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Citizen Participation in Budgeting: A Trade-Off between Knowledge and Inclusiveness?

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Abstract: *Research on citizen participation has noted a tension between fostering an inclusive policy-making process and simultaneously maintaining a competent pool of participating citizens. This article investigates the implications of this trade-off by testing the impact of measured levels of inclusiveness and participating citizens' knowledgeability on two performance metrics: citizen engagement and process efficiency. Results indicate that although inclusiveness may be negatively associated with the level of engagement, both knowledgeability and inclusiveness are positively associated with process efficiency. Overall, the findings suggest that policy makers can pursue the democratic ideal of opening policy making to the citizenry while still maintaining an efficient process.*

Practitioner Points

- Citizen knowledgeability is positively associated with participatory process efficiency.
- Inclusiveness is negatively associated with member engagement and positively associated with efficiency.
- Governments may pursue the democratic ideal of opening the door to the public while maintaining an efficient participatory process.
- When making a participatory process more inclusive by increasing the number of citizens involved, policy makers should hold smaller group meetings before convening the full committee.
- To maintain a high level of citizen engagement, inclusive participatory processes should include a large share of members who are openly recruited.

This article focuses on two central research questions in public administration research and practice: Is there a trade-off between inclusiveness and knowledgeability when a citizen participatory process is institutionalized in practice? If so, what are the impacts of these two aspects of participation on the level of engagement and efficiency associated with the participatory process? Although previous researchers have explored these questions, most investigations have been grounded in normative assumptions about democratic values; few have measured these factors empirically because of the lack of a sufficiently large number of comparable political institutions with differing participatory processes (Ebdon and Franklin 2006; Yang and Pandey 2011). This is a crucial omission: a lack of empirical evidence limits the formulation of more precise theories and complicates their practical implementation (Moynihan 2003; Yang and Pandey 2011). To address this paucity, this article provides empirical evidence on the recent implementation of citizen participation in budgeting in Seoul, South Korea.

Citizen participation in budgeting is a novel mode of governance that brings together multiple stakeholders with public agencies to engage in budgetary decision making within the networked environment of modern public administration (Ansell and Gash 2008; Fung 2006; Klijn and Skelcher 2008; Nabatchi 2010). Scholars have noted the potential for citizen participation, combined with well-developed public institutions, to address democratic deficits by realizing inclusive, egalitarian decision-making processes within governments (Denhardt and Denhardt 2015; Denhardt and Denhardt 2000; Frederickson 1982; King, Feltey, and Susel 1998; Schachter 1995; Thomas 1995).

Prior research has generally stressed the intrinsic value of citizen participation—that is, the benefits gained from increased deliberation and empowerment (e.g., Fung 2006; Fung and Wright 2001; Roberts 2004, 2008; Weeks 2008). However, studies have also noted that dilemmas may arise when trying to achieve public deliberation and participation (Fishkin 2009; Gaventa 2004; Irvin and Stansbury 2004; Wang 2001). Specifically, some scholars argue that it is challenging to achieve both features desired in the participating citizen group—inclusiveness and knowledgeability—when designing a participatory

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process (Cleveland 1985; Fishkin 2009; Posner 2003; Verba and Nie 1972; see also Abers 2000; Baiocchi 2001; Rossmann and Shanahan 2012). *Inclusiveness* refers to the openness of the political system and the degree of members' participation; it may be a key element in achieving equality in participation and direct democracy (Feldman and Khademian 2007; Rossmann and Shanahan 2012; Vigoda 2002). *Knowledgeability* indicates whether the participating citizens have the capacity to carefully evaluate and reach a thoughtful decision on the issue at hand; it, too, may be critical for fostering deliberative democracy and citizen participation (Roberts 2004).[1]

The trade-off between these two aspects implies that when designing a public participation system, one may be forced to choose between "the thoughtful but antidemocratic competence of elites on the one hand and the superficialities of mass democracy on the other" (Fishkin 1991, 3). Participatory processes with reduced inclusiveness may resemble the traditional governance model of hierarchical bureaucracy, offering nonelites scant opportunity to participate in decision making. A more inclusive participatory process, which integrates a large number of ordinary citizens into policy formulation, is more likely to be broadly representative of the population and thus embody the ideals of citizen participation. However, it may also fail to maintain the desired level of knowledgeability among the participating citizens; such knowledge may be required for decision makers to thoroughly consider the policy issues at hand.

Given this tension, this article will explore the implications of the trade-off between *inclusiveness* and *knowledgeability*, the two key measures of participatory process. The focus is not on verifying the existence of the trade-off itself but, more importantly, on examining the impact of the trade-off on the success of the participatory process. To measure this, we use the levels of *engagement* and *efficiency* of public participation, each of which captures a critical aspect of the participatory process.[2] The engagement level is measured by two variables: the average attendance rate of participating citizens and the number of items proposed per participating citizen. Scholars have long emphasized the importance of citizens' active political engagement as a cornerstone of democracy. However, the measured level of engagement does not capture another important aspect of the participatory process: its efficiency. The efficiency of a participatory process is measured by the proportion of proposals that are approved and adopted by the three institutions involved (the committee of participating citizens, the administration, and the legislature). Consideration of efficiency prevents us from making the falsely positive conclusion that a higher level of engagement is necessarily desirable, even in the extreme case in which none of the resulting proposals is adopted.

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Citizen Participatory Budgeting

As noted, this article estimates the impact of inclusiveness and knowledgeability on the participatory process in government budgeting. The practice of promoting deliberative democracy through citizen participation in budgetary decision making has been widespread for several decades. In the United States, attempts to solicit citizen input into the budgeting process date to the early 1900s, when Frederick Cleveland, a cofounder of the New York Municipal Research Bureau, emphasized the role of citizens in ensuring an efficient and responsive government and called for citizen input into resource allocation decisions (Ebdon and Franklin 2006). However, this attempt was met with limited success, partly because of the level of technical expertise required for budgetary decision making (Kelly and Rivenbark 2003).

From an international perspective, the best-known form of citizen participation in budgeting is the Porto Alegre model, considered the initial attempt at participatory budgeting (Wampler 2007). In 1988, the progressive Workers' Party won the mayoral election in Porto Alegre, Brazil. The new government, together with civil society groups, experimented with a participatory budgeting program aiming to invert the budget's priorities by shifting resources from middle- and upper-class neighborhoods to lower-class ones. Participatory budgeting has since spread to cities worldwide.

Prior research on participatory budgeting has mainly focused on three aspects (Wampler 2007): (1) the social and political environments that are conducive to participatory budgeting, (2) the nature of the participants, and (3) the measured outcomes of participation. The first group of investigations have found that participatory budgeting tends to be adopted when networks of civil society organizations (CSOs) are dense, a leftist mayor is present, authority is decentralized to local governments, and party institutionalization is not so strong as to prevent the emergence of participatory programs (Goldfrank 2007; Wampler 2007). The second block of research reports that participating citizens come mostly from low-income households or regions, with women and men participating equally (Baiocchi 2001). Most participants are affiliated with CSOs, implying that participatory budgeting either reinforces preexisting CSOs (Nylen 2003) or encourages the creation of new ones (Abers 1998). Past research also shows that participatory budgeting results in demonstrable outcomes, including significant resource redistribution, reduction of clientelism, and promotion of transparency (Moynihan 2007; Wampler 2007).

In sum, past scholarship has greatly enhanced our collective understanding of participatory budgeting. However, the majority of evidence focuses on single case studies, particularly that of Porto Alegre (Wampler 2007). Although invaluable in terms of building our knowledge of citizen participation in budgeting, this qualitative evidence from a single case would be greatly supplemented if it were supported and advanced by quantitative observational studies. This article aims to fill this important gap.

Hypotheses

Scholars have stressed that in order for citizen participation in budgeting to achieve its goal of promoting democratic values, its scope must be expanded to achieve inclusiveness (Box 1998; King and Stivers 1998). However, greater inclusiveness may also make it more difficult to effectively encourage participating citizens to actively engage in the budgeting process: expanding the number of citizens involved may decrease each individual's sense of ownership over the resulting decisions, thereby lowering his or her engagement in the process.

Greater inclusiveness may also make the budgetary decision-making process less efficient (Moynihan 2003, 2007). A typical complaint of governments that have adopted participatory budgeting is that citizen participation "simply result[s] in 'shopping lists' of demands from communities that do not reflect the scarce resources available" (Heimans 2002, 18). Expanding the number of citizens participating in the process requires the government to interact with larger groups with diverse interests, including the public, nongovernmental organizations, CSOs, and interest groups, and involves coordinating a larger number of (or more heterogeneous) interests. As a result, it can reduce the likelihood of reaching consensus and making decisions (Moynihan 2003). This increased difficulty in allocating scarce resources may lower the efficiency of the budgeting process.

Based on these arguments, we hypothesize that an increased level of inclusiveness, as measured by a larger number of participating citizens, is associated with a lower level of engagement and process efficiency, despite the normative and intrinsic value of inclusiveness in achieving democratic outcomes. Two specific hypotheses are examined:

Hypothesis 1: An increased level of inclusiveness decreases the average level of engagement of each participating citizen.

Hypothesis 2: An increased level of inclusiveness decreases the efficiency of the participatory process.

On the other hand, scholars have also addressed the challenges of public participation, which often arise from a lack of knowledge or expertise among participating citizens (Cleveland 1985). Budgetary decision making sometimes requires professional knowledge and an ability to understand technical information (Neshkova 2014); this could create barriers to citizen participation. Citizens who lack professional expertise are generally less likely to participate and often lack the self-confidence needed to publicly air their opinions (Abers 2000). Thus, even if they initially agree to participate in the budgetary process, they may gradually lose interest and become apathetic; their participation in the process thus becomes superficial, a mere formality. Therefore, citizens' lack of knowledge can lower their level of engagement in the process.

Participants' knowledgeability can also affect the efficiency of the budgetary decision-making process. Weighing competing budgetary demands can become more difficult if the decision-making process is scrutinized by those lacking the expertise required for decision making (Buckwalter 2014; Franklin, Ho, and Ebdon 2009; Robbins, Simonsen, and Feldman 2008). The notion that ordinary citizens may lack the knowledge required for policy making can be traced as far back as Plato's *Republic*, which suggests that elites, characterized by wisdom and virtue, should govern. Rulers with these attributes, Plato argues, are able to rule in the interest of true justice. This suggests that all else being equal, the opinions of citizens who are knowledgeable about the government's objectives, policies, and budgetary processes are more likely to be accepted by other citizens, bureaucrats, and legislators. Thus, having more knowledgeable participating citizens may improve the efficiency of the participatory process, although this may also weaken participation's embodiment of normative and intrinsic democratic values.

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Therefore, we hypothesize that an increased level of knowledgeability among participating citizens is associated with higher levels of engagement and efficiency in budgetary decision making. Specifically, we propose the following:

Hypothesis 3: An increased level of knowledgeability among participating citizens increases the average level of engagement of participating citizens.

Hypothesis 4: An increased level of knowledgeability among participating citizens increases the efficiency of the participatory process.

Using data from autonomous districts of Seoul, we examine these hypotheses empirically using ordinary least squares (OLS) regression and check their robustness using Bayesian model averaging (BMA). The investigation takes advantage of the fact that the relatively comparable districts have institutionalized different participatory processes and designs. The next section details the participatory process in one representative district, Seodaemun-gu, to show that it adequately matches the typical implementation of citizen participation, as discussed in the literature.

Participatory Budgeting in Autonomous Districts of Seoul

This article uses the 25 local districts of Seoul as the units of analysis. This section focuses on one of these, Seodaemun-gu, to examine the system's process design in greater detail. Seodaemun-gu, located in northwestern Seoul, was home to 135,496 households as of June 2014. Like many other districts, it adopted a participatory budgeting system in 2011, using it to help set the district's 2012 budget.[3] The Seodaemun-gu system uses a "1 percent participatory budgetary system": it aims to allocate 1 percent of the district budget to items proposed by residents. District residents can act as budgeting committee members or participate indirectly through the district's website, e-mail, fax, and/or mail.

This participatory system in Seodaemun-gu centers on a budgeting committee, which collects residents' opinions and ultimately decides which activities to propose to the district office. The committee's membership changes annually; as of May 2013, it had 53 members, selected mainly through open recruitment and recommendation. In some districts, rules require a few district government officers to be included in the committee. The key distinction between open recruitment and recommendation is that under open recruitment, all residents are eligible to apply—at least officially. Once an application is received, the district office reviews it, and citizen committee members are selected through various methods, including random lottery. Members are also recommended by various stakeholders, including the district government, politicians, CSOs, and interest groups.

The administrative processes of the citizen budgeting committees vary across districts. In some districts, all recruited committee members are assigned to one of several zone meetings. In Seodaemun-gu, members are assigned to a zone-specific meeting based on their address or interests; each member represents a small zone area, and all can offer proposals of interest to their zones or themselves. The proposals raised at zone meetings are reviewed by the budgeting committee, which then votes on the proposed items in a general meeting, which is attended by all committee members. In other districts, committee members are not assigned to small subgroups for zone meetings. Instead, all members are invited to a general committee meeting, at which they jointly propose, review, and vote on budgetary items. Regardless of whether districts maintain zone-specific meetings, a proposal will be reviewed by the district government and then brought before the district assembly if the majority of the members present approve it.

Any item proposed by a citizen must proceed through a three-step review process. First, the citizen budget committee, of which the participating citizens are members, votes and selects proposals approved by a majority of the members who are present. Then, the committee prioritizes the selected items using a "sticker vote," in which each citizen can allocate three stickers to his or her top three proposals. The district office then checks the proposals' feasibility in terms of expected benefits and costs; those that are not realistically implementable are cut. Finally, the district office forwards the vetted proposals to the district assembly; if the assembly approves a policy, it is then adopted.

Tables 1 and 2 present the allocation of participatory budgeting spending within Seodaemun-gu. In 2013, the amount allocated through participatory budgeting was smaller than the pledged 1 percent of the total budget. However, the share is not negligible when one considers that about 28 percent of the total budget was spent on payroll and 49 percent was social spending for predefined groups of poor and elderly people, which is nondiscretionary on the part of the district government.

Table 1 shows how the participatory budget-allocated expenditures for the 2014 fiscal year were apportioned across various spending areas. Expenditures allocated through participatory budgeting were overwhelmingly spent on urban infrastructure (classified as "security, construction, and transportation" in table 1). Within the participatory budget, 76 percent of total expenditures were allocated to infrastructure-related spending, compared with only 5 percent of the total budget. The two most significant urban infrastructure expenditures in the participatory budget were the installation of surveillance cameras for crime reduction and repair of the aging infrastructure including roads, parks, water supplies, and sewage facilities.

Table 2 shows how participatory budgeting processes and outcomes differed across zones of Seodaemun-gu during the combined 2012–14 fiscal years. It also shows the average income of each zone, as measured by local tax filings per household, to determine whether there is any relationship between participatory budgeting outcomes and income. Results show that the regional income level is negatively correlated with the number of proposals, approved items, and spending levels: citizens from low-income neighborhoods propose more items, and more resources are allocated to these neighborhoods in terms of number of items and total spending. However, the results differ if budget spending is measured on a per household basis. In this case, the correlation between regional income level and spending per household is significantly positive—that is, low-income neighborhoods receive more *total* spending but less *per household* spending than high-income neighborhoods. This preliminary mixed evidence

Table 1 Participatory Budgeting in Seodaemun-gu by Spending Area

	Total Budget		Participatory Budget	
Spending Area	Expenditure	Share	Expenditure	Share
Policy planning and audits	8,620	3%		
Administration and home affairs	85,929	29%	77	7%
Economy and finance	4,706	2%		
Welfare and culture	144,838	49%	63	5%
Environment and urban planning	18,276	6%	137	12%
Security, construction, and transportation	15,100	5%	887	76%
Health center	15,048	5%		
Administrative support for legislation	2,836	1%		
Museum of Natural History	2,505	1%		
Total	297,858		1,165	

Notes: Expenditures are reported in US$1,000, converted at the exchange rate of 1050.5 South Korean won per U.S. dollar (the rate as of January 2, 2014). Data are for fiscal year 2014.

Table 2 Participatory Budgeting in Seodaemun-gu by Regional Zone

Zone	No. of Proposed Items (A)	No. of Approved Items (B)	Approved Budget Spending (C)	Approved Budget Spending per Household (D)	Local Tax Filed per Household (E)
Namgajwa-1-dong	24	3	111	0.064	4.46
Namgajwa-2-dong	34	4	36	0.003	0.99
Bukgajwa-1-dong	37	4	97	0.013	2.38
Bukgajwa-2-dong	41	7	304	0.022	0.72
Bukahyun-dong	32	2	36	0.007	1.77
Shinchon-dong	39	4	216	0.019	3.50
Yonhee-dong	45	9	861	0.046	1.59
Chonyeon-dong	47	6	120	0.014	1.16
Choonghyun-dong	36	10	253	0.028	3.93
Hongeun-1-dong	34	6	378	0.037	0.99
Hongeun-2-dong	37	5	347	0.028	1.12
Hongje-1-dong	47	8	179	0.016	0.96
Hongje-2-dong	27	6	244	0.041	1.18
Hongje-3-dong	31	6	96	0.012	0.83
Correlation with column E	–0.327	–0.133	–0.112	0.424	1

Notes: Columns C, D, and E are all reported in US$1,000, converted at the exchange rate of 1050.5 South Korean won per U.S. dollar (the rate as of January 2, 2014). The numbers reflect combined data for three fiscal years, 2012–14.

motivates more in-depth empirical analysis to determine whether participatory budgeting, as is often claimed, has a redistributive effect.

Methods

This section explains the independent, dependent, and control variables employed in the study and presents their data sources, all of which are publicly available.

Independent and Dependent Variables

This article examines how the selection of participants affects the performance of citizen participation at the district level, focusing on two main independent variables: inclusiveness and knowledgeability. Inclusiveness is measured as the total number of citizens participating in the budgetary decision-making process. Knowledgeability is measured as the proportion of committee members who self-identified as working for CSOs and governments or as licensed professionals, such as attorneys or accountants. Most districts ask their citizen committee members about their professions in terms of the following categories: civil society, government (not limited to the district government), licensed professional, student, self-employed, and other. To construct the knowledgeability variable, the proportion working for CSOs and governments or as licensed professionals was chosen because it is people in these roles who would likely have made the budget decisions in the absence of citizen participatory budgeting. In other words, members from these professions are expected to have the qualifications usually requested for making budgetary decisions.

Admittedly, there are limitations in the measurements of the two independent variables. The theoretical notion of inclusiveness encompasses *proper representation* of different groups within a society; our measure, the number of participating citizens, does not fully capture this democratic ideal. Similarly, the proxy for knowledgeability may not adequately reflect the various aspects of "knowledge" required for decision making, including policy knowledge, budgeting expertise, technical skills, years of experience, and so on. Despite these limitations, these measures serve as imperfect but useful proxies that provide valuable insight into participatory processes.

Previous studies have indicated that a potential trade-off between the two independent variables is a source of difficulty in practically institutionalizing deliberative democracy. Although selection methods that ensure the inclusion of a wide range of perspectives are more likely to embody democratic values, higher inclusiveness may also lead to lower knowledgeability. This posited negative relationship is obvious in our data set: the correlation between knowledgeability and inclusiveness is strongly negative (–0.402) and statistically significant at the 1 percent level. This suggests that the average level of knowledgeability decreases with inclusiveness (i.e., as the number of citizen committee members increases). This negative correlation may imply that these two variables affect the performance of citizen participation in opposite directions, creating a trade-off. This hypothesis is tested here.

On the other hand, the dependent variables are the two process-oriented performance measures: level of engagement and the efficiency of participation. We measure the level of engagement using two relatively straightforward variables: the average attendance rate of participating citizens and the average number of items proposed per participating citizen. Measurement of the level of efficiency requires more elaboration. As a proxy for process efficiency, we use the proportion of total citizen-proposed items that are eventually adopted by the local legislature. If efficiency entails obtaining the maximum output from a given input, the items proposed by participating citizens are the inputs, and the proposals approved by the three institutions involved are the outputs. This assumes that the number of proposals approved can be viewed as a valid indicator of the performance of participation, as the three institutions—including the legislature, which has democratic accountability—will pass a proposal only if it is expected to improve constituent welfare. If this assumption holds, the efficiency measure can also be viewed as a measurable and meaningful proxy for the quality of deliberation.

Covariates

This analysis controls for two groups of district-level variables that could bias the estimated results if omitted. The first group of covariates relate to the *administrative process design* of participation. Within this, we control for how the district government recruited citizen committee members using two indicators: (1) the proportion of participants who were openly recruited and (2) the share of participants who work for the district government. The "openly recruited" members are citizens who applied for positions open to all district residents, as opposed to those who were recommended by the district office, politicians, CSOs, or interest groups. This variable may also capture the district office's efforts to protect the integrity or representativeness of the selection process by safeguarding it against arbitrary manipulations by bureaucrats, politicians, or special interests. In contrast, the participation of district government employees as committee members is required by district rules or recommended by the participatory budgeting officer. In addition, the following indicators are controlled: (3) whether zone-specific meetings are held, (4) the proportion of meetings held after 6:00 p.m., (5) the timing of the meetings during the fiscal year, and (6) whether citizens are paid to attend meetings.[4] These variables are included to control for potential variation in how participatory processes are managed across districts.

The second group of covariates relates to the *governing* and *social environments*. Researchers have often cited the governing environment as crucial in shaping the participation process (Ebdon and Franklin 2006; Wampler 2007). In this analysis, indicators of the political culture and relevant legal requirements are included as covariates to capture how the governing environment may affect the participatory process. We control for (7) the party identity of the elected head of the district and (8) whether the district legally mandates a participatory budgeting process. In addition, we also include three environmental factors: (9) the measured value of public infrastructure owned by the district office, (10) the district population, and (11) the share of district residents who self-identified, in a citywide survey, as being involved with local CSOs. The value of public infrastructure is the value of public land, buildings, structures, and trees that the district government owns. It is intended to relate to the demand side of the participatory process. As explained for the case of Seodaemun-gu, participating citizens' budgetary demands tend to be focused on investments in urban infrastructure. Therefore, the legislature and district government may find it more difficult to reject a given proposal in a district with limited public infrastructure. The size of the district may affect residents' sense of

ownership of local policy issues and thus impact the level of engagement, while the share of residents involved with CSOs may signify the strength of local civil society and social capital.

As explained, this article considers two models that differ in whether the dependent variable is the level of engagement or process efficiency. All covariates noted earlier are included in both models, with additional covariates in the model for the level of efficiency. The first is the total number of budget proposals submitted by citizens. The level of efficiency (i.e., the percentage of proposals eventually adopted) is generally negatively correlated with the number of proposals; failure to control for the number of proposals could lead to the false conclusion that districts with more proposals suffer from a lower efficiency of participation. The second covariate is an indicator of legislative gridlock in the district. The existence of legislative gridlock could significantly affect the likelihood that a given proposal will be approved by the legislature. This variable takes a value of 1 if the district head is from a different political party than that holding the majority of district assembly seats. Table 3 displays the full list of variables.

Data Sources

This article explores 25 local districts' participatory processes implemented during 2011–14 to set the budgets of the coming years (i.e., the 2012–15 fiscal years). Most data used in this study were collected through Korea's open public information initiative (http://open.go.kr). Four requests for data were made, in May 2013, January 2014, August 2014, and January 2015. The later requests were made because the data set resulting from the first request did not include a sufficient number of observations. In addition, a number of control variables were collected from the Seoul Statistics Web site (http://stat.seoul.go.kr). Table 4 lists the data sources and summary statistics for all variables, which are measured as district-level average values.

Results

The main results are presented in tables 5–7. In each table, the OLS estimates are reported in the first four columns, and the robustness checks using BMA are shown in the fifth column.

Main Results with OLS

Table 5 illustrates how inclusiveness and knowledgeability may influence the level of engagement of participating citizens, as measured

Table 3 Variable Definitions

Type	Variable	Description
Dependent variables	Level of engagement (proxy 1)	Average attendance rate of participating citizens (%)
	Level of engagement (proxy 2)	Average number of items proposed per participating citizen
	Level of efficiency	Proportion of proposals eventually passed by district assemblies out of the total number proposed (%)
Independent variables	Knowledgeability	Proportion of citizens who self-identified as working for CSOs or government or as licensed professionals (%)
	Inclusiveness	Number of citizens participating in the budgeting process
Covariates: Administrative process	Openly recruited participants	Share of committee members who are openly recruited (%)
	District officers among participants	Share of committee members who are working for the district government (%)
	Whether zone meetings are held	1 if zone meetings are held, 0 otherwise
	Meetings held after 6:00 p.m.	Share of meetings held after working hours (6:00 p.m.)
	Average timing of meetings	Average timing of meetings within the fiscal year (in months of the fiscal year, 1–12)
	Whether participants are paid	1 if paid, 0 otherwise
Covariates: Governing and social environment	Participatory budgeting mandated by district law	1 if participatory budgeting is mandatory, 0 otherwise
	Conservative head of district	1 if the party identity of the elected district head is conservative, 0 if liberal
	Urban infrastructure (log)	Logarithm of the value of urban infrastructure owned by the district government for public use
	District population (log)	Logarithm of the district population
	Residents involved with CSOs	Proportion of district residents who are involved with CSOs in the district (%)
Other covariates	Total number of proposals	Total number of items proposed by all participants
	Legislative gridlock	1 if the party identity of the district head differs from that of the majority in the assembly, 0 otherwise

Table 4 Data Sources and Summary Statistics

Variable	Data Source	Obs.	Mean	SD	Min.	Med.	Max.
Average attendance rate	open.go.kr	81	75.0	10.6	52	75	100
Average number of proposals per citizen	open.go.kr	81	1.6	1.3	0.0	1.2	5.5
Share of proposals adopted	open.go.kr	81	38.3	21.3	7.8	34.5	100
Knowledgeability	open.go.kr	81	20.1	16.0	0	16.3	57.7
Inclusiveness	open.go.kr	81	47.2	25.5	18	43	120
Total number of proposals	open.go.kr	81	72.2	62.0	9	45	259
Openly recruited participants	open.go.kr	81	57.3	33.8	0	56	100
District officers among participants	open.go.kr	81	8.9	9.3	0	4.6	28
Whether zone meetings are held	open.go.kr	81	0.6	0.5	0	1	1
Meetings held after 6:00 p.m.	open.go.kr	81	26.8	37.7	0	0	100
Average timing of meetings held	open.go.kr	81	7.2	1.7	3.8	7.3	11.5
Whether participants are paid	open.go.kr	81	0.9	0.3	0	1	1
Mandated by district law	open.go.kr	81	0.5	0.5	0	1	1
Conservative head of district	open.go.kr	81	0.2	0.4	0	0	1
Urban Infrastructure (log)	stat.seoul.go.kr	81	14.3	0.4	13.4	14.2	15.4
District population (log)	stat.seoul.go.kr	81	12.5	1.8	4.5	12.9	13.4
Residents involved with CSOs	stat.seoul.go.kr	81	0.7	0.5	0	0.6	3.6
Legislative gridlock	open.go.kr	81	0.6	0.5	0	1	1

Table 5 Knowledgeability, Inclusiveness, and Participant Engagement (Result I)

	Dependent variable: Average attendance rate of participating citizens (%)				
	OLS				BMA
	(1)	(2)	(3)	(4)	(5)
Knowledgeability	0.223**		0.159**	0.072	0.017
	(0.075)		(0.078)	(0.095)	
Inclusiveness		–0.147**	–0.111**	–0.096*	–0.041*
		(0.038)	(0.043)	(0.050)	
Openly recruited participants				0.096*	0.032*
				(0.052)	
District officers among participants				0.444**	0.376**
				(0.214)	
Whether zone meetings are held				–2.471	–1.411
				(2.592)	
Meetings held after 6:00 p.m.				–0.027	–0.005
				(0.031)	
Average timing of meetings				1.313*	0.813**
				(0.754)	
Whether participants are paid				–3.613	–0.673
				(3.930)	
Mandated by district law				0.976	0.001
				(2.650)	
Conservative head of district				4.531	1.274
				(4.089)	
Urban Infrastructure (log)				–5.486	–2.008*
				(3.770)	
District population (log)				–0.502	–0.058
				(0.538)	
Residents involved with CSOs				0.738	0.255
				(2.318)	
R^2	0.114	0.126	0.177	0.395	

Notes: Standard errors are given in parentheses; *$p < .10$; **$p < .05$. In column (5), Bayesian model averaging (BMA) post means are reported, *PIP > 0.5; **PIP > 0.7.

Table 6 Knowledgeability, Inclusiveness, and Participant Engagement (Result II)

	Dependent variable: Average number of budget proposals submitted per citizen				
	OLS				BMA
	(1)	(2)	(3)	(4)	(5)
Knowledgeability	0.010		0.005	0.014	0.003
	(0.009)		(0.010)	(0.012)	
Inclusiveness		–0.009**	–0.008**	–0.026**	–0.017**
		(0.003)	(0.004)	(0.005)	
Openly recruited participants				0.006	0.002
				(0.005)	
District officers among participants				–0.014	–0.003
				(0.023)	
Whether zone meetings are held				0.804**	0.730**
				(0.363)	
Meetings held after 6:00 p.m.				0.007	0.006**
				(0.005)	
Average timing of meetings				–0.137	–0.083*
				(0.090)	
Whether participants are paid				–0.381	–0.088
				(0.519)	
Mandated by district law				0.541*	0.234*
				(0.316)	
Conservative head of district				–0.246	–0.114
				(0.315)	
Urban Infrastructure (log)				–0.130	–0.070
				(0.259)	
District population (log)				–0.190**	–0.070*
				(0.048)	
Residents involved with CSOs				–0.333	–0.142
				(0.295)	
R^2	0.014	0.030	0.034	0.432	

Notes: Standard errors are given in parentheses; *$p < .10$, **$p < .05$. In column (5), Bayesian model averaging (BMA) post means are reported, *PIP > 0.5; **PIP > 0.7.

by their average attendance rate. The results from the models that omit the covariates (columns 1–3) support the hypothesized associations: participating citizens are more actively engaged when they are more knowledgeable and when fewer citizens are involved in the decision-making process. Once the covariates are added (column 4), however, only the coefficient of inclusiveness remains significant. All else being equal, a one-standard-deviation increase in the number of committee members is associated with a 2.5 percent decrease in the average citizen attendance rate. On the other hand, the positive effect of knowledgeability is found to be sensitive to which covariates are included. For instance, the coefficient shrinks when we control for the share of citizens working for the district government. This suggests that the attendance rate of participating citizens may be affected by how the participatory process is managed rather than by citizens' level of expertise or knowledge.

Table 6 presents results showing how inclusiveness and knowledgeability are associated with a second measure of engagement, the average number of budget proposals put forward per participating citizen. Between the two variables of interest, only inclusiveness has a meaningful association with the level of engagement: the more citizens participate, the fainter the voice of each participating citizen. All else being equal, a one-standard-deviation increase in the number of committee members is associated with a 0.66 decrease in the average number of items proposed per citizen.

Table 7 illustrates how inclusiveness and knowledgeability are associated with process efficiency, as measured by the percentage of citizen-submitted budget proposals that are eventually adopted by the district legislature. The results from models without covariates (columns 1–2) show that only knowledgeability has a meaningful association. Once the covariates are included, however, both inclusiveness and knowledgeability show positive and statistically significant associations with process efficiency. All else being equal, increasing the number of committee participants by one standard deviation is associated with an increase of 5 percentage points in the proportion of proposals adopted, while a one-standard-deviation increase in the share of knowledgeable citizens is associated with an increase of 6.3 percentage points.

Administrative process designs may also matter. First, the average attendance rate tends to be higher when the share of citizens who are openly recruited or working for the district government is higher (table 5). Openly recruited participants are more actively engaged, as their participation is more likely to be voluntary compared with those who were recommended by relevant district stakeholders. Those working for the district office may be more active either because their participation is mandated by district law or because the meetings are held in a location that is more convenient for them (e.g., at the district government office). Second, the average attendance rate tends to be higher when meetings are held later in the fiscal year (table 5). This result may imply that citizens anticipate that important decisions are most likely to be made just

Table 7 Knowledgeability, Inclusiveness, and the Efficiency of Participatory Process

	Dependent variable: Share of proposals adopted in the local legislature				
	OLS				BMA
	(1)	(2)	(3)	(4)	(5)
Knowledgeability	0.285*		0.345**	0.392**	0.290**
	(0.148)		(0.120)	(0.175)	
Inclusiveness		–0.068	0.159**	0.194**	0.081*
		(0.090)	(0.068)	(0.087)	
Total number of proposals			–0.231**	–0.260**	–0.239**
			(0.024)	(0.039)	
Openly recruited participants				0.035	0.007
				(0.074)	
District officers among participants				0.018	–0.026
				(0.392)	
Whether zone meetings are held				10.77*	8.682**
				(6.318)	
Meetings held after 6:00 p.m.				0.042	0.017
				(0.060)	
Average timing of meetings				0.873	0.204
				(1.182)	
Whether participants are paid				2.403	0.040
				(5.203)	
Mandated by district law				–1.693	–0.100
				(4.485)	
Conservative head of district				1.357	0.190
				(6.781)	
Urban Infrastructure (log)				5.332	1.024
				(5.364)	
District population (log)				1.906**	0.574
				(0.947)	
Residents involved with CSOs				6.835	3.130*
				(5.608)	
Legislative gridlock				–3.219	–0.752
				(4.540)	
R^2	0.046	0.007	0.462	0.576	

Notes: Standard errors are given in parentheses; *$p < .10$; **$p < .05$. In column (5), Bayesian model averaging (BMA) post means are reported, *PIP > 0.5; **PIP > 0.7.

Robustness Check: Bayesian Model Averaging

The primary limitation of the results presented so far is that they stem from analysis relying on a relatively small sample. To address this, we conducted a robustness check using BMA. The BMA procedure first estimates models for all possible combinations of explanatory variables and then takes a weighted average of results across all these models. This approach contrasts with conventional regression analysis, in which the one or two "best" models are presented based on the researchers' own choice of variables. When sample size is small, however, a Bayesian approach has substantial advantages over a classical approach because it does not depend on the assumption of a large sample (Koop 2003). Some past studies (e.g., Kelman and Hong 2015) have employed BMA to verify the robustness of findings drawn from small samples.

The fifth columns of tables 5–7 show the results of the BMA regressions. The figures shown are the posterior coefficients, presented side by side with the conventional regression coefficients (fourth columns) to facilitate comparison. The Bayesian posterior coefficients tend to be smaller than the OLS coefficients; this is because the BMA estimations are averaged over all possible models, including those in which a given variable is not included, and thus its coefficient is treated as zero.

A Bayesian posterior coefficient shows significance if its estimated posterior inclusion probability (PIP) is high. The PIP measures the importance of each variable in explaining the variation in the dependent variable; a PIP threshold of 0.5 is recommended (Magnus, Powell, and Prüfer 2010) for determining whether a variable has an impact on the dependent variable. In the fifth columns of tables 5–7, the estimated Bayesian coefficient is flagged with an asterisk if the variable has a PIP value greater than 0.5 (the standard threshold) or 0.7 (a stricter threshold). Overall, the robustness check provides support for the OLS results. Variables found significant in OLS are also deemed relevant through the Bayesian method.

Discussion

The results of this analysis can be summarized as follows: First, participant knowledgeability positively affects the efficiency of the participatory process. The more knowledgeable the participating citizens are, on average, the greater the proportion of proposed items eventually adopted by the district legislature. Second, the level of inclusiveness negatively affects the level of engagement. A greater number of participating citizens is negatively associated with the average attendance rate of participating citizens as well as the number of items proposed per citizen. Third, the level of inclusiveness positively affects process efficiency. The likelihood that a given proposed item will be adopted by the legislature is higher in districts with a greater number of participating citizens.

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The fact that inclusiveness and knowledgeability *both* have positive impacts on process efficiency, despite the two variables' negative correlation, requires further explanation. As described earlier, as the number of participants increases, it may be difficult to maintain their knowledgeability. This strong negative correlation could lead before the deadline for adopting the budget and adjust their behavior accordingly. Third, the levels of both engagement and process efficiency may depend on whether participants are grouped into smaller subcommittees based on their expertise or interests. The average number of budget proposals submitted by a participating citizen tends to increase substantially if zone-specific meetings are held in addition to district-wide meetings (table 6). This also increases the likelihood that any proposed items will be adopted by the local legislature.

Finally, we fail to find effects of certain environmental factors that previous researchers have argued to be critical. In contrast to research stressing the importance of a leftist mayor and civil society in designing participatory budgeting programs (Abers 1998, 2000; Nylen 2003; Wampler 2007), we find no meaningful association between these factors and the performance of citizen participation. This discrepancy may arise from the fact that in Korea, the national government strongly influences local districts' participatory approaches, whereas in Brazil, municipal governments and civil society play larger roles.

to the conclusion that the two variables influence the efficiency of participation in opposite directions, thus manifesting the posited trade-off. However, the results in table 7 clearly show a different picture: both knowledgeability and inclusiveness improve the efficiency of the participatory process.

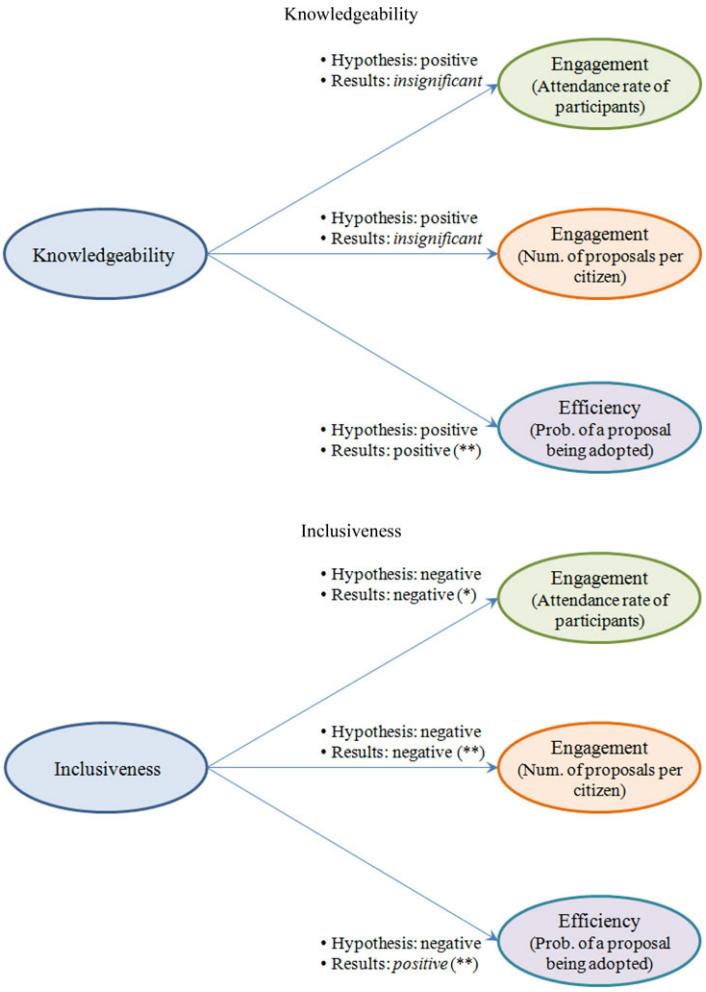
This apparent paradox is likely attributable to the fact that expanding participation lowers the average number of proposals submitted per participant (as shown in table 6) but increases the total number of proposals submitted by all participants. This conjecture is based on the changing sign of the *inclusiveness* coefficient in columns 2 and 3 of table 7.[5] This increased deliberation seems to explain the positive impact of inclusiveness. In other words, process efficiency is improved when participants enjoy the benefits of brainstorming, as the maxim "quantity breeds quality" suggests. This is consistent with prior research that has found that as a group increases in size, the ideas it generates become more creative and of higher quality (e.g., Gallupe et al. 1992).

The design of the administrative process is also shown to be important in promoting the performance of participation. The levels of both efficiency and engagement are positively associated with whether zone-specific meetings are held in addition to a general meeting. This supports the importance of focus group meetings—dividing participating citizens into multiple small groups based on their shared interests or expertise. However, the level of engagement is also affected by the process of selecting citizen members. Districts that have a higher share of citizens recruited openly, as opposed to being recommended, tend to outperform other districts in terms of engagement. This is likely because openly recruited citizens assume their committee positions entirely voluntarily. Finally, the scheduling of meetings also matters. The engagement level tends to increase when meetings are held later in the fiscal year, implying that people become more eager to participate as the deadline for budgetary decision-making approaches. To some extent, this contradicts previous work, which recommended that processes should start early because input received late in the fiscal year is less likely to have an impact (Callahan 2002; Ebdon and Franklin 2006; Kathlene and Martin 1991; King, Feltey, and Susel 1998; Thomas 1995).

Conclusion

Figure 1 summarizes the main findings. An increase in citizen knowledgeability is found to be positively associated with the level of process efficiency, whereas an increase in inclusiveness is negatively associated with the level of engagement but positively associated with the level of efficiency.

This new evidence that inclusiveness has a positive, not negative, association with the level of efficiency of participatory processes merits attention. It implies that increasing the number of citizens participating in policy making may encourage "the wisdom of crowds." This challenges the notion that expanding participation will necessarily undermine efficiency by making it increasingly difficult to maintain a high average level of knowledge and expertise on policy issues among a growing number of citizens participating in the deliberations. In contrast, our results support the hopeful view that governments can pursue the democratic aspiration of opening the door to the public while maintaining an efficient participatory



*$p < .10$; **$p < .05$.

Figure 1 Summary of Findings

process: a forced choice between the two options might be a false dichotomy. This evidence is also consistent with the idea of crowdsourcing, which seeks to leverage the collective intelligence of online communities to tackle complex public problems (Mergel and Desouza 2013). This suggests that new information and communication technologies, such as social media, may have the potential to further improve public participation if it is properly designed and managed.

The findings also yield practical recommendations in terms of how to design processes to improve the performance of citizen participation. When policy makers seek to make a participatory process more inclusive by increasing the number of citizens on the committee, they should consider holding smaller group meetings before all committee members assemble. The evidence presented here suggests that districts holding zone-specific meetings before their general committee meeting tend to perform better in terms of both engagement and efficiency. Policy makers may also benefit from expanding the share of citizen members who are openly recruited as opposed to recommended. Findings indicate that openly recruited citizens participate more actively, as demonstrated by their higher attendance rates. Further, as the open recruitment process is accessible to all residents, it is less vulnerable to critiques that question the

representativeness of participating citizens (Callahan 2002; Ebdon and Franklin 2006; Irvin and Stansbury 2004; Thomas 1995). For instance, combining open recruitment with quotas for different subgroups, stratified along observable citizen characteristics such as residency or income, might be a practical option.

Policy makers can also influence participant knowledgeability, as sufficient knowledge is important for maintaining an efficient budgetary process. To increase knowledgeability, participating citizens should be provided with information that enables them to reflect on the issues and values relevant to the decision at hand. Some districts hold a so-called budget school, through which citizens receive information that is essential for their participation. Districts should put effort into making citizens' experiences in such programs meaningful and informative (Yang and Callahan 2007).

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It is also important to note that despite the often-observed negative short-run correlation, knowledgeability and inclusiveness may not be conflicting in the long run. Prior research has suggested that citizens' experiences in the policy-making process can serve as a "school of democracy"; the experience of participation itself may help participants become more informed citizens (Wampler 2007). This point of view further supports the argument that, if properly managed, increasing participation and the inclusion of a large number of ordinary citizens in decision making may not necessarily undermine the performance of the policy-making process.

In conclusion, we note that the results of this study should be considered suggestive. The sample size is relatively small for drawing a decisive conclusion, and the analysis focuses on participation within a single place. Seoul may be characterized by certain unique political, economic, or social factors that limit the ability to generalize these results. Nevertheless, the findings provide a point of comparison for future work aimed at increasing understanding of the trade-offs involved in citizen participation. We look forward to following much-needed future work that builds on our foundation.

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Notes

1. The importance of citizen knowledgeability in democracy has been recognized by classic democratic theorists, such as John Stuart Mill and Jean-Jacques Rousseau. For instance, in his *Considerations on Representative Government* (1861), Mill recommended that extra voting power be given to educated people, whom he argued were more knowledgeable and thus better positioned to choose the best policies for society.
2. These two variables do not adequately capture all goals of public participation, such as participatory equality, transparency, or accountability. Nonetheless, understanding their influence would have important and practical policy implications for designing a public participation system, given that most critics of participation cite the threat that it poses to the integrity of the policy-making process rather than suspicions about whether it achieves normative values (Cleveland 1985; Heimans 2002; Moynihan 2007; Nylen 2003).
3. Some other districts adopted the system in 2012 or 2013.
4. In some districts, citizens were paid US$10–50 per meeting.
5. This conjecture can be proved formally. Given the negative correlation between the dependent variable and the added covariate (total number of proposals), the changing sign of inclusiveness in columns 2 and 3 of table 7 is attributable to positive covariance between inclusiveness and the total number of proposals. See Wooldridge (2002, 62) for a mathematical proof.

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