# Impact of Corruption Revelations on Expenditures: Empirical Analysis Based on Prefectural Data in Japan[*]

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## Abstract

Corruption is a mechanism for individuals with budgetary authority to gain profits on an individual basis, instead of directing or allocating profits (funds) to a specific organization. It is incompatible with public interest and distorts the efficient allocation of resources across society as a whole. Especially, there are two cases of emerging wasteful expenditure. First, total expenditures increase when allocating new funds. Second, when funds for specific fields increase, fund allocation may become inefficient. This paper uses statistical data to examine the relationship between the presence of corruption and increase in expenditures, while paying attention to the fact that the presence of corruption is not known until it comes to light.

Much of the previous research uses cross-country data, which has limitations in that it fails to account for the differences in fiscal systems between countries. In view of that, the novelty of this paper lies in its use of Japan's domestic data. For the first time, this paper uses data on prefectures in Japan to test the impact that revelations of corruption have on expenditures (total expenditures, civil engineering budget, and successful bid rate).

The estimated results show that there is a possibility that expenditures are restrained after revelations of corruption. In addition, the analysis on the impact of revelations of corruption from the political situation suggested that the effect of expenditure reduction from revelations of corruption tends to be more restrained among local governments with governors

who received a high percentage of votes in the elections (low percentage of votes for other competing candidates). These results imply that, depending on the political structure, revelations of corruption do not necessarily lead to immediate cuts in expenditure, and that attention should also be given to the actions of governors.

## I.   Introduction

With the arrival of the aging society, the finances of local governments[1] in Japan are facing difficult situations. In response to this problem, the idea of "New Public Management (NPM)" was introduced as the direction of the fiscal and administrative reforms of local governments in the 1990s (Inazawa, 2006). Subsequently, in the 2000s, "New Public Governance (NPG)," which involves a wide range of agents such as corporations and NPOs in the process of policy formation and implementation, was highlighted (Osborne, 2006). However, only a few local governments progressed in improving either or both the quality and the efficiency of public services through NPM. The same is true in promoting the participation of private enterprises and local residents through NPG.

Why were only some local governments able to make more progress in reform than others? This paper focuses on corruption in local governments. Mizoguchi (2017) points out that "individuals who benefit from inefficient systems have no incentive to improve the current system" and cites "inefficiency of the bureaucratic system" as the first impact of corruption. Corrupt local governments may resist various reforms for fiscal efficiency.

It is easy to imagine the bad effects of corruption to public finance, but it is not only that. When corruption exists, in which public positions are abused for personal gain, it can lead to kickbacks and nepotism in project selection, resulting in a decline in the quality of public services and infrastructure, ultimately affecting economic growth and people's quality of life (IMF, 2019).

Therefore, it is widely recognized internationally that tackling corruption is essential. The SDGs include "significantly reducing all forms of corruption and bribery," and efforts are being promoted worldwide. In addition, the book "Corruption: What everyone needs to know" (Fisman and Golden, 2017-2019) has been published, drawing attention to the causes and effects of corruption. Thus, corruption may be a factor that makes expenditures inefficient and hinders administrative reforms. It is urgent to clarify the reality of corruption.

According to the "Status of Disciplinary Actions against Local Government Officials in

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[1]  The local government in Japan does not have the constitution establishment right. And it is called a local public entity in Japan. In this paper, we call it local government for easy understanding.

FY2013"[2] by the Ministry of Internal Affairs and Communications, corruption in Japan is defined as "engaging in misconduct related to one's job for personal gain." Corruption among public officials (both special and general positions) in relation to the government and local government expenditures has been pointed out in several cases. For example, even shortly after the promulgation of the Japanese Constitution following World War II and the beginning of a new system design, issues related to corruption and expenditures were already being indicated (Shimizu, 2013)[3]. Even now, cases related to corruption are confirmed almost every year regardless of national or local government.[4] If corruption causes situations where unnecessary expenditures have to be made, it means that corruption is causing "wasteful expenditures." In fact, there have been reports that indicate that the possibility of expenditures expanding beyond the appropriate size due to bribery, such as when specific groups take advantage of public works bidding or acceptance, continues to be a problem in recent years.[5]

In addition to reports as above, there are also case studies that suggest that collusion as one form of corruption has led to an increase in public works procurement rates and expanded local government expenditures. For example, Nishikawa (2017) verified the distribution of the successful bid rate (= winning price/estimated price by client) for a small local government in Japan over time series data from April 2010 to November 2015 and pointed out that only under the influence of the mayor who was arrested for collusive behavior, the public works procurement rate was abnormally high.[6] An increase in the procurement rate beyond the appropriate level leads to an expansion in the size of expenditures. In fact, according to the website on collusion by the National Citizen's Ombudsman Liaison Conference[7], "residents nationwide filed lawsuits against public works projects ordered by local govern-

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[2]  Ministry of Internal Affairs and Communications website, "Status of disciplinary actions against local government officials in FY2013" (URL: http://www.soumu.go.jp/menu_news/s-news/01gyosei11_02000048.html). Accessed May 6, 2016.

[3]  Shimizu (2013) presents several examples of inappropriate accounting practices from the postwar period to FY2011.

[4]  For example, the July 4, 2015, edition of the Nihon Keizai Shimbun Osaka morning edition, page 16, "Eager to ensure transparency in political expenses, local councils face tough scrutiny from citizens, with net publication and temporary suspension also possible," discusses the inappropriate use of political activity expenses by Hyogo Prefectural Assembly members and Toyonaka City Council members in 2014.

[5]  For example, the December 9, 2006, edition of the Nihon Keizai Shimbun morning edition, page 39, "Three governors arrested for bid-rigging (Part 1) Mediators heard 'voice from heaven,' led by prefectural leaders again," reports on bid-rigging involving bribes, which distorted public works. Also, the January 6, 2016, evening edition of the Nihon Keizai Shimbun, page 15, "Fukuoka Prefecture employee suspected of taking bribes, convenience given to contractors for levee construction," reports that employees received meals and gifts and took money in return for leaking information about construction projects such as levees. As a result of the information leak, there is a possibility that the unit price of the construction work may have increased if appropriate competitive bidding was not conducted.

[6]  In Nishikawa (2016), it was revealed through a detailed case analysis of Kawasaki-machi in Fukuoka Prefecture and information obtained through information disclosure requests that the successful bid rate had increased during the term of the mayor who was involved in bid-rigging. In Yanagawa et al. (2005), four cases of construction work ordered by local governments, which were recognized as bid-rigging incidents by the Japan Fair Trade Commission, were analyzed by dividing them into two periods: before and after JFTC's on-site inspections. They reported that during the period when it was considered to be in a competitive situation, the bidding prices decided by each contractor had a positive correlation with the cost conditions of the companies, whereas during the period when bid-rigging was suspected, such a correlation was not observed, indirectly indicating that the competitive situation was not present during the period of bid-rigging.

[7]  The National Citizens' Ombudsman Conference has been conducting its own survey on "Winning Bid Rate and Suspected Bid-Rigging Rate" since the fiscal year 2002, and has been conducting a survey on winning bid rates for prefectures, designated cities, core cities, and prefectural capital cities nationwide.

ments where collusion was uncovered and returned large amounts of tax money to the local governments" since 1999 (date of judgment).[8]

Under these circumstances, the first objective of this paper is to use statistical data for the first time in Japan to clarify the relationship between the revelation of corruption and the reduction of expenditures. In this connection, corruption by public officials is thought to exist in both national government and local governments. However, since comparative analysis about corruption of public officials in national government between countries is difficult due to differences both in national attitudes toward corruption and the methods used to organize statistical data. Therefore, this paper analyzes the data for public officials (both special and general positions) who work for local governments. In addition, this paper analyzes the factors that contribute to corruption based on the differences between local governments in Japan.

This paper uses as a corruption indicator the number of corruption cases published in the "Status of Disciplinary Actions against Local Government Officials" survey conducted annually by the Ministry of Internal Affairs and Communications, and demonstrates through empirical analysis the impact of corruption detection events on government spending.

Next, this paragraph provides an overview of the state of corruption in Japan in recent years, based on the "Status of Disciplinary Actions Taken against Local Public Officials in Fiscal Year 2020 (April 1, 2020 - March 31, 2021)"[9] on the website of the Ministry of Internal Affairs and Communications. In the 2020 fiscal year, there were 61 cases of corruption in local governments, with 53 organizations and 63 related personnel involved. These corruption cases are divided into "Prefectures, etc."[10], "municipalities, etc.", and "Public corporations, etc." Looking at the number of cases, organizations, and personnel for each category, the percentages of prefectures were about 13.1% based on the number of cases, 13.2% based on the number of organizations, and 12.7% based on the number of personnel. In cities and towns, 52 cases involving 45 organizations and 54 personnel were uncovered, with percentages of 85.2%, 84.9%, and 85.7%, respectively. While the number of corruption cases in cities and towns is higher according to simple numerical comparisons, considering that there are 47 prefectures and 1,718 cities and towns, it can be seen that corruption detection is more frequent in prefectures than in cities and towns.

Figure 1 shows the changes in the number of corruption cases, organizations, and related personnel in local governments from 1999 to 2020.

As shown in Figure 1, the number of corruption cases, organizations, and related personnel have been decreasing since around the 2006 fiscal year.

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[8]  In response to such public opinion, reforms to the bidding system were carried out nationwide, including the "Declaration of Bid-Rigging Eradication" by the National Governors' Association in 2006. For information on bid-rigging and bidding system reforms in Japan and the actual situation in local governments, see Suzuki (2004) and Suzuki (2008).

[9]  URL: https://www.soumu.go.jp/menu_news/s-news/01gyosei11_02000170.html Accessed May 22, 2022.

[10]  "Prefectures, etc." refers to some administrative unions in which two or more prefectures have been established, and "municipalities, etc." refers to special wards and some administrative unions, excluding those established by two or more prefectures. "Public corporations, etc." refers to local three public corporations, local government employees' mutual aid associations, and public interest corporations, among others (See Footnote 8 in "2. Regarding Corruption Incidents").

Figure 1: Trends in the Number of Corruption Cases, Organizations, and Related Personnel
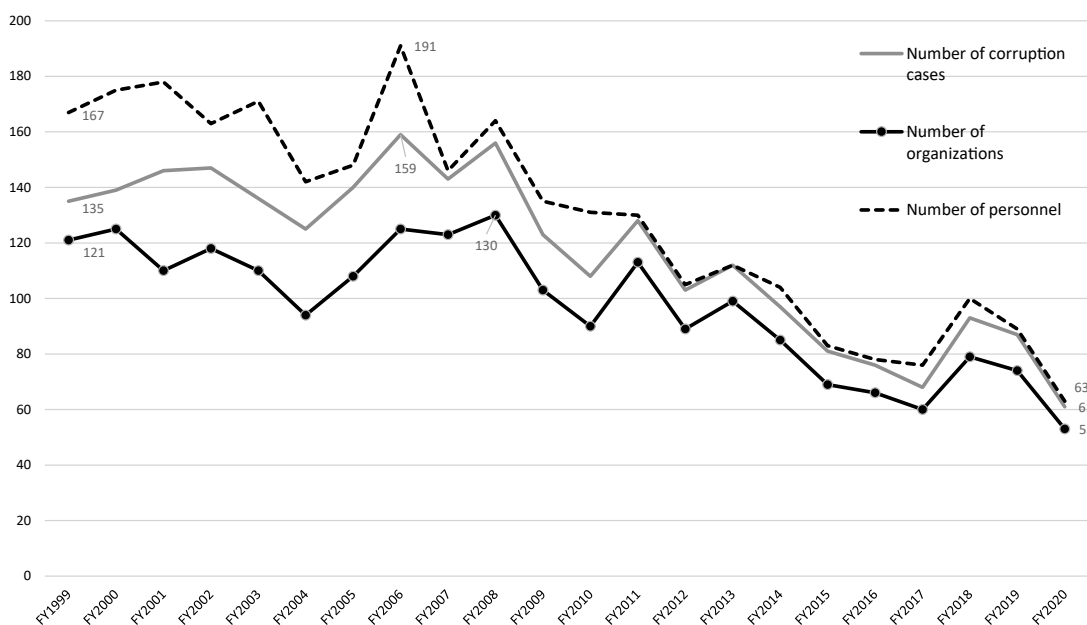


Source: Created by the author from the "Status of Disciplinary Actions against Local Government Officials" and the "Survey on Corruption Cases in Local Governments" published by the Ministry of Internal Affairs and Communications each year

For your information, Table 1 shows the trends in the number of corruption cases, organizations, and related personnel in local governments, shown in Figure 1.

The sentence mentioned above was explained by the trend for the entire country by the Ministry of Internal Affairs and Communications survey, but this did not touch upon regional differences. Therefore, in order to grasp the regional aspect of corruption, the number of corruption cases uncovered from fiscal year 2003 to 2018 was summed up by prefecture and presented in Figure 2.

From Figure 2, it can be seen that Tokyo (48 cases), Hokkaido (28 cases), Osaka Prefecture (27 cases), Chiba Prefecture (21 cases), Kanagawa Prefecture (18 cases), Aichi Prefecture (15 cases), and Fukuoka Prefecture (14 cases) have a higher number of corruption cases. Although it is understood that the number of corruption cases uncovered in local governments with a large population or number of companies tends to be high except for Hokkaido, it is difficult to see any further regional trends from these data.

Therefore, this paper clarifies the impact of corruption on public expenditures, taking into account some regional characteristics that may be involved. In addition, we focus not only on the total expenditure but also on the expenditure by field. We also conduct an analysis that considers political factors that are believed to influence the decision-making of local governments' expenditures.

This paper is structured as follows. In Section II, we introduce previous research and present the hypothesis of the impact of corruption revelations. In Section III, we conduct an

## Table 1: Trends in the Number of Corruption Cases, Organizations, and Related Personnel

| | | FY1999 | FY2000 | FY2001 | FY2002 | FY2003 | FY2004 | FY2005 | FY2006 | FY2007 | FY2008 | FY2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cases | Prefectures, etc. | 28 | 29 | 42 | 38 | 31 | 33 | 16 | 32 | 21 | 33 | 25 |
| | Municipalities, etc. | 101 | 107 | 98 | 106 | 104 | 92 | 124 | 126 | 120 | 122 | 98 |
| | Public corporations, etc. | 6 | 3 | 6 | 3 | 1 | 0 | 0 | 1 | 2 | 1 | 0 |
| | Total | 135 | 139 | 146 | 147 | 136 | 125 | 140 | 159 | 143 | 156 | 123 |
| Number of organizations | Prefectures, etc. | 16 | 23 | 24 | 20 | 19 | 15 | 10 | 19 | 11 | 22 | 11 |
| | Municipalities, etc. | 99 | 99 | 80 | 95 | 90 | 79 | 98 | 105 | 110 | 107 | 92 |
| | Public corporations, etc. | 6 | 3 | 6 | 3 | 1 | 0 | 0 | 1 | 2 | 1 | 0 |
| | Total | 121 | 125 | 110 | 118 | 110 | 94 | 108 | 125 | 123 | 130 | 103 |
| Number of personnel | Prefectures, etc. | 42 | 39 | 45 | 45 | 33 | 36 | 16 | 41 | 21 | 40 | 27 |
| | Municipalities, etc. | 117 | 133 | 127 | 115 | 137 | 106 | 132 | 149 | 123 | 123 | 108 |
| | Public corporations, etc. | 8 | 3 | 6 | 3 | 1 | 0 | 0 | 1 | 2 | 1 | 0 |
| | Total | 167 | 175 | 178 | 163 | 171 | 142 | 148 | 191 | 146 | 164 | 135 |

| | | FY2010 | FY2011 | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 | FY2018 | FY2019 | FY2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cases | Prefectures, etc. | 21 | 21 | 23 | 32 | 22 | 19 | 17 | 16 | 19 | 20 | 8 |
| | Municipalities, etc. | 87 | 106 | 80 | 80 | 75 | 62 | 59 | 52 | 74 | 67 | 52 |
| | Public corporations, etc. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 108 | 128 | 103 | 112 | 97 | 81 | 76 | 68 | 93 | 87 | 61 |
| Number of organizations | Prefectures, etc. | 16 | 17 | 17 | 25 | 13 | 16 | 13 | 11 | 11 | 16 | 7 |
| | Municipalities, etc. | 74 | 95 | 72 | 74 | 72 | 53 | 53 | 49 | 68 | 58 | 45 |
| | Public corporations, etc. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 90 | 113 | 89 | 99 | 85 | 69 | 66 | 60 | 79 | 74 | 53 |
| Number of personnel | Prefectures, etc. | 21 | 21 | 24 | 32 | 28 | 19 | 17 | 16 | 20 | 20 | 8 |
| | Municipalities, etc. | 110 | 108 | 81 | 80 | 76 | 64 | 61 | 60 | 80 | 69 | 54 |
| | Public corporations, etc. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 131 | 130 | 105 | 112 | 104 | 83 | 78 | 76 | 100 | 89 | 63 |

Source: Created by the author from the "Status of Disciplinary Actions against Local Government Officials" and the "Survey on Corruption Cases in Local Governments" published by the Ministry of Internal Affairs and Communications each year

## Figure 2: Number of Corruption Cases by Prefecture and Department
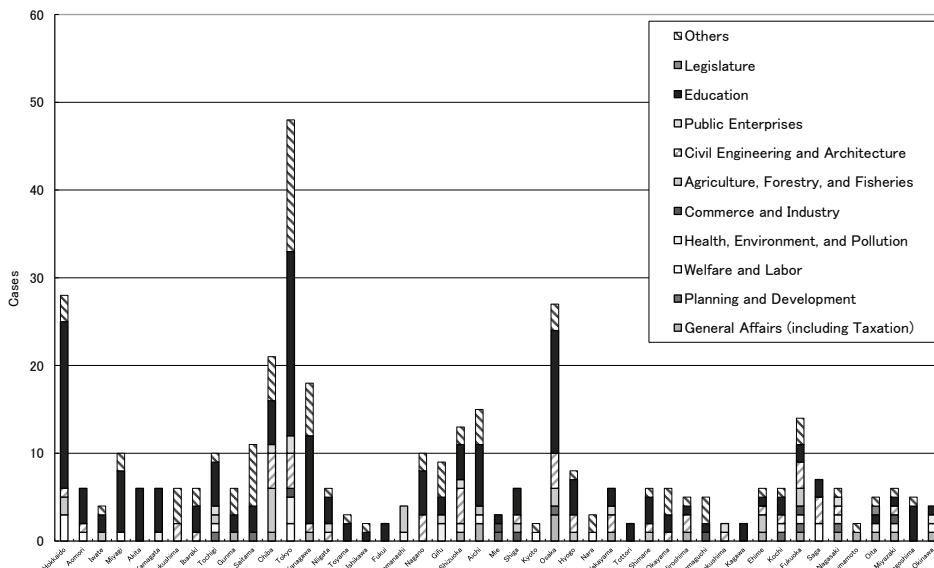


Note: The data is the total number of corruption cases from fiscal year 2003 to 2018.
Source: Compiled by the author from the original data of the "Status of Disciplinary Actions against Local Government Officials" and "Investigations into Corruption Cases in Local Public Bodies" published by the Ministry of Internal Affairs and Communications each year.

empirical analysis using panel data. In Section IV, we present the results of the analysis. Finally, in Section V, we conclude and discuss future challenges.

## II.    Introduction to Previous Studies

Empirical analyses on the impact of corruption have included studies analyzing the effects on economic growth and studies analyzing the effects on government spending.

First, studies analyzing the effect on economic growth focus on the so-called "sand the wheels" hypothesis, which examines whether the expansion of corruption inhibits economic growth by increasing the friction between the wheels of a train and its rails. Representative studies include Mauro (1995) and Mo (2001), which use cross-country data analysis to show that the existence of corruption has a negative impact on economic growth.[11]

Second, as early studies analyzing the effect on government spending, there are Mauro (1998), Gupta et al. (2001), and Fukumi (2002).

Moreover, there are recent studies using state-level data in the United States, such as Cordis (2014) and Liu and Mikesell (2014). Mauro (1998) examines the impact on the allocation of government spending, showing that corruption has a negative impact on education spending. Mauro (1998) and Gupta et al. (2001) show that military spending has a positive impact. Fukumi (2002) shows that corruption inhibits the economic growth effect of public investment. Theoretically, the incidence of corruption would increase the proportion of public investment allocated to government spending and the rate of embezzlement by government officials. Furthermore, the incidence of corruption would reduce the production effects of public capital. As a result, corruption is shown to lower the levels of private and public investment and to reduce the growth rate in the steady-state equilibrium. In addition, empirical analyses test two hypotheses: that "corruption increases the public investment rate beyond the optimal level and consequently lowers the growth rate," and that "corruption inhibits the effect of public investment per unit and consequently lowers the growth rate." As a variable for corruption, the "government corruption" index (7 levels, with higher values indicating more honest government officials) provided by the International Country Risk Guide (ICRG) is used in this previous study. Although this study was unable to support the first hypothesis, "the increase in public investment rate due to corruption," it did show the inverse U-shaped relationship between public investment rate and growth rate, as well as that the higher the degree of government corruption, the lower the effectiveness of public investment. However, this study employs the government corruption index as a proxy variable for corruption and does not directly analyze the impact of corruption revelations on government spending.[12] In recent years, Cordis (2014) and Liu and Mikesell (2014) con-

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[11]  In his work, Miguchi (2017) states that the "grease hypothesis" that corruption promotes economic growth has been refuted by recent empirical research.

[12]  As an indicator of corruption near detection, this paper focuses on "legal prosecution." Fisman and Golden (2017-2019) argue that if the judiciary operates in a relatively uniform manner across regions within a country, legal prosecution can be used as a reasonable indicator of how corruption varies across regions, citing studies such as Alt and Lassen (2008) that use prosecution figures to examine corruption by state in the United States.

ducted studies using the number of convicted public officials in the United States. The former investigated the relationship between corruption and state government expenditure composition. The study covered all 50 states from 1986 to 2008 and found that corruption reduced the proportion of state government expenditure allocated to higher education, correctional and public welfare, while increasing expenditure on health care, hospitals, housing and community development, and natural resources. The latter studied the impact of corruption on the size and distribution of U.S. state spending, covering the period of 1997-2008. As a result of this analysis, it demonstrated that corruption has increased public spending. In particular, the study reported that corruption can distort the allocation of public resources at the expense of the social sector, favoring more "bribe-producing" expenditures and items that directly benefit public officials, such as capital, construction, highways, borrowing, and total salaries and wages.

Baraldi (2008) showed that the effect of corruption varies depending on the level of political competition. Using panel data for 20 Italian regions from 1980 to 2003, he estimated both the quantitative effect and allocation effect of proportional representation, political competition, and bureaucratic corruption on public spending. As a result, it was shown that both less political competition (concentration of party votes) and the existence of corruption increased expenditure. In addition, the coefficient of the interaction term was positive. In other words, this showed that the combination of corruption and political conditions increased total public expenditure.

Thus, much of the previous empirical analysis was based on cross-country data. Although some studies used data from the United States state government to analyze the impact of corruption on expenditure within the same fiscal system, as far as we know, there has been no empirical analysis of the relationship between corruption and expenditure, particularly using data from Japanese local governments.[13] Moreover Baraldi (2008) conducted a study from the perspective that the effect of corruption on expenditure depends on political conditions. However, we are not aware of any research that used Japanese data.[14]

Therefore, the remaining task of previous research is that there has been no analysis of the impact of corruption on expenditure within the same fiscal system while considering political elements. To overcome this task, this paper presents a novel approach by using prefecture data in Japan, which allows us to confirm expenditure behavior under the Japanese fiscal system. This paper analyzes the impact of corruption on expenditure in Japanese local governments while considering political competition and bureaucratic characteristics.

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[13]  Ishida and Toume (2017), Yoneoka (2020), Yoneoka and Ishida (2020), and Yoneoka and Enatsu (2022) have all conducted empirical analyses of the causes of corruption (misconduct by local public officials) using data from the Ministry of Internal Affairs and Communications survey, focusing on the salary level of officials as a factor in the occurrence of corruption, which is different from the direction of analysis of the impact of corruption detection in this paper.

## III.    Empirical Analysis

### III-1.    Hypotheses

Corruption in local governments is a mechanism for individuals with budgetary authority to gain profits on an individual basis, instead of directing or allocating profits (funds) to a specific organization. Furthermore, it is incompatible with public interest and distorts the ef-

[14]  Several studies have analyzed the direct impact of political factors on local government spending. As prior research, Akuto and Sato (1986) pioneered this field, and Kikuchi (1989) focused on the relationship between the share of ruling party seats and total expenditure, ordinary construction project costs, and national government disbursements. Soga and Machidori (2001) examined the partisan composition of governors and assemblies using prefectural data, and Yamashita (2001) used two explanatory variables, ordinary construction project costs and prefectural project costs as public investment, and the proportion of construction workers among employees in the prefecture and the LDP's share of the assembly as explanatory variables. Kato (2010) used prefectural panel data, dividing expenses into independent project expenses and assistance project expenses, and used seven variables to show the characteristics of the assembly, such as the four variables of assembly composition (party share) and the governor's party affiliation to explain dummy variables indicating the governor's previous occupation (Ministry of Local Government (Ministry of Internal Affairs and Communications), other central bureaucrats, local administrative officials, and politicians).

Regarding the direction of examining the total amount of government expenditure and civil engineering expenses (public investment) in terms of political factors, there is a study close to our interest, Kondo (2007). In Kondo (2007), the change rate of each of the following explanatory variables from the previous term, national life infrastructure investment, industrial infrastructure investment, agricultural, forestry and fisheries administrative investment, national land conservation administrative investment, total administrative investment amount, and final government consumption expenditure, are taken as explanatory variables, and a regression analysis is conducted to verify the political economic cycle using the election year (implementation year of the House of Councillors election and House of Representatives election) as a dummy variable. The analysis results show that the House of Representatives election is not significant, or the sign condition is not met, and the House of Councillors election affects public investment related to industrial infrastructure, agricultural, forestry, and fisheries, and suggests that the situation of a political economic cycle of the "policy manipulation hypothesis" type exists. Additionally, using prefectural data on administrative investment amounts for business purposes, the influence of the number of Liberal Democratic Party seats is also analyzed. Furthermore, an analysis is conducted with four items for normal construction project costs: total amount, individual projects, subsidy projects, and share of total, and a variable representing the influence of profit groups (ratio of construction industry workers, dependence on public spending in the construction industry) shows a positive and significant result.

In Kato (2003), pool data from prefectures are used, and a dummy variable that divides the governor's approval, recommendation, and supporting political parties into six types is used as an explanatory variable, and an analysis is conducted with the number of governor's election wins, the share of political parties in the parliament (four political parties), and the proportion of the ruling party in the parliament as explanatory variables. A characteristic is the use of the proportion of the ruling party in the parliament as an indicator of divided government. When civil engineering expenses are taken as the explanatory variable, the ruling party's ratio is a significant negative result.

In Fujisawa (2004), panel data from 47 prefectures for 24 years from fiscal 1976 to 1999 are used, and a segmented linear model is estimated using the fiscal discipline (the difference between the net debt balance and the prefectural gross domestic product divided by the prefectural gross domestic product) as the explanatory variable and the tenure period as the explanatory variable or the explanatory variable with the square of the tenure period. In both cases, it is supported that the net debt balance divided by the prefectural gross domestic product (the difference between them) increases as the tenure period becomes longer. In Sunahara (2006), the dependent variable was divided into development policy and redistribution policy, and development policy was further divided into infrastructure development expenses and agriculture, forestry and fisheries expenses, while redistribution policy was divided into education expenses and welfare expenses. The explanatory variables used were the party seat ratio of prefectural assembly members, the support base and career of the governor, among others. In particular, the study differs from others in that it focuses on the governor's term, using dummy variables for the first three years and the final year of the term.

There are also studies that show that the effect of corruption on inequality varies depending on the level of political competition, although it is not the effect on expenditure. Wong (2017) examines whether government expenditure and corruption affect income inequality (Gini coefficient) based on data from 16 Asian countries and 18 Latin American countries from 1996 to 2009. The study argues that the level of political competition is an important factor in determining the effect of corruption, reporting that the interaction between corruption and political competition is negatively significant, rather than regional differences.

ficient allocation of resources across society as a whole. Especially, there are two cases of emerging wasteful expenditure. First, total expenditures increase when allocating new funds. Second, when funds for specific fields increase, fund allocation may become inefficient. Although it is unknown whether corruption is actually taking place until it is exposed, it is believed that after corruption is exposed, corrections are made to the expansion of total expenditure (in the case of new fund allocation) and the expansion of specific field expenditure (in the case of inefficient fund allocation). If a correction is made, it may be possible to say that excessive expenditure was made before corruption was exposed. Based on this idea, the following hypothesis is considered valid:

Hypothesis 1: "The exposure of corruption reduces later expenditure."

If this hypothesis is supported, it will not only reveal that expenditure is normalized after corruption is exposed, but also that expenditure had expanded before corruption was exposed.

Furthermore, from the following findings obtained from interviews[15] with the General Affairs Department of a certain prefecture, it is believed that this hypothesis is valid. The first finding is that although the number of corruption cases uncovered in prefectures is lower than in municipalities, it is more frequent in prefectures, considering that the total number of prefectures is 47 and the total number of municipalities is 1,718. The reason for this is probably that prefectures have larger authority and budget.

The second finding is that when confirming the type of corruption cases, embezzlement, such as creating false expenses in receipts, is more common[16]. It is said that this is because embezzlement can be done alone without the need for a partner, such as in bribery or abuse of authority. Therefore, it has been found that embezzlement that creates false expenses and increases expenditure is more likely to occur in prefectures with larger authority and budget. Furthermore, in past cases, there has been a tendency for the number of opinions and inquiries from residents through phone calls, etc. to increase after corruption is exposed.

The third finding is that, in the civil engineering and construction sector, even after the revelation of corruption, the predetermined expenditure amount is generally not changed due to the project's timeline. However, if leakage of the amount of money that a public sector estimated beforehand as the client is uncovered before the start of the project, it is possible to delay the project by changing the project (splitting one construction into several) and re-bidding. It was found that the postponement of expenditure plans in the following fiscal year is likely to cause changes in the trend of previous expenditures.

In addition, various political factors may influence local government expenditures. Although this paper examines the impact of the revelations of corruption on public expenditures, it also examines whether political factors may have affected it. Therefore, the follow-

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[15]  Conducted on March 14, 2022.
[16]  The most frequent types of corruption, in descending order, are embezzlement (57%), bribery (13%), and abuse of authority (6%) when classified by type.

ing hypothesis is set:

Hypothesis 2: "The decrease in expenditure due to the revelation of corruption is influenced by political factors."

Firstly, with regard to the governor's attributes, if the governor is in a politically weak position when corruption is uncovered, it may be difficult to review the project. Therefore, the governor's attributes may make it difficult to reduce expenditure when corruption is uncovered.

Secondly, regarding the attributes of the prefectural assembly that deliberates on budgets and settlements, it is considered that the behavior of prefectural assembly members to expand expenditures due to their re-election motives may also affect the reduction of expenditures due to corruption. The shorter the period until the next prefectural assembly election (the longer the elapsed months after the election), the more likely the council members will try to increase their chances of re-election and thus the reduction of expenditures due to corruption may not be carried out.[17]

On the other hand, the following findings were obtained through interviews. Firstly, if there is corruption involving the head of the local government and the head is replaced, there is a possibility that the new head may not see the value in the project supported by the former head and may reduce the project scale or abolish the project. Secondly, in the case of corruption by public officials related to "civil engineering works," there may be a voice from residents questioning the responsibility of special employees, and considering complaints from residents, there may be an incentive for the head of government or the assembly members running for re-election to temporarily stop expenditures if the period from the revelation of corruption to the election is approaching. From these findings, it can be said that there are both positive and negative effects of politics on the changes in expenditure after corruption is uncovered.

## III-2.    *Empirical Model*

In this paper, we use prefectural data to statistically clarify the impact of corruption on local government expenditure. To test the hypothesis presented in the previous section, we describe the empirical model to be used below. In setting up the empirical model, it is important to note that this study focuses on the revelation of corruption, not its existence. Even if corruption occurs, if it is not revealed, its presence cannot be determined, and it is difficult to ascertain the effects of corruption using data. On the other hand, the point in time when corruption revelation is clear, and it is possible to capture the impact on local governments

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[17]  Due to the overlapping election dates of many governors and members of parliament in the unified local elections, there is a large correlation between the elapsed months from the election for governor and the election for parliament, resulting in the problem of multicollinearity in estimation. Therefore, in this paper, we decided to use the elapsed months from the election as a variable representing the attributes of parliament and not use it as a variable for governor attributes.

after that point in time. As stated in the previous section, it can be assumed that expenditure is optimized after the revelation of corruption. Therefore, in this paper, we focus on prefectural expenditure at the time of corruption revelation and set up a panel data model to capture its effect, as follows:

$$G_{it} = \alpha_i + \lambda_t + \beta d_{it} + X_{it}\gamma + \varepsilon_{it} \tag{1}$$

Here, $G_{it}$ represents the expenditure of prefecture i in year t. $\alpha_i$ represents the individual effect of the region, and $\lambda_t$ represents the time effect. The coefficient $\beta$ of the corruption uncovered dummy variable $d_{it}$ is the main focus of this paper, and if $\beta$ is significantly negative, the verification hypothesis is supported. $X_{it}$ is a vector of other variables that affect expenditure changes, and $\gamma$ is the coefficient vector for those variables. The estimation is conducted using panel data for 47 prefectures from 2005 to 2019, as described in the next section.

Since it is believed that it takes time for expenditure distortion to be corrected after uncovering, estimates are made taking into account the time lag.[18] Specifically, it is natural to assume that the revelation of corruption in a given year will affect the budgeting process for the following year, and that expenditures will be executed the year after that (two years after the revelation of corruption). Therefore, corruption data is taken with a two-period lag, and analysis is conducted using data from fiscal year 2003 to 2017 (see Figure 3).

Figure 3: Assumed Impact of Corruption Revelations on Expenditure
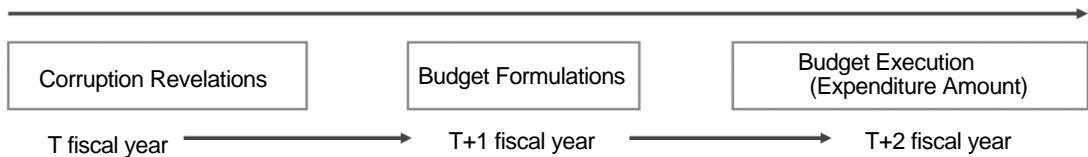


Note: The right-facing arrow represents the passage of time. When corruption is uncovered in the T fiscal year, it affects the budget formulation of local governments in the following year, and this result is assumed to affect the budget execution (expenditure amount) in the T+2 fiscal year.
Source: Illustrated by the author.

### III-3.   Data

In this section, we explain the details of the data and variables used for estimation. (For definitions and sources of the data, please refer to Table 2, and for descriptive statistics, please refer to Table 3.)

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[18]  It may be pointed out that there is a significant constraint on data analysis due to the presence of "observed corruption" and "unobserved corruption" in hypothesis testing. However, all corruption cases during the period covered by this paper were uncovered in all prefectures, and since there was corruption in all prefectures, there is a high probability that corruption is latent even in prefectures where it is less likely to be detected. In other words, it is natural to assume that latent corruption is causing a distortion in expenditures, and that the revelation of corruption leads to appropriate adjustment of these expenditures. Furthermore, even if there were prefectures where corruption did not exist, this would mean that there was no temporal increase in expenditures in those prefectures, but since this paper employs panel analysis, it is assumed that regional-specific effects are captured.

## Table 2: Definition and Source of Data

| | Variable | Definition | Source |
|---|---|---|---|
| Dependent Variable | Expenditure/Standard Fiscal Needs (SFN) | Total expenditure for the year/Standard Fiscal Needs (SFN) Amount for the year | Fiscal Year Editions of Prefectural Financial Statements |
| | Expenditures excluding national government disbursements/Standard Fiscal Needs (SFN) | Total expenditure for the year excluding national government disbursements/Standard Fiscal Needs (SFN) Amount for the year | Fiscal Year Editions of Prefectural Financial Statements |
| | Expenditure (Civil Engineering)/Standard Fiscal Needs (SFN) (Civil Engineering) | Civil engineering expenses for the year/Standard Fiscal Needs (SFN) Amount for civil engineering and construction for the year | Fiscal Year Editions of Prefectural Financial Statements, Obtained from the local allocation tax Bureau of the Ministry of Internal Affairs and Communications. |
| | Expenditures excluding national government disbursements (Civil Engineering)/Standard Fiscal Needs (SFN) (Civil Engineering) | Civil engineering expenses for the year excluding national government disbursements/Standard Fiscal Needs (SFN) Amount for civil engineering and construction for the year | The same as above |
| | Successful Bid Rate | Successful bid rate in the prefecture | National Citizens' Ombudsman Liaison Conference 'Bid Winning Rate and Suspected Collusion Rate Investigation' Annual Edition |
| Independent Variables | Corruption Uncovered Dummy | Dummy variable that takes a value of 1 for corruption uncovered in all departments 2 periods ago, and 0 otherwise | Obtained from the Ministry of Internal Affairs and Communications, Public Employee Division, the original data on the status of disciplinary actions against local public officials. |
| | Corruption Uncovered Dummy in the Civil Engineering Sector | Dummy variable that takes a value of 1 for corruption uncovered in the civil engineering and construction department 2 periods ago, and 0 otherwise | The same as above |
| | Population Ratio Under 15 Years of Age | Ratio of population under 15 years old to total population in the prefecture | Ministry of Internal Affairs and Communications website, 'Statistics on the Shape of Prefectures through Statistics', each annual version. |
| | Population Ratio Over 65 Years of Age | Ratio of population aged 65 and over to total population in the prefecture | The same as above |
| | Fiscal power index | Fiscal power index in the prefecture | The same as above |
| | Number of Governor Election Wins | Number of times the governor was elected as of April 30 (1 period ago) | Each annual version of the 'National Mayor Directory' |
| | Governor Election Vote Ratio | Election vote ratio for the governor's election. Uncontested elections are counted as 1 (1 period ago) | The same as above |
| | Months of Legislative Election Experience | Months since the election of prefectural assembly members as of April 30 (1 period ago) | The same as above |

Source: Created by the author

## Table 3: Descriptive Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Expenditure/Standard Fiscal Needs (SFN) | 799 | 2.296 | 0.443 | 1.787 | 5.948 |
| Expenditures excluding National government disbursements/Standard Fiscal Needs (SFN) | 799 | 1.951 | 0.343 | 1.468 | 3.885 |
| Expenditure (Civil Engineering)/Standard Fiscal Needs (SFN) (Civil Engineering) | 799 | 4.186 | 1.921 | 2.140 | 20.042 |
| Expenditures excluding National government disbursements (Civil Engineering)/Standard Fiscal Needs (SFN) (Civil Engineering) | 799 | 3.347 | 1.742 | 1.755 | 18.409 |
| Successful Bid Rate | 846 | 0.900 | 0.052 | 0.724 | 0.982 |
| Corruption Uncovered Dummy | 752 | 0.336 | 0.473 | 0.000 | 1.000 |
| Corruption Uncovered Dummy in the Civil Engineering Sector | 752 | 0.052 | 0.222 | 0.000 | 1.000 |
| Population Ratio Under 15 Years of Age | 799 | 0.132 | 0.012 | 0.098 | 0.190 |
| Population Ratio Over 65 Years of Age | 799 | 0.255 | 0.041 | 0.149 | 0.372 |
| Fiscal power index | 799 | 0.479 | 0.196 | 0.203 | 1.406 |
| Number of Governor Election Wins | 846 | 2.298 | 1.217 | 1.000 | 7.000 |
| Governor Election Vote Ratio | 846 | 0.681 | 0.164 | 0.291 | 1.000 |
| Months of Legislative Election Experience | 846 | 17.569 | 13.704 | 0.000 | 48.000 |

Source: Author's calculations

First, we use panel data for 47 prefectures from 2005 to 2019 (corruption data uses a two-period lag from 2003 to 2017) for the estimation. We adopt the fixed-effect model[19] based on the results of the test.

Next, we explain the dependent variable. In this paper, we use expenditures as the dependent variable to accurately capture the impact of corruption revelations on expenditure,

as described in the previous section's model.

Specifically, we use two types of expenditure, total expenditure and civil engineering expenditure, as the dependent variable. We also use the successful bid rate as a dependent variable related to expenditures.

Expenditure

As a basic indicator, we use amount of expenditures. However, to control for the difference in the necessary expenditure amount for each prefecture, we calculate and use the normalized value obtained by dividing the prefectural expenditure ($TG_{it}$) by the Standard Fiscal Needs (SFN) amount. The Standard Fiscal Needs (SFN) amount is calculated as the standard expenditure amount required for each local government, taking into account various natural conditions of each local government, and the value obtained by subtracting the actual expenditure amount from this value can be regarded as the deviation from the standard local government expenditure. In this case, the Standard Fiscal Needs (SFN) of prefecture $_i$ in year $_t$ are denoted as $FN_{it}$, and $G_{it}$ in equation (1) is expressed as follows.

$$G_{it} = \frac{TG_{it}}{FN_{it}} \tag{2}$$

Expenditure excluding national treasury disbursements

Next, considering the characteristics of the Standard Fiscal Needs (SFN) amount used for normalization, we use the expenditure excluding national treasury disbursements as a variable[20]. We denote this variable as local expenditure excluding national treasury disbursements ($LG_{it}$) for each prefecture. As in the case of Expenditure, we calculate and use the normalized value obtained by dividing by the standard fiscal needs amount to control for the difference in the necessary expenditure amount for each prefecture. In this case, the Standard Fiscal Needs (SFN) of prefecture $_i$ in year $_t$ are denoted as $FN_{it}$, and $G_{it}$ in equation (1)

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[19] The panel analysis can be divided into two categories: the fixed effects model in which $\alpha_i$ and $\lambda_t$ are constants and the random effects model in which they are probability variables. In addition, there are cases where the pooling regression model is selected as a result of model selection tests. However, since the selection of the fixed effects model was statistically supported by the F-test, Hausman test, and Breusch-Pagan test, we adopted the fixed effects model. Furthermore, the panel estimation by the fixed effects model has the advantage of being able to consider individual effects as characteristics of each prefecture that cannot be captured by the data used as explanatory variables, as well as year effects in each period of analysis as time (year) effects. "The fixed effects model enables control of unmeasured or unmeasurable variables" (Allison (2009-2021)).

[20] The Standard Fiscal Needs (SFN) amount are calculated from "unit cost × measurement unit × adjustment coefficient". The base part of this formula, which is determined by "unit cost × measurement unit", captures the necessary fiscal needs of each local government, while the adjustment coefficient adjusts for the characteristics of each local government. When using the standard fiscal need amount for standardization, it is not a problem to adjust for the regional characteristics with the adjustment coefficient. However, it is important to note that the base part, which captures the necessary fiscal needs with "unit cost × measurement unit," should be consistent with the scope of expenditures. It should be noted that the scope of fiscal needs in the standard fiscal need amount is the remaining fiscal needs after deducting national treasury expenditures. It may also be desirable to adjust the numerator of the formula to match this scope. Therefore, this study also includes an analysis using expenditures excluding national treasury expenditures. Additionally, since the fixed effects can be captured by panel analysis, even if there are differences in the national treasury expenditure ratio between regions, if those differences do not change over time, they can be absorbed by the fixed effects. In that case, the results are expected to be similar to those obtained from analyzing the entire expenditure. In fact, although there are differences in the national treasury expenditure ratio between regions, there is not much change over time, and there is not a significant difference in the analysis results. (Refer to section IV for details).

is expressed as follows.

$$G_{it} = \frac{LG_{it}}{FN_{it}} \tag{3}$$

The above expenditure indicators were created using the "Prefectural Settlement Situation Survey" for each year and the Standard Fiscal Needs (SFN) amount for each prefecture obtained from the Ministry of Internal Affairs and Communications. (For civil engineering expenses, the standard fiscal need amount corresponding to each expense item was used.)

Next, we will explain the explanatory variables. First, the most important variable is the corruption revelation dummy, which takes a value of 1 (also 1 in the case of recurrence) for the region and fiscal year of the corruption revelation. This was constructed using panel data for the 47 prefectures from 2003 to 2017, based on the "Situation of Disciplinary Actions Against Local Government Officials" survey by the Ministry of Internal Affairs and Communications from 2004 to 2018, which includes "corruption incidents." In this data, the revelation of corruption is listed by local government and year, and this corruption data is used.[21] The data was obtained from the Ministry of Internal Affairs and Communications by filing an information disclosure request, based on the original data of "Status of Disciplinary Actions against Local Public Officials," and "Survey on Corruption Cases in Local Governments" for each year.[22] Specifically, using dummy variables for corruption revelation by department (all departments[23], civil engineering and construction[24]), we capture the revelation of corruption by prefecture.

Next, to test Hypothesis 2 "The reduction in expenditure due to the revelation of corruption is influenced by political factors," we use variables that represent the political situation of the governor, such as the number of times the governor has been elected and the percentage of votes the governor received in the gubernatorial election. Moreover, we adopt a variable that represents the situation of the assembly, as the number of months since the election of the assembly members.[25] The number of times the governor has been elected represents political stability, the percentage of votes the governor received in the gubernatorial election represents competitiveness in the election, and the number of months since the election of the assembly members captures the influence of the election. The data was obtained from each year's edition of the "National Mayor List" (in the case of uncontested elections, the vote percentage is assumed to be 1).

In addition, we used some variables to control for regional characteristics, including the

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[21] The Ministry of Internal Affairs and Communications survey did not investigate the occupations of individual employees involved in corruption, but only investigated the departments where the incidents occurred. Therefore, there are limitations, such as no distinction between administrative staff and teaching staff in the education sector.

[22] Bribery is included in the corruption data. Bribery is something that companies do to seek returns, and it is natural to think that expenditure is distorted in favor of companies behind the scenes of bribery.

[23] For all departments, a total of 374 corruption cases were revealed in 47 organizations during the period from 2003 to 2017.

[24] In the civil engineering and construction sector, 45 corruption cases were revealed in 23 organizations during the period from 2003 to 2017.

[25] Several previous studies have examined the "partisanship" of governors as a factor affecting expenditure, but since the 1990s, the influence of partisanship has gradually disappeared due to constraints on financial resources (Sunahara, 2011). The data analyzed in this paper is from the 2000s and later, and we do not focus on the partisanship of governors.

ratio of population over 65 years old, the ratio of population under 15 years old, and the fiscal power index[26]. These data were created using the Ministry of Internal Affairs and Communications website "Statistics on the Prefectures in Figures" (each year's edition).

## IV.　Analysis Results and Interpretation

### IV-1.　Estimated Results and Interpretation of Total Expenditures

First, we conducted an analysis of total expenditures by prefecture. The results are shown in Table 4 and Table 5 (estimated results using expenditures excluding national government disbursements). The corruption uncovered dummy and the political variable inter-

Table 4: Estimation Results (Expenditure/Standard Fiscal Needs)

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Corruption Uncovered Dummy | -0.0340 | -0.0643 | -0.206* | -0.0299 | -0.206* |
| | (0.0256) | (0.0534) | (0.107) | (0.0448) | (0.115) |
| Corruption Uncovered Dummy × Number of Governor Election Wins | | 0.0141 | | | 0.00321 |
| | | (0.0218) | | | (0.0230) |
| Corruption Uncovered Dummy × Governor Election Vote Ratio | | | 0.257* | | 0.249 |
| | | | (0.154) | | (0.163) |
| Corruption Uncovered Dummy × Months of Legislative Election Experience | | | | -0.000206 | -0.000137 |
| | | | | (0.00186) | (0.00187) |
| Number of Governor Election Wins | -0.0435*** | -0.0483*** | -0.0426*** | -0.0435*** | -0.0438*** |
| | (0.0125) | (0.0146) | (0.0125) | (0.0126) | (0.0149) |
| Governor Election Vote Ratio | 0.0404 | 0.0409 | -0.0507 | 0.0403 | -0.0480 |
| | (0.0900) | (0.0900) | (0.105) | (0.0901) | (0.107) |
| Months of Legislative Election Experience | 0.000876 | 0.000876 | 0.000877 | 0.000945 | 0.000922 |
| | (0.000869) | (0.000869) | (0.000868) | (0.00107) | (0.00107) |
| Population Ratio Under 15 Years of Age | -42.43*** | -42.28*** | -42.39*** | -42.43*** | -42.35*** |
| | (5.828) | (5.835) | (5.820) | (5.832) | (5.834) |
| Population Ratio Over 65 Years of Age | -9.462*** | -9.418*** | -9.457*** | -9.460*** | -9.446*** |
| | (1.199) | (1.202) | (1.198) | (1.200) | (1.202) |
| Fiscal power index | 0.507 | 0.502 | 0.482 | 0.506 | 0.481 |
| | (0.313) | (0.313) | (0.313) | (0.313) | (0.314) |
| Constant term | 10.10*** | 10.08*** | 10.17*** | 10.10*** | 10.16*** |
| | (1.079) | (1.080) | (1.078) | (1.080) | (1.081) |
| Sample size | 705 | 705 | 705 | 705 | 705 |
| R2 | 0.113 | 0.114 | 0.117 | 0.113 | 0.117 |
| No. prefectures | 47 | 47 | 47 | 47 | 47 |

Note: Numbers in parentheses represent the standard error. *** means that the null hypothesis of the coefficient being zero was rejected at a significant level of 1%, ** at 5%, and * at 10%.
Source: Author's calculations

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[26]　In the analysis of this paper, variables related to the status of information disclosure are not used. The reason for this is that while the status of information disclosure may affect the occurrence and revelation of corruption, it is unlikely to affect the effect of corruption on expenditure (the degree to which expenditure is rectified after the revelation of corruption). Further examination of the status of information disclosure is a future task.

Table 5: Estimation Results (Expenditures Excluding National Government Disbursements/Standard Fiscal Needs)

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Corruption Uncovered Dummy | -0.00910 | -0.00112 | -0.115* | -0.0132 | -0.114 |
| | (0.0160) | (0.0334) | (0.0668) | (0.0280) | (0.0717) |
| Corruption Uncovered Dummy × Number of Governor Election Wins | | -0.00371 | | | -0.0120 |
| | | (0.0136) | | | (0.0144) |
| Corruption Uncovered Dummy × Governor Election Vote Ratio | | | 0.158 | | 0.185* |
| | | | (0.0966) | | (0.102) |
| Corruption Uncovered Dummy × Months of Legislative Election Experience | | | | 0.000211 | 0.000318 |
| | | | | (0.00117) | (0.00117) |
| Number of Governor Election Wins | -0.0292*** | -0.0279*** | -0.0287*** | -0.0291*** | -0.0244*** |
| | (0.00785) | (0.00914) | (0.00784) | (0.00786) | (0.00933) |
| Governor Election Vote Ratio | 0.0714 | 0.0712 | 0.0154 | 0.0714 | 0.00526 |
| | (0.0563) | (0.0564) | (0.0659) | (0.0564) | (0.0670) |
| Months of Legislative Election Experience | 0.000931* | 0.000931* | 0.000931* | 0.000861 | 0.000826 |
| | (0.000544) | (0.000544) | (0.000543) | (0.000668) | (0.000667) |
| Population Ratio Under 15 Years of Age | -21.24*** | -21.28*** | -21.21*** | -21.24*** | -21.34*** |
| | (3.647) | (3.652) | (3.642) | (3.650) | (3.649) |
| Population Ratio Over 65 Years of Age | -5.058*** | -5.069*** | -5.055*** | -5.060*** | -5.095*** |
| | (0.750) | (0.752) | (0.749) | (0.751) | (0.752) |
| Fiscal power index | 0.482** | 0.483** | 0.467** | 0.483** | 0.469** |
| | (0.196) | (0.196) | (0.196) | (0.196) | (0.196) |
| Constant term | 5.798*** | 5.803*** | 5.839*** | 5.800*** | 5.865*** |
| | (0.675) | (0.676) | (0.675) | (0.676) | (0.676) |
| Sample size | 705 | 705 | 705 | 705 | 705 |
| R2 | 0.098 | 0.099 | 0.102 | 0.099 | 0.103 |
| No.prefectures | 47 | 47 | 47 | 47 | 47 |

Note: Numbers in parentheses represent the standard error. *** means that the null hypothesis of the coefficient being zero was rejected at a significant level of 1%, ** at 5%, and * at 10%.
Source: Author's calculations

action term used in this paper are highly correlated and have a high potential to cause multi-collinearity. To avoid this problem and confirm the robustness of the estimation, we formulated each interaction term one by one in equations (2) to (4).

Let's take a look at the impact of uncovering corruption, which is the most noteworthy in this paper. As a result of the estimation, it was found that the corruption uncovered dummy (2 periods before) had a significant negative effect in several estimates (equations (3) and (5) in Table 4 and equation (3) in Table 5). In other estimates, although all coefficients of the corruption uncovered dummy were negative, no significant effect was shown. In other words, in some estimates, it was found that uncovering corruption significantly decreased expenditures, which was hypothesized and had an impact on suppressing expenditures with a lag of 2 periods.[27]

Next, let's take a look at the combined effect of corruption revelations and political fac-

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[27] In this paper, we adopt a corruption uncovered dummy variable (taking a value of 1 if one or more corruption cases were uncovered, and 0 otherwise) as a corruption variable. However, we have confirmed that even if the number of cases uncovered is used as the corruption variable, the coefficient is significantly negative with respect to the expenditure variable.

tors, which is the second most noteworthy in this paper. In equations (3) of Table 4 and (5) of Table 5, "corruption uncovered dummy × governor's vote rate" was positively significant. This means that although there is a reduction effect of expenditures due to corruption uncovered, the reduction effect is suppressed in prefectures where the governor's vote rate is high. In other words, in prefectures where there is no political competition, the reduction effect of expenditures due to corruption uncovered is limited.

Regarding the political variables, the number of times the governor was elected was significantly negative in all estimates. This indicates that governors who have been elected many times and have a long tenure are suppressing expenditures. In addition, in some of the estimates in Table 5, the coefficient of the months elapsed after the election of a member of the assembly was positively significant, suggesting the possibility of expenditure expansion due to re-election motivation.

This section suggests that even if corruption is uncovered, it does not necessarily lead to immediate expenditure cuts depending on the political structure. It should also be noted that the actions of the governor after corruption is uncovered should be monitored.

## IV-2.    *Estimation Results and Interpretation of Civil Engineering Expenses*

The purpose of this paper is to analyze the impact on local government expenditure, but it is unclear whether the impact of corruption uncovered on expenditure can be observed clearly in the overall expenditure data. Therefore, based on interviews, we examined a model that focused on the civil engineering and construction fields, which are more likely to show effects.

The results are shown in Table 6 and Table 7 (estimation results using civil engineering expenditure excluding national government disbursements). Here again, to avoid multicollinearity and ensure the robustness of the estimation, we adopted one interaction term at a time in formulations (2) to (4).

Let's also look at the model that focuses on the civil engineering and construction fields, which is the most important impact of corruption revelations in this paper. In Table 6, except for equation (4), the corruption uncovered dummy has a significantly negative effect in all estimations, and in Table 7, the result that the corruption uncovered dummy (two periods ago) has a significantly negative effect in estimations (1), (3), and (5) was shown. In other estimations, although all coefficients are negative, no significant effect was shown. In other words, in many estimations, the result that the corruption uncovered significantly reduced expenditure was obtained, and as hypothesized, it was shown that it may have influenced the reduction of expenditure with a time lag of two periods.

Next, let's look at the impact of the corruption uncovered and political factors, which is the second most important focus in this paper. In equations (3) and (5) of Table 6, "corruption uncovered dummy × governor's vote percentage" showed a significantly positive effect. This is the same result as the analysis of overall expenditure in the previous section. That is, there is a reduction effect on expenditure due to the corruption uncovered, but in prefectures

## Table 6: Estimation Results (Expenditure (Civil Engineering)/Standard Fiscal Needs (Civil Engineering))

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Corruption Uncovered Dummy in the Civil Engineering Sector | -0.282** | -0.514* | -1.570*** | -0.331 | -1.568*** |
| | (0.126) | (0.263) | (0.559) | (0.225) | (0.570) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Number of Governor Election Wins | | 0.109 | | | 0.0307 |
| | | (0.109) | | | (0.118) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Governor Election Vote Ratio | | | 2.083** | | 2.023** |
| | | | (0.881) | | (0.938) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Months of Legislative Election Experience | | | | 0.00251 | -0.00155 |
| | | | | (0.00953) | (0.00983) |
| Number of Governor Election Wins | -0.0831*** | -0.0905*** | -0.0832*** | -0.0830*** | -0.0854*** |
| | (0.0298) | (0.0307) | (0.0297) | (0.0298) | (0.0308) |
| Governor Election Vote Ratio | -0.134 | -0.128 | -0.233 | -0.136 | -0.228 |
| | (0.214) | (0.214) | (0.218) | (0.215) | (0.219) |
| Months of Legislative Election Experience | 0.00103 | 0.000907 | 0.000786 | 0.000904 | 0.000837 |
| | (0.00207) | (0.00207) | (0.00206) | (0.00212) | (0.00212) |
| Population Ratio Under 15 Years of Age | -67.71*** | -66.83*** | -67.56*** | -67.60*** | -67.39*** |
| | (13.87) | (13.90) | (13.82) | (13.88) | (13.87) |
| Population Ratio Over 65 Years of Age | -3.907 | -3.649 | -3.881 | -3.897 | -3.815 |
| | (2.855) | (2.867) | (2.845) | (2.858) | (2.862) |
| Fiscal power index | 3.579*** | 3.568*** | 3.631*** | 3.583*** | 3.624*** |
| | (0.749) | (0.749) | (0.747) | (0.750) | (0.748) |
| Constant term | 12.61*** | 12.44*** | 12.63*** | 12.59*** | 12.59*** |
| | (2.567) | (2.572) | (2.558) | (2.570) | (2.568) |
| Sample size | 705 | 705 | 705 | 705 | 705 |
| R2 | 0.224 | 0.225 | 0.230 | 0.224 | 0.230 |
| No. prefectures | 47 | 47 | 47 | 47 | 47 |

Note: Numbers in parentheses represent the standard error. *** means that the null hypothesis of the coefficient being zero was rejected at a significant level of 1%, ** at 5%, and * at 10%.
Source: Author's calculations

## Table 7: Estimation Results (Expenditure Excluding National Government Disbursements (Civil Engineering)/Standard Fiscal Needs (Civil Engineering))

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Corruption Uncovered Dummy in the Civil Engineering Sector | -0.262** | -0.418 | -1.136** | -0.170 | -1.069* |
| | (0.123) | (0.258) | (0.548) | (0.220) | (0.558) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Number of Governor Election Wins | | 0.0732 | | | 0.0366 |
| | | (0.107) | | | (0.116) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Governor Election Vote Ratio | | | 1.412 | | 1.430 |
| | | | (0.863) | | (0.919) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Months of Legislative Election Experience | | | | -0.00474 | -0.00793 |
| | | | | (0.00932) | (0.00963) |
| Number of Governor Election Wins | -0.0612** | -0.0662** | -0.0613** | -0.0615** | -0.0642** |
| | (0.0291) | (0.0300) | (0.0291) | (0.0291) | (0.0302) |
| Governor Election Vote Ratio | -0.224 | -0.220 | -0.291 | -0.221 | -0.285 |
| | (0.210) | (0.210) | (0.213) | (0.210) | (0.215) |
| Months of Legislative Election Experience | 0.00192 | 0.00183 | 0.00175 | 0.00215 | 0.00210 |
| | (0.00202) | (0.00203) | (0.00202) | (0.00208) | (0.00207) |
| Population Ratio Under 15 Years of Age | -58.04*** | -57.45*** | -57.94*** | -58.25*** | -57.99*** |
| | (13.56) | (13.60) | (13.55) | (13.58) | (13.59) |
| Population Ratio Over 65 Years of Age | -6.524** | -6.350** | -6.506** | -6.543** | -6.451** |
| | (2.792) | (2.805) | (2.789) | (2.794) | (2.804) |
| Fiscal power index | 5.161*** | 5.154*** | 5.196*** | 5.154*** | 5.181*** |
| | (0.733) | (0.733) | (0.732) | (0.733) | (0.733) |
| Constant term | 10.39*** | 10.29*** | 10.41*** | 10.42*** | 10.40*** |
| | (2.510) | (2.516) | (2.507) | (2.513) | (2.516) |
| Sample size | 705 | 705 | 705 | 705 | 705 |
| R2 | 0.175 | 0.176 | 0.179 | 0.176 | 0.180 |
| No. prefectures | 47 | 47 | 47 | 47 | 47 |

Note: Numbers in parentheses represent the standard error. *** means that the null hypothesis of the coefficient being zero was rejected at a significant level of 1%, ** at 5%, and * at 10%.
Source: Author's calculations

where the governor's vote percentage is high, the reduction effect on expenditure is weaker, and it is suggested that the effect of political factors and corruption revelations may compound.

The same as the previous section, with regard to political variables, the results showed that the number of times a governor was elected had a significantly negative effect on all estimates. This indicates that governors with many terms and long tenure are suppressing expenditures. Although the coefficient for the number of months elapsed after a legislator's election is positive, the effect is not significant.

In the analysis limited to the field of civil engineering in this section, as in the previous analysis, it was shown that even if corruption is uncovered, it is possible that it will not immediately lead to expenditure cuts depending on the political structure.

## IV-3.  Robustness Check: Analysis and Interpretation of Estimation Results on Successful Bid Rate

In this section, we conduct additional analysis focusing on successful bid rate as a variable capturing the effect of corruption uncovered in order to confirm the robustness of the verification results so far. The amount of expenditure can be decomposed into the product of project costs based on the amount of money that a public sector estimated beforehand as the client and the bid rate. The effect of corruption uncovered can also be tested by the successful bid rate.

Previous studies focusing on successful bid rate include Izumida (2005) and Nakanishi (2020). Izumida (2005) empirically analyzes whether the bidding system and political governance affect successful bid rate using cross-sectional data for fiscal year 2002. Specifically, the effect is analyzed by using the successful bid rate of prefectures and others as the dependent variable and bid system differences and information on mayors and councils as explanatory variables. The result was that bid system differences had little impact on successful bid rate and the successful bid rate increased as the proportion of Liberal Democratic Party members in mayors and council members increased. However, this study focused on bid system differences and mayoral governance, and did not directly consider corruption. Nakanishi (2020) verifies the factors that affect the successful bid rate of individual construction projects using multiple regression analysis based on bid result data published by the Civil Aviation Bureau of the Ministry of Land, Infrastructure, Transport and Tourism. Factors such as the number of bidders, project specificity, unclear usage, order time, project size, and successful bidder attributes are used, revealing that successful bid rate increases as the number of bidders decreases. However, this is a study aimed at verifying the impact of the competitive environment on successful bid rate for individual projects, and does not directly analyze the impact of corruption on successful bid rate.

Corruption and bribery have been pointed out to affect the successful bid rate by Nishikawa (2017) and others, but there has been no verification in Japanese prefectural data on whether the revelation of corruption affects the successful bid rate. Therefore, we used the successful bid rate as a component of expenditures as the dependent variable, tested the

same hypothesis, and confirmed the robustness of the results obtained in the previous section. Regarding the successful bid rate, we obtained the successful bid rate for each prefecture from the annual editions of the "Successful Bid Rate/Conspiracy Suspicions Investigation" by the National Citizens' Ombudsman Conference and used them.[28]

The results of the analysis focusing on the successful bid rate as a component of total expenditure are shown in Table 8. Here, in order to avoid the problem of multicollinearity and confirm the robustness of the estimation, we adopted one interaction term at a time in formulas (2) to (4) for formulation.

As a result of the analysis using the successful bid rate as the dependent variable, it was first shown in many estimates that the corruption uncovered dummy had a significantly negative effect. That is, in some estimates, it was found that the revelation of corruption significantly reduced the successful bid rate, and as hypothesized, it was shown to have an impact on suppressing expenditures with a lag of two periods.

Next, let's look at the combined impact of corruption revelations and political factors, which is the second focus of this paper. In some estimates, it was shown that the number of times the governor was elected, and the governor's vote percentage had a significantly posi-

### Table 8: Estimation Results (Successful Bid Rate)

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Corruption Uncovered Dummy in the Civil Engineering Sector | -0.000146 | -0.0278** | -0.0572** | -0.00872 | -0.0632** |
| | (0.00614) | (0.0128) | (0.0273) | (0.0110) | (0.0278) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Number of Governor Election Wins | | 0.0131** | | | 0.0101* |
| | | (0.00532) | | | (0.00575) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Governor Election Vote Ratio | | | 0.0923** | | 0.0635 |
| | | | (0.0430) | | (0.0457) |
| Corruption Uncovered Dummy in the Civil Engineering Sector × Months of Legislative Election Experience | | | | 0.000438 | 0.000118 |
| | | | | (0.000465) | (0.000479) |
| Number of Governor Election Wins | -0.00190 | -0.00278* | -0.00190 | -0.00187 | -0.00258* |
| | (0.00145) | (0.00149) | (0.00145) | (0.00145) | (0.00150) |
| Governor Election Vote Ratio | -0.000879 | -0.000172 | -0.00528 | -0.00115 | -0.00343 |
| | (0.0105) | (0.0104) | (0.0106) | (0.0105) | (0.0107) |
| Months of Legislative Election Experience | -0.000175* | -0.000189* | -0.000185* | -0.000196* | -0.000199* |
| | (0.000101) | (0.000101) | (0.000101) | (0.000104) | (0.000103) |
| Population Ratio Under 15 Years of Age | -1.067 | -0.961 | -1.060 | -1.047 | -0.975 |
| | (0.677) | (0.676) | (0.676) | (0.678) | (0.676) |
| Population Ratio Over 65 Years of Age | 1.002*** | 1.033*** | 1.003*** | 1.004*** | 1.027*** |
| | (0.139) | (0.140) | (0.139) | (0.140) | (0.140) |
| Fiscal power index | -0.326*** | -0.327*** | -0.324*** | -0.325*** | -0.325*** |
| | (0.0366) | (0.0365) | (0.0365) | (0.0366) | (0.0365) |
| Constant term | 0.937*** | 0.917*** | 0.938*** | 0.934*** | 0.922*** |
| | (0.125) | (0.125) | (0.125) | (0.125) | (0.125) |
| Sample size | 705 | 705 | 705 | 705 | 705 |
| R2 | 0.465 | 0.470 | 0.469 | 0.466 | 0.471 |
| No. prefectures | 47 | 47 | 47 | 47 | 47 |

Note: Numbers in parentheses represent the standard error. *** means that the null hypothesis of the coefficient being zero was rejected at a significant level of 1%, ** at 5%, and * at 10%.
Source: Author's calculations

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[28] The target of the investigation is construction projects with a planned price of 300 million yen or more excluding tax for Tokyo, and 100 million yen or more excluding tax for others (excluding bidding for PFI and other outsourced work).

tive effect, which is similar to the results of the previous analysis. That is, this result suggests that while there is a reduction effect on the successful bid rate due to corruption revelations, the reduction effect is suppressed in prefectures where the governor has been elected multiple times or has a high vote percentage, depending on the political structure. The analysis on the successful bid rate also suggests that the revelation of corruption does not necessarily lead to an immediate reduction in expenditures depending on the political structure.

## V.    Conclusion

In previous studies, analysis of the impact of corruption within a single country, considering the same fiscal system, using Japanese data has not been conducted. In this paper, we conducted an empirical analysis on the impact of corruption revelations on expenditures within a single country, using Japanese data (by prefecture) for the first time. The estimated results revealed the following possibilities:

Firstly, when we analyzed corruption uncovered and overall expenditures, the results suggested that corruption uncovered restrain expenditures. Similar results were obtained when analyzing only the civil engineering sector, and the robustness of these results was demonstrated through an analysis using the successful bid rate. In other words, corruption can be said to have expanded expenditures.

To examine the impact of political circumstances on corruption uncovered, we simultaneously conducted an analysis using the intersection of political factors and corruption. The estimated results suggested that the effect of reducing expenditures could be suppressed when the governor's vote rate was high (in other words, when the competing candidate was weak).

Furthermore, from the perspective of robustness, it was found in the analysis of successful bid rates that the effect of decreasing the successful bid rate could be suppressed when the governor had won multiple terms. It should be noted that even if corruption is uncovered, it may not immediately lead to expenditure reductions depending on the political structure, and attention should be paid to cases where reform is not implemented.

As for the remaining tasks in this paper, the following can be listed: Firstly, due to constraints in the corruption data, corruption is treated as the same type in this study, and the quality of corruption cannot be grasped at this stage. Additionally, the endogeneity of uncovering corruption has not been considered. The moral values of local government officials could be one of the factors that encourage uncovering corruption. In the future, it is desirable to obtain more detailed data and conduct further research on these topics.

## References

Allison, Paul D. (2009), *Fixed Effects Regression Models*, Sage Publications, Inc. (Allison (author), H. Taroumaru (supervising editor), Ikeda, H. Tanabe, Y. Nagase, K. Fujita, T. and Yamamoto, K. (translators) (2021) 'Keiryou bunseki One Point kotei kouka mode-

ru (in Japanese)', Kyoritsu Shuppan.)

Alt, J.E, and D.D. Lassen (2008), "Political and Judicial Checks on Corruption: Evidence from the American State Governments", *Economics & Politics,* Vol. 20 No. 1, pp. 33-61

Baraldi, Laura (2008), "Effects of Electoral Rules, Political Competition and Corruption on the Size and Composition of Government Consumption Spending: An Italian Regional Analysis", *B.E. Journal of Economic Analysis and Policy,* Vol. 8 No. 1, pp. 1-37

Cordis, Adriana S. (2014), "Corruption and the Composition of Public Spending in the United States", *Public Finance Review,* Vol. 42 No. 6, pp. 745-773

Fisman, Ray and Miriam A. Golden (2017), *Corruption: What everyone needs to know*, First Edition, Oxford University Press, New York. (Fisman, Ray and Miriam A. Golden (author), Yamagata, H. Morioka, M. (translators) (2019) 'Korapushon—naze oshoku ha okoru noka (in Japanese)', Keio University Press.)

Gupta, S., L de Mello, R. Sharan (2001), "Corruption and military spending", *European Journal of Political Economy*, Vol. 17, pp. 749-777

IMF (2019), 'Fiscal Monitor: Curbing Corruption'
- ➢ https://www.imf.org/-/media/Files/Publications/fiscal-monitor/2019/April/English/text.ashx (last accessed May 22, 2022)

Liu, Cheol and L. Mikesell (2014), "The Impact of Public Officials' Corruption on the Size and Allocation of U.S. State Spending", *Public Administration Review,* Vol. 74 No. 3, pp. 346-359

Mauro, P. (1995), "Corruption and Growth", *The Quarterly Journal of Economics*, Vol. 110 No. 3, pp. 681-712

Mauro, P. (1998), "Corruption and composition of government expenditure", *Journal of Public Economics*, Vol. 69, pp. 263-279

Mo, Pak Hung (2001), "Corruption and Economic Growth" *Journal of Comparative Economics*, Vol. 29, pp. 66-79

Osborne, S.P. (2006), "The New Public Governance?" *Public Management Review*, Vol. 8 Issue 3, pp. 377-387

Wong, Mathew YH. (2017), "Public spending, corruption, and income inequality: A comparative analysis of Asia and Latin America", *International Political Science Review*, Vol. 38 Issue 3, pp. 298-315

**in Japanese**

Akuto, H. and Sato, S. (1986), "Political Indicators and Public Expenditures: A Quantitative Analysis of 647 Cities (Seiji shihyou to zaisei shishutu: 647-shi no keiryou bunseki (in Japanese))", in W. Oomori and Sato, S. (eds), *Local Governments in Japan (Nihon no chihou seihu (in Japanese))*, University of Tokyo Press, pp. 141-179

Fujisawa, M. (2004), "Change of Government and Fiscal Discipline in Local Governments: Empirical Analysis of the 'Power corrupts after a decade' (Chihou jichitai ni okeru seiken koutai to zaisei kiritsu- 'kenpu jyuunen' no jisshou bunseki (in Japanese))," *Public choice studies*, No. 42, pp. 20-33

Fukumi, A. (2002), "Institutions, Public Investment, and Economic Growth: Theoretical and Empirical Analysis (Seido・koukyou toushi・keizai seichou: riron to jisshou (in Japanese))," *Journal of International Cooperation Studies*, Vol. 9 No. 3, pp. 147-166

Ishida, M. and Toume, M. (2017), "Corruption and Salary of Local Government Officials (Chihou koumuin no oshoku to kyuuyo no kankei (in Japanese))", *Japanese Journal of Local Public Finance*, No. 24, pp. 101-124

Inazawa, K. (2006), *Local Government Accounting Reform in the UK: Mapping the Transformation of Intergovernmental Relations through NPM Reform (Eikoku chihou seihu kaikei kaikaku ron-NPM kaikaku ni yoru seihu kan kankei hen-you no shazou (in Japanese))*, Gyosei.

Izumida, N. (2005), "Empirical Analysis of the Impact of Differences in Public Works Bidding and Contracting Systems and Governance of Local Governments on Winning Rates (Chihou jichitai no koukyou kouji nyuusatsu・keiyaku seido ya gabanansu no soui ga, rakusatsu ritu ni ataeru eikyou ni kansuru jisshou bunseki (in Japanese))", *Annual report of the Economic Society*, Tohoku University, Vol. 66 No. 4, pp. 769-789

Kanasaka, S. and Kuramoto, T. and Akai, N. (2022), "Impact of Corruption Revelations on Expenditures: Empirical Analysis Based on Prefectural Data in Japan," *Financial review*, No. 149, pp. 137-157

Kato, M. (2003), "The Influence of Political Factors on Local Finance: A Quantitative Analysis of Local Expenditures and Political Characteristics (Chihou zaisei ni okeru seijiteki youin no eikyou-Chihou saishutsu to chihou no seijiteki tokusei ni kansuru keiryou bunseki (in Japanese))", *The Kwansei Gakuin Economic Review*, No. 34, pp. 261-285

Kato, M. (2010), "Determinant factors on unsubsidized ordinary expenses: quantitative analysis with focus on local political factors", *Government auditing review*, No. 41, pp. 136-151

Kikuchi, K. (1989), "Changes in Policy Management as Seen from the Regional Allocation of Government Expenditures (Seihu shishutsu no chiiki haibun kara mita seisaku unei no suii (in Japanese))", *Leviathan*, No. 4, pp. 78-99

Kondo, H. (2007), "Political-Economic Analysis of Local Government Expenditures (Chihou zaisei shishutsu ni kansuru seiji keizai bunseki (in Japanese))", *Public Choice Studies*, No. 48, pp. 4-17

Mizoguchi, T. (2017), "Recent Trends in Empirical Studies on Corruption (Huhai no jisshou kenkyuu no saikin no doukou ni tsuite (in Japanese))," *The Economic Journal of Takasaki City University of Economics*, Vol. 60 No. 2-3, pp. 89-104

Nakanishi, Y. (2020), "Successful Bid Rates and the Number of Bidders: Statistical Analysis of the Premises of the Criticism for a One-Party Bid," *Journal of Business and Economics*, Vol. 99 No. 1-4, pp. 25-47

Nishikawa, M. (2016), "Current Status and Issues in Public Procurement (Koukyou choutatsu no genjyou to kadai (in Japanese))," *Taxation Research (Sozei kenkyu (in Japanese))*, No. 796, pp. 78-85

Nishikawa, M. (2017), "Occurrence and Contagion of Bid-Rigging in a Certain Town (Aru

machi ni okeru dangou no hassei to densen (in Japanese))," *Aoyama Economic Review (Aoyama keizai ronshuu (in Japanese)*, Vol. 68 No. 4, pp. 81-113

Shimizu, M. (2013), "Efforts to Prevent Inappropriate Accounting in National and Local Governments - Historical Changes in Inappropriate Accounting as Seen in Audit Reports (Kuni oyobi chihou jichitai ni okeru hutekisei keiri to saihatsu boushi heno torikumi - kessan kensa houkoku ni miru hutekisei keiri no rekishiteki hensen (in Japanese))," *Legislative and Research News (Rippou to chousa (in Japanese))*, No. 342, pp. 75-89

Sunahara, Y. (2006), "The Impact of Interest Groups on the Policy Decision-making of Local Governments (Chihou seihu no seisaku kettei ni okeru seijiteki youin - seidoteki kanten karano bunseki (in Japanese))," *Fiscal Studies*, No. 8, pp. 1-17

Sunahara, Y. (2011), *Democracy in Local Government: Constraints on Fiscal Resources and Policy Choices (Chihou seihu no minshu shugi: zaisei shigen no seiyaku to chihou seihu no seisaku sentaku (in Japanese))*, Yuhikaku.

Suzuki, M. (2004), *Study on Bid Rigging - Its Reality and Prevention Measures (2nd ed.) (Nyuusatsu dangou no kenkyuu - sono jittai to boushi saku (in Japanese)*, Shinzansha.

Suzuki, M. (2008), *Bid Reform in Local Governments to Prevent Bid Rigging (Dangou wo boushi suru jichitai no nyuusatsu kaikaku (in Japanese))*, Gakuyoshobo.

Soga, K. and Machitori, S. (2001), "The End of Reformist Local Government and Policy Changes (Kakushin jichitai no shuuen to seisaku henka (in Japanese))," *The annuals of the Japanese Society for Public Administration*, No. 36, pp. 156-176

Yamashita, K. (2001), "Political Decision-Making of Public Investment: Hypothesis Testing Using Panel Data (Koukyou toushi no seiji teki ishi kettei - paneru de-ta niyoru kasetsu kenshou (in Japanese))," *Public Choice Studies*, No. 36, pp. 21-30

Yanagawa, N., Kimura, Y., and Suzuki, T. (2005), "Economic Analysis of Bid-Rigging (Nyuusatsu dangou no kenkyuu (in Japanese))," Joint Research by the Japan Fair Trade Commission Competition Policy Research Center.
  ➤ Available at: https://www.jftc.go.jp/cprc/reports/index_files/cr-0305.pdf (Accessed on May 27, 2022).

Yoneoka, H. (2020), "Analysis of the Factors of Corruption in Local Governments in Japan (Waga kuni no chihou jichitai ni okeru oshoku no youin bunseki (in Japanese))," *The annuals of the Japanese Society for Public Administration*, Vol. 55, pp. 100-120

Yoneoka, H. and Ishida, M. (2020), "Official Corruption and Salary Cuts in the Japanese Local Governments: Focusing on the Labor Incentives of Officials," *JCER economic journal*, Vol. 78, pp. 35-61

Yoneoka, H. and Enatsu, I. (2022), "Empirical Analysis on Scandals in Local Governments: Focusing on Differences in Motivations for Scandals (Chihou jichitai ni okeru hushouji ni kansuru jisshou bunseki - hushouji no douki no chigai ni chakumoku shite (in Japanese))," *Government auditing review*, Vol. 65, pp. 9-31

**Reference data in Japanese**

National Citizens' Ombudsman Liaison Conference, "Successful Bid Rate and Suspected Collusion Rate Investigation (Rakusatsu ritsu・dangou giwakudo chousa (in Japanese))," Annual Edition.

National Citizens' Ombudsman Liaison Conference, "Bid-Rigging (Dangou (in Japanese))" web page,
  ➢ https://www.ombudsman.jp/dangou (last accessed May 27, 2022).

Ministry of Internal Affairs and Communications (2014), "Status of Disciplinary Actions against Local Public Officials in Fiscal Year 2013 (Heisei 25 nendo ni okeru chihou koumuin no choukai shobun tou no jyoukyou (in Japanese))," press release, December 22, 2014,
  ➢ http://www.soumu.go.jp/menu_news/s-news/01gyosei11_02000048.html (last accessed March 30, 2016).

Ministry of Internal Affairs and Communications, "Status of Disciplinary Actions against Local Public Officials (Chihou koumuin no choukai shobun tou no jyoukyou (in Japanese))," various years.

Ministry of Internal Affairs and Communications, "Survey on Corruption Cases in Local Public Entities (Chihou koukyou dantai tou ni okeru oshoku jiken ni kansuru shirabe (in Japanese))," various years.

Ministry of Internal Affairs and Communications, "Prefectural Financial Statements (Todouhuken kessan jyoukyou shirabe (in Japanese))," various fiscal years (Information on the Standard Fiscal Needs (SFN) by item is obtained through a request for information to the local allocation tax Bureau of the Ministry of Internal Affairs and Communications).

The Japan Research Institute for Local Government, "National Mayor Directory (Zenkoku shuchou meibo (in Japanese))," various years.