

Electoral Competition, Incumbency, News Coverage, and Prediction Market Price: A Preliminary Study of Campaign Contributions and Spending in Taiwan's 2016 Legislative Elections

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Abstract

In a political campaign, candidates attempt to mobilize voters by using contributions from individuals, corporations, and political parties. It is an accepted fact of democracy that campaigns should attempt to outdo one another in both the amount they collect in contributions and what they spend on campaigns. Previous research has explored the incumbent advantage in campaign finance, but many interesting factors remain. For instance, is fund-raising aided by factors such as the closeness of an election or a candidate's tenure in the Legislative Yuan? In this study, we explain campaign contributions using data from prediction markets and television news reports to account for variations in campaign spending. Our results suggest that incumbent advantage does indeed affect contributions and that DPP candidates outperformed other candidates in campaign finance. We also find that previous electoral margins and television news coverage contribute significantly to campaign donations, and that election betting has an impact on spending. These findings suggest that a political party's general campaign can influence the election race of an individual candidate, and that

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contributors tend to bet on likely winners, deepening the influence of the electoral system on competing political parties.

Keywords: news coverage, prediction market price, contribution, spending, legislative election

I. Introduction

As political equality is a core value of democracy, elections must offer both the freedom to vote and the right to fair competition. Few people are able to participate in elections, and it is imperative to assure that they are equal before the law (Przeworski 2010). However, only quality and transparency in the electoral process are required by law, as participants are required to disclose campaign expenditures and contributions from individuals. Without empirical research, it is hard to evaluate whether equality has actually been achieved in elections. Previous research has attempted to find a link between electoral outcomes and campaign money, but relatively fewer studies have been able to explain the relationship between campaign contributions and spending. We are concerned about the extent to which spending is determined by donations from political parties, businesses, and individuals. If campaign funds are more available to incumbents, visible candidates, and likely winners, campaign spending may only increase inequality in the electoral process. If this is not the case, we would have more confidence in both the process and the results of elections.

This study has policy implications for campaign finance system. To curb incumbent advantage for healthier competition, limits on campaign finance have taken effect in U.S. In 1976, however, the U.S. Supreme Court ruled that limits on candidate spending is unconstitutional but not the contribution limit. Since then, scholars have studied the effect of campaign finance limitation on American political campaigns. Aranson and Hinich (1979) argued that statutory contribution limit exacerbates trailing candidates. Bonneau and Cann (2011) found that state campaign contribution limit effectively decreases both incumbent and challenger spending in judicial elections, which puts challenger at greater disadvantage. Aranson and Hinich (1979) and Bonneau and Cann's (2011) findings imply that contribution limit may threaten competition if spending is solely dependent on contribution since some candidates can self-fund their campaigns. Therefore, it is important to examine the relationship between spending and contribution, otherwise campaign reform may target at a wrong spot.

In Taiwan, candidates must disclose their contributions and spending after an election. The Political Donations Act (PDA) states the total amount of donations contributed to a same person, political party or political association in a campaign. For example, each citizen (having the right of suffrage) cannot contribute more than 10,000 to a same person. To encourage declaration, however, there is no restriction on campaign spending in PDA. That raises concerns about quality

of democracy.¹ As such, assessing the extent to which campaign contribution affects spending allows us to forecast the consequence of campaign finance regulation more generally.

It is often argued that candidates under-report how much they receive and spend.² For example, candidates may pretend to be anonymous supporters that sponsor TV or newspaper ads, leaving no record of either their contributions or spending. Candidates may fund their campaigns with their own fortunes or that of their families, and neither of these appear in the accounting reports. In spite of these concerns, campaign finance data is regarded as credible. First of all, candidates who win an election can continue spending the money in their accounts under the supervision of the Control Yuan, a fact which may discourage the under-reporting of political donations. Secondly, all accounting reports are open to the public; donors can check to see if their gifts have been recorded and opponents can examine the details. For example, Ma Ying-jeou, the KMT's 2012 presidential candidate, was questioned about under-reporting his campaign spending at 400 million, which was 300 million lower than the DPP's spending in the same election.³ The third and perhaps most important reason is that hiding a political donation is a crime under the PDA. For instance, former Keelung city councilor Huang Jing-tai was sentenced for accepting political donations without a Control Yuan-approved accounting report.⁴

Scholars have rigorously analyzed campaign finance reports to understand how campaign spending affects both the vote margin (Chen 2010; Chen 2015; Wang 2007; 2011; Wang and Fan 2010), and subsequent corporate donations in an election (Lee 2016). We in turn have analyzed these reports to determine what factors are behind campaign contributions and spending. It is true that as candidates do not report all of what they receive and spend, analyzing only the reported data may not offer a complete picture of how the two relate. Nevertheless, this study is able to explore how candidates decide their spending, which might be a significant part of their actual

¹ For example, Taipei Mayor Ko Wen-je said election campaign spending is too high and is where political corruption starts. See <http://www.taipeitimes.com/News/taiwan/print/2018/04/15/2003691363>. Some people proposed that candidates should be fully sponsored by government to avoid misuse of donation and skyrocketing cost of election. See <http://www.storm.mg/article/77226>.

² Candidates are not likely to over-report either contributions or spending because each item needs a receipt or an invoice and it is a high crime to submit phony receipts or invoices.

³ Some journalists have suggested that the campaign staff was paid by the KMT and not the campaign organization in order for Ma to slash campaign spending. See <https://goo.gl/QfES7R>. The DPP criticized Ma's integrity but they did not make a case against him. See <https://www.nownews.com/news/20120717/149921>.

⁴ See the Central News Agency's report: <http://www.cna.com.tw/news/asoc/201711220406-1.aspx>.

expenses. In doing so, this research can contribute to understanding the particulars of campaign spending, as in the research of Cox and Magar (1999) and Box-Steffensmeier, Radcliffe, and Bartels (2005). Discovering what factors influence political donations will reveal the preference of voters for, for example, incumbents or challengers. Since an election was held in Taiwan as recently as 2016 in which seventy-three single-member districts were contested, this study will use that legislative election in Taiwan as a case study.

The structure of this paper is as follows. In Section 2, we review the existing literature related to campaign finance, explaining why Taiwan is chosen as a case study. In Section 3, we present a two-stage regression model of campaign contributions and spending. In Section 4, the data and variables are discussed in detail. Our findings are presented and their robustness is checked in Section 5 and 6 respectively. Section 7 concludes.

II. Literature Review

Jacobson (1980, 31) argues that “The patterns of voting behavior in congressional elections allow ample opportunity for campaign expenditures to influence election results.” It is shown that familiarity among other factors is a key to influencing the voting behavior, which requires considerable resources. Campaign funds are especially important when congressional elections are not held with presidential elections because turnout is low in off-year elections (Campbell 1987). In countries like Taiwan that view constituency interests as equally important to the national interest, candidates must reach out to voters through a variety of campaign activities. Survey data collected by Taiwan's Election and Democratization Study after the 2016 presidential and legislative elections shows that 42.5 percent of voters agree that constituency interest should be the foremost concern of legislators, while 48.6 percent believe that the national interest is more important.

Existing studies of campaign finance can be roughly classified into three broad approaches. Jacobson (1989) stresses that the party that expects to win would deploy well-financed challengers and the other party would send underfinanced candidates. A challenger's spending can reduce an incumbent's final vote margin by as many as 26 percentage points. Krasno and Green (1988) explain challenger quality by constructing a model of the “local political climate.” They include the incumbent's previous fundraising in their model but do not find any effect of past incumbent expenditure. Jacobson (1990) disagrees with Krasno and Green's

(1988) argument, presenting evidence from survey and campaign spending data to argue that a challenger's early spending does in fact have a significant impact on voter intent. In another study of his, Jacobson (1985) finds that while its influence is limited, money does influence the vote. However, Green and Krasno (1988) argue that candidates may form expectations about election results and spend money accordingly. In other words, the effects of spending could be over-estimated. Levitt (1994) estimates that campaign spending has very little influence on voting outcome. Box-Steffensmeier and Lin (1996) argue that candidates in different stages of the campaign process have different goals and their spending has different effects. Erikson and Palfrey (1998) construct a three-equation system with incumbent and challenger spending as dependent variables. They find that both incumbent and challenger spending have an impact on the incumbent vote margin and that the effect of incumbent spending varies over a candidate's career.

Differences between the incumbent and the challenger are related to the results of an election, and the amount that an incumbent raises and spends may determine challenger quality. Jacobson and Kernell (1983) propose the "strategic behavior" theory that high-quality challengers consider joining an election only if national conditions are favorable for their winning. Campaign contributors such as parties, individuals, and interest groups also take in short-term political conditions when deciding how to donate. Box-Steffensmeier (1996) finds that campaign spending indeed influences the entry of a high-quality challenger. Levitt and Wolfram (1997) argue that rising campaign spending lowers overall challenger quality. Goodlife (2007) finds that in Senate elections, campaign spending does not deter strong challengers and has no significant effect on challenger spending.

Other works attempt to build a model of campaign contributions. Grier and Munger (1991) show that interest groups contribute a lot to legislators who are on committees with jurisdiction over relevant policy issues. Cox and Magar (1999) show that when a political party loses its majority status, it also loses campaign contributions in the amount of \$50,000 per member in the House and about the same amount in the Senate. Box-Steffensmeier, Radcliffe, and Bartels (2005) consider the competitiveness of elections when modeling the timing of a political action committee's (PAC) contributions to an incumbent. They point out that PACs tend to offer earlier contributions to incumbents from the same state.

Mayhew (1974, 40-41) states, "Of campaign resources, one of the most vital is money." This review of the relevant literature has confirmed that candidates and contributors both act

strategically during election campaigns. It is also argued that money is central to decision-making (Jacobson 1989, 775). Challengers may be scared away by an incumbent's previous spending, and incumbents may adopt different spending strategies over their career. On the other hand, contributors also act rationally by carefully considering the timing of contributions and whether or not the recipient is a member of the majority party. However, previous research does not appear to include other important campaign factors such as the closeness of election results and coverage of the news media when they account for campaign contributions. Instead, only the characteristics of the contested districts and the majority status of the candidate's party are covered (Cox and Magar 1999).

Moreover, it seems odd that campaign spending is not considered as a linear effect of campaign contributions; candidates appear to act as if they needn't worry about how much money they receive. If this is the case, we should be concerned about corruption among officeholders and doubtful of the quality of our democracy, as it may be that only the wealthy can afford to participate in elections. As campaign expenditure in congressional elections is very much on the rise, we are obligated by normative concerns to explore what factors determine campaign spending.⁵

We test the arguments above with the help of an original dataset of campaign expenditure and contribution in the Taiwan 2016 legislative election. Moreover, Taiwan is an ideal case for assessing the impact of the mass media on a campaign. Ansolabehere, Snowberg, and Snyder (2006) use an experimental method to evaluate the impact of television coverage and incumbency advantage. With respect to the vote margins of incumbents, the study did not find a significant difference between states that had an in-state media market and states that didn't. Unlike the U.S., Taiwan has only one national media market. There are eight TV channels airing political news 24 hours a day.⁶ Moreover, government reports indicate that people over 13 years of age watched an average of three hours of television a day in 2014. More than 60 percent of viewers claimed a news program as their favorite.⁷ Therefore, television news plays an important

⁵ According to data from the Campaign Finance Institute, total expenditure in the House elections has increased from 44 million dollars in 1974 to 821 million dollars in 2014. See <http://www.cfinst.org/data/historicalstats.aspx>.

⁶ These channels are NextTV, ERA News, ETTV News, CTi News, FTV News, SET News, TVBS-News, and TVBS. In addition to these eight channels, Taiwan Television, Chinese Television System, Formosa Television, and Public Television Services also provide morning, afternoon, and evening news.

⁷ See the National Communication Commission's (NCC) report at <http://www.ncc.gov.tw/chinese/>

role during campaigns. Bartels (1993) found strong media exposure effect on opinion change in particular. Weaver and Drew (2001) and Drew and Weaver (2006) found that campaign news increases mass public's knowledge about issue positions of candidates and interest in the election campaigns.

Applying theories of campaign spending to Taiwan's elections, Wang (2007) analyzed campaign contributions using two-limit Tobit models. In these models, there were two limits to contribution data. First, some candidates received no contributions at all, and second, there was a cap on campaign spending as of 2007. Candidates were fined if their reported spending was higher than the amount announced by local election commissions based on a certain formula. Wang (2007) found that party endorsement had a large positive impact on campaign contributions. Since the fine on exceeding campaign spending was abolished in 2012, Wang's model is no longer applicable.⁸ In addition, his research considers only specific characteristics of candidates and districts, ignoring the other aspects of the campaign.

Wang and Fan (2010) and Wang (2011) evaluate the effect of campaign spending in both 2008 and 2004 with two-stage regression models. These two studies find that campaign spending has a significant effect on voting shares. Chen (2010) investigates the 2005 and 2008 legislative elections, suggesting that donors favor major party nominees and incumbents. Chen (2015) also finds that legislators serving in party caucuses tend to receive more campaign funds. Conducting in-depth interviews in Taipei city with two legislative candidates, their staff, and journalists, Hsu (2013) provides an account of campaign donations in the 2012 legislative elections. As for what determines who receives more campaign funds, candidates mentioned being a likely winner as a major factor in addition to economic situations, party endorsement, media coverage, and incumbency. The above research has established the role of incumbency, the chance of winning, media coverage, and party endorsement in campaign contributions. However, there has been as of yet no attempt to integrate these factors into a single model.

This research advances a new model of campaign spending and contributions that each candidate considers the availability of campaign funds while deciding on what to spend. The competitiveness and spending decisions of the candidate's opponent are also taken into account. As for campaign contributions, coverage of the news media may play an important role because it offers cues to contributors about who has a better chance of winning. Other than media

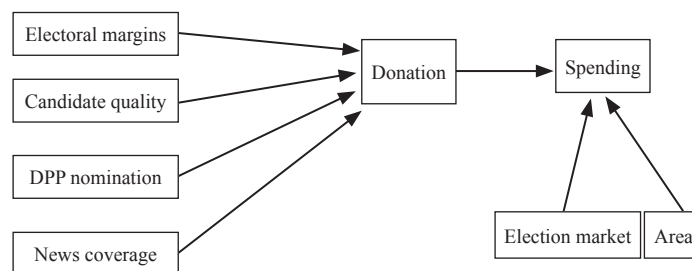
files/16041/3734_35413_160414_1.pdf.

⁸ For more details about regulations on contributions and spending, please see Appendix B.

exposure, candidates can gather resources by holding fund-raising dinners, advertising, and soliciting aid from business groups and political parties. In essence, we assume that candidates can control how much they are willing to spend and how much effort to spend on fundraising, and that their spending reflects to some degree how much funding they manage to collect. We therefore account for contributions and spending simultaneously.

III. Statistical Formulation

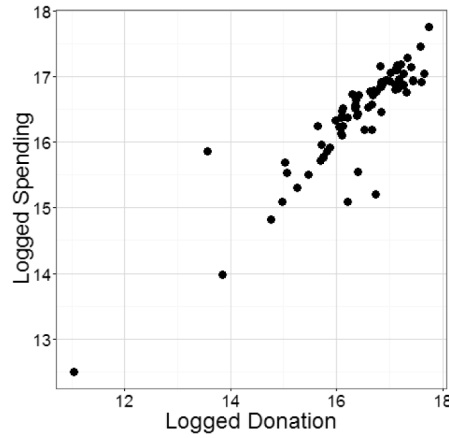
According to the major developments in the literature on the subject of campaign finance, we assume that candidates consider how much to spend based on how much they receive. In addition to advertise their account numbers for donation, candidates may hold fundraising banquets to receive donation as contributors pay for meals. They also set up vendors to collect small donation as they hold meetings or rallies, and they may solicit contribution from corporations or wealthy organizations, such as Rotary clubs or business chambers. All of them require staffs and time, and candidates may have to ask more if they want to preempt their opponents (Squire 1991). In Figure 1, spending is influenced by donation, which is determined by previous electoral margins and three less distant factors, candidate quality, party endorsement, and news coverage. In addition to donation, area and election betting also determine spending.



Source: By author.

Figure 1 Diagram of Donation and Spending

Following Erikson and Palfrey (1998), we take the natural logarithm of campaign finance. Although some scholars prefer to use the raw value of spending in dollars (Jacobson and Kernell 1983), transforming variables of this sort could straighten the relationship between two variables. Figure 2 shows that there is a linear relationship between the two transformed variables.



Source: Tsai (2017).

Figure 2 Logged Spending and Donations, 2016

Figure 2 suggests that we can regress the log of spending on the log of contributions. However, there could be a reciprocal relationship between them as indicated by Wang and Fan (2010) and Wang (2011). Voters and business groups tend to contribute to candidates with a better chance of victory, and candidates may tend to ask less from donors if they expect to win with less spending (Wang and Fan 2010). Regressing the log of spending on the log of donation may generate biased and inconsistent estimates because it violates the assumption of zero correlation between the dependent variable and the error term. Therefore, it requires exogenous variables to address the simultaneity problem when donation predicts spending. In Eq (1), Y denotes the log of spending, the dependent variable. X denotes the log of contributions, the independent variable of interest.

$$Y_i = \alpha + \beta X_i + \epsilon_i \quad (1)$$

Because of the simultaneity problem, β will be biased. Imagine that our instrument is Z and a model of interaction between the instrument and the explanatory variable can be written as

$$X = \pi Z + v_i \quad (2)$$

The predicted values of X can be computed in a first stage equation by regressing X on Z and can be inserted into the second stage to estimate the effect of campaign contributions, explained by media coverage, incumbency, and other variables shown in Eq (3):

$$Y_i = \alpha + \beta_{TSLS} X_i + \epsilon_i \quad (3)$$

Eq (3) shows the two-stage least squares (TSLS) model. The relevance of the instrument should be tested because IV estimation will be biased if instruments have low correlation with

the endogenous regressors (Angrist, Imbens, and Krueger 1999; Bound, Jaeger, and Baker 1995). Stock, Wright, and Yogo (2002) suggested that first-stage F-statistics should be large enough to avoid the TSLS estimator biased toward OLS estimator. For example, the first-stage F-statistics should exceed 10 if there are more than 5 instrumental variables for TSLS inference to be reliable (Stock, Wright, and Yogo 2002, 522).

IV. The Data and Variables

The research question of this paper is who receives donation and who spends more of it. It is assumed that donation and spending have a non-recursive relationship; candidates may decide how much they spend according to how much they receive and how much they spend may affect how much they seek for donation. Therefore, two-stage models will be set up and effects of two sets of variables are estimated.

The independent variables of the linear IV regression model, Eq (2), include level of competition of districts, candidate quality, party endorsement, and news coverage:

1. Electoral competition: Cox and Magar's (1999) research on contributions to legislative members used the difference in vote shares to measure electoral safety of districts and found that it has negative impact on contributions. When the district is safe, the candidate may need less money and contributors have less incentive to influence the election result. The standard way of measuring electoral competition is the difference in vote between the incumbent and challenger (Mayhew 1974). Because we concerned about incumbency advantage, we should focus on the incumbent instead of either major party. Thus we calculate the difference in vote between the winner and second candidate in the last legislative election as electoral competition. It is expected that the larger the margin in the last election, the less competitive the district, and the less donation each candidate can receive in this election.
2. Candidate quality: Incumbents have advantages on familiarity and resources, so incumbency should be associated with donation. In Taiwan, scholars found that political parties and incumbents' behavior and mindset is district-oriented. Tsai (2005) showed that less senior incumbents are assigned the positions of committee chairmanship by parties. Luor and Chan (2012) found that legislators propose bills related to their constituency because government respond to their requests in terms of grants. Incumbents also place constituent service before law-making after the change from single non-transferable voting system (SNTV) to single

member district (SMD) (Rich 2012). Because incumbents have aggressively prepared for re-election through constituent service, they are expected to receive more donations than their challengers do. The dummy variable of incumbency is included in Eq (2). If challengers have held office, elective office can establish their occupational qualification (Krasno and Green 1988). Many scholars utilized the distinction between candidates who have held and who have not as a measurement of quality (Bond, Convington, and Fleisher 1985; Born 1986). Considering some candidates were elected in the party-list constituency and some were elected eight years ago, therefore we estimate the effect of candidates' tenure on donation.

3. Party endorsement: Unlike the individual and corporation donation, there is no limit for political parties' giving to candidates.⁹ Therefore, party endorsement is crucial to candidates. Moreover, voters get cues about how to vote from their party leadership. In this case, party endorsement may increase individual or corporate contribution to candidates. While Kuomintang (KMT) and Democratic Progressive Party (DPP) and three minor parties nominated candidates, I only create a dummy variable that represents DPP's nomination. Instead of considering each political party, the contrast between the DPP candidates with the others can highlight the influence of one major party.¹⁰
4. News coverage: Jacobson (1980) suggested that information that reaches the electorate is the key to congressional campaign. The difference in candidate familiarity between incumbent and challenger explains incumbent advantage. In this study, I monitored television networks three and half months before the Election Day, in which more than sixty thousands of news stories on the presidential campaign activities are collected. Some of them are related to legislative candidates, such as the joint activities in which Tsai Ing-wen or Eric Chu attend. Aggregating the length of news stories, I measure information that voters may have about their candidates and their parties. The twelve candidates that aligned with the DPP may also share Tsai's popularity, although they were not nominated by the DPP. The longer news coverage in the

⁹ The amendment of PDA has cleared the Committee of Interior of the Legislative Yuan on Dec. 18, 2017. According to the amendment, every legislative candidate can accept up to NT\$ 2 million from a political party.

¹⁰ Table A-2 in Appendix C shows the result of the donation model with KMT and minor party nomination variables instead of DPP nomination. The result is similar to Table 1; KMT endorsement has a negative impact on donation and minor party nomination is not a strong predictor. The reason why we chose to report Table 1 instead of Table A-2 is because we can highlight the influence of one major party that had a presidential candidate and drew media coverage.

district, the more popular the candidate is.

As for the 2nd stage model, predicted value of donation and price in election market are the two main independent variables. Area is the control variable. The level of electoral competition is one of the weaknesses of previous research. When explaining campaign contribution, some research used previous vote shares to measure electoral safety (Cox and Magar 1999). Erikson and Palfrey (1998, 361) claimed that there aren't good instruments for incumbent spending and challenger spending, assuming that the error terms for challenger and incumbent spending equations are not correlated. Although Erikson and Palfrey (1998) overcame the problem with structure equations, this study aims to find the better predictor than previous vote shares in Cox and Magar (1999). Exchange of Wisdom, an election market company, set up a vote-share and winner-take-all contract for each district. Users can bid for the best price with cyber points. It is shown that the precision rate is about 0.95 (Tai et al. 2016). We use the price a day before the Election Day as the measurement of expected vote. According to the psychological effect in Duverger's law (Duverger 1959), voters would not waste their votes on the candidates that are least likely to win. Instead, they would rally to the least unacceptable candidates (Blais and Carty 1991). Therefore, I expect that donors would donate money to the leading candidate in election markets.

Finally, we control for groups of districts that compromise a particular region. It is still possible that a political party will support a candidate in a highly challenging district. For example, the KMT may cater more resources to candidates in southern Taiwan because the DPP has dominated these districts for some time. The northern Taiwan is used to be dominated by the KMT. The central Taiwan, such as Taichung City, Chunghwa County, and Nantou County, are more competitive. The KMT held 10 out of 14 districts, but the DPP won the mayor elections of Taichung and Chunghwa in 2014. Therefore, both major parties should cater more resources to candidates in the central Taiwan and they may also spend more on the campaign. All variables are summarized in Appendix B.

In short, the TSLS model is:

$$\text{Log(Donation)} = \alpha + \beta_1 \text{Electoral Margin} + \beta_2 \text{Incumbency} + \beta_3 \text{Years in LY} + \beta_4 \text{DPP nomination} + \beta_5 \text{News coverage} \quad \text{---(4)}$$

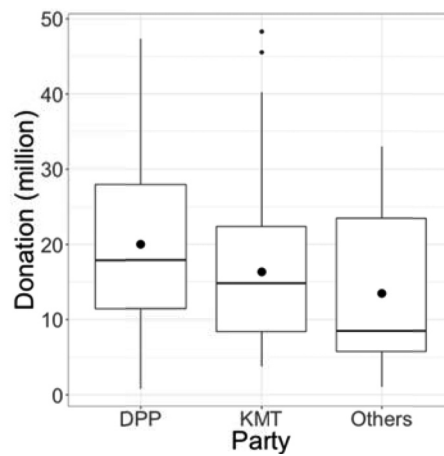
$$\text{Log(Spending)} = \alpha + \beta_1 \text{Predicted Donation} + \beta_2 \text{Election market} + \beta_3 \text{Central} + \beta_4 \text{South} + \beta_5 \text{East} \quad \text{---(5)}$$

Eq (4) models donation and the predicted value is expected to explain spending specified in Eq (5). Controlling for the previous election result, donation is explained by the influence of candidate quality, such as incumbency and service in LY, party endorsement and news coverage. Spending is a function of predicted value of donation and expected vote measured by the market price of candidates.

Data comes from “Policy Orientation, Satisfaction with Government and Voting Choice: Measure and Models” supported by Ministry of Science and Technology (Tsai 2017). The KMT formally nominated one candidate in each of the 72 contested districts while endorsing one candidate from the New Party (NP). As the major opposition party, the DPP officially nominated sixty candidates and implicitly supported six independents and six more nominated by other parties. In other words, only one district, Lienchiang County, was not contested by the two major parties. As such, we analyze spending and donation in 145 (73+72) districts.

V. Findings

Before estimating the TSLS model, it is necessary to visualize the two dependent variables of political donations and spending in terms of political parties. Figure 3 shows that the DPP candidates on average collected more contributions than candidates nominated by the KMT, the New Power Party, the People’s First Party, and other parties. The average amount of contributions to the DPP is NT\$ 20 million. However, donations received by KMT candidates are less dispersed than those of candidates of the DPP and other parties. Meanwhile, two KMT candidates received amounts at over 1.5 times the interquartile range.

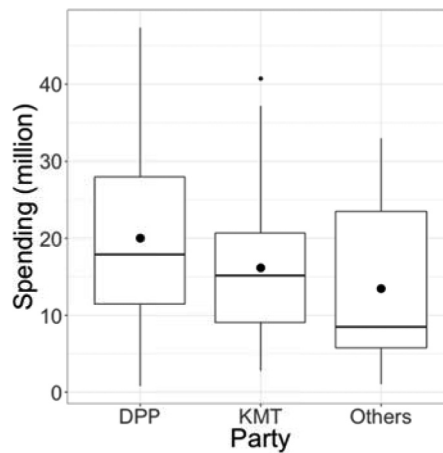


Source: Tsai (2017).

Note: The Circle and bar represent the mean and median value of spending, respectively.

Figure 3 Donations to Major Candidates, 2016

Figure 4 shows that on average, DPP candidates also spent more money than other candidates. KMT candidates showed the smallest deviation in spending. Figures 3 and 4 suggest that most candidates spend in such a way as to match the amount they receive in contributions.



Source: Tsai (2017).

Note: The circle and bar represent the mean and median value of spending, respectively.

Figure 4 Boxplot of Major Candidate Spending, 2016

Since the relationship between campaign spending and contributions is recursive, it is necessary to consider the instrumental variables that generate the predicted values of

contributions. The relevance of the instrument should be tested because IV estimation will be biased if instruments have a low correlation with the endogenous regressors (Angrist, Imbens, and Krueger 1999; Bound, Jaeger, and Baker 1995; Stock, Wright, and Yogo 2002). Valid instruments should be highly correlated with the endogenous variables even after controlling for them. If the F statistic in the first stage regression is smaller than 10, the instruments are weak.

Table 1 shows the estimates for campaign donations. First of all, the F-statistic is 11.62, which is greater than 10. Moreover, the VIF is 1.408, which means that collinearity is low and there is a low amount of excessive correlation among explanatory variables. This regression model can identify sources of variation in explanatory variables.

Because I take the natural logarithm of campaign contributions as the response variable, a linear relationship is hypothesized between the log-transformed contributions and a group of predictor variables. Since exponentiation is the inverse of logarithm function, we can interpret the exponentiated regression coefficients, $\exp(\beta)$.

As the average electoral margin increases, the expected natural logarithm of campaign contributions decreases. There is significant evidence at the 0.01 level to conclude that there is a linear association between the electoral margin and the natural logarithm of campaign contributions. The predicted campaign donation changes by a factor of 0.98 ($e^{-0.012}$) for each one percent increase in the electoral margin. In other words, the amount of a donation will be 2% less for a one percent increase in the difference between the winner and the runner-up.

It is expected that being an incumbent increases campaign donations along their natural logarithm. There is significant evidence at the 0.05 level to conclude that there is a linear association between incumbency and the natural logarithm of campaign donations. The predicted campaign donation changes by a factor of 1.413 ($e^{0.346}$) for each one-year increase in a candidate's service in the Legislative Yuan. As for party nomination, a DPP nomination has significant influence on donations. Donation will be 29.5% ($e^{0.259}$) more for the DPP candidates. Last, campaign donation will increase by 0.02% for one minute increase in television news coverage of candidates.

In sum, electoral margin, service in the Legislative Yuan, party endorsement, and news coverage contribute to campaign donation. The fitted value of donation from the IV linear regression model that contains exogenous regressors can be used to predict campaign spending.

Table 1 Determinants of Campaign Donation, 2016

| Variable | Estimate | exp(B) |
|--|------------------------|--------|
| Intercept | 16.082*** (131.092) | |
| Difference in voters won by the first and second candidate in 2012 (%) | -0.012** (-2.597) | 0.988 |
| Incumbency | 0.346** (2.865) | 1.413 |
| Years in LY | 0.035*** (3.395) | 1.035 |
| DPP nomination | 0.259* (2.462) | 1.295 |
| News coverage | 0.0002# (1.839) | 1.0002 |
| N | 145 | |
| R-squared | 0.295 | |
| Adj. R-squared | 0.270 | |
| F-statistics | 11.66 | |
| VIF | 1.408 | |

Source: Tsai (2017).

Note: #: $p < 0.1$, *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$, two-tailed test. Parentheses are t-value.

Furthermore, we regress log of spending on the fitted value of donation along with the price of candidates in the election market and three dummy variables of areas, central, south, and east. Table 2 presents the estimates. As the predicted value of donation increases, the expected natural logarithm of campaign spending increases. There is significant evidence at the 0.001 level. Campaign spending will also increase by 0.6% for one point increase in market price of candidates. As for region, candidates in the central and southern Taiwan are likely to spend more money than candidates in northern Taiwan.¹¹

¹¹ It is puzzling that leading candidates are likely to spend more than their opponents while they may receive less on average. One of the explanations is the leading candidates expect to receive enough reimbursement to cover their expenses. Another explanation is they are expected to show they are serious about the competition even though it might be not so competitive. We thank one of the reviewer's pointing out this puzzle.

Table 2 Determinants of Campaign Spending, 2016

| Variable | Estimate | exp(β) |
|--------------------|---------------------------------|--------|
| Intercept | 5.564 ^{***} (2.681) | |
| Predicted donation | 0.641 ^{***} (4.941) | 1.898 |
| Election market | 0.006 ^{**} (2.028) | 1.006 |
| Central | 0.219 [#] (1.884) | 1.244 |
| South | 0.284 [*] (2.328) | 1.328 |
| East | -0.088 (-0.330) | 0.915 |
| N | 145 | |
| R-squared | 0.290 | |
| Adj. R-squared | 0.265 | |
| F-statistics | 11.4 | |
| VIF | 1.408 | |

Source: Tsai (2017).

Note: [#]: $p < 0.1$, ^{*}: $p < 0.05$, ^{**}: $p < 0.01$, ^{***}: $p < 0.001$, two-tailed test. Parentheses are t-value.

The results presented in Table 1 and 2 suggest that incumbency is the major factor of donation, and, given the effect of predicted donation on spending, incumbents also tend to spend more. DPP's nomination also has significant impact on campaign donation, which implies that major party brand is a valuable asset for candidates. Campaign spending also increases with people's expectation to win the race, which indicates that candidates are willing to spend more if they are aware that they are the front-runners. In some senses, donation goes to candidates that have served in the Legislative Yuan, hold party nomination, and are being reported by television news programs. Donation encourages spending; candidates would spend more as they expect to receive more.

VI. Robustness Check

To ensure that the relationship between donation, spending and a battery of independent variables remains the same with a subset of the samples, we remove twelve candidates nominated

by minor parties and re-estimate the two models. Table 3 and 4 present the results.

Table 3 shows that the electoral margin, incumbency, service in the Legislative Yuan, and DPP endorsement have impact on donation, which is similar to Table 1. However, media coverage is not a significant factor. Perhaps it is because Tsai Ing-wen and Eric Chu mostly showed up in the districts of their parties' candidates; there is little variation among DPP and KMT candidate in this regard.

Table 3 Determinants of Campaign Donation (DPP and KMT only)

| Variable | Estimate | exp(B) |
|--|-----------------------------------|--------|
| Intercept | 16.634 ^{***} (93.339) | |
| Difference in voters won by the first and second candidate in 2012 (%) | -0.011 ^{**} (-2.409) | 0.989 |
| Incumbency | 0.357 ^{**} (3.047) | 1.429 |
| Years in LY | 0.038 ^{***} (3.801) | 1.038 |
| DPP nomination | 0.278 [*] (2.704) | 1.320 |
| News coverage | 0.0001 (1.209) | 1.0001 |
| N | | 133 |
| R-squared | | 0.301 |
| Adj. R-squared | | 0.273 |
| F-statistics | | 10.95 |
| VIF | | 1.03 |

Source: Tsai (2017).

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$, two-tailed test. Parentheses are t-value.

Table 4 shows that predicted donation and price in election market still play a major role in spending as Table 2 has shown. However, the effect of region turn insignificant.

Table 4 Determinants of Campaign Spending, 2016

| Variable | Estimate | exp(β) |
|--------------------|---------------------------------|----------------|
| Intercept | 6.863 ^{***} (3.101) | |
| Predicted donation | 0.568 ^{***} (4.132) | 1.764 |
| Election market | 0.005 [#] (1.670) | 1.005 |
| Central | 0.124 (0.117) | 1.132 |
| South | -0.057 (-0.561) | 0.944 |
| East | -0.153 (-0.599) | 0.858 |
| N | 133 | |
| R-squared | 0.242 | |
| Adj. R-squared | 0.213 | |
| F-statistics | 8.144 | |
| VIF | 1.408 | |

Source: Tsai (2017).

Note: [#]: $p < 0.1$, ^{***}: $p < 0.001$, two-tailed test. Parentheses are t-value.

After examining KMT and DPP candidates, we examine all candidates and consider the heterogeneity across districts. In other words, the diagonal element in the variance-covariance are the estimated cluster-robust coefficient variance. Comparing Table 1 and 5, the coefficients are the same but the t-values become larger.¹²

¹² See Arai (2015) for estimating cluster-robust standard errors using R.

Table 5 Determinants of Campaign Donation with District-level Clustered Errors

| Variable | Estimate | exp(B) |
|--|------------------------|--------|
| Intercept | 16.080*** (145.559) | |
| Difference in voters won by the first and second candidate in 2012 (%) | -0.012** (-2.983) | 0.987 |
| Incumbency | 0.346** (3.178) | 1.414 |
| Years in LY | 0.035*** (3.824) | 1.036 |
| DPP nomination | 0.259* (2.502) | 1.295 |
| News coverage | 0.0002* (2.417) | 1.0002 |
| N | 145 | |
| R-squared | 0.295 | |
| Adj. R-squared | 0.270 | |
| F-statistics | 15.140 | |
| VIF | 1.408 | |

Source: Tsai (2017).

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$, two-tailed test. Parentheses are t-value.

Using the predicted value of donation from the model in Table 5, we re-estimate the spending model. Table 6 shows significant effects of predicted donation and election market but less significant effects of regions.

Table 6 Determinants of Campaign Spending with District-level Clustered Errors

| Variable | Estimate | exp(β) |
|--------------------|---------------------|----------------|
| Intercept | 5.564*** (2.616) | |
| Predicted donation | 0.641*** (4.849) | 1.899 |
| Election market | 0.006* (2.217) | 1.006 |
| Central | 0.219 (1.470) | 1.246 |
| South | -0.001 (-0.017) | 0.998 |
| East | -0.088 (-0.594) | 0.915 |
| N | | 145 |
| R-squared | | 0.290 |
| Adj. R-squared | | 0.265 |
| F-statistics | | 14.910 |
| VIF | | 1.374 |

Source: Tsai (2017).

Note: *: $p < 0.05$, ***: $p < 0.001$, two-tailed test. Parentheses are t-value.

These two robustness examinations confirm our findings; spending is the function of donation after considering the quality of candidates, expected vote, and pre-existing political landscape.

VII. Conclusion

This paper innovates upon the existing literature on incumbent advantage, campaign spending, and donations. Results of the two-stage least squares regression models in part confirm that incumbent advantage, party nomination, and news coverage bring in contributions and election forecast contributes to spending. The notion of incumbent advantage indeed travels to Taiwan.

This study supports the assumptions that donation centers around incumbents, visible candidates, and party nominees. Candidates that are likely to attain to victory may be willing to spend more. The inequality of electoral process is conclusive as empirical findings indicate that competition is much more about incumbency, visibility, and party's label.

Aranson and Hinich's (1979) theory and Bonneau and Cann's (2011) findings implied that limitation on contribution can handicap challengers. This study confirms that less donation would go to losing candidates, challengers, and trailing presidential candidate's parties. Therefore, campaign reform should at least implement limitation on donation to incumbents so the "playing field" can be leveled.¹³

Our findings also have implications for party politics. Should the KMT have consolidated their presidential nomination earlier, their supporters and donors would have rallied to their legislative candidates as the DPP's supporters did. It also confirms the existence of party institutionalization in Taiwan (Cheng and Hsu 2015; Wong 2015). Although the number of party members is small and scandals are often seen among politicians (Hermanns 2009), the importance of a DPP nomination (statistically significant at the 1% level) for campaign contributions reflects a remarkable influence of parties on resources.

Having said that, it is necessary to be cautious about the problem of missing data. It is extremely hard to detect under-reporting of donations and spending as well as other irregular activities. Moreover, this study has not taken the financial conditions of candidates into account, not to mention those of their families. Although SERA, PDA and law enforcement may lead most candidates to count on donations and ballot reimbursements, there are many candidates who are backed up by wealthy and powerful families. In other words, we could overestimate the effect of donations on spending. One of possible solutions is observing every item of spending, such as transportation, advertising, staff, and so on. Assuming that candidates have similar pattern of spending after considering the level of contributions, those who report spending below average on certain items might under-report their spending.

This research is also related to instrumental variables. The IV estimator has become very popular in recent econometric literature and scholars have found ways of detecting weak instruments. It is prudent to check the relevance of instruments by computing the F statistics associated with the causal variable of interest. To completely ascertain the relationship between spending, donations, and the campaign process will require more data. Eventually, this study will be expanded to help understand the effects of campaign spending on election returns.

* * *

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¹³ See International Institute for Democracy and Electoral Assistance (2002) for this metaphor.

Appendix A

The Servants Election and Recall Act (SERA), amended in 2006, set up a spending limit and a fine for violating it. It also required candidates to report their spending and income to the Central Election Commission, but did not specify the auditing procedure. In 2004, the PDA was enacted. Candidates are required to report their donations and expenditure to the Control Yuan. However, total donations under NT\$ 8 million are not subject to certification by an accountant. Still, the PDA has no spending limit, so the fine for overspending was removed from the SERA in 2007. Because every candidate who wins more than one third of the winning candidate's vote is reimbursed NT\$ 30 dollars for each vote, the SERA maintains a maximum spending amount. It requires that legislative candidates spend no more than the sum of 70% of the total population of the electoral district divided by the quota of elect and then multiplied by the basic amount of NT\$ 30, plus NT\$ 10 million. However, overspending is not fined in order to encourage correct reporting. In short, the current regulations have placed no campaign spending limit but maintain one for the purpose of reimbursement.

Appendix B

Table A-1 Summary of Variables

| | Measurement | Statistics |
|-------------------|--|---|
| Donation | Logged value of all donations received by candidates | Min=13.6, Max=17.7, Mean=16.5 |
| Spending | Logged value of all spending reported by candidates | Min=14.0, Max=17.8, Mean=16.5 |
| Electoral margins | Vote difference between the winner and the candidate ran in second in 2012 | Min=0.22, Max=43.3, Mean=13.1 |
| Incumbency | Whether the candidate is currently the legislator | Min=0, Max=1, Mean=0.497 |
| Years in LY | Years of serving as the legislator | Min=0, Max=24, Mean=4.56 (years) |
| DPP nomination | Whether the candidate is nominated by the DPP or not. | Min=0, Max=1, Mean=0.413 |
| News coverage | Monitoring television networks three and half months before the Election Day, we collected more than sixty thousands of news stories regarding presidential campaign in 73 districts. | Min=7.73, Max=3087, Mean=526 (minutes) |
| Election market | Users in "Exchange of Wisdom" trade candidates as futures contract based on the expectation that candidates can win the election. The price a day before the Election Day is employed to predict spending. | Min=2.70, Max=97.5, Mean=46.3 |
| Area | North: Keelung City, Taipei City, New Taipei City, Taoyuan City, Hsinchu City, and Hsinchu County Central: Taichung City, Chunghwa County, and Nantou County South: Yunlin County, Chiayi City, Chiayi County, Tainan City, Kaohsiung City, and Pingtung County East: Ilan County, Hualien County, and Taitung County | Central=1, South=1, East=1, otherwise=0 |

Source: Tsai (2017).

Appendix C

Table A-2 Determinants of Campaign Donation, 2016

| Variable | Estimate | exp(β) |
|--|------------------------------------|--------|
| Intercept | 16.341 ^{***} (131.029) | |
| Difference in voters won by the first and second candidate in 2012 (%) | -0.012 ^{**} (-2.628) | 0.987 |
| Incumbency | 0.361 ^{**} (2.885) | 1.435 |
| Years in LY | 0.035 ^{***} (3.418) | 1.037 |
| KMT nomination | 0.259 [*] (2.462) | 0.760 |
| Minor party nomination | -0.173 (-0.832) | 0.840 |
| News coverage | 0.0002 [#] (1.782) | 1.0002 |
| N | | 145 |
| R-squared | | 0.296 |
| Adj. R-squared | | 0.266 |
| F-statistics | | 9.701 |
| VIF | | 1.127 |

Source: Tsai (2017).

Note: [#]: $p < 0.1$, ^{*}: $p < 0.05$, ^{**}: $p < 0.01$, ^{***}: $p < 0.001$, two-tailed test. Parentheses are t-value.

Table A-3 Determinants of Campaign Spending, 2016

| Variable | Estimate | exp(β) |
|--------------------|---------------------------------|--------|
| Intercept | 5.686 ^{***} (2.725) | |
| Predicted donation | 0.633 ^{***} (4.856) | 1.884 |
| Election market | 0.006 ^{**} (2.023) | 1.006 |
| Central | 0.221 [#] (1.894) | 1.248 |
| South | 0.005 (0.050) | 1.005 |
| East | -0.088 (-0.307) | 0.9121 |
| N | | 145 |
| R-squared | | 0.287 |
| Adj. R-squared | | 0.261 |
| F-statistics | | 11.2 |
| VIF | | 1.408 |

Source: Tsai (2017).

Note: ^{*}: $p < 0.05$, ^{**}: $p < 0.01$, ^{***}: $p < 0.001$, two-tailed test. Parentheses are t-value.

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選舉差距、現任者優勢、新聞報導以及預測市場價格：探討台灣 2016 立委選舉的捐款與支出

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《本文摘要》

在競選過程中，候選人運用從個人、政黨、企業所募得的資金，試圖動員選民，這已經是民主的常態。過去的研究已經探討現任者在選舉花費的優勢，但是仍有許多因素仍待探討。例如，選舉的差距變大會減少候選人募到的經費嗎？候選人在立法院的年資會有助於募款嗎？本研究使用預測市場以及電視新聞的資料，解釋候選人申報的政治獻金以及選舉支出，結果顯示現任者優勢的確存在，而且民進黨候選人的收入與支出高於國民黨與其他候選人。本研究也發現，四年前的選舉結果以及候選人所屬政黨的總統候選人出現在電視新聞的時間，顯著影響候選人的募款，此次選舉中預測市場的價格則顯著影響候選人的支出。歸納這些發現可以得出政黨的選舉方式將會影響個別候選人的競選過程，而捐款可能集中在勝選機會大的候選人，而這可能擴大選舉制度對於政黨競爭的影響。

關鍵詞：新聞報導、預測市場價格、捐款、支出、立委選舉

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