Do Scandals Matter? An Interrupted Time-Series Design on Three Cases.

Tzu-Ping Liu

University of California, Davis
tpliu@ucdavis.edu

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1 Introduction

How voters process and then react to the political information has long been discussed within political science. This paper seeks to analyze how/whether scandals could affect voters' evaluation of parties/politicians. This is important because, theoretically, the results could help us understand the relationships between voters and parties/politicians, and empirically, researchers have to know the factors that we actually need or need not to include in analyses.

The literature has taken many efforts to disentangle what may affect voters' decisions. Recent researches show that instead of "what politicians/parties say," voters utilize "what politicians/parties do" as political heuristics to update their political perceptions. Especially, rank-and-file voters tend to focus more on "cheap" actions to update their political perceptions, such as considering whether parties in the same coalition have the same political ideology (Fortunato and Adams, 2015). This is because compared to policies/ideologies/issues, political actions of politicians/parties are more easily accepted by the general public, due to the inability of rank-and-file voters to process complex political information (Adams, Ezrow and Wlezien, 2016; Fortunato and Adams, 2015). This brings a question: are voters also attentive to other cheap actions as well, such as, scandals?

In addition, as a cheap action, scandals are also related to the "valence issue," which is usually referred to political images with respect to honesty, competence, charisma, likability and unity (Adams, 2012). Unsurprisingly, these attributes could usually affect voters' voting intentions and the electoral results (Adams and Merrill III, 2009; Clark, 2014). Therefore, given a scandal is the combination of cheap action and the valence issue, it is expected to have influence over political behaviors.

However, on the other hand, the literature also shows that voters are not affected by

political cues. As mentioned before, the possible reason is that voters' inability to process political information. Especially, it claims that such an inability could lead voters to not process all kinds of information (Adams, Ezrow and Somer-Topcu, 2011; Converse, 1962). The second possible reason is that the information from political cues could be distorted by partisan attachment (Anderson and Guillory, 1997; Anderson and LoTempio, 2002; Anderson and Tverdova, 2003).These works conclude in different ways that even if some information is cheap and noticed by voters, they do not pay much attention due to their inability or consideration of partisanship.

Overall, since there is still no agreement over how political cues could affect voters' behaviors, this paper tries to utilize better data and a careful design to help understand the mechanism better. More precisely, by political cues, this project mainly focuses on scandals. The research question I try to answer is "do scandals affect how voters evaluate parties/politicians?" Furthermore, the research design will focus on approaches that could examine causal relationships, so if the answer to the first question is yes, the results will further answer "what are the causal effects of scandals?" Finally, since the data I utilize will only focus on cases from Western European countries, I will also examine whether the effects of scandals will spill-over to other partners in the same coalition government.

2 Why Do Rank-and-File Voters Care Scandals?

Fortunato and Stevenson (2013) provide their explanation regarding why previous works find only weak, conditional, or even non-existent relationships between changes in voters' perceptions of the ideological positions of parties and actual changes in those positions. To them, these works use measures of policy promises, i.e., manifestos, but voters respond more to the observable actions of parties than to party promises. As they argue, since the cost of monitoring the ongoing policy-making process is high, many voters are likely to rely on a

simple set of heuristics that allow them to make sensible judgments about how the positions of political parties are changing, without the need to pay close attention to information about the policy-making activities of parties or even to something relatively less substantive, such as policy promises.

Therefore, the relatively simple, costless, and straightforward activities of parties/politicians are in fact what the mass public pays attentions to. Simply put, since monitoring how partys live up to their promises requires time, energy, and understanding, voters may instead evaluate parties on more easily transmitted activities such as valence. In other words, Fortunato and Stevenson's (2013) work proposes that (rank-and-file) voters in fact pay more attentions to what parties/politicians do.

Their reasons are as follows. First, it has empirically proven by literature that parties are more likely to participate in coalitions together once they have ideologically converged. In other words, coalitions serve as a low-cost heuristic by which voters can infer the ideological positions of individual parties. Second, scholars have shown that cabinet membership is a generally useful heuristic for inferring the direction of change in the policy positions of cabinet parties that govern in formal coalitions together are more likely to compromise on policies than parties that are otherwise similar but not in the same coalition. This means that, parties in the same coalitions are more likely to accommodate to each other. Third, the literature shows that such promised compromises are monitored, and therefore, this implies that parties' moderation and accommodation among parties in the coalitions are real and consistent across cases (Fortunato and Stevenson, 2013).

In addition to just focusing on how political heuristics affect voters' perceptions to politicians/parties ideologies, scholars further extend the discussion to whether the action of politicians/parties will affect voters' perceptions to policies (Adams, Ezrow and Wlezien, 2016).

Because European integration cannot be mapped onto a Left-Right ideological scale, as they argue, Adams, Ezrow and Wlezien's (2016) results expand the applicability of the theory more generally. As they conclude, their finding suggests that when estimating party positions on European integration, rank-and-file voters diverge from political experts in that voters assign primacy to coalition partners' concrete actions—in particular the easily observable fact of the governing coalition itself.

Fortunato and Stevenson (2013) further ask in the coalition government, whether voters map the policy positions of the PM party onto its junior coalition partners, and whether voters map junior partners' positions onto the PM party. They find that: first, voters indeed map the PM party's Left-Right position onto its junior cabinet partners, and by contrast, they find no evidence that voters project junior coalition partners' Left-Right positions onto the PM party; second, this tendency of mapping the PM party's ideology onto the junior members; positions is especially pronounced among less educated voters, particularly in situations where they confront a novel governing coalition.

Empirically, scholars find that voters do not merely use ideological proximity to inform their political choices. For instance, by using the panel data from the 1980 American National Electoral Survey, Jacoby (2009) finds that the space of candidates' positions is actually two-dimensional. The result shows that in addition to ideology position, voters care about the other attributes as well, and according to each candidate's relative position on the second dimension, Jacoby (2009) concludes this second attribute highly corresponds to credibility/electability, which is considered as the valence attributes.

In general, spatial modelers usually model the second dimension by introducing the idea of the "valence issue." Stokes (1963) first introduced this idea to assert dimensions "on which parties or leaders are differentiated not by what they advocate, but by the degree to which

they are linked in the public's mind with conditions, goals, or symbols of which almost everyone approves or disapproves" (Stokes, 1963). In the recent literature, the valence dimensions usually refer to such attributes as parties'/party leaders'/candidates' images with respect to honesty, competence, charisma, likability and unity (Adams, 2012).

Since it is assumed candidates and parties adjust or make policies based on the voters' thoughts/feelings/ideologies, we should expect the interaction between the two dimensions if voters care about candidates' performance of the valence issues. Clark (2014) finds that in West Europe, parties respond to their disadvantages in their character-based valence attributes by moderating their Left-Right policy positions, but that this response is lagged. Simply put, when parties find they are considered as worse on the valence issues by the voters, they will tend to converge to the position of the median voter on the Left-Right spectrum.

Overall, the literature shows that voters do consider valence when assessing their political choices. In a broader sense, testing whether such heuristics can also affect voters' perceptions of parties'/politicians' valence qualities, such as competitiveness, capability, or even scandals, can help us understand how effective political heuristics are in informing the perceptions and decisions held by voters. Given that scandals reveal the vicious stories of politicians/parties, we could take scandals as one type of political information related to the valence issue. Furthermore, scandals should never be hard information since scandals are only about whether politicians/parties do something bad and what they do. The expectation is that if voters use some external cues to make their political judgment, such concept should also be applied to valence issues as well.

3 Why Should Rank-and-File Voters not Care Scandals?

However, on the other hand, the literature also points out reasons why scandals may not have such effects as expected. The first possible reason is regarding voters' abilities of processing information. Converse (1962) found that, most members of the mass public fail to proceed to absorb contextual information that makes clear to him/her the connections of the policy area of his/her initial interest with policy differences in other areas. This is due to that rank-and-file voters do not have abilities to process the political information, and therefore, they are just inattentive to any political information (Adams, Ezrow and Somer-Topcu, 2011; Converse, 1962). This result implies that scandals may not have an effect on voters' evaluations of politicians/parties because they just do not accept the political cues.

The second possible reason is that how partisan alignment may interfere voters' perception regarding politicians/parties. Although the attributes of scandals make themselves look like the targets to which rank-and-file voters should pay attention, there has been found that they are sometimes just ignored by certain groups of voters. As Anderson and Tverdova (2003) mentioned, political cues could be distorted by partisan attachment. Indeed, previous literature finds that citizens who identify with or voted for a governing party are more likely to posses positive political efficacy, i.e., those citizens tend to consider the government's performance is good and support the government (Anderson and Guillory, 1997; Anderson and LoTempio, 2002). This is due to that psychologically, voters tend to think the political world aligns with their political believes (Zaller, 1992). Moreover, if voters are prone to positively evaluate their attached parties, they should tend to ignore negative information of their attached parties too—Anderson and Tverdova (2003) find that those who voted for the government have less negative view on corruption than those who did not vote for the government.

While the discussion in the last section suggests that scandals should affect voters' evalu-

ations of politicians/parties, it seems that there has not been a uniformed agreement on what roles scandals could play. Although it looks like that scandals could be a general political cues that rank-and-file voters will utilize to make political judgement, it is still possible that rank-and-file voters are just not able to process such information or they just ignore such information due to their partisan alignment. Simply put, the other half of the literature shows that there is a chance that voters are immune from scandals.

4 Research Question and Research Design

The goal of this paper is to solve the disagreement within the literature. Therefore, the research question of this paper is very simple and straightforward—"do voters care about scandals?" The hypothesis behind this question is that voters tend to devaluate politicians/parties involved in scandals and their partners in the same coalition government. To test this hypothesis, this paper will adopt the most straightforward measurement regarding voters' evaluation of politicians/parties—the approval rate. By adopting the approval rate, I further narrow the research question down to "do the approval rates of politicians/parties that are involved in scandals decrease?" The hypothesis could also be revised as: "If a party is involved in a scandal, its approval rate should significantly drop compared to the time before the scandal happens." Since the data set this paper utilizes focuses on Western European countries, I will test to what extent, if any, scandals spill over to junior member's parties. Specifically, I ask "If the approval rate of a party which is involved in scandals will drop, is its partners' approval rates affected too?"

Surprisingly, even though topics regarding scandals are not new in political science, there was no such data which could afford to let researchers analyze the causal mechanism carefully. Fortunately, Jennings and Wlezien (2016) construct a huge data set regarding daily

poll data across a long time period and countries. The data set consists of a total of 26,917 polls spanning the period from 1942 to 2013 across countries. In every poll in this data set, respondents were asked for which candidate or party they would vote, and cross-national and within-country differences in question wording is ignored. However, this data set also suffers from the missing data issue—we just do not have polls everyday. To solve the issue, the authors interpolate daily time-series data of voter preferences from available polls. For any date without a poll, an estimate is created as the weighted average from the most recent date of polling and the next date of polling. Weights are in proportion to the closeness of the surrounding earlier or later poll. Where the missing data is interpolated, the authors also introduce a random component based on the poll variance—controlling for country, party, and election—to reflect the uncertainty associated with the imputed values. More precisely, given poll readings on days $t - x$ and $t + y$, the estimate for a particular day t is generated using the following formula: $\hat{V}_t = \{[y * V_{t-x} + x * V_{t+y}]/(x + y)\} + \epsilon$, where ϵ is drawn from the following distribution: $\mu = 0$, $\sigma = 3.394$ (Jennings and Wlezien, 2016).[1]

As researchers, we cannot manipulate which party/politician will have scandals, when scandals happen, and what type of scandals will happen, and therefore, we need to adopt the design and the method which can provide the as-if experimental results. Based on this data set, I propose the following methodology, interrupted time-series analysis. The interrupted time-series design resembles the one-group pretest-posttest design except that instead of a single observation before and after the treatment, there are multiple observations before and

[1]Due to some parties' approval rates are in fact very low, such error component will create negative approval rates, which are unrealistic. To solve this issue, I replace the standard error of the error component by the sampling error of the mean real approval rate within a given election cycle. For instance, if the average of party A's real approval rate is p within a given election cycle, the standard error is $\sqrt{\frac{p(1-p)}{n}}$, where n is set as 600. More precisely, the error component is set up as $\epsilon \sim N(\mu = 0, \sigma = \sqrt{\frac{p(1-p)}{600}})$

afterward (Singleton Jr and Straits, 1993).

Given the attribute of the data, I compare the difference within the dependent variable before and after the "intervention/treatment" to analyze its causal effect. This design is very useful when the researcher does not have the control group, and it has been shown that the difference between with and without the control group under the interrupted time-series design is insignificant (Fretheim et al., 2013). This method could examine the causal mechanism because the hypothetical scenario under which the intervention/treatment had not taken place and the trend continues unchanged is referred to as the "counterfactual," and this counterfactual scenario provides a comparison for the evaluation of the impact of the intervention by examining any change occurring in the post-intervention period (Bernal, Cummins and Gasparrini, 2016). One could analogize the interrupted time-series design as the regression discountinuity (RD) design, and the analytical results could tell us two things: the effect of the intervention/shock right at the time (the short term effect) and the effect of the intervention on trending (the long term effect).

Although adopting weighted average and adding the error component could more or less fix certain issues of the data, it does not suggest that all problems are mitigated. By imputing the data, we could reliably construct the trend of the data so the long term effect could be estimated without an issue. However, if both the data point right before the intervention and the data point at the day when intervention happens are imputed, the estimated result very likely only reflects the imputation algorithm. This confines this project to only select cases in which at most only one of the mentioned data points is imputed. Furthermore, since this paper is to analyze how politicians' involvement of scandals affects parties' approval rates, this also restrict me to select cases which are related to politicians whom could be considered as influential or representative within the party. To satisfy this condition, I will only consider cases in which politicians who are involved in scandals are at the minister level.

Finally, the original data set shows that the missing data issue is less severe after 2000 so I will only search for cases after 2000. Overall, there are only three cases which satisfy all of the conditions, Peter Hain's donation scandal, Guido Westerwelle's Wikileaks event, and Karl-Theodor zu Guttenberg's plagiarism scandal.

5 Case Description

The Donation Scandal On January 9th, 2008, *The Guardian* reported that Peter Hain failed to declare £100,000 of donations to his campaign for Labour's deputy leadership (Wintour and Hencke, 2008). According to the report at the time the news came out, "Peter Hain has reported to the commission only £82,000 in donations, suggesting he spent nearly £200,000 in total on his campaign, considerably more than his five opponents for the deputy leadership" (Wintour and Hencke, 2008). On January 24th, 2008, Peter Hain resigned from the position as the Secretary of State for Work and Pensions after the Elector Commission passed this case to the Metropolitan Police (BBC News, 2008).

The WikiLeaks Scandal In late November, the "United States diplomatic cables leak" revealed that American diplomats thought Westerwelle as not to be helpful to transatlantic relations due to "he tends to look across the Pacific Ocean rather than the Atlantic" and "several (German Foreign Ministry) desk officers remarked to (the embassy employee) that they were not yet persuaded that Westerwelle had the 'foreign and security policy expertise necessary' to become a successful Foreign Minister" (Friedmann, 2010). On Decmber 2nd, 2010, the Free Democratic Party (FDP) identified Helmut Metzner, who was Westerwelle's personal assistant, regularly provided secrets to the U.S. He was fired by Westerwelle on December 3rd, 2010 (Pop, 2010; Weiland, 2010). On January 6th, 2011, it was reported that Westerwelle is "ranked as one of the most unpopular and ineffective foreign ministers since

the late 1940's" in the poll (Peel, 2011). On April 4th, 2011, Guido Westerwelle announced that he would to step down as Vice Chancellor and the leader of the FDP (The Economist, 2011)

The Plagiarism Scandal On February 16th, 2011, Karl-Theodor zu Guttenberg was revealed that "several points throughout the dissertation are brazen plagiarism and a deceit" by Munich daily Süddeutsche Zeitung (Gathmann, 2011). Guttenberg finished his dissertation in 2007 and this dissertation—"Constitution and Constitutional Treaty: Constitutional Developments in the U.S. and EU—was accepted by Bayreuth University" (Jordans, 2011). Guttenberg denied such accusation immediately (Shotter, 2011). However, at March 1st, 2011, Karl-Theodor zu Guttenberg resigned from the position as the Defense Minisetr (Dempsey, 2011).

6 Methodology

Before the analysis, I first present the overall distribution of the parties' approval rates which were involved in scandals at the time. Figure 1 below shows the distribution of the approval rates of the Union (CDU/CSU), the political alliance of the Christian Democratic Union of Germany (CDU) and Christian Social Union in Bavarian (CSU), the FDP, and the Labour Party under different time windows.[2] According to Figure 1a, Figure 1b, and Figure 1c, the approval rates of CDU/CSU, FDP, and the Labour Party seem to be affected by some exogenous variables given that none of the distribution is stable. Therefore, the best analytical strategy is to control the confounders across the whole time line and further to compare the difference of the level of the outcome before and after the scandal happens.

[2]Since Figure 1 just provides readers a general sense regarding the distribution of the data, the error component is not added yet.

However, given that the lack of daily time-series data of the possible external variables, it is impossible to control the confounders. Furthermore, although there is indeed monthly data for the variable such as GDP per capita, this strategy does not work due to politicians involved in scandals usually resign within days, i.e., analyzing monthly data will very likely not be able to capture the the difference before and after scandals.

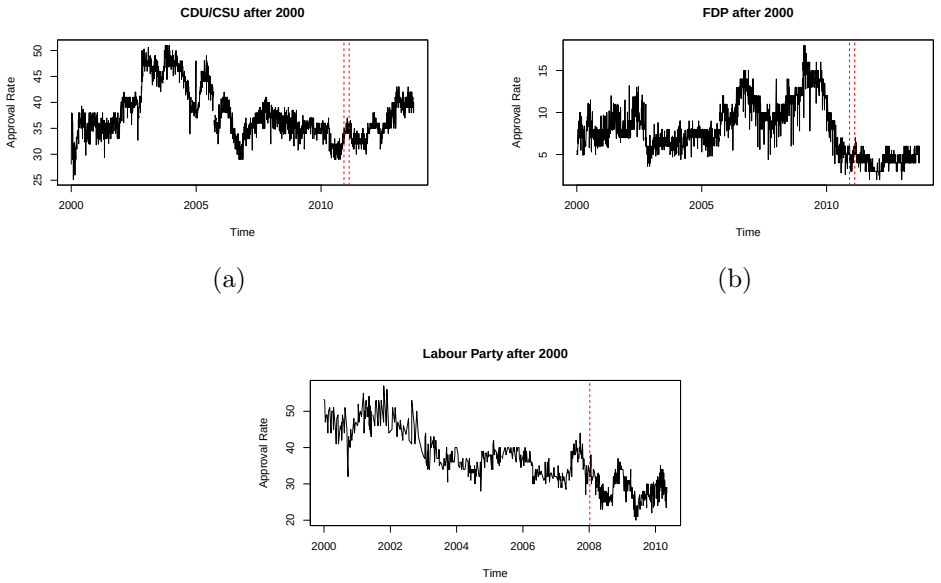


Figure 1: The General Distribution of All Three Cases

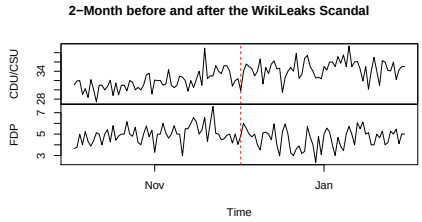
To solve the analytical problem, I will first construct a binary variable that indicates whether the scandal has happened or not—every cell of this variable before the scandal is 0 and 1 otherwise. Furthermore, given the characteristics of the time-series data, I will test for the autoregressive process and stationarity of the data before conducting the analysis only by the data before the scandal happens. The assumptions behind the data generating process (DGP) of the time-series data are not the same with assumptions of the cross-sectional data. For the time-series data, the data is not identical and independent distributed (iid) but only as if iid. This assumption is due to the time-series data could be ergodic, i.e., the data at this time point is related to its previous data but this whole series is as if random

drawn data. Therefore, it is necessary to specify the relationships among the data points correctly to reduce potential biasness of the estimation. Stationarity is the other issue of which the researcher should be aware. Simply put, we need to be sure the data is stationary, i.e., moving around its mean, or the result we find may be spurious.

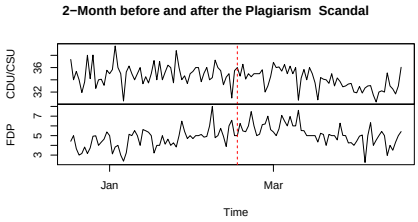
Once the data generating process and stationarity is decided, I will conduct segmented regression—regressing the outcome time-series variable (`Y`) on the impulse/shock/intervention (`X`), the time trend (`t`), and the interaction term of the former two (`X` $\times$ `t`): $Y_t = \phi + \beta_1 X_t + \beta_2 t + \beta_3 X_t t$. In which, β_2 indicates the causal effect of the scandal right at the moment it is revealed, and β_3 captures the effect of the scandal on the time trend. Finally, I will only analyze the data points within the window which only includes two months before and two months after the scandal.

As mentioned, since one could think interrupted time-series design as the RD design, this method will analyze whether the intervention/treatmnt produces a discontinuity to examine the "local effect," the effect at the time when the intervention happens based on the data points close to the exact point where the discontinuity is expected to happen. Since controlling external variables is impossible but only estimating the level and the trend of the outcome variable, narrowing down the data points we utilize for the analysis could reduce the possibility of biasness. Given that OLS is only a consistent estimator of time-series data, 120 data points should be a reasonable length of the data. By and large, I will use data points closer to the time when the scandal is revealed to estimate the distribution of the outcome variable in that time window, and then I will examine whether this intervention causes any discontinuity of the regression line and/or the change of the trending.

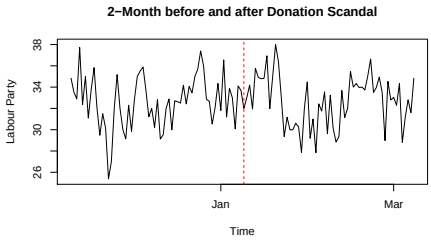
7 Analysis



(a) Window: 10/03/2010-01/30/2011



(b) Window: 12/18/2010-04/16/2011



(c) Window: 11/10/2007-03/082008

Figure 2: The General Distribution of All Three Cases

Figure 2 above shows the distribution of all of the approval rates of the cases with added error component under 120 days window. Through eyeballing, we could see that none of the data is unstable, i.e., nonstationary. Indeed, the results of Augmented Dickey-Fuller test (ADF test) show that none of the cases rejects the null hypothesis that the data contains unit root, i.e., being nonstationary, as shown in Table 1 below.[3] The Bayesian Information Criterion (BIC) is adopted as the method to select the number of lags in each test.

Since it shows that all of the cases are stationary, I will just estimate the causal effects through OLS without any adjustment.[4] Figure 3 below shows the estimated causal effect of Peter Hain's donation scandal on the Labour Party, Guido Westerwelle's Wikileaks event on

[3]All the cases are tested only under the data contains only "drift" (intercept).

[4]BIC is adopted to decide the ARIMA process of each data. Except the FDP of the plagiarism scandal is an AR(5) process, the rest of the data is an AR(1) process.

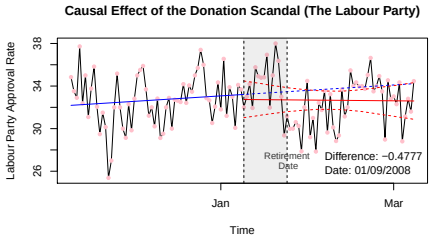
Table 1: The ADF Test Results

Case	ADF Statistics	ADF 95% Critical Value
`Labour Party Donation Scandal`	-5.113	-2.88
`CDU/CSU Plagiarism Scandal`	-6.640	-3.43
`FDP Plagiarism Scandal`	-6.767	-2.88
`CDU/CSU Plagiarism Scandal`	-5.516	-2.88
`FDP Plagiarism Scandal`	-5.110	-2.88

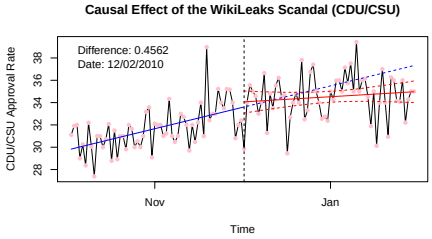
both CDU/CSU and FDP, and Karl-Theodor zu Guttenberg's plagiarism scandal on both CDU/CSU and FDP.[5] As one could see, only two cases have the significant local effect—the FDP of the Wikileaks scandal and the FDP of the plagiarism scandal, and the scandal decreases the approval rate immediately in the former case and increases the approval rate immediately in the later one. Furthermore, Figure 3 shows that the direction of the trending significantly changes to downward after the scandal in all cases, which indicates that scandals might have negative long term effect.

The results from Figure 3 seem to be convincing. In the WikiLeaks scandal, since the FDP is the party whose significant member is involve in the scandal, its approval rate decreases, and such effect does not spill-over to the CDU/CSU. On the other hand, in the plagiarism scandal, given that the FDP is not the party which is directed involved in the scandal, it is reasonable to think that voters who stop favoring the CDU/CSU, whose significant member is involved in the scandal, might turn to the FDP. However, it looks like such local effect only happens to the small party. Nevertheless, in all cases, the trend of the approval rates of all related parties go downward after the scndal. This means that although scandals' local effect does not happen to every party, it affects them in a relative long term.

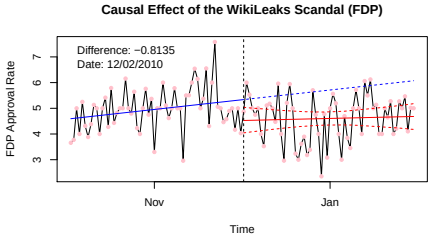
[5]Tables presenting the estimated results are in Appendix A.



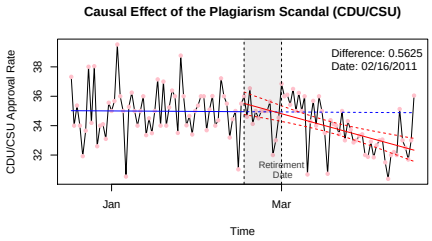
(a) 11/10/2007-03/08/2008



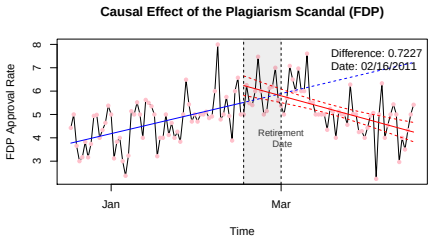
(b) Window:10/03/2010 - 01/30/2011



(c) Window:10/03/2010 - 01/30/2011



(d) Window:12/28/2010 - 04/16/2011



(e) Window:12/28/2005 - 04/16/2013

Figure 3: Estimated Effects of Scandals on Parties' Approval Rates

8 Robustness Check and Sensitivity Analysis

Examining a causal relationship is never a easy job. In addition to the method of analyzing the causal effect and its significance, I further propose a robustness test and a sensitivity analysis to make sure the results are truly convincing. As Caporale and Grier (2005) point out, in the time-series analysis, the significant shifts in the sample may not always be caused by the considered factor under investigation. Indeed, such shift may come from other events or even just the attribute of the AR process. Even though it shows significant results of scandals, we need be sure that whether the time point with significant discontinuity is exactly the break point in the time-series data.

To test the potential break points in the time-series data, Bai and Perron (1998, 2003) develop methods for both testing the existence of structural change and estimating the time points when the changes happen. The steps are as follow: first, conducting a Double Maximum F (DMaxF) test—calculating the highest F statistics under the assumption of m break points against no break points and conducting an F test by the highest F_m statistics across all m cases—this step is to build the upper bound of the amount of break points (Caporale and Grier, 2005), and it could reduce potential bias when the sample size is small; second, conducting a super F (SupF) test—conducting a test of the null hypothesis of zero breaks against the alternative of one break, and if the null hypothesis is rejected, then the first break is taken and sequential tests are conducted (Carter and Smith, 2007), i.e., two breaks, three breaks, and so on, until to the upper bound of the number of breaks or until it fails to reject the null hypothesis; third, checking whether the estimated points are close to the assumed point or not. By and large, since the locations of the break points are only estimated objectively based on the distribution of the data, it should be a good robustness check to see whether the considered event and its assumed effect is in fact consistent with what the data presents.

According to Table 2, two of the cases do not have any break point, and even those which do, none of the break points contains the date in which the scandal happen. The result of the robustness check, given by the DMaxF test and supF test, shows that all the effects found above are spurious. In other words, given the attribute of the data with AR process—the distribution would deviate from the mean, although the OLS results above show significant results, it is very likely that those results rather capture the AR process instead of the causal effects of scandals. The temporal conclusion is that scandals do not affect parties' approval rates. Of course, these results may be due to the algorithm of missing data imputation. To mitigate such uncertainty, I further present a sensitivity analysis to test how the results are

Table 2: The DMaxF Test and the supF Test

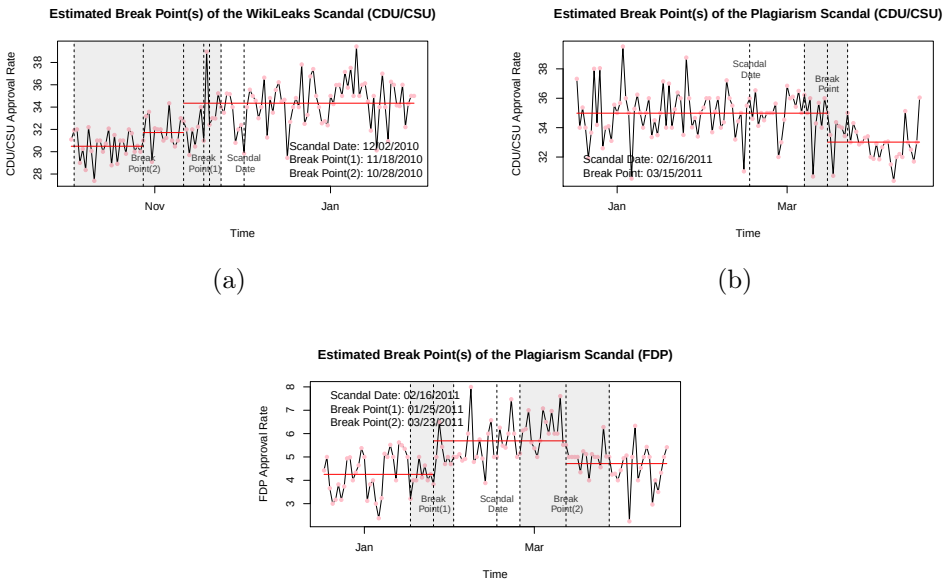
	Test	Statistic	5% Critical Value	Estimated Date	95% Bounds
The Labour Party	UDmax	16.35	9.52		
	WDmax	27.71	10.39		
	supF(1|0)	2.03	9.10		
The CDU/CSU (WikiLeaks)	UDmax	100.94	9.52		
	WDmax	152.33	10.39		
	supF(1|0)	92.04	9.10	02/02/2011	12/29/2010,02/04/2011
	supF(2|1)	17.17	10.55	01/12/2011	01/26/2011,02/08/2011
	supF(3|1)	3.95	11.36		
The FDP (WikiLeaks)	UDmax	9.16	9.52		
	WDmax	15.53	10.39		
	supF(1|0)	4.87	9.10		
The CDU/CSU (Plagiarism)	UDmax	37.78	9.52		
	WDmax	37.78	10.39		
	supF(1|0)	37.78	9.10	03/15/2011	03/07/2011,03/22/2011
	supF(2|1)	3.11	10.55		
The FDP (Plagiarism)	UDmax	15.13	9.52		
	WDmax	18.39	10.39		
	supF(1|0)	11.89	9.10	01/25/2011	01/17/2011,02/01/2011
	supF(2|1)	20.035	10.55	03/12/2011	02/24/2011,03/22/2011
	supF(3|2)	6.77	11.36		

Note: Maximum number of breaks set to five and minimum regime size to 10% of sample. Robust standard errors for all tests.

sensitive to the algorithm.

I will utilize the imputed data without error component for the sensitivity analysis. The ideas is that we could consider the imputed data without the error component as sort of the lower bound of the estimation, which means that we could consider the estimation from such data to only contain the minimum level of variation within the data set. On the one hand, if the break point test is more or less consistent with the scandal dates, we could conclude that the inconsistency derived above is very likely affected by the imputation algorithm. On the other hand, if the inconsistency still remains, even the detected break points are not quite the same between the data with and without the error component, we could still conclude that the scandal dates do not generate any structural break. The results are presented in Figure 5.

According to Figure 5, first of all, there is no any local effect and long term effect on both



(a) (b)

(c)

Figure 4: The Estimated Break Point(s)

the Labour Party under the donation scandal and the FDP under the WikiLeaks scandal, given that the the whole counter factual line is within the 95% bounds across the whole time. Secondly, although there is estimated long term effect on both the FDP under the WikiLeaks scandal and the FDP under the plagiarism scandal, there is no detected break point for these two cases. In other words, the structure of both cases should be stable across the whole window. Finally, it shows that the scandal has a long term effect on both of the CDU/CSU under the plagiarism scandal and the CDU/CSU under the plagiarism scandal. However, none of the break points contains the scandal date, i.e., the scandals do not generate significant structural discontinuity. The estimated results of the lower bound of the missing data algorithm provide consistent results that scandals do not affect voters' evaluations of politicians/parties.

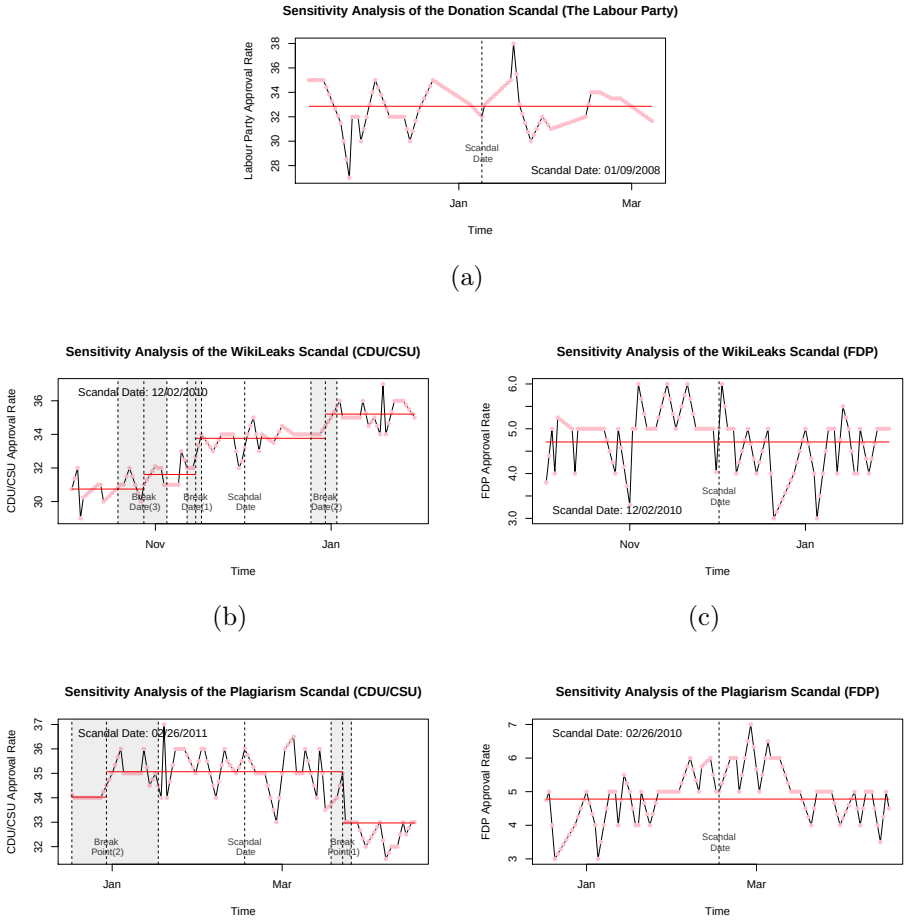


Figure 5: Sensitivity Analysis—Estimations without Error Components

9 Conclusion

Through experimental design, Funk (1996) finds that voters tend to connect scandals as the valence issue. Later, Clark (2014) finds that parties respond to declines in their character-based valence, which is operationalized as scandals, attributes by moderating their Left-Right policy positions, and this finding implies that voters care about the scandals and this motivates parties to gain votes from the policy aspect. Abney et al. (2013) show that scandals matter only during the election time. Although all these pieces do not completely agree with each other, they all point to one thing—voters care about scandals and tend to devaluate politicians/parties involved in scandals.

Do scandals matter? From the analytical results of the three selected cases in this paper, the answer is no. Although the OLS estimates show that scandals could cause significant local and long term difference between parties approval rates before and after the scandal, all of these considered date are inconsistent with the structural break points detected by the DMaxF test and the supF test. Furthermore, through the results estimated based on the imputed data without the error component, we could see that such lower bound estimates still show that all of scandals selected in this project do not cause any significant change on parties' approval rates. This indicates that the null results are not sensitive to the imputation algorithm. Two reasons may explain the inconsistency. First, since none of the cases in this project happens around the election time, voters would just ignore these scandals as argued by Abney et al. (2013). Secondly, the inconsistency may instead reflect Anderson and Tverdova's (2003) argument that voters tend to ignore information contradictory to their believes, given the outcome variable adopted in this project is parties' approval rates.

The results of this paper also brings a methodological implication too. When analyzing the time-series data, researchers should very careful about the estimated results and should not only adopt the OLS model. As this paper shows, the results of the OLS models do provide exciting results but which are completely not agreed by the results from objective and "data mining" type methods. Such spurious results mainly come from the characteristics of the time-series data with the autoregressive process—the data points will naturally deviate from the mean and will not come back to the mean soon. Therefore, when adopting the interrupted time-series design, the researchers are suggested to utilize the OLS model and the DMaxF test and the supF test together.

Compared to previous literature, the advantage of this project is that it has better design to analyze the causal effect of scandals on parties' approval rates and handles the potential

analytical threats more carefully. Therefore, we can at least confirm that when it is not during the time of elections, scandals do not significantly affect parties' approval rates. Or we should say that at least when it is not during the time of elections, supporters will ignore information regarding that their supported politicians/parties are involved in scandals. The results also bring two questions on which require us to further put more efforts in the future.

The first question is that we need further research to study that whether partisanship can interfere voters' opinions about scandals, and I suggest that this research should be conducted at the individual level and analyzing how voters process their feeling when they see politicians/parties are involved in scandals under the conditions with and without the partisan implication. The second one is that even the logic seems plausible that voters with partisan attachment ignore information contradictory to their cognition, why these politicians resign is still unanswered. If scandals do not hurt parties approval rates at all, resigning is indeed irrational, because there is no need to do so. More than this, resigning may rather tell the supporters that what has happened is really a "bad thing" if supporters do not link scandals to the valence issue at the first place. By solving these two questions, I believe our understanding about party politics will be much improved.

A Appendix A

Table 1: The OLS Estimation of the Donation Scandal on the Labour Party

Coefficient	β	Std
`Intercept`	32.171	0.903
`Trend`	0.017	0.026
`Scandal`	0.070	2.543
`Trend`×`Scandal`	-0.019	0.037

Table 2: The OLS Estimation of the WikiLeaks Scandal on the CDU/CSU and FDP

	Coefficient	β	Std
CDU/CSU	`Intercept`	29.772	0.510
	`Trend`	0.063	0.015
	`Scandal`	3.359	1.428
	`Trend`×`Scandal`	-0.048	0.021
FDP	`Intercept`	4.583	0.261
	`Trend`	0.012	0.007
	`Scandal`	-0.218	0.736
	`Trend`×`Scandal`	-0.010	0.011

Table 3: The OLS Estimation of the Plagiarism Scandal on the CDU/CSU and FDP

	Coefficient	β	Std
CDU/CSU	`Intercept`	35.019	0.402
	`Trend`	-0.001	0.011
	`Scandal`	3.780	1.130
	`Trend`×`Scandal`	-0.053	0.016
FDP	`Intercept`	3.744	0.213
	`Trend`	0.029	0.006
	`Scandal`	4.552	0.063
	`Trend`×`Scandal`	-0.063	0.009

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