

Voter rationality, the use of accounting information and voting behavior: evidence from a referendum

Voter
rationality

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Abstract

Purpose – This study aims to investigate whether objective and subjective rationality affects individual voters' use of accounting information and if such use affects voting behavior. While prior accounting studies assume voter rationality concerning financial performance and political outcomes, this study distinguishes between two types of voters: objective rational voters (who make voting decisions about multiple alternatives based on objective information) and subjective rational voters (who make decisions based on their subjective values, and thus do not explore information or explore only information biased toward one alternative). This study expects that accounting information can influence the voting behavior of objective and subjective rational voters.

Design/methodology/approach – Focusing on the 2020 Osaka Metropolitan Plan Referendum, this study used an online survey conducted on 768 respondents after the referendum.

Findings – This study finds that objective rational voters use accounting information more than subjective rational voters, voters who used accounting information were more likely to vote against the referendum, and voting behavior is not directly affected by the type of rationality of voters; rather, objective rational voters are more likely to use accounting information that has a mediating effect on voting behavior.

Originality/value – The results advance the understanding of public sector accounting research and practices by providing evidence of the individual voter's use of accounting information and their voting behavior in political contexts.

Keywords Referendum, Accounting information, Voting behavior, Voter rationality, Online survey

Paper type Research paper

1. Introduction

This study investigates whether types of individual voter rationality affect the use of accounting information associated with future policies and whether such use affects voting

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behavior [1]. Accounting information surrounding public sector reform is critical to the legitimacy of politicians and to citizens' decision-making (Liguori and Steccolini, 2018). Research shows that accounting performance – including raising taxes and debt – service performance, and variance from plans is related to election outcomes at the local government level (Bradbury and Scott, 2015; Lewis-Beck and Paldam, 2000) where it is accepted that voters' use of accounting information and voter rationality is not in dispute (Brusca and Montesinos, 2006; Feroz and Wilson, 1994; Ingram and Copeland, 1981). Voters tend to search through the Web for accounting information during pre-electoral periods, to make an informed and supposedly rational decision (Drago *et al.*, 2014; Repetto, 2018). However, accounting information is not necessarily useful at the individual voter level because it may be incomplete (Zimmerman, 1977) or omit material information such as substantial transfers (Baber and Sen, 1984), or be too detailed or complex (Aidt, 2000). Although accounting information may be one important determinant of individual voting behavior (Benito and Bastida, 2009; van Helden and Reichard, 2019), there is a lack of empirical studies that investigate what kinds of individual voters tend to use accounting information and whether the use of accounting information alters voting behavior. Thus, this study addresses the gap in accounting literature by examining types of voter rationality, the use of accounting information and voting behavior at the individual voter level in the political referendum context.

This study focuses on the referendum on the 2020 Osaka Metropolitan Plan (hereinafter, the 2020 Referendum) held on November 1, 2020. It asked the Osaka citizens to approve or disapprove the division of the city into four special districts and the transfer of some of the area-wide administrative authority of Osaka City to Osaka Prefecture. It was a political event that asked voters to make a simple yes-or-no decision. The residents made their decision after considering a variety of information. The financial impacts of the proposed change, particularly costs, potential revenue changes and impacts on assets/liabilities in case of approval, became a point of contention in the public debate over the 2020 Referendum. Thus, accounting information was central to public discourse on the 2020 Referendum. Additionally, the plan had difficulty communicating the benefits and outcomes of the approval to voters; hence, the use of accounting information might have been a sign of future financial deterioration. I illustrate my argument using the 2020 referendum to provide an expanded understanding of accounting information and voting behavior at individual voter level based on previous studies.

Research has classified voters as having objective or subjective rationality. The concept of objective rationality (Simon, 1982) states that objective measures can be implemented to evaluate voters' knowledge, understanding and preferences regarding the target issues (Campbell *et al.*, 1964; Shapiro, 1969). In this study, objective rational voters are defined as persons who are able to actively seek out objective information about every available alternative (Simon, 1982): basically, persons for whom voting behavior can be influenced by such information (Alt *et al.*, 2016; Gomez and Wilson, 2006; Lau and Redlawsk, 2006; Luskin, 1987). In contrast, studies have highlighted the importance of evaluating human decisions and behavior through the lenses of subjective rationality (Boudon, 1989, p. 176). Subjective rational voters are those who make subjective decisions based on their prior preferences and beliefs (Simon, 1982) and who passively collect information or make minimal effort to acquire information.

This study first investigates the relationship between voter rationality and the use of accounting information. Studies show that some voters value and rely on objective accounting information regarding budgets and finances (Benito and Bastida, 2009; Brusca and Montesinos, 2006). However, understanding the fundamental data is essential to the use

of accounting information (van Helden and Reichard, 2019) and, thus, may be related to voter objective rationality. This study expects that objective rational voters are more likely to use accounting information than voters with subjective rationality.

Additionally, this study examines if the use of accounting information affects voters' decision-making. Research indicates that accounting performance, especially fiscal deterioration, such as increased taxes and debts, is associated with voting behavior. Accounting information in the 2020 Referendum showed a potential increase in new debt and costs, including infrastructure, operation and opportunity costs, which signaled a possible future fiscal deterioration. This concern may have increased the probability of citizens voting to oppose the 2020 Referendum, assuming they considered such information. Results from the survey are consistent with this expectation those who used accounting information to vote were more likely to oppose the 2020 Referendum than those who did not. However, this was not the direct result of voter objective rationality but suggests that accounting information used by objective rational voters plays a mediating role and affects voting behavior. Voter objective rationality in itself does not seem to have a direct impact on voting behavior.

This study contributes to financial and public sector accounting literature by providing new evidence regarding the use of accounting information and voter rationality. Studies have provided evidence of the impact of accounting performance information on voting behavior at local government level (Boyne *et al.*, 2009; Brender, 2003; Bradbury and Scott, 2015; James and John, 2006). Furthermore, conceptually, the use of accounting information in the public sector requires the expertise, knowledge and understanding of users (Buylen and Christiaens, 2016; van Helden and Reichard, 2019). However, there is a lack of empirical studies that investigate the relationship between the types of voter rationality and the use of accounting information at the individual voter level. Evidence provided by this study suggests that objective rational voters do not influence voting behavior *per se* but influence voting behavior by using accounting information. There is an emerging interest in accounting and psychological studies as well as research informed by traditional economic theory that characterize individual decision-makers as rational, self-interested and utility maximizers (i.e. Goddard, 2010). This study expands on traditional public sector accounting research to focus on individual voter objective and subjective rationality.

The paper is organized as follows: Section 2 summarizes the institutional background of the 2020 Referendum, Section 3 reviews the literature and develops the hypotheses, Section 4 presents the research method, Section 5 presents the empirical and additional test results and Section 6 describes the study's implications and limitations and concludes the paper.

2. Background

2.1 Referendum on the Osaka Metropolitan Plan

Osaka Prefecture is one of Japan's 47 prefectures, with a population of approximately 8.8 million, and is responsible for the administration of a large area. Osaka City has a population of about 2.6 million, which makes it an ordinance-designated city (those with a population of 500,000 and more) with some independence and is the largest of the 43 municipalities in Osaka Prefecture.

Both Osaka City and Osaka Prefecture have authority over planning and administering medical care, welfare, education and other public services, such as the establishment of high schools, public universities, research institutions, libraries, public hospitals and other facilities. However, Osaka City is also responsible for land redevelopment projects and the

administration of family and residence registries, taxes, health insurance, pension and welfare.

Although Osaka prefecture is responsible for a much larger area than Osaka City, the latter's financial budget is larger. The budget for fiscal 2020 was approximately ¥2tn for Osaka Prefecture and approximately ¥3.5tn for Osaka City. Each of them has been investing in the same public services, stretching the budget and depleting public finances.

The Osaka Metropolis Concept was a plan proposed by the Osaka Restoration Association to change the administrative structure and relationship between Osaka Prefecture and Osaka City [2]. Under this plan (to reduce the duplication of administration), the 24 administrative wards of Osaka City would be consolidated into four or five special wards, and the authority and budget for a portion of the wide-area administration carried out by Osaka City would be transferred to Osaka Prefecture. As this was primarily a reorganization plan for Osaka City, with a significant impact on its citizens, the 2020 Referendum was limited to them.

On May 11, 2015, the first referendum was held for the citizens of Osaka City and rejected, with 49.62% voting in favor and 50.38% voting against. The plan was revised, and a referendum was held and rejected again on November 1, 2020, with 49.37% voting in favor and 50.63% voting against [3]. Osaka City citizens were not required to vote; the turnout was 66.8% in 2015 and 62.3% in 2020.

2.2 Political campaigns and accounting information

Following the announcement on October 12, 2020, that the second referendum, the subject of this study, would be held on November 1, 2020, an intense political campaign was conducted by proponents and opponents. Their arguments were widely publicized in the media, across television, newspapers and websites.

There was a disagreement between the Osaka Restoration Association and other parties in the city council over the referendum. The Osaka Restoration Association shared the blueprint and accounting information for the Osaka Metropolis plan prepared by the Osaka City with the public, whereas the other parties generally shared only information expressing negativity or concern about the plan. This study defines voters that sought out information from most or all of these sources as objectively rational voters and those that sought out information from only one or a limited number of resources as subjectively rational voters.

Accounting information associated with the referendum was discussed and disclosed in detail. Three main types of information were provided:

- (1) information about the costs of implementing the plan;
- (2) financial simulations about the possible outcomes of the plan in revenues, expenditures and public financing; and
- (3) the current financial state of Osaka City and future projections. This study uses these three types of information to define *accounting information* related to voting behavior.

First, in calculating the costs associated with the establishment of the special districts, two patterns emerged: the case of establishing a new government building in each special district and that of renting private buildings. The initial cost was estimated at ¥31.1–55.8bn, and the running cost at ¥4.1–4.8bn per year.

Second, Osaka City argued that, based on the financial simulations, the proposed reforms would result in savings sufficient to cover costs, with no shortfall in revenue and

expenditure. Approximately 75% of the investment needs were to be financed through public bonds, with the impact of administrative reforms adequate to achieve a return on the initial investment. However, the public financing of the establishment of special districts could lead to financial deterioration and a decline in public services.

Finally, Osaka City provided information on the current and projected financial situations. As of March 2020, Osaka City's overall fiscal balance was a negative ¥10.7bn and was expected to remain at the same level for the next 10 years. Although the municipal debt balance had been decreasing over the past 10 years, the city already faced a severe fiscal situation, set to worsen due to the outbreak of COVID-19 and pandemic management.

Osaka City held briefing seminars to explain the details of the Plan, including the wastefulness of the dual administration of Osaka Prefecture and Osaka City, past fiscal problems and issues related to future public finance. The city argued that the future costs of the Plan and bond financing were reasonable and that future reorganization into four or five special districts would generate revenue and returns for the residents. However, a concern was raised by some citizens and the media that the costs of establishing special districts would result in future financial deterioration; they argued that costs would be high, and the revenue and returns of the plan would be small or at best uncertain. Furthermore, the fiscal simulations proposed by Osaka City were unrealistic as they included unrelated revenues and did not accurately portray the current situation (The Japan Times, November 2, 2020).

This was a unique referendum as it related to the unique structure of Japan's local governments, law and delegation of authority to local governments. Yet, such issues are commonly faced by voters in referendums around the world, who also need to grapple with similar public financing issues and whether the short-term costs of a project can be set off by long-term returns.

3. Literature review and hypotheses development

3.1 Rational voters and accounting information

Accounting studies have focused on the association between budget and accounting information and political outcomes, such as presidential and mayoral elections (Ingram and Copeland, 1981). In the context of New Zealand local elections, Bradbury and Scott (2015), for example, show that accounting performance and signs of accounting performance (i.e. expenditure over-runs) impact the chance of re-election. Political science studies also show that reported accounting performance (including tax and debt increases), decline in services and variances from plans influence election results (Boyne *et al.*, 2009; Lewis-Beck and Paldam, 2000; Lowry *et al.*, 1998). Overall, these literature suggest that accounting information can be electorally relevant.

However, in traditional political science literature, researchers assume that voters are rational as follows:

- individuals are motivated by economic self-interest;
- individual voters are the underlying factor in political decisions; and
- politicians must make decisions supported by a majority coalition of voters (Downs, 1957). Such utility-maximizing voters are assumed to explore and are knowledgeable on all available information about differences in public spending and income patterns (Tiebout, 1956).

This study defines the process by which dispassionate voters make objective rational choices (Simon, 1982; Lee *et al.*, 2017). Objective rational voters search for objective information about all alternatives as actively as possible. Their decisions consider the

positive and negative consequences of each alternative in a way that maximizes their own utility.

Theoretically, however, not all voters necessarily explore all objective information. Accounting studies offer theoretical explanations for why some voters do not use accounting information based on the characteristics of information, such as incompleteness or too much detail and complexity (Aidt, 2000; Baber and Sen, 1984; Zimmerman, 1977). Other studies indicate that accounting information is used as additional ammunition in that decision-makers often have made up their minds about what they prefer and then seek accounting information to support this preference (Burchell *et al.*, 1980; van Helden *et al.*, 2021). However, these studies do not focus on voter characteristics related to the use of accounting information and are inconsistent with the empirical evidence on accounting performance and electoral outcomes.

To help explain this situation, this study proposes a different model, one of *objective and subjective rational voters*. It defines objective rational voters as those that make decisions based on all objective information (Simon, 1982), can understand political and economic information and actively seek out as much information as possible about every available alternative (Alt *et al.*, 2016; Lau and Redlawsk, 2006). In contrast, subjective rational voters demonstrate intrinsic decision-making based on prior preferences and beliefs (Simon, 1982), collect information passively or make minimal effort to acquire information that would allow them to make informed decisions (Simon, 1982; Lee *et al.*, 2017). They passively gather information or use cognitive shortcuts and various decision heuristics, ignoring other information. Their decisions are primarily based on prior perceptions and beliefs about alternatives and the typical characteristics of the proponents and opponents on a proposal (Lau and Redlawsk, 2006; Lee *et al.*, 2017).

Accounting information in this study includes information about past, present and future financial projections. Objective rational voters make decisions after considering this information, whereas subjective rational voters do not use such complex accounting information and rely on heuristics to confirm their perceptions and beliefs. Thus, I propose the first hypothesis as follows:

- H1.* There is a positive association between voters classified as objective rational voters and those that used accounting information in the 2020 Referendum.

3.2 Accounting information and voting behavior

This study investigates whether the use of accounting information, especially by rational voters, affects voting behavior. Research shows that accounting performance, including increasing taxes and debts, service performance and variance from plans is related to election outcomes (Lewis-Beck and Paldam, 2000). Additionally, accounting studies have investigated and found an association between accounting information and election outcomes (Brusca and Montesinos, 2006; Feroz and Wilson, 1994; Ingram and Copeland, 1981). However, they do not observe individual voters' use of accounting information and voting behavior. Whether the use of accounting information generally can influence voting behavior in referendums is an open question.

In elections, voters have access to a variety of information. Accounting information (including cost, revenue, assets and debt information) is provided to voters through mass media and other channels during political campaigns. Campaigning in the run-up to referendums plays a crucial role in curbing uncertainty about ballot proposals. Hobolt (2009) and Morisi (2016) show that in referendums, compared to general elections, campaigns

reduce the uncertainty associated with ballot propositions by providing voters with the means to make well-informed decisions.

First, studies show that voters are interested in accounting information, such as information about whether budgets have been balanced and penalize incumbents when the public financial balance deteriorates. For example, Peltzman's (1992) study of presidential, senatorial and gubernatorial elections in the USA proposes that voters are "fiscal conservatives." They punish spending increases (and hold macroeconomic conditions constant) regardless of whether they are financed by taxes or borrowing – especially the candidates from the incumbent party. Lowry *et al.* (1998) find that incumbent governors are punished in legislative elections for failing to maintain fiscal balance; their results show how electoral accountability for fiscal policy outcomes is strong.

Second, voters may base their decisions, in part, on their qualitative perceptions of the costs and benefits of the alternatives as well as quantitative analysis. Blais and Young (1999) studied individual citizens who indicate that their voting decisions are influenced by expected utility based on an analysis of the costs and benefits of the possible voting outcome. Alt *et al.* (2016) suggest, from experimental results, that the perceptions about future economic conditions (e.g. unemployment rates) influence voting behavior. Thus, information about the costs and benefits of voting outcomes may revise voters' expected utility and influence their voting behavior.

Third, prior research shows that voters have a strong propensity for bias in negative government fiscal performance (as well as other nonfiscal areas). Boyne *et al.* (2009) find evidence for a nonproportional performance threshold hypothesis, which implies that only the difference between low performance and mediocre performance matters, but there is no reward for high performance, suggesting negativity bias in the relationship between performance and electoral support for incumbents. In other words, the negative impact on incumbents when finances deteriorate may be stronger than the positive impact of when they improve.

In the 2020 Referendum, the accounting information associated with the establishment of special wards became the focus of the political campaign. Proponents indicated through accounting information that approval of the 2020 Referendum would result in cost savings and improved public service levels and would not result in a loss. However, postreferendum analysis widely concluded that Osaka City did not provide sufficient specific financial or nonfinancial information about the benefits of approving the 2020 Referendum (The Japan Times, November 2, 2020). They also cautioned that accounting information indicating the approval of the 2020 Referendum would lead to an increase in debt and other opportunity costs, such as the risk of long-term deterioration of the city's financial health.

For these reasons, the use of accounting information may result in lowering voters' perceptions of the financial health of the governmental entity in question. Based on this, this study predicts that objective rational voters are more likely to reject a plan under a referendum if they use accounting information to make their voting decision. Thus, the second hypothesis is proposed as follow:

H2. There is a positive association between voters who used accounting information in the 2020 Referendum and those who voted against it.

4. Research design

4.1 Online survey

After the second referendum (on November 1, 2020), this study used a Japanese research firm (INTAGE Inc.) to conduct an online survey during December 23–24. Data collection

took place only after an online explanation of the company’s code of ethics, individual consent and a warning that the survey may include political content. Respondents received a small incentive for completing the survey but were allowed to quit the survey at any time.

The online survey was distributed to 4,528 random voters living in Osaka City, and 1,051 responses were received (23.2% response rate). When the online survey was collected, it was adjusted based on residents’ residential area, age, gender and family structure. The final sample included 768 participants, after the exclusion of those who had selected “did not vote or did not have the right to vote” and “do not want to answer” in their answers to political and ethical questions and provided low-quality responses with many identical selections (Table 1) [4].

4.2 Survey items

Based on Lau and Redlawsk (2006) and other studies (i.e. Alt et al., 2016; Morisi, 2016), this study set variables including voter rationality, accounting information, voting behavior and other personal characteristics of the voter. All online survey items are presented in the Appendix.

4.2.1 Objective or subjective rationality. There are two approaches to measuring objective or subjective rationality: the amount of information (Lau and Redlawsk, 2006) and accuracy of the actual economic evaluation (Alt et al., 2016). However, this study differentiates economic information (including accounting information) from information from political campaigns. As this study does not focus on the accuracy of the value of economic information (i.e. the rate of unemployment), voter rationality is based on the amount of information that a voter reviewed in the 2020 Referendum campaign information.

In an experimental study, Lau and Redlawsk (2006) distinguish whether voters are rational or not in terms of two characteristics: depth and breadth of information. In other words, if the voter compared the viewpoints of both the proponents and opponents, the same two characteristics are used here to measure the extent of voter rationality. By separating by the median of depth and breadth of information, Lau and Redlawsk (2006) define rational voters as those for whom both the depth and breadth of information used are greater than the media. They also describe three additional categories of limited rational voters, being voters for whom one or both of depth or breadth is below the median. However, these three categories can be lumped together and described as subjective rational voters for whom voting behavior is based on subjective information and on their own preferences, personal

Criteria	Sample
<i>Panel A: Sample selection for the 2020 Referendum decision-making</i>	
Target of the survey (Number of people enrolled in the online survey)	4,528
<i>Less</i>	
No responses from the online survey	(3,477)
Voters who did not vote in the 2020 Referendum	(178)
Missing values of items and groups that responded with “do not want to answer”	(105)
Final observations of equation (1)	768

Table 1.
Sample selection
criteria

Notes: Online survey data were available from INTAGE Inc. Data for the online survey were collected during December 23–24, 2020

Source: Table by author

values and beliefs. Therefore, this study uses the simpler binary categories of objective and subjective rational voters rather than the four categories determined.

This study focuses on the information conveyed in the campaign by the proponents and opponents on 16 controversial items regarding the 2020 Referendum. The items are past financial issues of Osaka City, dual administration, socio-demographic discussion, resident services, information from politicians and information from political parties. To determine the rationality of respondents, the study measures both the depth and breadth of the political and economic information reviewed by the voters. It reviews the information (*Depth*) by looking at the number of items of information reviewed and the breadth of information (*Comparison*) by looking at whether respondents considered information from both proponents and opponents.

According to [Lau and Redlawsk \(2006\)](#), voters for whom both *Depth* and *Comparison* are higher than the median are objective rational. Based on this method, this study defines a voter as rational if both *Depth* and *Comparison* are greater than the median and as limited rational if either or both are less than the median.

4.2.2 The use of accounting information. The study tested whether respondents reviewed and used accounting information by asking:

- “Did you use cost information in making the decisions of how to vote in this referendum?”
- “Did you use financial simulation information about the possible outcomes of the Plan in making the decision of how to vote in this referendum?”
- “Did you use current state and future fiscal projections about the current situation in Osaka City in making the decision of how to vote in this referendum?”

This study assumes that not all voters recognize and use accounting information. Therefore, the following explanation was added:

The costs associated with the establishment of special districts is the total of the initial cost related to system renovation, internal maintenance, and other initial costs and the running cost of system operation expenses, private building rent, and expenses newly required for each special district, as estimated by Osaka City in the event that special districts were established.

“The financial simulation for Establishment of Special Wards” was prepared by Osaka City as a reference material to verify whether the financial management of special wards would be viable in the future. To avoid unclear responses from respondents, the responses allowed were yes or no [5]. Because the accounting information officially published by Osaka City excludes the opportunity cost claimed by opponents, this study only supplemented public information.

Voter rationality was determined using two measures – depth and comparison of information use – which may be systematically related to the measurement of the use of accounting information and the problem of common method bias. To mitigate these issues through procedural and statistical remedies based on [Podsakoff et al. \(2003\)](#), this study first separated the measurement of dependent and independent variables by placing the questionnaire items at a distance from each other and by using different response formats. Second, as part of the statistical remedies, I conducted Harman’s (1967) single-factor test to evaluate the extent of common-method variance in the data ([Abernethy et al., 2013](#)); the proportion of variance explained for each factor was below 50%.

4.2.3 Voting behavior. In response to the question:

Q1. Did you vote in favor of the referendum to establish the special wards of Osaka City on November 1, 2020?”

The respondents were asked to choose from the following four options: yes; no; did not vote or did not have the right to vote; and do not want to answer. For ethical reasons, this study excludes the last category of responses from the observations.

4.2.4 Other personal characteristics of voters. This study also considers the influence of voters' political knowledge and past political behavior on their voting decisions (Lau and Redlawsk, 2006). To determine voters' political knowledge, respondents were asked three basic questions from middle school textbooks (regarding the role of diet members, courts and cabinet), and the average percentage of correct answers to these questions was determined. For political behavior, respondents were asked six representative questions about their past behavior. The responses to these questions were summed based on Lau and Redlawsk (2006). Finally, to control for voter demographic characteristics, this study controlled for education, age, gender and income [6].

4.3 Analytical strategy

To investigate *H1* and *H2*, the following logistic regression models [in equations (1)–(3)] were used for the survey results. Although the hypotheses and these models investigate associations, by comparing the regression results of equations (2) and (3), this study can investigate the mediating effects of accounting information:

$$\begin{aligned} \text{Accounting Information} = & \alpha_1 + \alpha_2 \text{Rationality} + \alpha_3 \text{Political Behavior} \\ & + \alpha_4 \text{Knowledge} + \alpha_5 \text{Age} + \alpha_6 \text{Gender} + \alpha_7 \text{Income} \\ & + \alpha_8 \text{Education} + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Vote}_{\text{Yes}} = & \beta_1 + \beta_2 \text{Rationality} + \beta_3 \text{Political Behavior} + \beta_4 \text{Knowledge} + \beta_5 \text{Age} \\ & + \beta_6 \text{Gender} + \beta_7 \text{Income} + \beta_8 \text{Education} + \varepsilon \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Vote}_{\text{Yes}} = & \beta_1 + \beta_2 \text{Accounting Information} + \beta_3 \text{Rationality} + \beta_4 \text{Political Behavior} \\ & + \beta_5 \text{Knowledge} + \beta_6 \text{Age} + \beta_7 \text{Gender} + \beta_8 \text{Income} + \beta_9 \text{Education} + \varepsilon \end{aligned} \quad (3)$$

where:

Accounting Information = an indicator variable of 1 if the respondent used more accounting information than the median to make their voting decision in the 2020 Referendum, and 0 otherwise.

Vote_{yes} = an indicator variable of 1 if the respondent voted in favor of the 2020 Referendum, and 0 otherwise.

Rationality = an indicator variable of 1 if both the depth and comparison of information considered by the respondent are greater than the median, and 0 otherwise.

Knowledge = the percentage of correct answers to the three questions about Japan's political system.

Political Behavior = the sum of scores from six representative questions about past political behavior.

Age = the age of respondent.

Gender = an indicator variable of 1 for females and 0 otherwise.

Education = education level of 1 (junior high school graduate) to 8 (postgraduate doctorate).

Income = personal income of 1 million each from 1 “no income” to 12 “more than ¥10m.”

In equation (1), the dependent variable is *Accounting Information*, which is an indicator variable of value 1 for respondents that used accounting information to make their voting decision in the 2020 Referendum greater than the median and 0 otherwise. This study set the independent variable *Rationality*, which represents the rational voters who have both depth and comparison of information. If voters’ rationality is relevant to the use of accounting information, the coefficient of *Rationality* is expected to be positive.

In equations (2) and (3), the dependent variable *Vote_{yes}* is an indicator variable of 1 if the respondent voted for the 2020 Referendum and 0 otherwise. To investigate the mediating effect of accounting information on voting behavior, equation (2) excludes the accounting information variable. In equation (3), if voters’ use of accounting information is relevant to voting behavior, the coefficient of *Accounting Information* is expected to be negative. Furthermore, if voter rationality does not directly affect voting behavior but rather is mediated by accounting information, then there should be no statistical relationship between rationality and voting behavior in equations (2) and (3).

Following Lau and Redlawsk (2006), three categories of control variables were created: respondent’s political *Knowledge* and *Behavior*; and personal attributes including *Age*, *Gender*, *Income* and *Education*.

5. Results

5.1 Survey results

Table 2 shows the results of the independent variables in equation (1): 24.5% of the voters considered accounting information in making their voting decision (*Accounting Information*); 34.6% of the voters were defined as objective rational (*Rationality*), information not shown in the table includes the following: voters in general considered a mean (median) of 4 (2) items of information (*depth*), whereas the number of items examined from both the pro and con sides of the argument (*comparison*) was very low, with a mean (median) of 0.838 (0). These results

Variables	Mean	SD	Min	Q1	Median	Q3	Max
<i>Vote_{yes}</i>	0.529	0.500	0	0	1	1	1
<i>Accounting Information</i>	0.245	0.430	0	0	0	0	1
<i>Rationality</i>	0.346	0.476	0	0	0	1	1
<i>Political Behavior</i>	0.759	0.674	0	0	1	1	6
<i>Knowledge</i>	0.387	0.487	0	0	0	1	1
<i>Age</i>	45.724	10.454	19	39	47	54	59
<i>Gender</i>	0.569	0.495	0	0	1	1	1
<i>Education</i>	3.708	1.597	1	2	4	5	8
<i>Income</i>	4.515	2.827	1	2	4	6	12

Notes: 768 responses were received from the online survey. Variable definitions = *Accounting Information* = the indicator variable of 1 if the decision was made using accounting information greater than the median, and 0 otherwise; *Vote_{yes}* = the indicator variable of 1 if a voter agrees with the establishment of a special district in 2020 referendum, and 0 otherwise; *Rationality* = the indicator variable of 1 if both the depth and comparison of information are greater than the median, and 0 otherwise; *Political Behavior* = the sum of scores from six representative questions about behavior that they have experienced; *Knowledge* = percentage of correct answers to three questions about Japan’s political system; *Age* = age of respondents; *Gender* = the indicator variable of 1 for female, and 0 otherwise; *Education* = education level from 1 (junior high school graduate) to 8 (postgraduate doctorate); *Income* = personal income in a range of 1 million each from 1 “no income” to 12 “more than ¥10m”

Source: Table by author

Table 2.
Descriptive statistics
of the variables in
equations (1)–(3)

indicate that even in a referendum, which is a simple yes/no election, voters obtain little information not only in accounting but also in depth and consideration of information from both sides

Next, the results of the control variables are described below. The percentage of correct responses for *Knowledge*, which enquired about political knowledge in three areas, was 38.7%. The mean (median) value of respondents' involvement in political activities in the past was 0.759 (1.000). This indicates that voters are not politically knowledgeable, and their past political activities tend to be limited to voting. The average *Age* was 45 years, 56.9% of the respondents were female, the median education was a university degree (4) and the mean income was ¥3–4m.

Table 3 shows how the voting results are distributed according to whether accounting information was considered in making voting decisions (*Accounting Information* = [0, 1]). The result shows that the respondents who considered accounting information (*Accounting Information* = 1) were more likely to state *no* as their response (49.75%) than *yes* (43.78%) and were less likely to respond with *did not vote or did not have the right to vote* (6.47%) or *yes* (42.68%) than those who did not consider accounting information (22.15% and 35.17%, respectively). these components are statistically different ($\chi^2 = 19.88, p < 0.001$), indicating that accounting information influenced voter decision-making in the 2020 referendum

5.2 Hypotheses testing

To test *H1*, this study performed a logistic regression analysis using [equation \(1\)](#). Column (1) of Panel A in [Table 4](#) shows the estimation results for each variable for *Accounting Information*. The top row of each coefficient shows the odds ratio and z-value in parentheses.

In the estimation result of [equation \(1\)](#), the coefficients of *Rationality* are positive and significant for *Accounting Information*. The odds ratio is 6.503. This suggests that rational voters are six times more likely than other voters to use accounting information, indicating a positive association between rational voters and those who used accounting information in referendums, supporting *H1*.

In the results for the control variables, the coefficients of *Political* and *Knowledge* are positive and significant for the dependent variable *Accounting Information*, with odds ratios of 1.330 and 1.783, respectively. These results, as well as those noted by prior studies and regulatory entities, suggest that the use of accounting information by voters requires politically knowledgeable citizens.

Subsequently, Columns (2) and (3) of Panel A in [Table 4](#) show the estimation results for each variable for *Vote_{yes}*. In Column (3) of [equation \(3\)](#), the coefficients of *Accounting Information* are less than 1 and significant in *Vote_{yes}*, with an odds ratio of 0.744; that is, the probability that voters who considered accounting information and favored the 2020 Referendum were lower than for those who did not use such information. This suggests a

	Accounting information = 0		Accounting information = 1	
	Freq.	%	Freq.	%
Did not vote or did not have the right to vote	165	22.15	13	6.47
No votes	262	35.17	100	49.75
Yes votes	318	42.68	88	43.78
Total	745	100.00	201	100.00

$\chi^2 = 19.88^{***}$

Table 3.
Voting behavior and
the use of accounting
information

Note: The table considers 946 responses obtained from the online survey
Source: Table by author

	Accounting information		$Vote_{yes}$
	(1)	(2)	(3)
<i>Panel A: Logistic regression results from equation (1)–(3)</i>			
<i>Intercept</i>	0.040*** (−4.946)	1.185 (0.348)	1.091 (0.180)
<i>Accounting Information</i>			0.744*** (−2.638)
<i>Rationality</i>	6.577*** (9.781)	0.656*** (−2.635)	0.775 (−1.484)
<i>Political Behavior</i>	1.299* (1.850)	1.413*** (2.839)	1.470*** (3.101)
<i>Knowledge</i>	1.780*** (3.020)	1.111 (0.686)	1.157 (0.936)
<i>Education</i>	1.074 (1.115)	0.955 (−0.911)	0.965 (−0.702)
<i>Age</i>	1.016 (1.462)	0.997 (−0.305)	0.999 (−0.164)
<i>Income</i>	0.971 (−0.777)	1.019 (0.650)	1.018 (0.608)
<i>Gender</i>	0.864 (−0.650)	0.968 (−0.187)	0.974 (−0.148)
<i>N</i>	768	768	768
<i>Pseudo R²</i>	0.174	0.015	0.022
<i>Panel B: Robustness checks using logistic regression model with the pre-vote variable</i>			
<i>Intercept</i>	0.042*** (−4.852)	0.915 (−0.127)	0.022 (0.030)
<i>Accounting Information</i>			0.703*** (−1.981)
<i>Rationality</i>	6.503*** (9.709)	0.620* (−1.854)	0.746 (−1.065)
<i>Political Behavior</i>	1.330** (2.004)	0.934 (−0.368)	0.959 (−0.219)
<i>Knowledge</i>	1.783*** (3.022)	1.210 (0.779)	1.271 (0.973)
<i>Education</i>	1.075 (1.120)	0.869* (−1.758)	0.877* (−1.645)
<i>Age</i>	1.017 (1.553)	0.965*** (−2.807)	0.967*** (−2.641)
<i>Income</i>	0.972 (−0.737)	1.022 (0.465)	1.020 (0.435)
<i>Gender</i>	0.851 (−0.718)	1.701* (1.837)	1.721* (1.874)
<i>Pre-vote</i>	0.777 (−1.320)	96.200*** (16.519)	97.575*** (16.394)
<i>N</i>	768	768	768
<i>Pseudo R²</i>	0.174	0.514	0.517

Notes: * ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively. The results are estimated using the logistic regression model in equations (1)–(3) without (Panel A) and with (Panel B) the *pre-vote* variable, using 768 full samples. This table shows the odds ratio and z-statistics of the logistic regressions in parentheses. See Table 3 for the variable definitions

Source: Tables by author

Table 4.
Results

positive association between voters who used accounting information and those who voted against the 2020 Referendum, supporting *H2*.

However, both Columns (2) and (3) have coefficients of rationality smaller than 1 (0.656 and 0.775, respectively) and are nonsignificant or weak toward voting behavior. The results do not show that the voting behavior of rational voters differs from limited rational voters and may indicate a mediating effect of accounting information on voting behavior.

5.3 Additional test and robustness check

This study conducted two additional analyses. First, the study excluded the “did not vote or did not have the right to vote” group from the sample, but these observations were included in the additional analysis. The results show the same relationship between rational voters, use of accounting information and voting behavior as in the main results.

Second, this study replaces *Accounting Information* with three types of alternative dummy variables in equation (3): *Cost Information*, *Fiscal Simulation* and *Fiscal Projections*. The result shows that the coefficient of *Cost Information* is negative and significant, whereas that of *Fiscal Projections* is negative but nonsignificant. This suggests that, among the three types of accounting information, cost information is particularly indicative of voters’ voting behavior.

This study performs the following two robustness checks [7]. First, although this study used three logistic models to investigate the mediating effects of accounting information, the difference in covariates between voters who use accounting information and those who do not may strongly affect voting behavior. Therefore, this study calculates a propensity score using the results of [equation \(1\)](#) to construct a matched sample with a control group that uses accounting information and using only the matching sample to estimate [equation \(3\)](#). The results are consistent with the main results of this study.

Second, this study considers that personal preferences, such as behavioral biases and potential beliefs, affect voting behavior. This study analyzes the degree of myopia, loss aversion and social consistency based on behavioral studies ([Kahneman and Tversky, 1979](#); [Loewenstein and Prelec, 1992](#)) in the robustness check, as well as the 2015 referendum behavior as additional control variables (*pre-vote* variable; see [Table 4](#)). The results are identical to those of this study [8].

6. Discussion and conclusion

This study investigates if voter rationality affects the use of accounting information associated with future policies and whether such use affects voting behavior regarding the 2020 Osaka Metropolitan Plan. The results show a statistical association between voter rationality and the use of accounting information. In addition, they show that voters who used accounting information to make voting decisions are more likely to oppose the referendum than those who did not.

The results suggest that the use of accounting information by objective rational voters plays a mediating role and affects voting behavior, but objective voter rationality in itself does not have a direct impact on voting behavior. Studies analyze accounting performance and political outcomes at the local government level ([Bradbury and Scott, 2015](#); [Feroz and Wilson, 1994](#); [Ingram and Copeland, 1981](#)). The evidence in this study complements the arguments of prior studies related to the types of voters, use of accounting information and political outcomes by suggesting that only the use of accounting information by objective rational voters influences their voting behavior. Additionally, voter rationality alone has unclear, or only a weak, effect on voting behavior, indicating that voting behavior requires the complex interaction of objective/subjective voter rationality and use of accounting information.

The findings extend our understanding of public-sector accounting research. They indicate that use of accounting information and its impact are varied and depend on rationality. Prior accounting studies show the association between political outcomes and accounting information ([Bradbury and Scott, 2015](#)). However, this study extends public sector accounting research by focusing on the types of rational voters and showing a relationship between accounting information and voting behavior at the individual level. The evidence in this study suggests that objective rational voters are associated with the use of accounting information, and this influences their voting behavior, whereas subjective rational voters may not use accounting information or accounting information that they do consider has no influence on their voting behavior. This evidence on the usefulness of accounting information in elections and referendums extends prior research by suggesting that the impact of accounting information on subjective rational voters is weak.

The results offer practical implications for public sector accounting. Political events such as referendums and plebiscites have been held frequently in recent years, and the social and economic impact of the voting outcomes can be very significant. This study shows that use of accounting information and voting behavior depends on voter rationality. Although 29.9% of voters in this study are objective rational, if all voters are objective rational and have access to accounting information, the final referendum outcome may change. From this standpoint, it is important to take measures and encourage the use of accounting information in referendums. However,

politicians and public administrators may have a disadvantage from disclosing accounting information in referendums and promoting its use to voters. They may have incentive problems that discourage the use of accounting information because they avoid being negatively evaluated by giving voters objective accounting information that infers future financial deterioration. Thus, there may be a small number of objective rational voters who can use accounting information, but with the potential to influence their voting decisions; based on the evidence of this study, accounting disclosure regulations of public sector accounting would contribute to voting behavior during elections and referendums should be considered. Specifically, disclosure regulations are important during elections and voting, not only for the candidate's personality and performance but also for the financial rationale of policies and accounting information.

However, this study has some limitations. In particular, this study uses an online survey methodology, which cannot avoid potential bias in the voters who register to be monitored. Additionally, the sample may suffer from nonrandom selection bias, even after using the propensity score matching model in robustness checks. Furthermore, the possibility that the results have been influenced by other factors cannot be excluded. For example, this study could not confirm about the pre-existing beliefs. It is important to note that observations of voting behavior at the individual level may be biased toward a particular population and thus be misaligned with the results of election outcomes at the municipal level.

Finally, this study deals with the special case of the 2020 Referendum on the Osaka Metropolis concept, and caution must be exercised in generalizing the findings to other political referendums. Based on the evidence, it is necessary to investigate the case for the use of accounting information in other political referendums or elections.

Notes

1. Prior studies use various terms to describe voter turnout, including voting outcome, voting decision and voting behavior. In this study, "voting behavior" is defined as an individual's decision to vote against a referendum.
2. Proponents of the Osaka Metropolis Concept expressed their expectations for the future of the two metropolitan areas of Tokyo and Osaka, provided the plan was implemented, as Osaka's proposed restructuring modeled is similar to the way Tokyo is structured.
3. This section is based on the special ward system and agreement on the establishment of special districts published by Osaka City on its website ([Deputy capital promotion bureau, Osaka city, 2020](#); in Japanese).
4. The nonresponse bias of the excluded sample was investigated by region of residence, age, gender, family structure and income, but no response bias between the initial and final samples was found.
5. This measure refers to the simple choices of ([Lau and Redlawsk 2006](#)).
6. In addition to these voter demographic characteristics, this study also controls for the following items in the Robustness Check subsection. First, to control the initial beliefs that replaced political ideology, this study uses voting behavior during the first Osaka referendum (May, 2015) because Japanese political ideology was formed around the national security debate. Since 2000, however, citizens have been less likely to make decisions based on their own political ideology ([Endo and Jou, 2019](#)). Second, this study controls three behavioral economic traits: myopia, loss aversion and social consistency.
7. The tables on robustness check are not included in this paper because the results are no different from the main results; however, those interested in verifying them can contact the author.
8. As these bias-related variables differ from the rationality assumption, they are excluded from the estimation of the main results.

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Appendix. Questionnaire items

Voter rationality

- (1) Proponents' (Opponents') information.

From which of the following information sources did you obtain information regarding the Osaka City Referendum. Please select all of the answers that apply to you:

- Discussion on the Dual Administration of Osaka Prefecture and Osaka City.
- Past political environment.
- Discussion on the concentration of people in Tokyo.
- Discussion on the decline of the working-age population.
- Discussion on the impact of an aging society.
- Discussion on the growth and development of Osaka.
- Discussion on past services provided to residents.
- Discussion on current services provided to residents.
- Biographies of politicians (mayors or representatives of opposition groups).
- Track record of politicians (mayors or representatives of the opposition).
- Political philosophy of politicians (mayor or representative of the opposition).
- Political plans of politicians (mayor or representative of the opposition).
- Description of the referendum by a political party.
- Officers of a political party (representative, deputy, etc.).
- Platform of a political party.
- [Prospective (Opponents) voters] Others.
- None.

The use of accounting information

Did you use cost information in deciding how to vote in this referendum?

- Yes.
- No.

Did you use the information on financial simulations about the possible outcomes of the Plan in deciding how to vote in this referendum?

- Yes.
- No.

Did you use the current state and future fiscal projections about Osaka City in deciding how to vote in this referendum?

- Yes.
- No.

Notes: The “costs associated with the Establishment of Special Wards” is the total of the initial costs related to system renovation, internal maintenance and others and running cost of systems operation, private building rents and new expenses for each special district, as estimated by Osaka City in the event special districts are established. The “financial simulation for Establishment of Special Wards” was prepared by Osaka City as a reference material to verify whether the financial management of special wards will be viable in the future.

Voting behavior

Did you vote in favor of the referendum to establish the special wards of Osaka City on November 1, 2020?

- Yes.
- No.
- Did not vote or did not have the right to vote.
- Do not want to answer.

Did you vote in favor of the referendum to establish the special wards of Osaka City on May 15, 2015?

- Yes.
- No.
- Did not vote or did not have the right to vote.
- Do not want to answer.

Political knowledge

Citizens who are dissatisfied with a decision are allowed to file an appeal to a higher court, but how many times do you think a person can currently be tried in Japan? Please choose only one. Please tell us about the judicial system in Japan:

- 2 times.
- 3 times.
- 4 times.
- 5 times.
- I do not know.

What do you think is the Cabinet’s responsibility? Please choose only one from the following:

- Diet.
- Bureaucracy.
- Supreme Court.
- Emperor of Japan.
- I do not know.

How long do you think is the term of a member of the House of Councilors? Please choose only one from the following:

- 3 years.
- 4 years.
- 5 years.
- 6 years.
- 11 years.
- Do not know.

Past political behavior

Please answer all of the following that you have had political experiences with:

- Voted in the last mayoral election.
- Cooperated in a political campaign.
- Donated money to a candidate or political party.
- Worked on a community-related project, such as a neighborhood association.
- Written articles (including on social networking sites) about a candidate or political party to express my opinion.
- Sent a letter to a candidate or political party.

Behavior biases

- Assuming that I will receive money, if I have a choice between receiving ¥100,000 now or ¥110,000 a year from now, I will choose the former.
- If an investment of ¥100,000 has a 50% probability of either a gain of ¥20,000 or a loss of ¥10,000, I would invest ¥100,000.
- When there are several similar products, I am more likely to buy the one that is recommended as the best seller than the one I think is better.

Answers:

- Highly applicable.
- Somewhat applicable.
- Neither applicable or inapplicable.
- Somewhat inapplicable.
- Not at all applicable.

About the author

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