count of a news organization for a date refers to the sum of how many times the news organizations news articles published on that day have been shared (either shared, liked, or commented) on Facebook. I put the discussion in a separate section below on the validity of using Facebook counts as a measure of media organization's reputation.

The left hand side term, *Variation in Reputation*, was calculated as the difference in median Facebook counts during the pre- and post-scandal periods. And, the measurement for *Engagement during Scandal* was calculated as the news organization's sum of Facebook counts during the scandal period (Oct 2016 to Mar 2017) for articles whose titles include keywords related to the scandal. The resulting analysis shows the following figure and table.

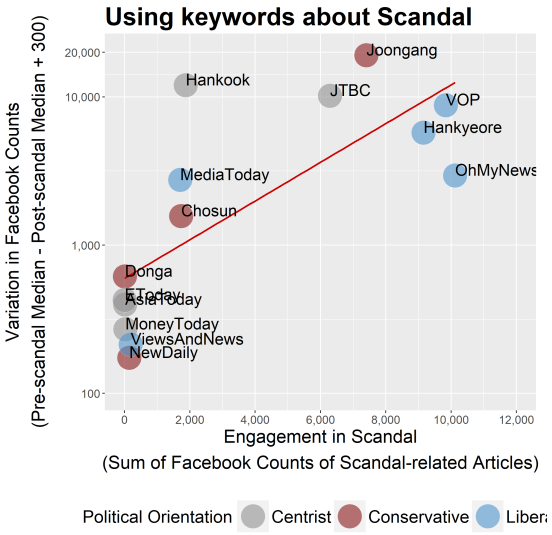

Figure 2: Correlation between Engagement in Scandal and Average Facebook Counts

	Dependent variable:
	variation_log
engagement	1.458***
	(0.381)
Constant	26,451.170***
	(2,000.854)
Observations	14
R^2	0.550
Adjusted R^2	0.513
Residual Std. Error	5,629.295 (df = 12)
F Statistic	14.676*** (df = 1; 12)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 1: OLS Regression results[1]

3.2 Using Facebook Counts as a Measure of Reputation

Measuring public opinion and behavior is vital in many topics in social science, and methodologies for it has been widely debated. Recently, as the costs of getting data from social media have become significantly low compared to those from traditional survey methods, many raised the possibility of using social media data as a supplement or replacement to survey methods. Schober, et al. (2016) discuss at length whether survey research could be supplemented or even replaced with social media contents. Though they claim that it is premature to fully endorse or reject the idea of using social media analyses to provide insights independent of probability-based surveys, they provide successful research examples to use social media data. In one study of consumer sentiment, the content of tweets was shown to correlate highly with answers to survey questions that contribute to Gallup's Economic Confidence Index (O'Connor et al. 2010), and in another study of election forecasting (Tumasjan et al. 2010), the number of tweets mentioning each major political party

[1]The dependent variable is the variation of average sum of Facebook count of a news organization for a day between pre- and post-scandal periods and is in log(10) scale. To see the coefficient for engagement better, a constant (10) was added and another constant (10,000) was multiplied.

preceding the 2009 German federal election predicted the election outcome as accurately as some pre-election polls. Other successful examples include Sang and Bos (2012), Fu and Chan (2013), Jensen and Anstead (2013), and Ceron et al. (2014).

There are also skeptics about using social media data (Couper 2013; Langer Research Associates 2013; Smith 2013), and Ruths & Pfeffer (2014) discuss specific issues in the study of human behaivor through large-scale social media data sets and suggest strategies to address them. Among the issues, there are mainly three concerns relevant to this paper's measurement of reputation using the Facebook counts. First, there is a nonhuman account problem. Second, there is a problem whether the Facebook users could represent the entire population. Third, there is also a problem whether people's behavior on Facebook could represent the population's behavior.

For the nonhuman account problem, we relied on the fact that Facebook, compared to other platforms, has smaller proportion of nonhuman accounts and that it is particularly true in South Korea. For the population representation issue, as advised by Ruths & Pfeffer (2014), I separated the data into different periods from the same platform so that I can deduce implications from comparative variation.

For the behavioral representation issue, I focused on the research findings that the motives of sharing news articles on social media is closely related to the person's social reputation. Past findings suggest that people share news on social media to gain reputation, to draw people's attention, and thus to attain status among peers or other users (boyd, Golder, & Lotan, 2010; Lee & Ma, 2012; Ma, Lee, & Goh, 2011). Also, people share news to fulfill their need to socialize, interact with, and get social approval from others (Hanson & Haridakis, 2008; Lee & Ma, 2012; Ma et al., 2011). Based on these findings, it would not be illogical to claim that news sharing activity is closely related to the person's trust on the news source, which translates into the news organization's reputation among people.

3.3 Validity of Engagement in Scandal as an Explanatory Variable

The correlation may be a mere reflection of a news organization's popularity on Facebook; the more popular a news organization is on Facebook, the more likely it will engage in the scandal (either intentionally or unintentionally), and since the scandal was a great political event, the more popular they would become in the post-scandal period. To examine this point, I can check if the variation is particularly well explained by news organizations' scandal-related engagement compared to other variables. If a news organization's popularity is as explanatory as engagement in the scandal, then the correlation should appear in other topic areas as well. I measured each media outlet's engagement in other topics (Politics other than scandal, economy, crime, and weather) and saw if these engagements also have correlation with the variation. If the above correlation is only by popularity on Facebook, then the correlation should appear across other explanatory variables.

The results below (Figure 3 and Table 2) show that the correlation is particularly conspicuous for scandal-related engagement. The explanatory variable of scandal-related engagement has lower standard deviations and higher R^2 values. This implies that in addition to popularity on Facebook, a news organization's en-

gagement in reporting the scandal caused the variation in average Facebook counts across pre- and post-scandal period.

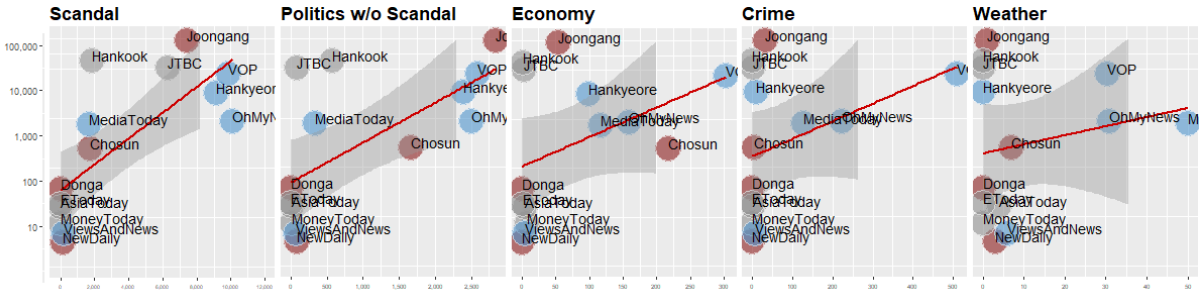

Figure 3: Comparison of other explanatory variables of different keyword groups((1) Scandal, (2) Politics other than scandal, (3) economy, (4) crime, and (5) weather)

	Dependent variable:				
	variation_log				
	(1)	(2)	(3)	(4)	(5)
engagement	1.294***	4.010**	29.922	17.698	86.035
	(0.333)	(1.334)	(19.255)	(13.378)	(123.689)
Constant	27,866.630***	28,571.660***	30,260.710***	31,193.830***	31,727.540***
	(1,749.800)	(1,951.950)	(2,250.027)	(2,043.566)	(2,218.107)
Observations	14	14	14	14	14
R^2	0.557	0.430	0.168	0.127	0.039
Adjusted R^2	0.520	0.382	0.098	0.055	-0.041
Residual Std. Error (df = 12)	4,922.968	5,588.043	6,750.661	6,911.910	7,049.449
F Statistic (df = 1; 12)	15.105***	9.037**	2.415	1.750	0.484
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 2: Comparison of OLS Regressions: (1) Scandal, (2) Politics without the scandal, (3) economy, (4) crime, and (5) weather

3.4 Intensive and Extensive Margins of the Variation

In addition to the above correlation, we would need to look more closely to see the existence of extensive margin in addition to the intensive margin; if reputation of a news organization is a factor, then in addition to that people who already liked that news organization like the news outlet more intensively, it would be that more people, regardless of their previous favorite news organizations, would trust some news organizations more than before. Hence, if reputation really changes, then the correlation should be significant across different topic areas.

We selected four different topic areas (politics, crimes, economy, and sports) by using appropriate keywords and found the correlations as below (Figure 4). The result implies that the correlation exists across topic areas where the media have a more interpretative role.

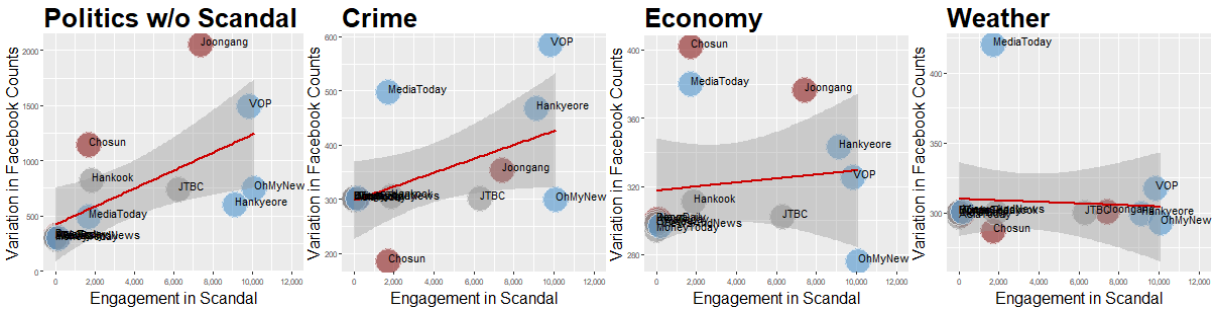

Figure 4: Variation in average Facebook counts in different topic areas according to engagement in scandal reporting

4 Conclusion

The present paper investigates correlation between the reputation of news organizations and people's choice of news sources. Using Facebook counts and RSS feed data from 14 major South Korean news outlets before and after the Presidential scandal in 2016, I suggest an evidence to the claim that there is correlation between a news organization's engagement in truthful reporting and variation in its reputation across pre- and post-scandal periods. This suggests that while people prefer to follow news from like-minded news organizations, they occasionally update their beliefs on news outlets and change their news sources accordingly. This paper also finds that a news organization's mere popularity on Facebook cannot well explain the variation; the variation in reputation showed less significant correlation with a news organization's reporting in other topic areas.

Also, this correlation appears across different topic areas, suggesting that active engagement in the Presidential scandal not only increased the intensive margin but also the extensive margin of people's news consumption of the news organization.

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