

# “Presidential election polls and stock returns in Taiwan”

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## ARTICLE INFO

Yi-Shuan Chen (2022). Presidential election polls and stock returns in Taiwan. *Investment Management and Financial Innovations*, 19(3), 139-152.  
doi:[10.21511/imfi.19\(3\).2022.12](https://doi.org/10.21511/imfi.19(3).2022.12)

## DOI

[http://dx.doi.org/10.21511/imfi.19\(3\).2022.12](http://dx.doi.org/10.21511/imfi.19(3).2022.12)

## RELEASED ON

Wednesday, 17 August 2022

## RECEIVED ON

Monday, 20 June 2022

## ACCEPTED ON

Wednesday, 03 August 2022

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## JOURNAL

"Investment Management and Financial Innovations"

## ISSN PRINT

1810-4967

## ISSN ONLINE

1812-9358

## PUBLISHER

LLC “Consulting Publishing Company “Business Perspectives”

## FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

**37**



NUMBER OF FIGURES

**0**



NUMBER OF TABLES

**8**

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**BUSINESS PERSPECTIVES**



LLC "CPC "Business Perspectives"  
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Sumy, 40022, Ukraine  
[www.businessperspectives.org](http://www.businessperspectives.org)

**Received on:** 20<sup>th</sup> of June, 2022

**Accepted on:** 3<sup>rd</sup> of August, 2022

**Published on:** 17<sup>th</sup> of August, 2022

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# PRESIDENTIAL ELECTION POLLS AND STOCK RETURNS IN TAIWAN

## Abstract

This paper examines the impacts of 29 opinion polls from three prominent media sources on 825 firms listed on the Taiwan Stock Exchange during the 2020 Taiwan presidential election campaign. In the election, the challenger Han adopted unprecedented election tactics of asking his supporters to mislead pollsters on their voting intentions, separating the sample polls published before and after the start of this election tactic into normal and chaotic periods. This study assumes that stock markets respond positively to the increased incumbent polling leads due to the reduced probability of future changes to economic policy only for the credible normal polls. A standard event study in a 3-day event window, one day before and after the event day, is employed to analyze the short polling effects on stock returns during the sample period. The estimation window is 120 days. The results indicate that market returns are positively associated with the changes in the incumbent's lead only for the television's normal polls, and markets react more strongly to decreased polling leads than to increased polling leads for television polls, as presumed by the uncertain information hypothesis. Analysis of the impact of polling during the chaotic period on investor sentiment indicates that the market has positive reactions to both positive and negative polling changes, suggesting the tactic creates confusion in the market. This paper concludes that markets may react differently to opinion polls depending on their source and candidates' election tactics.

## Keywords

presidential election, political uncertainty, uncertain information hypothesis, opinion polls, cumulative average abnormal returns

## JEL Classification

D72, G12, G14

## INTRODUCTION

An emerging body of literature links political elections events and stock market performance. Pantzalis et al. (2000) find that stock returns are negatively impacted by election-induced uncertainty in the run-up to elections, consistent with the uncertain information hypothesis (UIH) proposed by Brown et al. (1988). Goodell and Vähämaa (2013) propose the political uncertainty hypothesis (PUH), assuming that unexpected changes in the likelihood of election outcomes may raise concerns among voters for future changes to macroeconomic policy. They find that stock market uncertainty increases when changes to the probability of the eventual winner are positive. Goodell et al. (2020) find that changes in the incumbent party's re-election probability during US presidential election campaigns are an important measure of economic policy uncertainty.

Public opinion polls and prediction markets are widely used to forecast election outcomes prior to the election date. Erikson and Wlezien (2012) find that betting prices add nothing to election prediction accuracy beyond polls for voters. As opinion polls can provide information regarding election results that majorly influence future economic policies, markets tend to respond to polling information. Thus,



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### Conflict of interest statement:

Author(s) reported no conflict of interest

some studies have examined the impact of political election events on market efficiency by analyzing stock market responses to public opinion polls and show mixed results (Thompson & Ioannidis, 1987; Gemmill, 1992; Gwilym & Buckle, 1994). However, Herold et al. (2021) employ a candidate's absolute polling advantage as a good measure of the election outcome and propose that the polling changes may influence stock prices. To measure the impact of polling data on stock prices, in the 2016 US presidential election, Clinton consistently led the polls, leading Herold et al. (2021) to propose a poll spread for Trump to measure the probability of Trump's victory.

According to the literature, stock markets expect to react positively to the increase in the probability of an incumbent win (Oehler et al., 2013; Goodell & Vähämaa, 2013; Goodell et al., 2020). This study examines the relationship between presidential election polls and stock returns. The 2020 Taiwanese presidential election is particularly interesting. While Clinton had enjoyed an absolute polling lead throughout the campaign, during the 2020 Taiwan presidential campaign, the incumbent President Tsai Ing-wen (Tsai) had started at a disadvantage but later regained ground. Thus, encouraging polling results for Tsai would suggest she would win re-election and thus continue her existing economic policies. However, trailing Tsai by more than twenty points, the major challenger, Kuomintang candidate Han Kuo-yu (Han), adopted the unique strategy of calling on his supporters to back Tsai in future polls late in the campaign of intentionally seeking to negate the credibility of such polls. This paper refers to this strategy period as the "chaotic polling period," which leads the study to document the effect of campaign tactics on stock returns.

This paper is organized as follows. Section 1 reviews the relevant literature and proposes research hypotheses. The data and the methodology are presented in Section 2. Section 3 discusses the study's findings. Finally, the paper offers conclusions.

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## 1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Previous studies report that presidential partisanship affects stock market performance (Santa-Clara & Valkanov, 2003; Bialkowski et al., 2008; Füss & Bechtel, 2008). Oehler et al. (2013) investigated the impacts of eight US presidential elections on stock returns. Their findings suggest that ruling party alternation leads to greater decreases in stock returns.

Chan and Wei (1996) find that Hong Kong's Hang Seng index significantly reacts to political news. Shon (2010) finds firms making campaign contributions to Bush (Gore) experience positive (negative) stock returns during the 2000 Florida recount period of the 2000 US presidential election. Wagner et al. (2018) find that tax rate expectations have a significant impact on stock prices following Donald Trump's surprise victory in 2016. Finally, Child et al. (2021) examine the financial and economic benefits of political connections around the 2016 US

presidential election, finding that firms with ties to Trump enjoyed greater abnormal returns over the post-election period and received more government contracts in the post-election period.

Following Brown et al. (1988) and Pantzalis et al. (2000), Mehdian et al. (2008) examine the reactions of the Turkish stock market to the news regarding economic or political events, with findings that support the UIH. In Taiwan, based on whether the final pre-election poll released by the major television shows one candidate has an absolute advantage, Chen et al. (2017) separate the six presidential elections (from 1996 to 2016) into expected and unexpected events. They find a positive CAR for expected events but a negative CAR for unexpected events during the whole event window.

Some researchers have documented that opinion polls, as a proxy for the uncertainty during an election campaign, may influence both the returns and the volatility of financial markets. Thompson and Ioannidis (1987) find a significant association between stock returns and pre-election opinion poll

results. Gemmill (1992) documents that the implied volatility of the FTSE-100-Index increases, which is driven by opinion polls showing an increased probability of a Conservative victory, leads to arbitrage opportunities. Different from Gemmill's study, Gwilym and Buckle (1994) investigate market reactions to another UK parliamentary election in 1992 and find no room for arbitrage when accounting for transaction costs, consistent with the semi-strong efficient market hypothesis.

Li and Born (2006) use US presidential polling data to measure election uncertainty and find that stock implied volatility increases when polls do favor a particular candidate, supporting the election uncertainty hypothesis (EUH). Ejara et al. (2012) use a lag value of lead percentage differences in opinion polls between Obama and McCain during the 2008 US presidential campaign. They find that the stock market reacts negatively (positively) to polling advantages for Obama (McCain), indicating that the party affiliation of presidential candidates may affect stock returns. However, Levy and Yagil (2015) use New York Times opinion polls for the next 2012 presidential election and find that the S&P 500 index responds positively to polls showing an increased probability of Obama's re-election. Finally, Goodell and Bodey (2012) find a negative connection between price-earnings ratios and uncertainty around US presidential elections.

Another extended implication regarding UIH is the PUH. Malley et al. (2007) report that macroeconomic uncertainty, induced by political events, affects stock market volatility. Goodell and Vähämaa (2013) document a positive association between the election probability of the eventual winner and implied volatility, suggesting that the concomitant anxiety of future potential macroeconomic changes contributes to political uncertainty during election campaigns. Goodell et al. (2020) use a prediction market analysis to find how election uncertainty impacts economic policy and financial market uncertainties. Thus, the EUH (Li & Born, 2006; Goodell & Bodey, 2012) and the PUH (Goodell & Vähämaa, 2013; Goodell et al., 2020) are broadly consistent with the UIH (Brown et al., 1988).

Unlike Wagner et al. (2018), who studied stock reactions to the surprise outcome of the 2016 US

election, Herold et al. (2021) use the increasing Trump's poll scores as a measure of the probability of Trump winning the election and find that the stock performance of most industries is linked negatively to the measure of election uncertainty. P. K. Narayan and S. Narayan (2021) investigate the effect of the Morgan polling data on party preference in Australia. They find that stock returns react more strongly to a support lead for the Australia Labor Party than the Liberal-National Party.

Previous studies document that the perceived credibility of news varies with media channels. Welch (2002) examined the reliability and validity of polls reported in four major national newspapers and four smaller newspapers during the 2000 US presidential election campaign. It was found that whether the newspaper conducted a poll determines the poll's perceived reliability. Flanagan and Metzger (2000) find that news obtained from online sources is considered to be as credible as that obtained from television. Mehrabi et al. (2009) find that the public trusts television news more than online news sources. Idid et al. (2017) compare the credibility of traditional and online media among Malaysian voters regarding expectations of policy performance following national elections. They find that television media engender the highest levels of trust, while online news sources are seen as least credible. Similarly, Besalú and Pont-Sorribes (2021) find that Spanish news consumers assign considerably higher credibility to television than to social media.

The purpose of the study is to explore whether and how Taiwan's market returns react to changes in the probability of an incumbent party winning depending on the source of such opinion polls and during various periods. To examine the effect of pre-election polls on the Taiwan stock market, this paper takes initial polls with the incumbent at a disadvantage as negative news since such polls reflect a high probability of policy discontinuity. It also views changes to polling results over time as positive (good) news or negative (bad) news. Polls showing an improved position for the incumbent were taken as positive news, which signals that such results improve investor sentiment. Conversely, nega-

tive polling news for the incumbent are expected to have negative impacts on financial markets. Assuming stronger reactions to bad news than to good news, the CAR difference between lead decreases and lead increases should be significantly negative. The first hypothesis thus consists of three parts for normal polls,  $H_{1a}$ ,  $H_{1b}$ , and  $H_{1c}$ . The second hypothesis,  $H_2$ , examines whether opinion polls obtained from television influence stock returns more than those obtained from newspapers.

For the 2020 Taiwan presidential election, the challenger candidate Han responded to his poor polling performance by adopting a poll-spoiling strategy, which separates polls before and after the implementation of this strategy as “normal polls” and “chaotic polls.” The study proposes that changes in poll leaders during the chaotic period do not provide incremental information to measure changes in political uncertainty because investors ignored polling fluctuations. Furthermore, once the incumbent Tsai’s polling lead crossed a certain threshold, markets were confident of her eventual victory. Thus, differences in investor sentiment were statistically insignificant in reaction to positive or negative polling changes during the chaotic period. The third hypothesis,  $H_3$ , examines the CAR difference between lead increases and lead decreases to be not negative for chaotic polls. Hence, the hypotheses are set as follows:

$H_{1a}$ : *Markets respond negatively to bad news; thus  $CAR^{\Delta Lead Decrease} < 0$ .*

$H_{1b}$ : *Markets respond positively to good news; thus  $CAR^{\Delta Lead Increase} > 0$ .*

$H_{1c}$ : *Markets react more strongly to bad news than to good news; thus  $CAR^{\Delta Lead Decrease} - CAR^{\Delta Lead Increase} < 0$ .*

$H_2$ : *Television opinion polls during the 2020 Taiwan presidential election have a more significant impact on stock returns than polls published by other media channels.*

$H_3$ : *The mean CAR difference between the decrease and increase subsamples is not negative for the chaotic data.*

## 2. DATA AND METHODOLOGY

### 2.1. Sample selection

This study examines how stock performance responded to changes in the 2020 presidential election polling results. The sample period includes the 114 trading days from the first TVBS polls on primary results, confirmed on July 15, 2019, to the legally mandated pre-election polling moratorium date on December 31, 2019. That is, the stock prices and polling data were collected for about six months prior to the 2020 Taiwanese presidential election date.

The stock sample, obtained from the Taiwan Economic Journal (TEJ) database, includes companies listed on the Taiwan Stock Exchange. The sample, excluding firms either without complete stock price data or with significant events such as mergers and acquisitions announcements for the sample period, and comprises 825 listed firms.

Based on prior work examining the credibility level of television, newspapers, and Internet-based media sources, this study proposes that the market impacts of polling results were mediated by the relative perceived credibility of the information source (including television, newspaper, online). According to “A Study of Taiwan’s Media Credibility in 2019” released by the Taiwan Media Watch Fund, TVBS was ranked the most credible source due to public perceptions of the station having less of a partisan slant. Moreover, the impact of press media polls on the stock market is also concerned. The “2019 Media Book” released by the Media Agency Association (MAA) reports that Taiwan’s most widely read newspapers are the Liberty Times and Apple Daily. TVBS, Liberty Times, and Apple Daily also have an extensive online presence.

The starting point is the TVBS opinion center database, but this source lacks critical details, including release time. Thus, this study confirms all 40 sampled polls from the original online news sources. To avoid the confounding effect attributed to multiple media polls released on the same event window, the original sample of 40 polls was reduced to a total of 29 polls for the sample period, including 13 polls from TVBS, 13 polls from Apple Daily, and 3 polls from Liberty Times.

Further, the initial polls include the first public surveys from three media outlets. The challenger Han launched his poll-spoiling strategy on November 29, 2019, which thus marks the start of the chaotic period. Polls released between these dates are called the normal polls. Sample polls are classified chronologically into three periods: initial polling, normal polling, and chaotic polling.

Tsai's lead rate (Lead) is defined as her polling support less that of her opponent, with the initial polls used to set a benchmark for subsequent polling changes. Changes in Tsai's lead ( $\Delta\text{Lead}$ ) in subsequent polls are used to proxy for changes in the incumbent re-election probability. Based on changes to Tsai's lead, normal and chaotic poll samples are then divided into "increase" and "decrease" groups.

Finally, the TVBS sample includes one initial poll, three decrease polls, five increase polls during the normal period, and two decrease polls and two increase polls for the chaotic period. The 13 Apple Daily polls consist of one initial poll, four decrease normal polls, seven increase normal polls, and one increase chaotic poll. One initial poll and two increase chaotic polls are included for the Liberty Time's polls.

## 2.2. Methodology

This paper uses the event study methodology proposed by Brown and Warner (1985) to investigate the impact of Tsai's lead changes on stock returns. The event date is defined as each survey's release date ( $t = 0$ ). Based on Peterson (1989), the estimation period should be set between 100 and 300 days for daily data; this study applies the 120-day estimation period for the whole sample.

To determine an appropriate event window, it is necessary to observe the polling sample frequency. As opinion polls of TVBS and Liberty Times were published sporadically in response to specific political events, but Apple polls were released weekly (5 trading day period), there are short polling effects analyzed. Moreover, opinion polls were released during or after the local stock market closes. Therefore, this study includes one day before and after (-1, 1) the poll news announcement date as the event window. That is, the cumulative abnormal returns CAR (-1, 1) are used to meas-

ure the cumulative effect of these polls, leaving a margin for possible information effects. Following Pantzalis et al. (2000), the risk-adjusted market model is employed to calculate the abnormal returns for each stock as follows:

$$R_{i,t} = \alpha_i + \beta_i R_{mt} + \varepsilon_{i,t}, \quad (1)$$

$$E(\hat{R}_{i,t}) = \hat{\alpha}_i + \hat{\beta}_i R_{mt}, \quad (2)$$

$$AR_{i,t} = R_{i,t} - E(\hat{R}_{i,t}), \quad (3)$$

where  $R_{i,t}$  and  $E(\hat{R}_{i,t})$  are actual return and expected return for stock  $i$  on day  $t$ , respectively.  $R_{mt}$  denotes the market portfolio return on the Taiwan Capitalization Weighted Stock Index (TAIEX) on day  $t$ .  $AR_{i,t}$  is abnormal return for stock  $i$  on day  $t$ .  $\varepsilon_{i,t}$  denotes error term. The formula to calculate average abnormal return (AAR) on day  $t$  is:

$$AAR_t = \frac{1}{N} \sum_{i=1}^n AR_{i,t}, \quad (4)$$

where  $N$  is the number of sample stocks on the event day. The average abnormal returns are cumulated across the event period to measure the average cumulative effect on the sample securities from day  $\tau_1$  (the beginning of the event period) to day  $\tau_2$  (the end of the period). That is cumulative abnormal return for each event, CAR, is given by:

$$CAR = \sum_{t=\tau_1}^{\tau_2} AAR_t. \quad (5)$$

Most researchers focus on testing hypotheses about the average or cumulative average abnormal returns as well as estimating their magnitude. The traditional method (Brown & Warner, 1985) to test the statistical significance of the average abnormal returns is to assume that individual ARs are cross-sectional independent and normally distributed. The squared root of variance of cross-sectional error terms during the estimation period divided by  $N$  is

$\frac{1}{N} \sqrt{\sum_{i=1}^N \hat{S}_i^2}$ , and the  $t$ -test is calculated by:

$$t = \frac{AAR_t}{\frac{1}{N} \sqrt{\sum_{i=1}^N \hat{S}_i^2}}. \quad (6)$$

Based on the preceding assumptions, AAR's are further assumed to be independent over time and

the t-test is applied to examine the statistical significance of cumulated abnormal return during the period from  $\tau_1$  to  $\tau_2$ .

$$t = \frac{ACAR_{\tau_1, \tau_2}}{\sqrt{Var(ACAR_{\tau_1, \tau_2})}} = \frac{1}{\sqrt{N}} \sum_{i=1}^N \frac{\sum_{t=\tau_1}^{\tau_2} \left( \frac{AR_{it}}{\hat{S}_i} \right)}{\sqrt{m}}, \quad (7)$$

where  $m = \tau_2 - \tau_1 + 1$ .

Another testing approach in the analysis is the ordinary cross-sectional method. The t-test for the statistical significance of AAR and CAR are given by respectively:

$$AAR \cdot t = \frac{AAR_t}{\sqrt{Var(AAR_t)}} = \frac{AAR_t}{\sqrt{\frac{1}{N(N-1)} \sum_{i=1}^N (AR_{it} - AAR_t)^2}}, \quad (8)$$

$$CAR \cdot t = \frac{ACAR_{\tau_1, \tau_2}}{\sqrt{Var(ACAR_{\tau_1, \tau_2})}} = \frac{ACAR_{\tau_1, \tau_2}}{\sqrt{\frac{1}{N(N-1)} \sum_{i=1}^N \left( CAR_{i, \tau_1, \tau_2} - \sum_{j=1}^N \frac{CAR_{j, \tau_1, \tau_2}}{N} \right)^2}}. \quad (9)$$

This paper examines the association between the market returns and the incumbent winning probability by regressing the CAR on changes in incumbent's polling lead, and three control variables for the normal and chaotic polls, respectively. The regression models are as follows:

$$CAR_j = \alpha + \beta_1 \Delta Lead + \beta_2 \text{Log}MV_j + \beta_3 M / B_j + \beta_4 \text{Turn}_j + e_j, \quad (10)$$

$$CAR_j = \alpha + \beta_1 \cdot \text{Dummy\_media} \cdot \Delta Lead + \beta_2 \text{Log}MV_j + \beta_3 M / B_j + \beta_4 \text{Turn}_j + e_j, \quad (11)$$

$$CAR_j = \alpha + \beta_1 \cdot \text{Dummy\_normal} \cdot \Delta Lead + \beta_2 \text{Log}MV_j + \beta_3 M / B_j + \beta_4 \text{Turn}_j + e_j, \quad (12)$$

where  $\Delta Lead$  denotes the incumbent's lead points deduct the preceding lead points. Three control variables include the logarithm of the market size ( $\text{Log}MV$ ), market to book ratio ( $M/B$ ), and turnover

( $\text{Turn}$ ). Market size ( $MV$ ) is calculated by the closing price on the event date times the number of outstanding shares. The market to book ratio ( $M/B$ ) is the ratio of closing price on the event date to book value. The turnover ratio ( $\text{Turn}$ ) denotes the trading volume divided by number of outstanding shares.  $\text{Dummy\_media}$  is a dummy variable, which equals to one if the poll is released by TVBS, and zero otherwise.  $\text{Dummy\_normal}$  is a dummy variable, which equals to one if the poll is the normal poll, and zero otherwise.

Table 1 presents the descriptive statistics and correlations for the variables in this study. The mean of CAR during the normal and chaotic period is -0.09 percent and -0.001 percent, respectively. Regarding the main variables of interest, the results show that the mean for  $\Delta Lead$  has been relatively smaller for the normal period than the chaotic period (-0.42 percent vs. 2.6 percent). Moreover, Panel B in Table 1 shows that CAR is positively (negatively) correlated with  $\Delta Lead$  for the normal (chaotic) polls. Regarding the correlations between CAR and the control variables, Table 1 shows that CAR is positively correlated with the turnover but negatively correlated with the market-to-book ratio of  $M/B$ . Finally, the descriptive statistics demonstrate that CAR and  $\Delta Lead$  need to be further discussed by various media over the two different periods.

**Table 1.** Descriptive statistics and correlations

Source: Author's calculations.

Panel A. Descriptive statistics

Variable	Mean		Stdev		Median	
	Normal	Chaotic	Normal	Chaotic	Normal	Chaotic
CAR(%)	-0.09	-0.001	2.80	2.82	-0.22	-0.18
$\Delta Lead$ (%)	-0.42	2.60	4.88	4.30	1.00	3.00
LogMV	8.89	8.92	1.51	1.52	8.76	8.78
M/B	1.74	1.70	3.23	1.53	1.23	1.27
Turn	0.49	0.49	1.36	1.28	0.13	0.13

Panel B. Correlation coefficient matrix for normal samples

Variable	CAR	$\Delta Lead$	LogMV	M/B	Turn
CAR	1	0.03***	-0.006	-0.02***	0.16***
$\Delta Lead$		1	-0.001	0.003	-0.002
LogMV			1	0.083***	0.074***
M/B				1	0.08***
Turn					1

**Table 1 (cont.).** Descriptive statistics and correlations  
Panel C. Correlation coefficient matrix for chaotic samples

Variable	CAR	ΔLead	LogMV	M/B	Turn
CAR	1	-0.17***	-0.08***	-0.02***	0.21***
ΔLead		1	-0.006	-0.010	-0.026*
Log MV			1	0.266***	0.069***
M/B				1	0.159***
Turn					1

Note: All variables are defined in Appendix A. \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels, respectively.

### 3. EMPIRICAL RESULTS AND DISCUSSIONS

#### 3.1. Results

The paper examines whether CARs were driven by media type and firm characteristics, such as market size. The study presumes that the first polls of each media carry information about voter preferences because of the bandwagon effect, which suggests that an early lead would encourage further support to consolidate around the leader. Thus, the initial poll showing Tsai with a negative lead indicates the decreased incumbent win probability, suggesting increased political uncertainty.

Table 2 shows the abnormal returns (AR<sub>t</sub>) and the CARs for the TVBS polls. Panel A of Table 2 shows

that the initial TVBS poll with respect to the main challenger’s nomination shows a negative incumbent lead ratio of -4 percent and results in a significant negative abnormal return of -0.15 percent on release day. The mean CAR for the TVBS’s poll is not as expected to be significantly positive, 0.16 percent, which reflects the market’s positive reaction to Tsai’s disappointing initial poll. It can be explained that the opinion poll showing the incumbent Tsai losing to her challenger Han by four points was not worse than the previous poor polling performance on Tsai’s policy failures.

Panel B of Table 2 shows the impacts of “lead increase” (good news) and “lead decrease” (bad news) subsamples for normal polls and chaotic polls, respectively. For normal polls, the left part of Panel B of Table 2 presents the mean CAR for TVBS decrease and increase subsamples, respectively anticipated as -0.42 percent and 0.27 percent, in favor of hypotheses H<sub>1a</sub> and H<sub>1b</sub>. As the reaction to bad news is stronger than to good news, the mean CAR difference between the decrease and increase subsamples during the normal polling period is -0.69 percent at a 1 percent significance level, in favor of hypothesis H<sub>1c</sub>.

Next, the chaotic polling results are shown on the right part of Panel B in Table 2. The mean CAR for the decrease subsample is significant at 0.27 percent. The mean CAR for the increase subsample is still positive at 0.001 percent, but it is smaller than

**Table 2.** Cumulative abnormal returns for the TVBS polls

Source: Author’s elaboration based on TVBS (n.d.) opinion center.

Panel A. CAR for initial poll

Release Time	Lead Ratio	Variable/ Period	N	AR <sub>-1</sub>	AR <sub>0</sub>	AR <sub>1</sub>	CAR
18 Jul. 2019	-4%	Mean	825	0.37***	-0.15***	-0.06	0.16*
18:38		P-value		<0.001	0.002	0.162	0.06

Panel B. CAR for normal and chaotic polls

ΔLead	Variable/ Period	N	Normal Polls				N	Chaotic Polls			
			AR <sub>-1</sub>	AR <sub>0</sub>	AR <sub>1</sub>	CAR		AR <sub>-1</sub>	AR <sub>0</sub>	AR <sub>1</sub>	CAR
Decrease	Mean	2475	-0.09***	0.08***	-0.41***	-0.42***	1650	0.31***	-0.02	0.28***	0.57***
	P-value		0.003	0.007	<0.001	<0.001		<0.001	0.681	<0.001	<0.001
Increase	Mean	4125	0.09***	0.09***	0.08***	0.27***	1650	-0.21***	0.25***	-0.04	0.001
	P-value		<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	0.331	0.993
Difference	Mean		-0.18***	-0.01	-0.49***	-0.69***		0.51***	-0.26***	0.32***	0.57***
	P-value		<0.001	0.816	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001

Note: All variables are defined in Appendix A. Based on ΔLead, normal and chaotic poll samples are divided into “decrease” and “increase” groups. P-values of the t-test by the ordinary cross-sectional method for CARs are presented under corresponding means. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10%, respectively.

that of the decrease subsample, which reflects that the market responds positively to both increase and decrease polls. Furthermore, the mean CAR difference between the decrease and increase subsamples is significant but positive for the chaotic data, not consistent with hypothesis  $H_1$  but in favor of hypothesis  $H_3$ .

This paper examines whether markets reacted similarly to polls released by the Apple Daily and Liberty Times. Though Apple Daily outsourced its polling to independent contractors, it provided the highest frequency of poll reporting at once a week, including 13 Apple Daily polls. Panel A of Table 3 shows that the mean  $AR_0$  for the Apple Daily initial poll with a lead of -0.5 percent is still significantly negative -0.12 percent, which is similar to the TVBS's initial poll result. The cumulative effect of CAR is insignificant but negative at -0.08 percent. Furthermore, the CAR for both the decrease and increase subsamples are significantly negative, respectively -0.19 percent and -0.17 percent; the mean CAR difference between these two subsamples is not significant. For the increase polls of the chaotic period, the mean CAR is positive 0.29 percent at a 1 percent significance level. However, the results showing the market does not respond differently to the lead changes in Apple Daily normal polls provide evidence to reject the null hypotheses  $H_{1b}$  and  $H_{1c}$ .

Unlike the initial TVBS and Apple Daily polls, the Liberty Times' initial poll shows Tsai in the lead.

The Liberty Times released fewer poll results than the Apple Daily. Panel A of Table 4 shows significant but negative pre-release returns for AR and cumulative returns of CAR. One possible explanation is that other media outlets had released polling results showing Tsai in the lead prior to the Liberty Times poll in November. Market reaction to the Liberty Times' initial poll was confounded because it appeared about four months after the first polls released by another two media. While the markets show a significant but negative cumulative effect in response to the first poll, the mean CAR for the chaotic increase polls published by Liberty Times is not positive -0.72 percent either.

Collectively, the results confirm that stock markets respond positively to lead increases (good news) and negatively to lead decreases (bad news), in favor of hypotheses  $H_{1a}$  and  $H_{1b}$ . Further, the mean CAR difference between the decrease and increase subsamples during the TVBS normal polling period is significantly negative, suggesting markets react more strongly to bad news than to good news, in favor of hypothesis  $H_{1c}$ .

Additionally, stock markets react differently to polls published by three media. During the normal period, markets only respond positively (negatively) to positive (negative) polling data when such results are reported on television (TVBS) but not in newspapers, suggesting that the type of media has an impact on investor sentiment in favor of

**Table 3.** Cumulative abnormal returns for the Apple Daily polls

Source: Author's calculations based on the Apple Daily (n.d.).

Panel A. CAR for initial poll

Release Time	Lead Ratio	Variable/Period	N	$AR_{-1}$	$AR_0$	$AR_1$	CAR
23 Jul.	-0.5%	Mean	825	-0.11**	-0.12**	0.15**	-0.08
18:48		P-value		0.042	0.014	0.013	0.384

Panel B. CAR for normal and chaotic polls

$\Delta$ Lead	Variable/Period	N	Normal Polls				N	Chaotic Polls			
			$AR_{-1}$	$AR_0$	$AR_1$	CAR		$AR_{-1}$	$AR_0$	$AR_1$	CAR
Decrease	Mean	3300	-0.10***	-0.22***	0.13***	-0.19***		NA	NA	NA	NA
	P-value		<0.001	<0.001	<0.001	0.011					
Increase	Mean	5775	-0.02	0.02	-0.17***	-0.17***	825	0.27***	-0.31***	0.32***	0.29***
	P-value		0.325	0.348	<0.001	<0.001		<0.001	<0.001	<0.001	0.002
Difference	Mean		-0.08**	-0.24***	0.3***	-0.02					
	P-value		0.017	<0.001	<0.001	0.685					

Note: All variables are defined in Appendix A. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10%, respectively.

**Table 4.** Cumulative abnormal returns for the Liberty Times polls

Source: Author's calculations based on the Liberty Times Net (n.d.) opinion center.

## Panel A. CAR for initial poll

Release Time	Lead Ratio	Variable/Period	N	AR <sub>-1</sub>	AR <sub>0</sub>	AR <sub>1</sub>	CAR
28 Nov.	30.46%	Mean	825	-0.18***	-0.04	0.03	-0.18*
5:30		P-value		0.002	0.427	0.579	0.08

## Panel B. CAR for normal and chaotic polls

$\Delta$ Lead	Variable/Period	N	Normal polls				N	Chaotic polls			
			AR <sub>-1</sub>	AR <sub>0</sub>	AR <sub>1</sub>	CAR		AR <sub>-1</sub>	AR <sub>0</sub>	AR <sub>1</sub>	CAR
Decrease	Mean		NA	NA	NA	NA		NA	NA	NA	NA
	P-value										
Increase	Mean		NA	NA	NA	NA	1650	0.05	-0.36***	-0.41***	-0.72***
	P-value							0.236	<0.001	<0.001	<0.001

Note: All variables are defined in Appendix A. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10%, respectively.

hypothesis H<sub>2</sub>. Therefore, the television polls are employed in the following analysis.

### 3.2. Discussion

The empirical results for hypotheses H<sub>1a</sub> and H<sub>1b</sub> indicate that market returns were related positively (negatively) to the television polls showing increased (decreased) polling leads for the incumbent under normal conditions. This finding is consistent with the PUH of Goodell and Vähämaa (2013). They argue that stock markets expect to react positively to reduced political uncertainty due to the increase in the probability of an incumbent win. Moreover, the results for hypotheses H<sub>1c</sub> show that markets reacted more strongly to decreased polling leads (bad news) than to increased polling leads (good news) for television polls, consistent with the UIH (Brown et al., 1988).

The study finds a positive association between stock returns and the incumbent lead changes only for TVBS normal polls. The results for the second hypothesis provide evidence that stock returns are associated positively with the increased incumbent polling lead only to opinion polls released by television media, implying that investors react to polling information based on the relative credibility of the media source. This finding supports the argument that the market assigns significantly higher credibility to television than to other media (Idid et al., 2017; Besalú & Pont-Sorribes, 2021).

The chaotic sample results, supporting hypothesis H<sub>3</sub>, suggest that Han's unconventional tactics successfully confused markets. As a result, chaotic polls did not provide additional information for actual lead changes, which can be explained that the majority of voters believed that Tsai held a strong lead in the polls and responded positively regardless of whether her lead expanded or contracted. To sum up, the results confirm that stock markets respond differently to opinion polls depending on their source and campaign tactics.

### 3.3. Additional analysis on size effect

Another interesting presumption is that normal poll releases have a greater impact on smaller firms. This study expects small firms have relatively lower (higher) future returns following the polling lead decreases (increases). In the analysis, small firms are defined as being within the first-quantile and large firms as exceeding the third-quantile of Log MV.

This study examines whether the size premium, computed as the CAR differential between the small and large firms during the normal period, is positive following increases but negative following decreases. The upper part of Table 5 shows the size effect for normal polls. Following negative news (decreases), the size premium is negative of -0.36 percent at a 5 percent significance level. Following positive news, the size premium is negative at -0.06 but insignificant, suggesting that polls reporting lead decreases have a greater impact on the returns of smaller firms.

**Table 5.** Cumulative abnormal returns for the TVBS polls by market size

Source: Author's calculations.

## Panel A. CAR for normal polls

MV	ΔLead Decrease			ΔLead Increase			Difference	
	N	Mean	P-value	N	Mean	P-value	Mean	P-value
Small	618	-0.49***	<0.001	1030	0.08	0.08	-0.57***	<0.001
Large	618	-0.13	0.22	1030	0.14	0.51	-0.27*	0.06
Size premium		-0.36**	0.04		-0.06	0.66		

## Panel B. CAR for chaotic polls

Small	412	0.67**	<0.001	412	0.62***	0.001	0.05	0.85
Large	412	0.31***	0.005	412	-0.31	0.87	0.63***	<0.001
Size premium		0.36*	0.08		0.94***	<0.001		

Note: All variables are defined in Appendix A. Small firms and large firms are defined as being within the first-quantile and exceeding the third-quantile of Log MV, respectively. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10% level, respectively.

According to the UIH, markets tend to under-react to good news (increase) and overreact to bad news (decrease). Therefore, it seems plausible that small firms would exhibit more asymmetric reactions than large firms. The return difference between the decrease and increase subsamples is used to examine this assumption. The results show that the magnitude of returns for decreases exceeds that for increases (-0.49 percent vs. 0.08 percent). The CAR difference is significant at -0.57 percent for small firms and also significant at -0.27 percent for large firms, indicating that investors react more strongly to both bad and good news for small firms than they do for large firms. These results are consistent with UIH.

Different from the previous discussion of the normal polls, the lower part of Table 5 shows the size effect test for the chaotic polls. Polls during the chaotic period usually showed Tsai as having a lead of ten points or more. Market reactions to lead decreases were weaker than to increases because lead decreases do not convey negative information. Table 5 shows the mean CAR is positive at 0.67 percent and 0.62 percent, respectively for decrease and increase, with an insignificant difference for small firms. However, large firms have different results, which indicate a positive CAR difference of 0.63 percent. Finally, small firms experience higher returns to good news than large firms (0.62 percent vs. -0.31 percent), and, as expected, the size premium is positive of 0.94 percent at a 1 percent significance level.

### 3.4. Regression analysis

To identify explanatory factors for cumulative abnormal returns of pre-election opinion polls from sample polls, the CAR is used as the dependent variable. The most influential independent variable is the change in polling lead ( $\Delta$ Lead). Based on the UIH, markets expect to respond positively to these independent variables during the normal period, while the markets barely responded positively to these variables during the chaotic period. Therefore, two regressions are used to examine the period difference. This study establishes three independent variables of market size, market-to-book ratio, and turnover to control for the influence of firm characteristics.

Table 6 lists the regression results of the changes in lead variable, showing a significant and positive relationship between CAR and  $\Delta$ Lead for the TVBS normal sample but not for the chaotic sample. The coefficient of  $\Delta$ Lead is 0.07 at a 1 percent significant level. However, coefficients of the market-to-book ratio and turnover variables in the two-period regressions are all statistically significant. The coefficient of the size control variable (Log MV) is significant (-0.17) for the chaotic period but not for the normal period, indicating the size variable provides additional explanatory power for CAR since the market does not view chaotic polls as providing useful information showing the real gap between the two candidates. Furthermore, conducting regressions with sample polls chosen for the pooled TVBS polls and the whole normal polls by adding the dummy variables of period

**Table 6.** Regressions analyses of cumulative abnormal returns for sample polls

Source: Author's calculations.

Independent variable	TVBS sample			Full sample
	Normal	Chaotic	Pooled	Normal
Intercept	-0.1	1.77***	0.49***	0.05
	0.64	<0.001	0.003	0.71
$\Delta$ Lead	0.07***	-0.05***		
	<0.001	<0.001		
Dummy_media* $\Delta$ Lead				0.07***
				<0.001
Dummy_normal* $\Delta$ Lead			0.07***	
			<0.001	
Log MV	0.001	-0.17***	-0.006***	-0.02*
	0.98	<0.001	0.003	0.06
M/B	-0.06***	-0.09***	-0.07***	-0.03***
	<0.001	0.006	<0.001	<0.001
TURN	0.45***	0.51***	0.47***	0.31***
	<0.001	<0.001	<0.001	<0.001
Observations	6,600	3,300	9,900	15,675
Adj. R <sup>2</sup>	0.062	0.07	0.06	0.01
F	110.09	61.46	157.74	115.43
	<0.001	<0.001	<0.001	(<0.001)

Note: All variables are defined in Appendix A. P-values of the t-test for each coefficient are presented under the corresponding coefficient. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10% level, respectively.

(*Dummy\_normal*) and media (*Dummy\_media*), respectively, produced qualitatively similar results. Overall regression analysis shows that the positive release effect of the pre-election polls on CAR exists only during the normal period.

### 3.5. Robustness test

The ordinary cross-sectional testing method is used to check for the consistency of the results, which examines whether investors' reactions follow the UIH. Alternatively, the traditional testing approach can be used to examine CARs. Table 7 shows two alternative testing method results for CAR of the initial polls have similar conclusions.

The additional tests result in a large number of tables (not reported but available from the author upon request) and remain supportive of the hypotheses.

**Table 7.** Two alternative testing methods for CAR of the initial polls

Source: Author's calculations.

Variable/ Period	TVBS	Apple Daily	Liberty Times
Mean	0.16*	-0.08	-0.18*
(O)P-value	0.06	0.384	0.08
(T)P-value	0.09	0.393	0.06

Note: O(p-value) and T(p-value) denote P-values of the t-test by the ordinary cross-sectional method and by the traditional testing method, respectively. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10% level, respectively.

## CONCLUSION

This study aims to examine how pre-election surveys from three prominent media sources affect stock returns during the 2020 Taiwanese presidential election campaign. Moreover, this study examines how markets responded to changes in the opinion polls after challenger Han adopted an unprecedented election tactic of asking his supporters to feign support for the incumbent in future polls, damaging the credibility of all subsequent polling results.

The empirical findings indicate that the stock market had an unexpectedly positive reaction to the initial television poll showing the incumbent behind in the race, which indicates the initial poll could not convey additional uncertain information as the subsequent polls do. Consistent with the UIH, financial

markets respond positively (negatively) to subsequent polls showing increasing (decreasing) support for the incumbent. However, market reactions to polls from two prominent newspapers show inconsistent results, suggesting that markets only respond to influential surveys from credible sources, in line with the uncertainty information hypothesis. Additional analysis of the size effect shows small firms experience higher returns to increasing polling leads news than large firms. Further, analysis of the impact of polling during the chaotic period on investor sentiment indicates that Han's unorthodox tactics create considerable confusion in markets, thus the narrowing of the polling difference does not cause a significantly negative reaction. Overall, the analytical results indicate that markets react to normal opinion polls conducted by trustworthy media, thus supporting the UIH.

As noted, these findings provide evidence that the impact of 2020 Taiwan pre-election opinion polls on stock returns may differ based on media source and campaign strategy employed. Hence, the findings suggest that the opinion polls released by influential media may convey political uncertainty information, which provides investors an opportunity of adjusting investment strategy to make profits. Moreover, these chaotic polling results suggest that investors can obtain profits by simply staying invested after Han's unconventional tactics. This small media outlet range is a limitation of the current study, and an obvious direction for future research is to apply the model to examine other elections.

## AUTHOR CONTRIBUTIONS

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 Visualization: Yi-Shuan Chen.  
 Writing – original draft: Yi-Shuan Chen.  
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## REFERENCES

1. Apple Daily. (n.d.). *Politics*. (In Chinese). Retrieved from <https://tw.appledaily.com/politics>
2. Besalú, R., & Pont-Sorribes, C. (2021). Credibility of digital political news in Spain: Comparison between traditional media and social media. *Social Science*, 10(5), 1-18. <https://doi.org/10.3390/soc-sci10050170>
3. Bialkowski, J., Gottschalk, K., & Wiśniewski, T. P. (2008). Stock market volatility around national elections. *Journal of Banking and Finance*, 32(9), 1941-1953. <https://doi.org/10.1016/j.jbankfin.2007.12.021>
4. Brown, K. C., Harlow, W. V., & Tinic, S. M. (1988). Risk aversion, uncertain information, and market efficiency. *Journal of Financial Economics*, 22(2), 355-385. [https://doi.org/10.1016/0304-405X\(88\)90075-X](https://doi.org/10.1016/0304-405X(88)90075-X)
5. Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics*, 14(1), 3-31. [https://doi.org/10.1016/0304-405X\(85\)90042-X](https://doi.org/10.1016/0304-405X(85)90042-X)
6. Chan, Y., & Wei, K. (1996). Political risk and stock price volatility: The case of Hong Kong. *Pacific Basin Finance Journal*, 4(2-3), 259-275. [https://doi.org/10.1016/0927-538X\(96\)00014-5](https://doi.org/10.1016/0927-538X(96)00014-5)
7. Chen, Y., Cho, T., & Pai, S. (2017). The impact of presidential election on Taiwan's stock market. *Journal of Electoral Studies*, 24(1), 33-60. (In Chinese). <https://doi.org/10.6612/tjes.2017.24.01.33-60>
8. Child, T. B., Massoud, N., Schabus, M., & Zhou, Y. (2021). Surprise election for Trump connections. *Journal of Financial Economics*, 140(2), 676-697. <https://doi.org/10.1016/j.jfineco.2020.12.004>
9. Ejara, D. D., Nag, R., & Upadhyaya, K. P. (2012). Opinion polls and

- the stock market: evidence from the 2008 US presidential election. *Applied Financial Economics*, 22(6), 437-443. <https://doi.org/10.1080/09603107.2011.617692>
10. Erikson, R. S., & Wlezien, C. (2012). Markets vs. polls as election predictors: An historical assessment. *Electoral Studies*, 31(3), 532-539. <https://doi.org/10.1016/j.electstud.2012.04.008>
  11. Flanagin, A. J., & Metzger, M. J. (2000). Perceptions of Internet Information Credibility. *Journalism & Mass Communication Quarterly*, 77(3), 515-540. <https://doi.org/10.1177/107769900007700304><sup>1</sup>
  12. Füss, R., & Bechtel, M. M. (2008). Partisan politics and stock market performance: The effect of expected government partisanship on stock returns in the 2002 German federal election. *Public Choice*, 135(3-4), 131-150. <https://doi.org/10.1007/s11127-007-9250-1>
  13. Gemmill, G. (1992). Political risk and market efficiency: tests based in British stock and option markets in the 1987 election. *Journal of Banking and Finance*, 16(1), 211-231. [https://doi.org/10.1016/0378-4266\(92\)90086-F](https://doi.org/10.1016/0378-4266(92)90086-F)
  14. Goodell, J. W., & Bodey, R. A. (2012). Price-earnings changes during US presidential election cycles: voter uncertainty and other determinants. *Public Choice*, 150(3-4), 633-650. <https://doi.org/10.1007/s11127-010-9720-8>
  15. Goodell, J. W., & Vähämaa, S. (2013). US presidential elections and implied volatility: The role of political uncertainty. *Journal of Banking and Finance*, 37(3), 1108-1117. <https://doi.org/10.1016/j.jbankfin.2012.12.001>
  16. Goodell, J. W., McGee, R. J., & McGroarty, F. (2020). Election uncertainty, economic policy uncertainty and financial market uncertainty: a prediction market analysis. *Journal of Banking and Finance*, 110, 1-15. <https://doi.org/10.1016/j.jbankfin.2019.105684>
  17. Gwilym, O. A., & Buckle, M. (1994). The efficiency of stock and options markets: tests based on 1992 UK election polls. *Applied Financial Economics*, 4(5), 345-354. <https://doi.org/10.1080/758536472>
  18. Herold, M., Kanz, A., & Muck, M. (2021). Do opinion polls move stock prices?-Evidence from the US presidential election in 2016. *Quarterly Review of Economics and Finance*, 80, 665-690. <https://doi.org/10.1016/j.qref.2021.03.013>
  19. Idid, S. A., Ahmed, I. S. Y., & Souket, R. (2017). Examining political efficacy among Malaysian voters: The role of traditional and new media. *Journal of Asian Pacific Communication*, 27(1), 43-64. <https://doi.org/10.1075/japc.27.1.03idi>
  20. Levy, T., & Yagil, J. (2015). The 2012 US presidential election polls and stock returns. *Business and Economic Research*, 5(2), 66-74. Retrieved from <https://ideas.repec.org/a/mth/ber888/v5y2015i2p66-74.html>
  21. Li, J., & Born, J. A. (2006). Presidential election uncertainty and common stock returns in the United States. *Journal of Financial Research*, 29(4), 609-622. <https://doi.org/10.1111/j.1475-6803.2006.00197.x>
  22. Liberty Times Net. (n.d.). *Main Page*. (In Chinese). Retrieved from <https://www.ltn.com.tw/>
  23. Malley, J., Philippopoulos, A., & Woitek, U. (2007). Electoral uncertainty, fiscal policy and macroeconomic fluctuations. *Journal of Economic Dynamics and Control*, 31(3), 1051-1080. <https://doi.org/10.1016/j.jedc.2006.06.004>
  24. Mehdiyan, S., Nas, T., & Perry, M. J. (2008). An examination of investor reaction to unexpected political and economic events in Turkey. *Global Finance Journal*, 18(3), 337-350. <https://doi.org/10.1016/j.gfj.2007.06.002>
  25. Media Agency Association. (2019). *Media Book*. (In Chinese) Retrieved from <https://maataipei.org/media-knowledge/>
  26. Mehrabi, D., Hassan, M. B., & Ali, M. S. S. (2009). News Media Credibility of the Internet and Television. *European Journal of Social Sciences*, 11(1), 136-148.
  27. Narayan, P. K., & Narayan, S. (2021). Do opinion polls on government preference influence stock returns? *Journal of Behavioral and Experimental Finance*, 30, 100493. <https://doi.org/10.1016/j.jbef.2021.100493>
  28. Oehler, A., Walker, T. J., & Wendt, S. (2013). Effects of election results on stock price performance: evidence from 1980 to 2008. *Managerial Finance*, 39(8), 714-736. <https://doi.org/10.1108/MF-May-2012-0126>
  29. Pantzalis, C., Stangeland, D. A., & Turtle, H. J. (2000). Political elections and the resolution of uncertainty: The international evidence. *Journal of Banking and Finance*, 24(10), 1575-1604. [https://doi.org/10.1016/S0378-4266\(99\)00093-X](https://doi.org/10.1016/S0378-4266(99)00093-X)
  30. Peterson, P. P. (1989). Event studies: A review of issues and methodology. *Quarterly Journal of Business and Economics*, 28(5), 36-66. Retrieved from <https://www.jstor.org/stable/40472954>
  31. Santa-Clara, P., & Valkanov, R. (2003). The presidential puzzle: political cycles and the stock market. *Journal of Finance*, 58(5), 1841-1872. <https://doi.org/10.1111/1540-6261.00590>
  32. Shon, J. J. (2010). Do stock returns vary with campaign contributions? Bush vs Gore: the Florida recount. *Economics & Politics*, 22(3), 257-281. <https://doi.org/10.1111/j.1468-0343.2009.00359.x>
  33. Taiwan Media Watch Fund Foundation. (2019). A Study of Taiwan's Media Credibility in 2019 (In Chinese). Retrieved from <https://www.mediawatch.org.tw/news/9911>
  34. Thompson, R. S., & Ioannidis, C. (1987). The stock market response to voter opinion polls. *Investment Analyst*, 83, 19-22.
  35. TVBS. (n.d.). *Poll Center*. (In Chinese). Retrieved from <https://www.tvbs.com.tw/poll-center>
  36. Wagner, A. F., Zeckhauser, R. J., & Ziegler, A. (2018). Company stock price reactions to the 2016 election shock: Trump, taxes, and trade. *Journal of Financial Economics*, 130(2), 428-451. <https://doi.org/10.1016/j.jfineco.2018.06.013>
  37. Welch, R. L. (2002). Polls, polls, and more polls: An evaluation of how public opinion polls are reported in newspapers. *Harvard International Journal of Press/Politics*, 7(1), 102-114. <https://doi.org/10.1177/1081180X0200700107>

## APPENDIX A

**Table A1.** Variable definitions

Variable	Description
CAR	<p>The 3-day cumulative average abnormal returns (AAR) during the event window (-1, 1), which is one day before and after the polls' release day (t = 0), is calculated as</p> $CAR = \sum_{t=-1}^1 AAR_t.$
	<p>The benchmark daily return (AR) is calculated based on the market model using the 120-day estimation period from 140 days to 21 days before the event date, (-140, -21).</p>
$\Delta$ Lead	<p>Change in opinion poll lead points (in percent) of the incumbent president Tsai, that is, the lead scores in the present poll less her lead points in the previous poll. Tsai's lead points are the support ratio for Tsai less the support ratio for Han.</p>
Lead Increase	<p>Increase in the incumbent's lead points if <math>\Delta</math>Lead is positive.</p>
Lead Decrease	<p>Decrease in the incumbent's lead points if <math>\Delta</math>Lead is negative.</p>
Dummy_media	<p>Dummy variable equal to 1 if the poll is released by TVBS, and zero otherwise.</p>
Dummy_normal	<p>Dummy variable equal to 1 if the poll is released during the normal polling period, and zero otherwise.</p>
LogMV	<p>The logarithm of the market size (MV). MV is calculated by the closing price on the event date times the number of outstanding shares.</p>
M/B	<p>The market to book ratio (M/B) is the ratio of the closing price on the event date to book value.</p>
Turn	<p>The turnover ratio is the trading volume divided by the number of outstanding shares.</p>