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FISCAL ILLUSION AND DEMOCRATIC MATURITY: EXPLORING THE ROLES OF INFORMATION, TRUST, AND PARTICIPATION IN CITIZENS' PERCEPTION OF TAXES AND SPENDING

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Abstract

The concept of fiscal illusion is a paradox in public finance; that is, people believe that it is possible to expand government services despite decreased revenues. Evidence suggests that fiscal illusion relates to democratic maturity, considering the lack of transparency, trust, and participation in developing countries. Accordingly, an important research question arises: What factors remedy such misperceptions of fiscal situations? This study explores these factors through a survey experiment. The empirical evidence indicates that citizens' fiscal illusion decreases when transparency in the fiscal process is ensured through information, trust, and participation. This research contributes to the field of public administration by identifying the factors that reduce fiscal illusion in public finance management and providing important policy implications, namely, that developing countries should make more efforts to reduce citizens' illusion regarding public spending for sustainable growth by transparently disclosing financial information and ensuring trust in government and civic participation.

Keywords: fiscal illusion, democratic maturity, information, trust, participation.

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1. Introduction

The concept of 'fiscal illusion' describes a paradox in public attitudes toward tax and spending (Citrin, 1979). Although Puviani (1903) did not clearly define fiscal illusion in 'The Theory of Fiscal Illusion', public financial studies define public fiscal illusion as citizens' perception of 'less tax burden but more spending', which is an 'illusion' because it is impossible to expand government spending without increasing taxes (Winter and Mouritzen, 2001; Simonsen and Robbins, 2003). A critical question regarding fiscal illusion regards what factors affect citizens' fiscal illusion and how to overcome such misperceptions. In particular, it has been demonstrated that democratic maturity contributes to a high level of fiscal illusion, as prior studies have identified the difference in fiscal illusion indices between developed and developing countries (Mourão, 2007). Fiscal illusion relates to the degree of transparency of government decision-making and how much citizens trust the government through public participation under democratic governance (Levi and Skoker, 2000). Citizens are willing to pay for more public services and support increased spending when they are fully cognizant of government financial decision-making (Scholz and Lubell, 1998).

Despite the importance of fiscal illusion from a democratic perspective, the literature has not sufficiently investigated how to overcome this paradox. Accordingly, this study seeks to initiate this research agenda by exploring the roles of fiscal information, trust in government, and public participation in reducing fiscal illusion, posing the following questions: (1) Does citizens' fiscal illusion decrease when they receive various types of fiscal constraint information?; (2) Does citizens' trust in government and their participatory experiences help reduce their fiscal illusion?; and (3) Do public trust and participation moderate the relationship between fiscal information and decreased fiscal illusion? This study seeks to answer these questions through a survey experiment that tests how citizens' fiscal illusion differs depending on the framing of absolute and relative fiscal constraint information and their degree of trust in government and participatory experiences.

Specifically, we conducted a survey experiment targeting citizens in Korea. In the survey, citizens were presented with different fiscal information and then asked to respond to questions measuring their level of agreement with tax increases or decreases in government spending to assess whether and how much their fiscal illusion decreased. Conducted in an empirical setting, this study contributes new evidence about democratic maturity and fiscal illusion by identifying the effects of open information, trust, and participation on citizens' perceptions of tax and spending.

2. Theory and hypotheses

2.1. Theory of fiscal illusion: citizen perceptions of taxes and spending

Regarding individuals' attitudes toward taxes and spending, one important theory is that citizens experience fiscal illusion because they misperceive the consumption of public

services (Welch, 1985). Fiscal illusion describes a paradoxical situation whereby citizens favor more services despite paying fewer taxes; in other words, citizens misunderstand their tax burden and demand more services, leading to higher government expenditure (Dollery and Worthington, 1996; Afonso, 2014). Empirical evidence supports this paradoxical concept: for example, citizens in Danish and English municipalities demand both more spending and fewer taxes (Winter and Mouritzen, 2001; Gemmell *et al.*, 1999).

Wagner (1976) developed a simple graph depicting fiscal illusion (Figure 1). Lines D and S are the respective curves representing the demand for and supply of public goods. The demand decreases as the price increases. P_1 represents the actual price of public goods, whereas P_2 denotes the perceived cost of public goods, which is lower than the actual price because of fiscal illusion. The problem is that the quantity of public goods rises from Q_1 to Q_2 because citizens demand more public goods, perceiving their price to be lower than the actual price (P_1). Point a is the balanced point for the optimal production of public goods, and the total budget size is P_1aOQ_1. While fiscal illusion causes citizens to misperceive that the optimal point is c and the budget size is P2cOQ2, the actual budget size is P_1dOQ_2 because the actual price of public goods is P_1. Nevertheless, citizens demand more public goods (Q_2) than Q_1. Eventually, the overestimated budget of adQ_1Q_2 occurs due to fiscal illusion.

Although citizens' fiscal illusion exists in the realm of public finance, one missing agenda item regarding fiscal illusion is identifying what factors help reduce citizens' perception

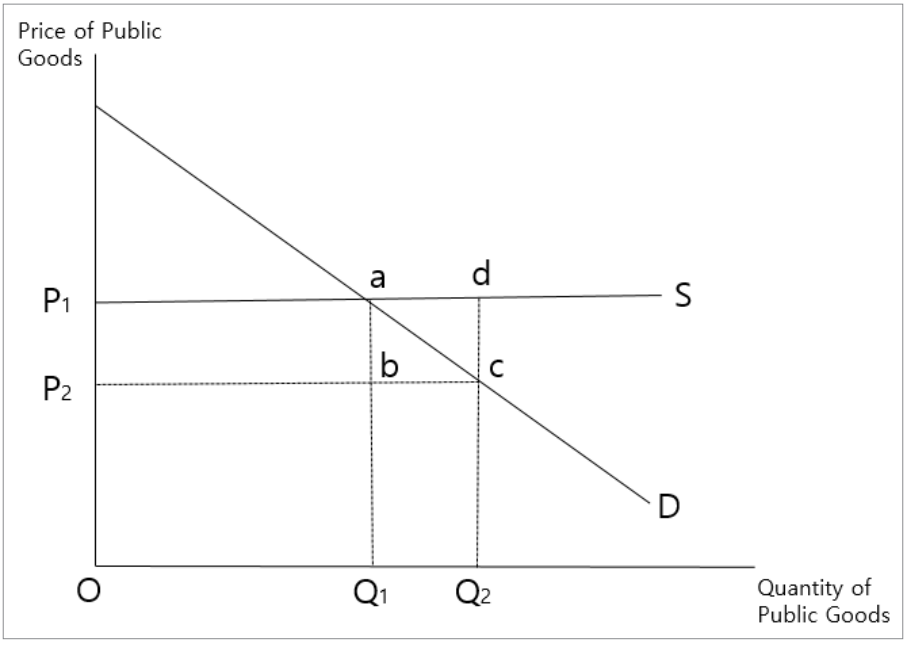


Figure 1: Fiscal illusion and oversupply of public goods
Source: Adapted from Wagner (1976)

of it. Potential factors in overcoming citizens' fiscal illusion include democratic elements such as information, trust, and participation, as illusions may occur when citizens experience information asymmetry regarding complex fiscal systems such as revenues, debts, and transfers or grants and when they distrust fiscal systems due to their lack of participation in fiscal decision-making.

2.2. Information effects

Citizens' fiscal illusion primarily derives from an information asymmetry regarding complex fiscal systems between citizens and the government. Sanandaji and Wallace (2011) highlight fiscal systems' invisibility as a source of budgetary illusion, arguing that citizens experience fiscal illusion when they have limited knowledge about taxation and budgetary systems. Due to the lack of transparency in fiscal decision-making processes, citizens have difficulty finding relevant fiscal information that is conducive to identifying revenue capacity and actual public-service costs. However, this information gap declines when the government discloses fiscal information on public debt and fiscal balance to ensure fiscal transparency.

Prior studies indicate that budget transparency is positively associated with government fiscal balance because fiscal performance information activates bureaucrats' fiscal accountability to avoid political blame (Romzek and Dubnick, 1987; Benito and Bastida, 2009). Accordingly, ensuring transparency by opening fiscal information also helps citizens understand the optimal levels of their tax burden and government spending. It is expected that citizens can decide how much they pay for public services and what level of public expenditure is needed to respond to informational cues received from external environments. In particular, citizens are highly influenced by fiscal constraint information, which illustrates the levels of public debt and fiscal deficit, because they perceive it as a risky signal in fiscal systems. Accordingly, when taxpayers are exposed to fiscal constraint information, they become more rational and consider the optimal degrees of their tax burden and public service costs, rethinking how to overcome fiscal constraints. In other words, when presented with absolute fiscal constraint information, citizens as taxpayers admit that increasing their own tax burden and reducing current expenditures are necessary to overcome fiscal constraints.

Hypothesis 1: Citizens presented with fiscal constraint information offer greater support for increased tax burden compared to those without such information.

Hypothesis 2: Citizens presented with fiscal constraint information offer greater support for decreased government spending compared to those without such information.

In addition to absolute fiscal information, taxpayers may be more sensitive to fiscal constraint information that is negatively framed to fiscal situations. In this process, negativity bias, which explains that people are more susceptible to negative events, memories, and information than positive or average ones (Rozin and Royzman, 2001), may influence peoples' fiscal illusions because citizens are more reactive to negative information than

either general or positive information. Recent studies have theorized and empirically tested the existence of negativity bias in performance information processing (Cyert and March, 1963; Nielsen and Baekgaard, 2015; James *et al.*, 2016). As suggested by Cyert and March's (1963) behavioral model, public managers are more reactive to negative performance information indicating that their current performance is lower than their past performance or their peers' performance.

Similarly, negativity bias is applicable to understanding how negative fiscal constraint information diminishes citizens' fiscal illusions. Negative fiscal information leads citizens to interpret their current fiscal situation as much riskier. In this case, citizens may understand that increasing services is not sustainable without tax increases. Research also indicates that fiscal illusion is eased by severe budget constraints or fiscal deficits. Simonsen and Robbins (2003) found that citizens are willing to support a high tax burden and budget cuts to solve problems when confronting serious budget constraints. According to theoretical and empirical rationales, citizens become more rational and more strongly support an increased tax burden and decreased spending when provided with negative fiscal information concerning increased government debt and fiscal deficit over time than when provided absolute fiscal constraint information.

Hypothesis 3: Citizens' fiscal illusion diminishes more in the presence of negative longitudinal fiscal constraint information versus absolute fiscal constraint information.

2.3. Trust in government

In addition to fiscal information, trust in government and participatory experiences play a role in reducing citizens' misunderstanding of fiscal policies. Trust in government is defined as individual psychological attitudes toward government decision-making, based upon positive expectations about government capacity, honesty, and virtues (Levi and Stoker, 2000). Prior studies indicate that trust in public institutions activates citizens' compliance with policy processes (Kye and Hwang, 2020). Similarly, studies in public finance indicate that trust in government is associated with citizens' willingness to pay for public services (Scholz and Lubell, 1998; Donahue and Miller, 2005; Djawadi and Fahr, 2013).

Trust in government enhances tax compliance because it leads taxpayers to believe that the government will use their money appropriately. For example, empirical evidence confirms that citizens' distrust in political institutions has been a driver of tax revolts, for example, engendering support for Proposition 13 in the United States (Sears and Citrin, 1982). Citizens who distrust the government tend to think that the tax burden is too high and object to tax increases (Rudolph, 2009). However, high trust in the government reduces tax resistance, leading taxpayers to perceive that tax cuts are unnecessary. Accordingly, citizens may either alleviate or correct their misunderstandings of tax cuts and accommodate a higher tax burden because of their high level of trust in the government, understanding that revenues may be required to effectively operate budgetary programs for their benefit.

Overcoming citizens' illusions regarding increased public services may also be possible when there is a high level of trust in government because political trust is associated with an

optimal level of government expenditure. A sense of trust in government may lead citizens to perceive that the government must efficiently use financial resources to overcome fiscal crises and support decreased spending even though this reduces existing public services. Accordingly, we can assume that citizens with a high level of trust in government will assent to enduring decreased public spending to overcome adverse fiscal conditions.

Hypothesis 4: Under a high level of trust in government, citizens more strongly support an increased tax burden.

Hypothesis 5: Under a high level of trust in government, citizens more strongly support decreased government spending.

2.4. Public participation

Public participation is also an important means of weakening citizens' illusions regarding fiscal systems, as participation and information opening are important policy tools that ensure government transparency (Benito and Bastida, 2009). Public participation is defined as the democratic process whereby citizens are engaged in administrative or policy decision-making processes (Arnstein, 1969; Irvin and Stansbury, 2004). Significantly, citizen participation mechanisms are the primary platform through which citizens gain policy knowledge and communicate with public officials about important policy or administrative issues within democratic governance. Indeed, prior studies have emphasized the educative role of public participation in government institutions and policies (Stewart, 2007); for example, Oh and Lim (2017) found that citizens' participation in administrative processes enhances their understanding of complex political and policy issues by nurturing their political efficacy. In the case of fiscal illusion, citizen deliberation in various participation mechanisms enables citizens to overcome fiscal illusion by extending their in-depth understanding of complex fiscal policy issues.

Citizens' participatory experiences are conducive to relieving fiscal illusion because these experiences enhance their in-depth understanding of non-transparent and complex fiscal systems. For instance, in educational programs on participatory budgeting, citizens can learn the complex revenue systems through which revenues are collected and distributed, which can help them recognize that tax increases are necessary to operate various budget programs. Citizens also extend their understanding of various budget conditions by experiencing budget decision-making in citizen budget committees; as a result, they can recognize that the government must reduce public services to ensure budget efficiency. Accordingly, we can assume that when citizens are more engaged in participatory programs, they are aware of complex fiscal systems and, therefore, support tax increases and reductions in government spending.

Hypothesis 6: Citizens more strongly support an increased tax burden when they are more involved in various participation programs.

Hypothesis 7: Citizens more strongly support decreased government spending when they are more involved in various participation programs.

2.5. Moderating effects of trust and participation

Finally, the impacts of fiscal constraint information may be conditioned on the degrees of trust and participation. First, political trust is associated with citizens' perception of the optimal levels of their own tax burden and government expenditure. For example, people are willing to pay more when they trust their public officers (Donahue and Miller, 2005). However, a low level of trust weakens citizens' positive perception of their tax burden and government spending. Given the effects of trust on tax and spending, the effects of fiscal information may also vary according to citizens' existing levels of trust in government. For example, when citizens highly trust their government, they are less reactive to fiscal constraint information. However, citizens who distrust their government are more responsive to fiscal constraint information because they consider the government incapable of overcoming a fiscal crisis and perceive that tax increases and budget cuts are necessary to solve fiscal constraints.

Similarly, participation effects may moderate the impacts of fiscal constraint information on fiscal illusion. The more citizens participate in the budget process, the greater their understanding of the contexts of complex fiscal systems. Accordingly, even though citizens are provided with fiscal constraint information, they are not susceptible to crisis signals because of the educational effects learned through participatory systems. However, citizens with fewer participatory experiences are more reactive to fiscal constraint signals due to information asymmetry, which leads to the perception that more tax revenues and budget cuts may be necessary to overcome fiscal constraints.

Hypothesis 8: Trust in government moderates the relationship between fiscal constraint information and citizens' decreased fiscal illusion.

Hypothesis 9: Participation moderates the relationship between fiscal constraint information and citizens' decreased fiscal illusion.

3. Data and methods

3.1. Data collection and randomization

We conducted a survey experiment in 2019 to examine citizens' agreement with increasing their tax burden and decreasing government spending to measure how much citizens' fiscal illusion is overcome when presented with fiscal constraint information on government debt and fiscal deficit. This survey targeted general citizens with registered email addresses in the Korean telephone directory. We selected 900 participants from the telephone directory after asking whether they agreed to receive the survey questionnaires to initiate the experiment. Ultimately, 900 participants were selected via stratified sampling based on gender, age, and locality to ensure the sample's representativeness of the Korean population. To initiate the survey experiment, two treatment groups and a control group were created by randomizing the citizens who agreed to participate in the survey through MS Excel's random extraction function. For the experiment, 900 citizens were randomly

sorted into two treatment groups and a control group. Before answering the survey questionnaires, the 300 citizens in the first treatment group read a table containing absolute fiscal constraint information that displays the absolute values of the Korean government's public debt and fiscal deficit published by the National Statistics Office and the Ministry of Strategy and Finance in Korea (Figure 2). Similarly, the 300 citizens in the second treatment group were presented with a graph that contained more negative fiscal constraint information over time showing that the public debt and fiscal deficit in Korea have increased since 2010 (Figure 2). The 300 citizens in the control group were not provided with any information indicating fiscal constraints in Korea. Finally, citizens in all three groups answered the online survey questionnaires to assess their fiscal illusion. Table 1 displays the

Table 1: Demographics of survey experiment participants

Variable	N	%	Cumulative %
Gender			
Male	451	50.1%	50.1%
Female	449	49.9%	100%
Age (years)			
Under 30	180	20.0%	20.0%
30–40	210	23.3%	43.3%
40–50	240	26.7%	70.0%
Over 50	270	30.0%	100%
Married			
Yes	533	59.2%	59.2%
No	367	40.8%	100%
Education			
More than college	81	9.0%	9.0%
College	626	69.6%	78.6%
High school	174	19.3%	97.9%
Less than high school	19	2.1%	100%
Income			
Very low	62	6.9%	6.9%
Low	239	25.6%	33.4%
Average	531	59.0%	92.4%
High	66	7.3%	99.8%
Very high	2	0.2%	100%
Homeowner			
Yes	635	70.6	70.6%
No	265	29.4	100%
Political ideology			
Progressive	349	38.8	38.8%
Otherwise	551	61.2	100%

participants' demographic characteristics, and Figure 2 illustrates the experimental flow and vignettes. This survey was supported by the Dongguk University Research Fund in 2019. The survey database was previously used in articles published in Korea to examine the various factors that affect citizens' perception of tax compliance (Kim and Oh, 2022).

Experimental Flow

Sampling	Randomization	Treatment	Survey
900 citizens were selected from the telephone directory based on gender, age, and locality	Three groups with 300 citizens each were created using the Excel random function	Treatment group 1: absolute information Treatment group 2: negative information Control group: no information	Citizens in treatment group 1, treatment group 2, and the control group answered the online survey questionnaires

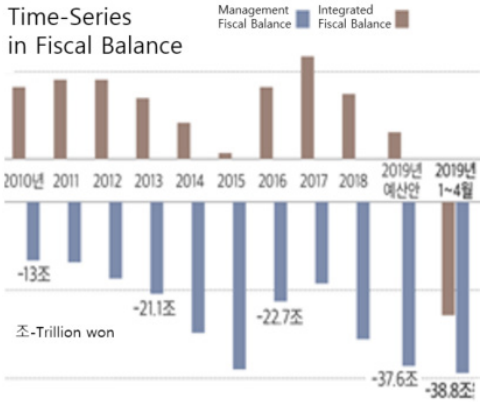
Treatment Group 1
Absolute fiscal constraint information framing: Public debt and fiscal deficit

Fiscal Performance	Definition (%)	Value	Source
Government Debt	100*Government Debt/GDP	39.5% (2018)	National Statistical Office – KOSIS: https://kosis.kr/index/index.do
Fiscal Deficit	100*Fiscal Deficit/GDP	2.4% (2018)	Ministry of Planning and Finance – Open Finance: https://www.openfiscaldata.go.kr/

Treatment Group 2
Negative fiscal constraint information framing: Longitudinal comparison with public debt and fiscal deficit

Increase in Government Debt

Increase in Fiscal Deficit



Control Group – No information

Note: A Korean-language survey was provided to participants, which has been translated into English

Figure 2: Experimental flow and vignette

In an experimental study, the most important point is to ensure equivalence between the treatment and control groups through random assignment, as selection bias may threaten the reliability and validity of the results (Shadish *et al.*, 2002). Therefore, we compared the mean values between the treatment and control groups across participants' demographic variables by conducting a mean comparison test (ANOVA). Table 2 reports the balance test results between the different groups across various demographic characteristics. The mean values between the two treatment and control groups were balanced across participants' demographic attributes. Notably, there were no statistically significant differences between the groups. In addition, we calculated the power using the G-power 3.0 software to estimate how many samples were needed to explain the relevance of our experiment. The power test indicated that our experiment's sample size of 900 explains 0.986 at the significance level of 0.05 (effect size: 0.15) for the ANOVA conducted with the three groups. For the regression analysis with 12 predictors, the power was 0.989 at a significance level of 0.01 (effect size: 0.04).

Table 2: Balance tests of between-group mean differences (ANOVA)

Group	N	Male	Age	Marriage	Education	Income	Homeownership
Treatment 1	300	0.500	43.08	0.630	2.140	2.620	0.676
Treatment 2	300	0.500	42.69	0.580	2.130	2.710	0.713
Control	300	0.501	43.06	0.596	2.180	2.690	0.720

Note: $^{**}p < .01$, $^{*}p < .05$

3.2. Variables

We captured how much citizens' notion of fiscal illusion decreased using a survey questionnaire measuring respondents' level of agreement with increasing the tax burden and decreasing government spending to provide more public services in the budget process. Specifically, the questionnaires asked respondents whether they would agree to increase their tax burden and whether they would agree to reduce the budgets of existing programs to fund new financial programs in the Korean government's fiscal decision-making processes. The scale of dependent variables ranged from 1 (strongly disagree) to 10 (strongly agree).

The treatments in the survey experiment represented the independent variables. Three dummy variables were created to test the treatment effects of fiscal constraint information depending on whether citizens were exposed to such information. In the survey experiment, if citizens reviewed either absolute or negative information, it was coded as 1 (Treatment – information provided), with 0 indicating that no information was provided. When citizens received fiscal constraint information indicating the absolute values of government debt and fiscal deficit in comparison to the levels of GDP prior to the survey, it was coded as 1 (Treatment 1), with 0 indicating that they were not exposed to such information. Similarly, when citizens reviewed more negative fiscal constraint information

showing that the government debt and fiscal deficit in Korea had increased over time, it was coded as 1 (Treatment 2), with 0 indicating that they were not exposed to such information.

In addition to the treatment-based variables, the levels of trust in government and participation experiences were measured. To measure trust in government, we used a survey questionnaire asking respondents to quantify their trust in government on a scale from 1 (very little) to 7 (very high). Participatory experience was measured according to how often the respondents attended participation opportunities such as participatory budgeting, citizen petitions, and citizen meetings (1 = no participation, 2 = once, 3 = 2–3 times, 4 = 3–4 times, 5 = >5 times). The moderating effects of trust and participation were measured by creating high-trust (participation) and low-trust (participation) groups. First, respondents who responded with 6 or 7 in the trust item were classified as the high-trust group, while those who selected 1 or 2 comprised the low-trust group. Similarly, when respondents did not participate in any mechanisms, they were assigned to the low-participation group, while respondents who had participated in participation opportunities more than three times comprised the high-participation group.

Several variables were employed to control other effects on citizens' perceptions of the expansion of government expenditures that prior studies have empirically proven using the models of self-interest and symbolic politics (Lowery and Sigelman, 1981; Donahue and Miller, 2005). Regarding variables of symbolic politics that represent citizens' images of fiscal and political systems, perceived budget, tax fairness, and political ideology (left) were selected. Budget waste and tax fairness were respectively derived from the following survey questions: 'To what extent do you think the government is wasting the budget?' and 'To what extent do you think the tax burden is equally imposed on all taxpayers?'. These survey item scales were based on a seven-item Likert scale ranging from 1 (very little) to 7 (very much). Political ideology was also measured with a single survey item: 'Which party do you support?'. When respondents chose progressive parties, it was coded as 1, and 0 otherwise. As seen in Table 1, we selected control variables that reflect the self-interest model (gender, age, marriage, income, education, and homeownership) because people with high income and those who own homes more strongly object to tax increases because of their economic benefits.

3.3. Analytical procedure

We tested our hypotheses with ANOVA testing. In the ANOVA tests, we identified statistically significant differences in citizens' level of agreement with increased government spending between our treatment and control groups. We also conducted regression analyses to enhance the statistical accuracy of our experimental design and test the moderating effects of trust and participation.

4. Results

4.1. ANOVA testing

We tested our hypotheses by running ANOVA tests to analyze the mean differences between the treatment groups and the control group. Table 3 reports the mean and standard errors of the ANOVA tests. First, the two types of fiscal constraint information did not influence citizens' perceptions of increased tax burden, rejecting Hypothesis 1. However, Hypothesis 2 is statistically supported: when both absolute and negative fiscal constraint signals are provided, citizens' level of agreement with reducing current budget programs is higher than when no information is provided (difference: Treatment 1 vs. Control = 0.413, p = .05; Treatment 2 vs. Control = 0.510, p = .01). Hypothesis 3 is not supported because there was no statistical difference between Treatments 1 and 2 (difference: −0.143) even though the value of Treatment 2 (6.207) was slightly higher than that of Treatment 1 (6.110). Table 4 displays the ANOVA results.

Table 3: Mean comparison between groups (ANOVA)

Analysis	Group comparison	N	M	SE	Difference
Increased tax burden	Treatment 1	300	5.377	0.130	
	Treatment 2	300	5.520	0.133	
	Control	300	5.320	0.130	
	Treatment 1−Treatment 2				−0143
	Treatment 1−Control				0.057
	Treatment 2−Control				0.143
Decreased spending	Treatment 1	300	6.110	0.110	
	Treatment 2	300	6.207	0.112	
	Control	300	5.697	0.170	
	Treatment 1−Treatment 2				−0.097
	Treatment 1−Control				0.413**
	Treatment 2−Control				0.510***

Note: $^{***}p < .01$, $^{**}p < .05$, $^{*}p < .1$

4.2. Regression analyses

We retested Hypotheses 1–3 by performing regression models that included the treatment-based variables, trust in government, participation, and the control variables. As seen in Table 4, the regression results are consistent with the ANOVA results. Even with the control variables included, the results indicate that citizens support decreased spending when they have received any type of fiscal constraint information (Treatment-information provided: coefficient = 0.370, $p = .01$; Treatment 1: coefficient = 0.376, $p = .05$; Treatment 2: coefficient = 0.363, $p = .05$).

Both Hypotheses 4 and 5 are also supported, indicating that citizens with high levels of trust in government support a greater tax burden and decreased spending, overcoming

fiscal illusion (tax increase: coefficient = 0.689, p = .01; decreased spending: coefficient = 0.392, p = .01). The participation effects were identical to those for fiscal constraint information. In other words, even though citizens' participatory experiences were not associated with their support for tax increases, the more they engaged in participation mechanisms, the greater their support for decreased government spending (coefficient = 0.111, p = .05). Accordingly, the results reject Hypothesis 6 but support Hypothesis 7.

Table 4: OLS regression results

Variable	Increased tax burden		Decreased spending	
	(1)	(2)	(3)	(4)
Treatment	−.027		0.370***	
Treatment 1		−.019		.376**
Treatment 2		−.034		.363**
Trust in government	.689***	.689***	.392***	.392***
Participatory experiences	.002	.002	.111**	.111**
Perceived tax fairness	.189***	.188***	.145***	.144***
Perceived budget waste	.008	.008	.132***	.132***
Political ideology (left)	.362**	.362**	−.007	−.007
Male	.330**	.330**	.120	.120
Age	−.017***	−.017***	.004	.004
Married	−.041	−.042	−.088	−.088
Homeowner	−.078	−.078	.018	.018
Education	.035	.035	−.059	−.059
Income	−.017	−.017	.090	.091
N	900	900	900	900
R-square	0.326	0.326	0.144	0.144

Note: $^{***}p < .01$, $^{**}p < .05$, $^{*}p < .1$

4.3. Moderating effects

In addition to the direct effects of trust and participation, we tested whether trust and participation moderate the effects of fiscal constraint information on citizens' decreased sense of fiscal illusion to verify Hypotheses 8 and 9. Tables 5 and 6 reveal that moderating effects were only observed in the models for decreased spending. Regarding expenditure, the effects of fiscal constraint information on overcoming citizens' fiscal illusion were more remarkable in the low-trust and low-participation groups than in the high-trust and high-participation groups. The results demonstrate that when citizens distrust the government and do not participate in government decision-making processes, their fiscal illusion decreases in response to fiscal constraint information.

A consideration is that the explanatory power (R^2) of our models is relatively low because there were some variables that we did not examine in our survey. Despite this low explanatory power, we ensured the goodness of fit of all models through *F*-testing. Future

studies should extend these empirical findings by including more variables that may influence fiscal illusion.

Table 5: Moderating effects of trust in government

Variable	Increased tax burden		Decreased spending	
	Low trust	High trust	Low trust	High trust
Treatment	.242	−.234	1.233**	−.101
Participatory experiences	.061	.080	.092	.173
Perceived tax fairness	.226*	.134	.142	.181*
Perceived budget waste	−.356***	.211**	.032	.183**
Political ideology (left)	.040	−.092	−.674	−.329
Male	−.209	.789**	−.018	.124
Age	−.012	−.011	.015	−.014
Married	−.291	.167	−.821	.239
Homeowner	−.031	−.265	.162	.123
Education	−.064	.074	−.189	−.213
Income	.310	−.133	.045	.071
N	143	148	143	148
R-square	0.124	0.155	0.071	0.143

Note: ***p < .01, **p < .05, *p < .1

Table 6: Moderating effects of participation

Variable	Increased tax burden		Decreased spending	
	Low participation	High participation	Low participation	High participation
Treatment	0.092	−.177	.540***	.164
Trust in government	.597***	.837***	.340***	.446***
Perceived tax fairness	.221***	.121	.135**	.179**
Perceived budget waste	−.101*	.132	.030	.266***
Political ideology (left)	.420**	.318	.057	−.209
Male	−.017	.690**	−.012	.306
Age	−.013	−.024	.005	.012
Married	−.212	.294	−.105	.127
Homeowner	−.182	.108	.049	−.149
Education	−.011	−.034	−.082	−.053
Income	−.033	−.121	.171	−.114
N	540	228	540	228
R-square	0.322	0.343	0.128	0.148

Note: ***p < .01, **p < .05, *p < .1

5. Discussion and conclusion

In the past, researchers have questioned why taxpayers are captured by the fiscal illusion that leads them to demand both a lighter tax burden and increased government services. Our empirical evidence demonstrates that peoples' misperceptions of taxes and spending can be modified through democratic maturity variables such as open fiscal constraint information, trust in government, and public participation. Notably, our results suggest that when presented with different fiscal constraint information indicating government debts and fiscal deficits, citizens' fiscal illusion becomes less salient. Furthermore, citizens' trust in government and participatory experiences reduce their illusion, moderating the relationship between fiscal constraint information and citizens' decreased fiscal illusion.

Our findings also demonstrate that fiscal constraint information contributes to correcting citizens' illusions that the government should increase public spending, enabling them to agree with the reduction of current budget programs. The evidence is consistent with prior studies' arguments that fiscal transparency contributes to budget efficiency (Benito and Bastida, 2009). Taxpayers experience fiscal illusion because of their limited knowledge about their government's fiscal capacity (Sanandaji and Wallace, 2011). However, this illusion may decrease when citizens receive fiscal constraint information that describes the difficulties of the current fiscal situation (Simonsen and Robbins, 2003). After encountering fiscal constraint information on government debt and fiscal deficit, citizens may understand the actual costs of government debt and the importance of fiscal balance, overcoming their debt or budget illusion (Dell'Anno and Dollery, 2014). Accordingly, governments must make a broad range of fiscal information content accessible to citizens, even when the fiscal situation is undesirable. For practitioners, performance dashboards including various contents that accurately describe current fiscal performance could be operationalized (Shin and Oh, 2022).

Despite such effects of fiscal constraint information, there is no statistical difference between a citizen receiving absolute information versus negative longitudinal information. Although prior studies have identified the concept of negativity bias explaining that humans are very reactive to negative events, content, and information (Meier, Favero and Zhu, 2015; Zhu and Rutherford, 2019), in our study, citizens were not more responsive to the negative fiscal constraint information than to absolute information. This may be because the absolute fiscal constraint information necessarily included the negative information indicating the size of the public debt and deficit, even though it had no comparative data. This finding implies that any fiscal constraint information is conducive to overcoming citizens' fiscal illusion by reducing the information asymmetry between citizens and the government.

Furthermore, the findings confirm the positive effects of trust in government and public participation on overcoming citizens' fiscal illusion. Some countries – such as South Korea and Norway – effectively addressed the 2020 COVID-19 pandemic because their citizens well understood the governmental regulations to control the virus, which reflected the high levels of citizen trust in the government and active citizen participation programs

to tackle the pandemic (Christensen and Lægried, 2020; Kye and Hwang, 2020). In this regard, both trust in government and deliberative participation programs contribute to relieving citizens' misunderstandings about the optimal levels of tax burden and expenditure, reducing citizens' information asymmetry in fiscal decision-making. In particular, developing countries where citizens do not highly trust their government should make more efforts to restore citizens' trust in government decision-making while also encouraging citizens to participate in various activities such as participatory budgeting. This is because citizens are willing to pay more when they trust in their government and are able to overcome their fiscal illusion. For example, governments can help correct citizens' misperceptions of tax and spending by communicating with citizens about the difficulties of the current fiscal situation through various participation programs. For practitioners, initiatives like the national participatory budgeting first operationalized by the Korean government in 2017 are recommended to help reduce fiscal illusion. This program in particular has contributed to fiscal transparency by fostering citizens' trust and participation in the budget process (Kim and Oh, 2022).

Regarding the moderating effects of trust and participation, citizens are more reactive to fiscal constraint information, overcoming their fiscal illusion when they have low trust in government and their participatory experiences are insufficient. Citizens in the low-trust and low-participation groups may be more reactive to fiscal constraint information because they do not believe or understand the government's capacity to handle fiscal crises, which leads them to support necessary reductions in current budget programs to overcome fiscal constraints. Accordingly, governments should publicize fiscal information more actively when citizens distrust fiscal systems and are hesitant about participating in policy processes.

One interesting finding is that citizens' reactions to taxes are less elastic than their reactions to spending. Despite receiving fiscal constraint information, citizens did not support a higher tax burden in any of our regression models. When citizens receive fiscal crisis signals during a fiscal process, they may believe that crises can be overcome without higher taxes. Two interpretations are possible. First, our treatments did not include fiscal constraint information concerning tax systems. However, revenue complexity is a primary source of fiscal illusion, as taxpayers are unfamiliar with complicated tax structures (Dollery and Worthington, 1996). Citizens may be more reactive to taxes if actual revenue information is provided. Another interpretation is that citizens are more sensitive to their self-interests than common fiscal crises. Applying the self-interest model of taxpaying, Lowery and Sigelman (1981) argued that taxpayers resist all taxes that adversely affect their economic benefits. Accordingly, even when they encounter fiscal constraint information, citizens do not agree with increasing their own tax burden based on their economic self-interest.

From a comparative perspective, our empirical findings provide important policy implications for practitioners seeking public financial soundness. If spending rises without a corresponding increase in taxes or a decrease in hidden costs, countries may suffer from increasing debts and fiscal deficits. Mourão (2007) compared fiscal illusion in 68 countries

since 1960 and found that the fiscal illusion indices in developing countries were higher than in developed countries (e.g., the Netherlands and New Zealand). That being the case, practitioners in developing countries with undesirable financial situations must reduce citizens' illusion by understanding the true costs of different government programs. The practical message is clear: the risk of fiscal illusion is great in developing countries. As this study highlights, government officials in developing countries need to recognize that to overcome citizens' fiscal illusion, the benefits of fiscal democracy outweigh the costs of policy tools such as information, trust, and participation. In other words, to close citizens' information gap on government finances, their trust in government must be secured by expanding the disclosure of fiscal information and increasing their participation in the budget process.

This study constitutes the first attempt to clarify how citizens' fiscal illusion can be overcome through various factors in democratic decision-making processes. Accordingly, we believe that our research will guide public financial studies exploring taxpayers' attitudes toward public finance while advancing more refined theoretical insights and rigorous research methods from the perspective of democratic maturity.

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