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Budget Bargaining and Fiscal Outcomes: A Theory and Some Evidence[1]

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Abstract

Most countries use a budget process in which the executive proposes expenditures and the legislature can cut or amend them. We develop a bargaining model of budget formation in a separation-of-powers system and test its predictions empirically. When the executive and legislature have divergent spending priorities, compromise expands the budget and increases deficits. When disagreement is mainly about budget size, check-and-balance mechanism restrains spending and contains deficits. Using South Korean data, featuring frequent shifts in the political stances of both branches, we confirm these predictions. Our findings explain why some divided governments run high deficits while others maintain fiscal discipline.

Keywords: Budget deficits; Fiscal policy; Separation of powers; Political bargaining; Common-pool problem.

JEL Codes: H61; H62; D72

1. Introduction

How do separation-of-powers systems, designed to restrain government spending through "checks and balances," sometimes end up with excessive budgets and deficits? This paper argues that the answer lies in viewing budget formation not as a top-down principal-agent delegation, but as a bilateral bargaining process between two strategic actors: the (executive) government and the legislature. In many countries, the constitution divides the "power of the purse" between these two branches. For instance, the government typically proposes the budget, while the legislature retains the power to amend and approve it.[4] We

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[4] Most democratic countries follow these constitutional principles. For example, all OECD member countries (e.g., the US and Korea), as well as Brazil, South Africa, Thailand, Malaysia, the Philippines, and Pakistan, adhere to these principles.

model this institutional interaction as a bargaining game that captures its essential features: each actor has distinct fiscal preferences, and a final budget can only be adopted through mutual agreement. The model focuses on the strategic tension and compromise that shape government-legislative negotiations, which lie at the core of real-world budgetary politics in separation-of-powers systems.

There are compelling reasons to adopt a bargaining framework in our study. First, real-world budgeting is inherently a negotiation. Whether it occurs through formal proposals and amendments or informal, behind-the-scenes deals, the final budget reflects a bargain between what the government wants and what the legislature will accept. Modeling this process as a cooperative game (with both parties agreeing on an outcome) is a parsimonious way to capture the result of potentially complex sequential moves. We specifically use the Nash Bargaining Solution (NBS) as our solution concept because it embodies the idea of a fair compromise given each side's alternatives.

The NBS yields the outcome that maximizes the product of the two sides' gains from agreement, effectively finding a middle ground that reflects both parties' leverage. In an actual legislative process, one might see a similar outcome emerge from protracted negotiations or even from an alternating-offers game (à la Rubinstein) if both sides are patient and have equal bargaining power. Thus, using the NBS is not only analytically convenient but also conceptually justified as a normative prediction of a balanced negotiation. Second, by abstracting from procedural minutiae, we can identify the fundamental determinants of budget outcomes, namely, the actors' preferences and bargaining power. If we modeled every step (e.g., a government proposal, legislative amendment, conference committee review, etc.), we would tie our results to one particular set of rules, which might differ across countries or over time. Instead, our bargaining model can apply to any system where government and legislature must ultimately assent to a budget.

Our approach is motivated by the limitations of the traditional principal-agent model of budgeting. In that classical view, the legislature (principal) tries to control a bureaucratic or government agent that always wants a larger budget (à la Niskanen, 1971). The principal-agent framework implies that if only the legislature can design the right incentives or oversight, it will implement the socially desired budget. However, this idealized scenario overlooks a crucial political reality: the legislature itself may not be purely aligned with the social optimum. Legislators have electoral incentives: they want to fund projects in their districts, cater to special interests, and spend on popular programs to win votes. In other words, the legislature can also harbor a "budget-maximizing" impulse, especially when spending confers political benefits and costs are diffused. Empirically, many legislatures exhibit a spending bias. For instance, legislative bodies often engage in logrolling, where members support each other's spending proposals, leading to bloated budgets. Thus,

treating the legislature as the guardian of the public interest (as principal-agent models do) is often inaccurate.

This paper instead treats government and legislature as two separate political principals, each pursuing its own objective. This perspective aligns with an evolution in the budgeting literature: over time, it has become recognized that both branches act strategically in the budget process. Theoretical models began to account for legislative bargaining power (e.g., Romer and Rosenthal's (1978) model of an agenda-setting executive facing a take-it-or-leave-it legislative vote) and even fully endogenous legislative bargaining (Baron and Ferejohn, 1989). What has been missing, however, is a model that explicitly unites these two actors within a single framework in which each has strategic weight and neither is automatically aligned with the social optimum. Our contribution is to fill this gap with a simple yet rich bargaining model.

Crucially, our model explains why the "checks and balances" mechanism can fail to prevent overspending. In theory, dividing power between government and legislature should moderate fiscal outcomes: each side vetoes the other's extreme demands, yielding an outcome close to a balanced budget. We find that this ideal outcome applies only under certain conditions, mainly when the disagreement between branches is about degree (how much to spend) rather than type (what to spend on). As will be shown later, if government and legislature agree on which areas to fund but differ in how much to spend (e.g., one wants a *5%* increase, the other *2%*), then indeed their negotiation will result in a compromise near the lower end, approximating fiscal prudence. However, if the two branches have different spending priorities (e.g., one prioritizes defense, the other welfare), budget negotiation will involve trade-offs: "I will support your priority if you support mine." Such trades lead to budget expansion because each priority gets funded to some extent. Neither side fully vetoes the other's projects, but instead, they tend to combine them.

This scenario is essentially a common-pool problem playing out at the institutional level: each branch treats the budget as a shared resource to finance its distinct agenda, leading to overuse of that resource (excessive spending). Even if one branch (say, the government) is somewhat more fiscally conservative, it might still agree to additional spending in an area it cares less about as the price of securing spending in the area it values highly. In short, checks and balances may promote fiscal discipline only when the debate is solely about "how big should the budget be," not "what should the budget contain."

Our model's logic connects to well-known concepts in public finance, such as the "law of *1/n*" and the common-pool hypothesis. Weingast et al. (1981) famously demonstrated that when *n* legislators each push for localized benefits while sharing the tax cost, the equilibrium budget is inefficiently large, increasing in *n*. Our setting differs (we have two collective actors, not *n* individuals), but the spirit is similar: fragmentation of authority leads to fragmented responsibility, and each actor internalizes only part of the cost of additional spending. Also, empirical studies like Roubini and Sachs (1989) and Hagen et al. (1996) found that countries with multi-party coalitions or weak fiscal institutions tend to have worse fiscal outcomes (i.e., higher deficits and debt). These findings are often

attributed to the difficulty of coordinating many decision-makers (the more cooks, the more likely to oversalt the soup, so to speak). Our model provides a microfoundation for that phenomenon: it is not just the number of players, but the interplay of their preferences. If each of several coalition partners demands a chunk of the budget for itself, the total will be inflated. By the same token, in a simpler two-actor context, if each branch demands a chunk (one perhaps for national projects, the other for local projects), you also get overspending. In essence, we tie together the common-pool problem and the separation-of-powers context.

A key innovation in our analysis is emphasizing the role of preference divergence among institutions. We differentiate between two types of divergence: (i) divergence in scope (government and legislature want to spend on different areas of interest) and (ii) divergence in preferred magnitude (one wants to spend more overall than the other). This distinction yields very different outcomes in our model. If the divergence is purely in magnitude and not in scope, the classic "checks and balances" narrative holds: the side favoring restraint (say the government) will keep the total budget near its preferred level, effectively checking the more profligate side. However, if divergence is in scope, even a relatively conservative government might allow some extra spending on the legislature's priorities (and vice versa) as part of a deal, thereby undermining fiscal prudence. This theoretical point provides a nuanced understanding of when divided government, executive government vs. legislature in our context, is likely to produce fiscal deficits. It is not simply a matter of which party controls which branch; rather, it is about what each side seeks to achieve. If one side's goals are orthogonal to the other's, they will "split the difference" by splitting the budget, and taxpayers will foot the bill for both. On the other hand, if both branches are tugging on the same rope (e.g., one pulling to increase spending, the other to decrease) the rope will not move much (i.e., spending stays in check).

To make these ideas more concrete, we derive several testable predictions from our model and then verify them with data. We summarize three core theoretical predictions and their empirical counterparts as our key findings:

1. Divergent policy priorities result in overbudgeting. If government and legislature prioritize different domains of spending, the negotiated outcome will include substantial funding for both sets of priorities, leading to a larger total budget than either alone would have chosen. This is our theoretical "compromise effect," which results in overbudgeting. Empirically, this implies that in cases of divided government where, say, the government cares more about defense and the legislature cares more about social welfare (i.e., an agenda mismatch), total spending and deficits will be higher than in cases where both branches focus on the same spending category. We test this by examining episodes of divergent agendas and find that budget totals expand under split agendas.
2. Divergent fiscal stances (hawks vs. doves) yield restrained spending. If the only difference is that one institution is fiscally hawkish (prefers a smaller budget) and the other is dovish (prefers a larger budget), with no disagreement on where

money should go, then the bargaining outcome skews toward the hawk's position. In other words, checks and balances work as intended: the more cautious player reins in the other, producing a near-optimal budget (perhaps slightly above the ideal of the hawk, but much closer to it than to the dove's). Empirically, we expect that when government and legislature disagree on how much to spend but not on what to spend on (for instance, both prioritize social welfare, but one wants to spend far more than the other), the resulting budget is relatively restrained, often closer to what the conservative side wanted. Our data analysis confirms this pattern: when the conflict concerns "how much" rather than "on what," the final spending level is modest and deficits are contained, aligning closely with the lower-spending side's preferences.

3. Shared expansionary preferences (no conflict) result in the largest overspending. If both government and legislature agree on a high-spending agenda (for example, both are populist or expansionary), then there is little to stop the budget from ballooning. In our model, this scenario yields the highest equilibrium budget — essentially, each side says "yes" to the other's spending proposals because both want to maximize spending across the board. This is a worst-case scenario for fiscal discipline: the very mechanism of having two separate decision-makers breaks down because neither is willing to object to spending. Empirically, when the same pro-spending party or coalition controls both branches, we see the largest deficits and expenditure increases. Our findings strongly support this result: periods of unified, populist control over government and legislature coincide with significant budget overruns. Conversely, if both branches are aligned in fiscal conservatism, we get the smallest budgets and often surpluses — the mirror image (shared fiscal restraint leading to very disciplined outcomes).

These points encapsulate our paper's core message. In essence, whether or not checks and balances result in balanced budgets depends on the nature of the disagreement between the two branches of government. It is not enough to have "opposition" between branches; what matters is on what the branches disagree. If they oppose each other's priorities, they might just end up financing both. If they oppose each other's spending scale, they will meet somewhere in the middle (which tends to favor caution). And if they do not oppose each other at all (because both want to spend), then the sky is the limit for the budget.

Our contributions to the literature are threefold. First, we introduce a formal model that treats budgetary negotiation in a separation-of-powers system as a bargaining problem. This theoretical innovation builds on earlier works that treated one side as an agenda-setter (Romer and Rosenthal, 1978) or examined multi-legislator bargaining (Baron and Ferejohn, 1989) by combining the two branches into a single framework. We show that a cooperative solution (i.e., NBS) in this context yields sharp comparative statics that match intuitive political scenarios. Second, we provide a theoretical foundation for the observed empirical regularity that more "fragmented" governance leads to worse fiscal outcomes. Prior work, such as Hagen et al. (1996) and Persson and Tabellini (2004), documented correlations

between certain institutional structures and deficits. Our model explains why those correlations arise by pinpointing the mechanism of mutual give-and-take among strategic players. In doing so, we formalize the idea that the "law of *1/n*" is not merely about legislative bodies but rather a more general phenomenon in any multi-party decision-making process over budgets, including bargaining between distinct branches. Third, we provide new empirical evidence by testing our model's nuanced predictions with data that reflect the political alignment of both branches. Unlike many studies that use a crude dummy for divided vs. unified branches, we delve into the ideological composition of government and legislature and the nature of their divergence. By doing so, we can show, for example, that not all instances of divided branches are alike: divided branches can be fiscally responsible or irresponsible depending on what the branches are divided over. This contributes to the empirical literature by clarifying mixed results. Some earlier studies found that divided government leads to gridlock and smaller budgets, while others found it leads to higher deficits. Our model and empirical evidence fill these gaps by indicating that the content of the disagreement is the critical factor.

The rest of the paper proceeds as follows. Section 2 reviews related literature to position our work and highlight differences from key studies. Section 3 formally presents our theoretical model. Section 4 describes the data and empirical strategy and presents findings that corroborate our theory. Finally, Section 5 concludes.

2. Related literature

The classic theoretical work on budgeting tackles a principal-agent problem between the legislature and the government. Niskanen's (1971) model set the tone for the budgeting literature: the bureaucracy (the government) is a budget maximizer, and the legislature must constrain it, typically by setting a spending cap or by paying the bureaucracy only up to a certain output. In Niskanen's framework, if the legislature does nothing, the government will push spending beyond the social optimum, so the legislature's role is to act as a brake. This principal-agent perspective influenced many subsequent analyses, treating the legislature as a benevolent overseer of a potentially profligate government. However, many studies questioned the realism of this one-sided assumption. Miller and Moe (1983), for example, argued that legislatures are not passive: they have tools (e.g., legislative oversight and budget negotiations) to counteract a government's expansionary tendencies. They showed that, with sufficient bargaining power or information, the legislature can induce an outcome closer to its own preferences, thereby avoiding the "budget explosion" of Niskanen's unchecked agent. While their work still largely assumed the legislature's goal is aligned with the social optimum, it highlighted the importance of strategic interaction, that is, a step away from treating one side as purely dominant or purely altruistic.

Around the same time, formal models started granting the government or a subset of legislators agenda-setting power, recognizing institutional structures. Romer and Rosenthal (1978) is a landmark: it envisages a setting where an agenda setter (like a budget committee or the government) proposes a budget knowing that the legislature can only

accept or reject it, with rejection leading to a breakdown outcome (like a government shutdown or a continuing resolution at the status quo). The model yields the insight that the agenda setter can exploit the breakdown threat to secure more spending than the median legislator would prefer, because the alternative (the breakdown outcome) is worse for the legislature. The result is an equilibrium with overspending relative to legislative median preferences, driven by institutional rules (a take-it-or-leave-it structure). This is a different mechanism from Niskanen's bureaucracy model: here, overspending arises not from a biased agent, but from asymmetric power in bargaining, because the government can craft a proposal favoring itself. Subsequent non-cooperative models, like Baron and Ferejohn (1989), extended the model to bargaining within the legislature, examining how coalition formation leads to distributive outcomes. They showed that in a legislature deciding how to split a "pie" of spending, the proposer can form a minimal winning coalition and allocate budget strategically to just enough members to pass, potentially leading to inefficient allocations (pork for some, exclusion of others, etc.). Although their model focuses on legislative bargaining in isolation, it underscores a general point: who has veto or proposal power can greatly influence budget outcomes, and those outcomes often entail compromises that are not socially optimal.

Meanwhile, the empirical literature on fiscal outcomes has documented patterns that warrant a theoretical explanation. One prominent pattern is the common-pool or fragmentation effect: governments with more veto players, parties, or decision-makers tend to have larger deficits and debts. For instance, Roubini and Sachs (1989) observed that among OECD countries in the 1980s, those with multi-party coalition governments had significantly higher budget deficits than those with single-party governments. They suggested that coalitions struggle to coordinate fiscal discipline: each party would try to cater to its own constituents, leading to excessive spending or an inability to cut deficits (a "tragedy of the commons" in fiscal policy). This idea was further supported by studies such as Kontopoulos and Perotti (1999) and Franzese (2000), which quantitatively showed that as the number of spending decision-makers increases, fiscal performance worsens. Likewise, Persson and Tabellini (2004) found that institutional settings associated with greater fragmentation (e.g., proportional representation electoral systems that yield coalitions, or parliamentary systems where legislative back-benchers have strong influence) are correlated with higher spending and larger welfare programs. A related line of inquiry by von Hagen and Harden (1996) introduced indices of budgetary institutions (such as how centralized the budget process is under the finance minister vs. how much open bargaining occurs in parliament) and showed that countries with more hierarchical, disciplined budget processes tend to have better fiscal outcomes (smaller deficits), whereas those with fragmented, collegial processes have worse outcomes. The findings in Hagen et al. (1996) essentially echo the common-pool logic: when every minister or legislator can bid for funds, total spending rises; when a central authority imposes restraint, the budget is tighter.[5]

[5] The literature identifies several additional political sources of fiscal inefficiency beyond legislative fragmentation; see, for example, Persson and Svensson (1989), Tabellini and Alesina (1990), Rogoff (1990), Alesina and Drazen (1991), and Shi and Svensson (2006), among others.

These empirical regularities set the stage for our work. We ask: can we build a formal model that encapsulates the common-pool problem in a separation-of-powers negotiation? Existing theory offers pieces of the puzzle but not the whole picture. Weingast et al. (1981) provided the formal backbone for common-pool problems in a purely legislative context (*n* legislators sharing costs). Romer and Rosenthal (1978) and later veto player models (Tsebelis, 2002) explained how separation of powers and agenda control can yield outcomes skewed toward one actor's preferences but also potentially limit changes (Tsebelis famously argued that more veto players make policy more inert, possibly preventing large spending increases). To our knowledge, what has been missing in the literature is a model in which government and legislature negotiate and both contribute to overspending. In principal-agent terms, one might say we need to model a scenario in which the principal is not benevolent but also self-interested. This is precisely what we undertake. Our model positions itself at the intersection of these literatures: it is a game of strategic interaction like Romer and Rosenthal, but without a fixed agenda setter and with both sides contributing to fiscal outcomes; it produces a common-pool type inefficiency akin to the "law of *1/n*" in Weingast et al. (1981), but in a context of two collective actors rather than many individual legislators; and it speaks to the empirical findings of Hagen et al. (1996) by showing how institutional structure (two veto players) interacts with preference misalignment to produce a deficit bias.

A critical difference between our work and that of Hagen et al. (1996) is that their analysis is largely empirical and normative: they identified which budget procedures correlate with discipline and recommended reforms accordingly. They did not provide a detailed theoretical model explaining why fragmented processes lead to deficits (beyond the intuitive collective action problem). Our paper fills this theoretical gap by offering a bargaining-based microfoundation: in our model, a "fragmented" process corresponds to a two-player negotiation in which each has spending authority in different areas, and we can explicitly solve for how that leads to higher spending. By contrast, a "centralized" process would collapse the two players into one, essentially eliminating the negotiation, which in our model would remove the overspending incentive (since a single decision-maker internalizes the full cost of spending). Thus, we provide a formal rationale for Hagen et al.'s (1996) empirical observations. Additionally, while they emphasized procedural fixes, our results suggest that underlying preference alignment is just as important. Even a centralized process would not save you if the single decision-maker wants to overspend (e.g., a populist government with no legislative check will still run deficits). Conversely, even a fragmented process might be okay if both players are very conservative. So our contribution is not only theoretical completeness but also a more nuanced policy implication: it is not just "fragmentation equals bad," but "fragmentation with diverse interests equals bad for budgets."

We also differentiate our work from the principal-agent (P-A) literature in political budgeting. A large body of work in political economics has examined problems involving politicians (agents) and voters (principals), or governments (agents) and legislators (principals). While that literature yields rich insights, it often assumes that one principal is

socially benevolent or at least financially prudent. Our model has two agents, each with its own principal (the voters or constituencies behind each). One could interpret government and legislature in our model as each acting on behalf of their supporter base: for instance, the government might cater to a national median voter while the legislature caters to various districts. In that sense, one could embed our bargaining model within a larger P-A framework (with voters above). While it would be possible, for our purposes, we collapse that higher layer and simply say: both the government and the legislature might have "populist" incentives, meaning a bias toward spending to please their constituents. This is related to the literature on populism and fiscal policy. Dornbusch and Edwards (1990) documented how populist governments in Latin America engage in reckless fiscal expansion until a crisis occurs. More recent theoretical work, like Acemoglu et al. (2013), examined why voters might elect politicians who promise extensive spending (populists), even if it is unsustainable, as a strategy to signal against elite capture.[6] Our model's notion of a "populist bias" in each branch can be seen as an exogenous characteristic (e.g., a certain legislature may be more populistic if the electoral system incentivizes pork-barrel spending or if the majority party runs on expansive promises). We incorporate this by allowing each player's ideal point to be a larger budget than the societal optimum. By doing so, we can analyze cases like "both players are populist" vs. "one populist, the other not." This goes beyond the standard P-A story (which usually assumes the legislature, as the people's representative, is not populist by itself). Therefore, our work broadens the perspective by treating conflict or alignment among budgetary institutions in the context of populism as a key factor.

3. Theoretical analysis

We begin by analyzing the interaction between two players: Government (G) and Legislature (L). These players engage in bargaining over the budget to determine fiscal outcomes (e.g., budget size, debt, deficits). This framework is motivated by the institutional realities of budget formation. Real-world budget processes are far from monolithic, one-shot negotiations. Instead, the budget is formally divided into numerous subunits, resulting in what appears to be "n" independent bargaining tables. For example, the U.S. budget process involves 12 distinct appropriations bills (U.S. Congressional Budget and Impoundment Control Act of 1974), and the Korean process relies on multiple standing committees (Korean National Assembly Act #84).

However, these n negotiations are not conducted by n independent actors. They are, in effect, managed by two unified principals: the government (centered on the President) and the legislature (led by the majority party leadership). The situation is thus more accurately described as two principals engaging in n distinct bargaining games. Our model captures the strategic logic by which these two principals handle the multiplicity n. Crucially, they do not treat all n issues identically. Rather than negotiating issue-by-issue, they strategically categorize them based on the nature of the required compromise. While conceptually there are three distinct domains—issues uniquely prioritized by G, issues uniquely prioritized by L, and standard areas of mutual concern—they are ultimately "bundled" into two distinct

[6] Related empirical studies include Funke et al. (2023) and Elsässer and Röth (2024), among others.

bargaining logics. Therefore, the whole process naturally converges to the two-stage structure of our model, which we discuss below.

The first stage concerns bargaining over the "scope" of budget spending. This stage aggregates the first two domains: the core, identity-defining priorities uniquely held by each side. For example, *G* may prioritize a major increase in defense spending, while *L* prioritizes a new welfare program. These are not issues to be compromised on in isolation; they are strategic assets to be traded (i.e., logrolled). Our first-stage bargaining game models negotiation over a bundle of core priorities that may diverge between the two parties.

Meanwhile, the second stage addresses bargaining over the "level" of budgetary spending. This stage aggregates the third domain: the remaining issues on which both sides agree on the scope but possibly disagree on the level of spending. This disagreement often stems from different fiscal philosophies — for instance, *G* may be a fiscal "hawk" (preferring restraint) while *L* is a fiscal "dove" (preferring expansion). Our second-stage bargaining game models the negotiation over this bundle of items agreed upon in principle but disputed at the level.

Thus, our two-stage bargaining game is not merely an analytical simplification. It is a realistic abstraction designed to capture how two unified political principals strategically manage a complex, multi-committee budgetary process by separating budget negotiations into two distinct strategic logics: the exchange of priorities (first stage) and the conflict over total budget size (second stage). This structure not only enhances theoretical clarity but also provides a crucial framework that links our theoretical predictions to the data.

Nash bargaining solution

We employ the Nash Bargaining Solution (NBS) to model the budget negotiation process between *G* and *L*. The NBS is a well-established solution concept in cooperative game theory, designed to capture how two rational players reach a mutually beneficial agreement when faced with conflicting preferences. Formally, the NBS identifies the outcome that maximizes the product of the players' payoff gains relative to their breakdown (or disagreement) payoffs.[7] Our choice of the NBS is further motivated by its alignment with key characteristics of our problem.

First, the budget-setting process involves bilateral negotiations where *G* and *L*, despite conflicting preferences, must reach a mutually acceptable agreement. The NBS provides a structured, well-balanced method for determining optimal budget allocations that reflect both players' interests. Second, the NBS ensures Pareto efficiency, meaning no alternative allocation can improve one party's payoff without harming the other. This is crucial in public finance, as inefficiencies can lead to resource waste. Third, the NBS includes

[7] Mathematically, it is defined as

$$\arg max_{(u_G,u_L)\in U}\,(u_G - b_G)(u_L - b_L)$$

where U denotes the feasible set of payoff outcomes, and b_G and b_L represent the breakdown payoffs for *G* and *L*, respectively.

breakdown payoffs, which represent each party's fallback option if negotiations fail, thereby ensuring that the final budget is mutually preferred to a deadlock.

Theoretically, the NBS is unique in satisfying four fundamental axioms of a desirable outcome: efficiency, scale invariance (i.e., invariance to the units of payoff), symmetry (i.e., equal treatment of identical players), and independence of irrelevant alternatives (i.e., robustness to the removal of unchosen options). Together, these axioms define a fair, consistent, and rational solution, uniquely satisfied by the NBS.

While alternative solutions such as the Egalitarian Bargaining Solution (EBS) and the Utilitarian Bargaining Solution (UBS) exist, they have notable limitations. The EBS prioritizes equal payoff gains but may sacrifice Pareto efficiency, potentially leading to suboptimal resource allocation. Conversely, the UBS maximizes total payoff but can result in highly imbalanced outcomes, disproportionately favoring one party. The NBS, by contrast, achieves a crucial balance between fairness and efficiency, positioning itself as a robust and well-balanced solution that avoids the extremes of these alternatives.

In sum, the NBS is exceptionally well-suited for our study. It provides a well-balanced, mathematically rigorous framework for analyzing budget negotiations by effectively capturing strategic interactions, ensuring efficient and fair outcomes, and realistically incorporating fallback options into the decision-making process.

First-stage bargaining game

In the first stage, *G* and *L* negotiate their respective allocations to two distinct components of the budget, denoted by *x* and *y*. These notations *x* and *y* represent the amounts assigned to policy areas *X* and *Y*, which reflect each institution's preferred domains of public expenditure. For simplicity, we assume that *G* seeks to allocate the budget exclusively to area *X*, while *L* seeks to allocate the budget solely to area *Y*.

For example, suppose the government prefers to allocate \$100 billion each to defense and welfare, whereas the legislature prefers \$50 billion for defense and \$150 billion for welfare. In this case, the domain of disagreement in defense becomes *X*, and that in welfare becomes *Y*. Hence, the disagreement magnitudes in the two areas are $|100 - 50| = 50$ and $|100 - 150| = 50$, respectively. In general, *X* and *Y* do not have to represent only one specific sector each. They can encompass multiple sectors, grouped according to the two players' divergent preferences. For instance, if the government wants to allocate more funds to defense and infrastructure, and the legislature prioritizes welfare and education, then *X* would collectively represent defense and infrastructure, while *Y* would represent welfare and education. Thus, the model, while using only two symbolic categories, effectively captures a wide range *of* real-world policy conflicts.

Payoff functions. The payoff functions for each player, *G* and *L*, are defined as $u_G^f: \mathbb{R}_+^2 \to \mathbb{R}$ and $u_L^f: \mathbb{R}_+^2 \to \mathbb{R}$, respectively, such that

$$u_G^f(x,y) = V_G^f - (d-x)^2 - cy^2$$

and

$$u_L^f(x,y) = V_L^f - (d-y)^2 - cx^2$$

where subscripts *G* and *L* denote players *G* and *L*, respectively, and superscript *f* denotes the first stage of the game (superscript *s* denotes the second stage). These functions capture each player's satisfaction from the final budget allocation. The term $-(d-x)^2$ signifies that player *G*'s payoff is maximized when the allocation to its preferred area, *x*, reaches its ideal funding level, *d*. Any deviation from this level results in a quadratic loss. Symmetrically, *L*'s payoff is maximized when *y* approaches its own ideal funding level, *d*. The terms $-cy^2$ and $-cx^2$ reflect the fiscal burden or disutility each institution incurs from the other's spending.

The parameters in these functions carry specific interpretations. The parameter d (≥ 0) represents the ideal funding level that each institution strives to secure for its own priority area. Consequently, *d* also serves as an *index of preference divergence*. Since player *G*'s ideal outcome is $(x,y) = (d,0)$ and player *L*'s is $(0,d)$, a higher value of *d* naturally signifies a greater conflict over spending priorities. In essence, as *d* increases, the gap between the players' most preferred allocations widens, indicating more intense disagreement. Conversely, $d = 0$ reflects perfect agreement, as neither institution pushes for its own agenda. Meanwhile, the parameter c (> 0) represents the *degree of concern* each institution feels toward the other's expenditure. A high value of *c* indicates that each player considers the counterpart's expenditure too wasteful and severely detrimental to the national budget. Conversely, a low value of *c* suggests that while the counterpart's spending may still be viewed as unnecessary, it is perceived as offering some marginal contribution to the nation, thus not being entirely wasteful. To align our theoretical predictions with empirical findings, we exclusively consider cases where $c < 1$, implying that each side is somewhat indifferent to a portion of the other's spending (they don't treat it as completely useless). Finally, V_G^f and V_L^f denote the maximum feasible payoffs for *G* and *L*, respectively, in this stage of the bargaining game.

Nash bargaining solution. For analytical simplicity, we assume that if negotiations between *G* and *L* break down, the default allocation is $x = y = 0$. Under this disagreement point, the corresponding payoffs are $V_G^f - d^2$ for *G* and $V_L^f - d^2$ for *L*. Accordingly, the NBS is characterized by the following objective function

$$\arg max_{(x,y)\in[0,d]^2} \{V_G^f - (d-x)^2 - \mathrm{c}y^2 - \left(V_G^f - d^2\right)\}\{V_L^f - (d-y)^2 - cx^2 - \left(V_L^f - d^2\right)\}.$$

Given the symmetry of the payoff functions, and invoking the symmetry axiom of the NBS, we infer that the solution must satisfy $x = y$. Substituting this condition into the objective function reduces the problem to a single-variable maximization

$$\arg max_{x\in[0,d]} \{2dx - (1+c)x^2\}\{2dx - (1+c)x^2\}.$$

This expression can be equivalently written as

$$\arg max_{x\in[0,d]}\left[\frac{d^2}{1+c}-(1+c)\left(x-\frac{d}{1+c}\right)^2\right]^2.$$

Therefore, the maximum is attained when the squared term is minimized, which leads to the NBS. *Theorem 1* formally presents this result.

Theorem 1. *In the first-stage bargaining game, there exists a unique Nash bargaining solution, and it is*

$$x^*=y^*=\frac{d}{1+c}.$$

Remark (Budget compromise and overspending). Because $x^*=y^*=\frac{d}{1+c}<d$, the Nash Bargaining Solution shows that neither the government nor the legislature obtains its individually preferred budget allocation. This outcome reflects a compromise between the two institutions. However, a crucial implication arises given the assumption $c<1$. In this scenario, because of the inherent divergence in their budgetary preferences, the total amount of the final budget allocated to the contested areas, defined as the sum of expenditures on both sides, exceeds what either party individually considers its optimal level *d*. Mathematically,

$$x^*+y^*=\frac{2d}{1+c}>d.$$

This tendency toward budget expansion in areas of conflict becomes more pronounced when *d* is larger (i.e., when the divergence between the government's and the legislature's spending priorities is greater) and/or when *c* is smaller (i.e., when each player exhibits relative indifference toward the other's spending, prioritizing its own allocation). In such cases, the bargaining outcome yields an even larger total budget, reflecting increased fiscal inefficiency. *Figure 1* illustrates this phenomenon for c = 0.1, 0.3, and 0.5. As shown in the figure, the difference between the determined total budget x^*+y^* and the ideal budget amount *d* increases as *d* increases and/or as *c* decreases.

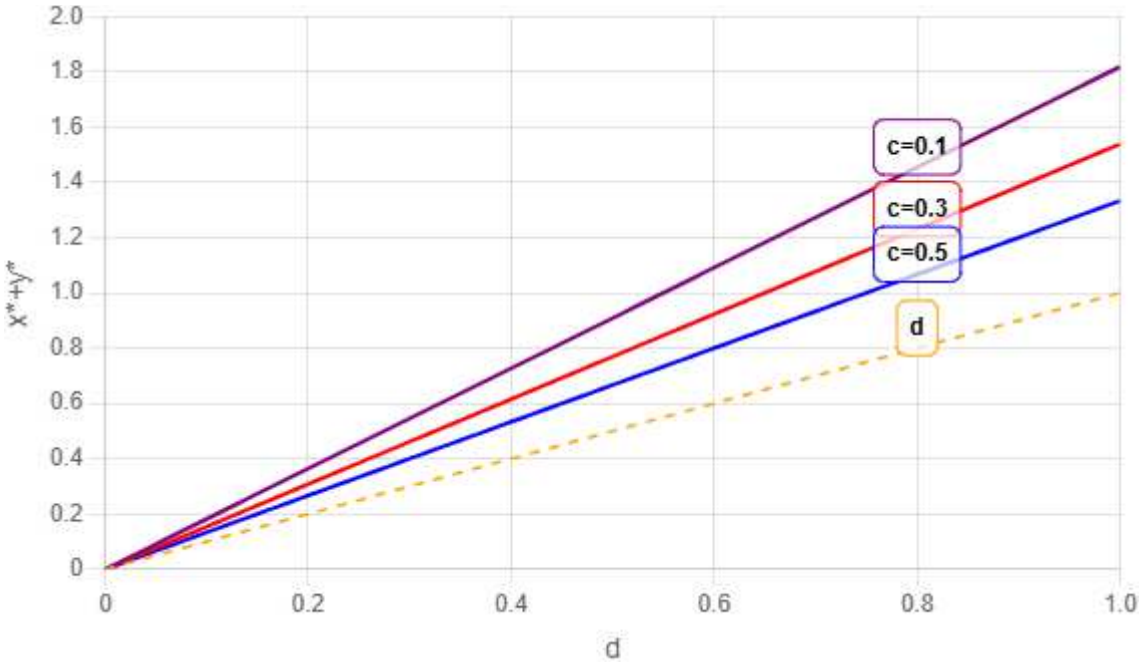


Figure 1: The total budget allocation in the first stage by *d* and *c*

Policy insight (Common-pool and fragmentation). The overspending outcome in the first-stage bargaining game can be understood through the lens of the classic common-pool problem in public finance. Each institution treats the budget as a shared resource to fund its own priorities, with only part of the costs falling on itself. The result is analogous to the "law of 1/*n*": when multiple independent actors each demand a share of the budget, the total tends to be inefficiently large. This mechanism aligns with findings in the literature on government fragmentation and fiscal outcomes. Empirical studies have shown that fragmented decision-making—such as multi-party coalition governments or open-ended parliamentary bargaining—often leads to higher spending and deficits, as shown in Roubini and Sachs (1989). Similarly, von Hagen and Harden (1996) documented that countries with less centralized (more collegial) budget processes had worse fiscal outcomes, whereas those with a hierarchical budget process (e.g., a strong finance minister controlling the total budget) achieved better discipline. Our model's first-stage result provides a theoretical explanation for these patterns: when budget authority is split between two strategic actors with distinct spending agendas, the negotiated compromise behaves like a fiscal "tragedy of the commons." Each side bargains for its own slice of the pie, and because neither fully internalizes the cost of accommodating the other's slice, the overall pie grows larger than optimal. This common-pool dynamic under separation of powers thus formalizes why fragmented governance tends to produce a deficit bias, consistent with the arguments of the fragmentation literature.

Second-stage bargaining game

In the second stage, *G* and *L* negotiate over the third component of the budget, denoted by *z*. This variable represents the budget assigned to policy area *Z*, which encompasses all public expenditures not covered by areas *X* and *Y* in the first stage. Unlike in the first stage, both *G* and *L* recognize the importance of funding area *Z*, but they differ in their preferred size of the allocation. Therefore, the divergence in this stage is specifically about the magnitude of the budget to be allocated to *Z*. Without loss of generality, we assume that *G* seeks a smaller allocation to area *Z* (reflecting a preference for fiscal conservatism), while *L* seeks a larger allocation to area *Z* (reflecting a preference for broader public spending).

Payoff functions. The payoff functions for *G* and *L* are defined as $u_G^S: \mathbb{R}_+ \to \mathbb{R}$ and $u_L^S: \mathbb{R}_+ \to \mathbb{R}$, respectively, such that the second-stage payoffs are:

$$u_G^S(z) = V_G^S - (1 - z)^2$$

and

$$u_L^S(s) = V_L^S - (e - z)^2 \text{ where } e > 1.$$

G's payoff increases as *z* approaches its ideal budget level of 1, while *L*'s payoff rises as *z* nears its ideal level of *e* where *e* > 1, reflecting *L*'s preference for a larger allocation to area *Z*. Both payoffs decrease as *z* deviates from their respective ideal levels.[8]

In these functions, we normalized *G*'s ideal budget for area *Z* to 1. The parameter *e* (>1) then captures the relative extent of the expansionary fiscal policy desired by *L* compared to *G*, indicating how much more *L* prefers a larger total budget relative to *G*'s conservative stance. Additionally, V_G^S and V_L^S denote the maximum attainable payoffs for *G* and *L*, respectively, in this second stage.

Nash bargaining solution. The default outcome is again assumed to be *z* = 0. Under this disagreement point, the corresponding payoffs are $V_G^S - 1$ for *G* and $V_L^S - e^2$ for *L*. Accordingly, the NBS is characterized by the following objective function

$$\arg max_{z \in [0,e]} \{V_G^S - (1 - z)^2 - (V_G^S - 1)\}\{V_L^S - (e - z)^2 - (V_L^S - e^2)\}.$$

Simplifying the objective function by eliminating constants and expanding terms yields the equivalent maximization problem

$$\arg max_{z \in [0,e]} \{z^4 - 2(1 + e)z^3 + 4ez^2\}.$$

[8] Here, we focus on the case $e > 1$ without loss of generality. If instead $e < 1$ (meaning the government desires a more expansionary fiscal policy than the legislature), it would simply reverse the roles in our analysis: the government would then be the "big spender" and the legislature the "fiscal conservative," yielding analogous results. We restrict attention to $e > 1$ to avoid redundant cases, as the qualitative insights are symmetric when the players' roles are swapped.

This is a quartic polynomial that increases from zero, reaches a maximum within the interval (0,2), and then declines. Hence, to identify the NBS, we apply the first-order condition

$$\frac{d}{dz}(z^4 - 2(1+e)z^3 + 4ez^2) = z\{4z^2 - 6(1+e)z + 8e\} = 0.$$

Therefore, the candidate for the NBS is the values of z^* that satisfy this condition and fall within the interval (0,2). Solving the quadratic equation above for the non-zero root yields the NBS. *Theorem 2* formally presents this result.

Theorem 2. *In the second-stage bargaining game, there exists a unique Nash bargaining solution, and it is*

$$z^* = \frac{3(1+e) - \sqrt{9e^2 - 14e + 9}}{4}.$$

Remark (Checks and balances restraint). The Nash Bargaining Solution z^* does not fully align with the ideal preferences of either institution. From the government's perspective, its preferred budget level is 1, yet the bargaining outcome z^* exceeds this level. Conversely, the legislature favors a larger allocation *e* (>1), but the realized outcome z^* remains strictly below *e*. As a result, z^* always lies between the two ideal points, 1 and *e*. Importantly, as *e* increases, z^* also rises, reflecting the growing influence of the institution desiring an expansionary budget on the negotiated outcome. However, the solution is systematically biased toward the government's preference (i.e., toward a smaller, more fiscally conservative budget) rather than simply being the arithmetic midpoint between 1 and *e*. This asymmetry arises because, given the structure of the payoff functions, the bargaining outcome tends to favor the party advocating for a smaller budget.

Specifically, the bias arises from asymmetric default payoffs. If bargaining collapses, the outcome reverts to $z = 0$, i.e., a minimal-spending scenario that imposes a modest utility loss on the government but a much larger loss on the legislature. Because the legislature's disagreement payoff is dramatically lower, it concedes more to avoid breakdown, and the NBS—maximizing the product of gains over disagreement points—shifts toward the government's ideal point. This mechanism is empirically supported: in many countries (e.g., the United States, South Korea, and Japan), failing to pass a budget triggers a partial shutdown, effectively locking in low spending and benefiting the smaller-budget actor. Hence, the threat of a low-spending default credibly curbs expansionary demands.

This theoretical result also offers an explanation for the empirical finding that when both the government and the legislature favor expansive fiscal policies, the resulting budget increase is significantly larger than when only one side supports budget expansion. In our model, the observed skewness of z^* towards the fiscally conservative government's ideal budget exemplifies the principle of "checks and balances." It suggests that even when one institution (the legislature in this case) advocates for a significant fiscal expansion, the

institutional bargaining process moderates the outcome toward a more restrained budget size. This mechanism acts as a counterbalance, preventing runaway spending. Conversely, the empirical finding implies that when this counterbalancing force gets weaker (for instance, if both institutions align on expansive fiscal policies), the budget tends to grow substantially larger, as the "checks" become less effective. The relationship between e and z^* is illustrated in *Figure 2* below.

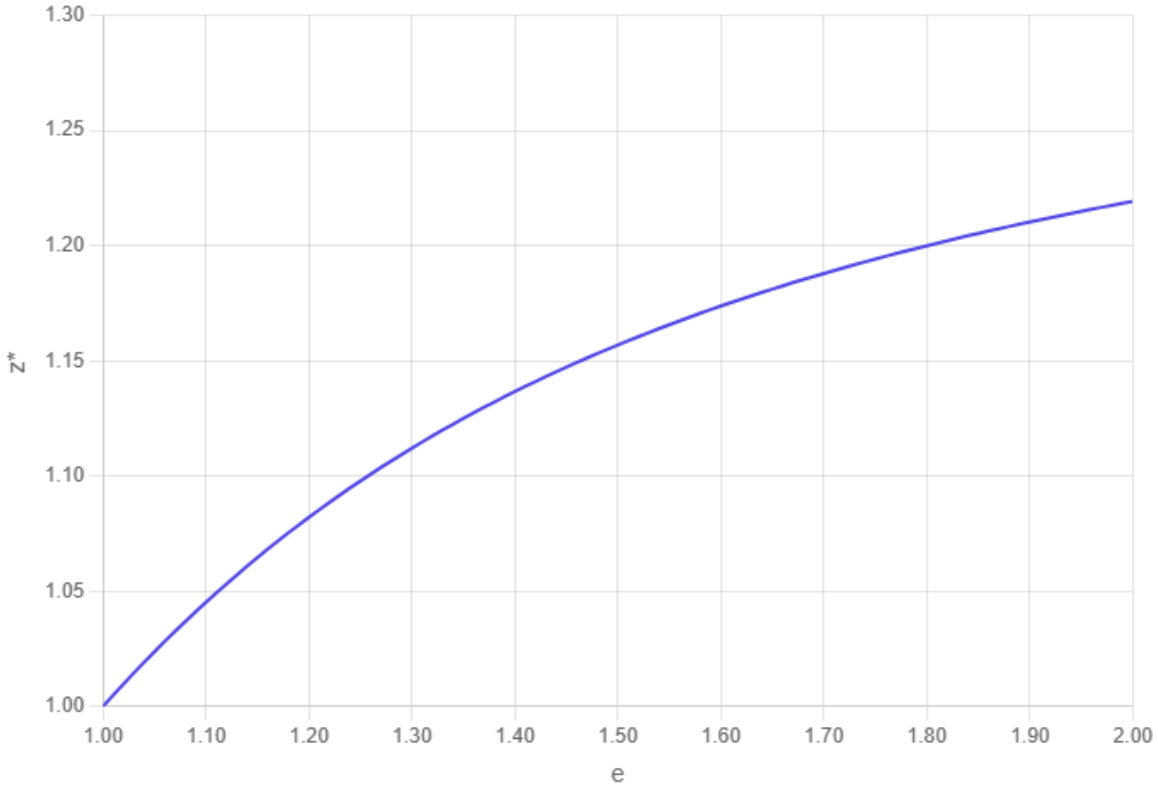


Figure 2: Relationship between e and z^*

Policy insight (Fragmentation and fiscal restraint). This second-stage result highlights the flip side of the common-pool problem: because both branches are contesting the scale of spending on a shared priority (rather than each pushing distinct projects separately), the check-and-balance dynamic effectively restrains the budget. The side advocating restraint (the government in our setup) uses the threat of the low-spending default to keep the outcome closer to its ideal. In intuitive terms, this scenario resembles a centralized budgeting process in which a single authority (or a unified government) can enforce fiscal discipline. Consistent with this intuition, empirical evidence shows that when budgetary power is concentrated—say, under a single-party majority government or a strong finance minister setting a hard budget ceiling—spending tends to be contained and deficits are smaller. Our model's second-stage outcome thus aligns with the literature's finding that less fragmented governance yields more restrained fiscal outcomes. In our case, even though two actors are bargaining, their disagreement is only over "how much" to spend on a common agenda, and the more frugal actor (backed by a potent default) substantially

anchors the result. This exemplifies the classic logic of checks and balances working as intended: one branch's fiscal conservatism checks the other's expansiveness, preventing runaway spending. Indeed, the skewness of z^* toward the government's ideal in our solution embodies that moderating effect. It suggests that as long as the two branches disagree primarily over the overall scale of spending (with one acting as a fiscal hawk), the budget will stay near the lower end of their acceptable range – a finding in line with von Hagen's observation that more hierarchical (less collegial) budget processes promote fiscal discipline.

Finally, it is worth noting how these results extend to extreme cases. If both the government and the legislature were to favor highly expansionary fiscal policy (a case not formally modeled in our two-stage game, but analogous to setting e very high and having the government also want a big increase), the common restraint mechanism identified above would largely disappear. In that scenario, our model predicts (and empirical studies confirm) that budget outcomes would gravitate toward the highest spending impulses of the two sides, unchecked by any conservative counterweight. Conversely, if both branches were extremely conservative (each wanting low spending), agreement would naturally yield a very small budget. Thus, our bargaining framework captures a wide range of possibilities: checks and balances can either moderate spending or, if both sides align on pro-spending goals, fail to prevent overspending.

4. Empirical evidence

This section tries to test our theoretical predictions empirically. To this end, we review real-world budgetary environments to properly match them with our theoretical findings. Many countries have constitutional laws that specify (i) that the government outlines the budget as a law and (ii) that the legislature reviews and approves the budget. We aim to demonstrate empirically that this widespread constitutional framework for the budget determination process—characterized by the government's authority to prepare the budget (Korea constitutional law #54) and the legislature's right to reduce the budget formulated by the government (Korea constitutional law #57)—often leads to excessive budgeting.

Typically, liberal governments tend to run large expenditures, creating an environment prone to overspending; however, if checks and balances operate at the legislative level (perhaps by conservative legislatures), this tendency might be curbed. Additionally, greater divergence in policy focus between the government and the legislature can also contribute to excessive budgets, as both parties in the bargaining process make concessions on budget items related to their secondary interests while prioritizing self-interest in essential budgets to advance their objectives. For instance, Republicans in the U.S. tend to focus on defense and economic spending, whereas Democrats pay relatively little attention to redistributive spending; the opposite holds. While pursuing their primary objectives, they must make concessions regarding their secondary concerns, resulting in an excessive budget. This section presents empirical findings that support our intuition and

theoretical predictions, especially the implications of Theorems 1 and 2. Next, we discuss the data and the empirical strategy used to provide evidence.

Data

We use data from South Korea spanning 1998 to 2023. This data provides detailed information on public spending trends over time and the ideological positions of both government and legislature, along with business cycle fluctuations. An advantage of using Korean data is the significant variation in the fiscal and political stances of governments and legislatures over relatively short periods, which permits the proper identification of key theoretical mechanisms in the paper. First, there have been frequent regime changes after the democratic transition since 1987.[9] Second, fiscal management often changes after major elections, including presidential and general elections, which are staggered in timing due to institutional reasons: presidential elections occur every five years, while general elections take place every four years, generating natural variations in government preferences compared to those of the legislature, even within a government. Third, fiscal stances have changed considerably over the sample period, presumably because the country has experienced rapid economic growth, leading to greater demand for public services and social welfare programs, thereby providing sufficient sources of divergence in policy priorities.[10] Fourth, because Korea is widely regarded as a fiscally sound country, its legal system lacks fiscal rules or other institutional fiscal restraints, thereby providing an ideal opportunity to test our theory of budget bargaining. Despite all these features, tax changes have been relatively mild or have lagged behind the expansions in fiscal expenditure, which permits us to focus on fiscal spending.[11]

Given the nature of a small open economy relying heavily on international trade, Korea faces many external shocks, which often require government intervention. Counter-

[9] Over the past 30 years, South Korea has undergone a fundamental regime change, with control of the presidency and legislature alternating between conservative and liberal parties. Following the democratic transition in the late 1980s, Presidents Roh Tae-woo (1988-1993) and Kim Young-sam (1993-1998), both from the conservative lineage, led the initial phase of democratization.
A significant shift occurred with the first peaceful transfer of power to the liberal camp under President Kim Dae-jung (1998-2003), followed by President Roh Moo-hyun (2003-2008). Power then reverted to the conservative side with President Lee Myung-bak (2008-2013) and President Park Geun-hye (2013-2017). After Park's impeachment, President Moon Jae-in (2017-2022) of the liberal party took office. Recently, President Yoon Suk-yeol (2022-2024) led the conservative government, followed by impeachment.

[10] In general, liberal governments have tended to pursue more expansionary fiscal policies, whereas conservative governments have shown a relatively stronger preference for fiscal consolidation and soundness, including balanced budgets and/or fiscal rules.

[11] While fiscal expenditures have changed rapidly and significantly, government revenues—mainly tax revenues—have increased steadily over time, maintaining a roughly constant share of GDP (around 20%), with only minor fluctuations. Therefore, fiscal deficits or surpluses are more likely driven by shifts in spending patterns than by changes in revenue.

cyclical fiscal management causes fluctuations in fiscal outcomes, which should be properly controlled in analysis. The variables used in our empirical study include national debt, GDP, the debt-to-GDP ratio, and business-cycle and external factors such as the unemployment rate and the current account surplus. We also collect information on the ideological stances of fiscal institutions (i.e., the government and the legislature) as well as the intensity of the legislature's ideological stance relative to the corresponding government. The following subsection explains how we process raw data for proper use in our empirical specifications.

Empirical strategy

We consider the following conceptual setting:

$$\text{Fiscal outcome} = f(A, B, C) + \text{error term} \quad (1)$$

where we treat the accumulation of fiscal debt or deficits as fiscal outcomes; variable A represents internal economic factors, such as GDP and the unemployment rate; B indicates an external economic factor, like the current account surplus; and C pertains to fiscal institutions, including the degree of liberalness of governments and legislatures and the divergence in policy focus between the two branches regarding the national budget: these elements are included in line with earlier theoretical predictions. Taxes are considered rigid or sluggish for institutional reasons, at least in the case of Korea's data, so excessive expenditures, if they arise through bargaining between government and legislature, can easily lead to budget deficits.

Given the non-stationary time-series properties of most macroeconomic variables including national debt, we need to adjust equation (1) to derive a standard empirical equation with stationary variables. First, we divide the fiscal outcome by GDP to eliminate the output effect, as it tends to grow with GDP. Second, the debt-to-GDP ratio grows over time, implying it is technically an I(1) variable; therefore, we take the time difference to derive a stationary variable of $\Delta(debt/GDP)$, which essentially represents the *real* fiscal deficit to GDP. The real value of fiscal deficits falls with economic growth and inflation (i.e., inflation tax), so even if an annual (nominal) fiscal deficit is high, the real fiscal deficit can be moderate. The time difference in the debt to GDP ratio can thus satisfy the purpose of our analysis, i.e., measuring the net real effect of budget bargaining on fiscal outcome. The resulting dependent variable $\Delta(debt/GDP)$ is referred to as $\Delta debt_ratio$ in what follows. Third, our theory links budget bargaining to fiscal outcomes, holding other factors constant. To isolate the bargaining effects, we need to control for cyclical fiscal policy interventions, which are key economic factors that influence fiscal deficits. Although procyclical GDP movements are already controlled for by dividing debt by GDP, we also control for the unemployment rate to account for possible domestic business cycle changes unrelated to GDP. Similarly, we also control for the current account surplus to consider external business cycle factors affecting the economy. In addition, trade surplus may influence a government's fiscal stance, as a government with a trade surplus can afford to run some fiscal deficits

without causing macroeconomic instability. We use a GDP-adjusted current account surplus measure, CAS/GDP, which is the current account surplus relative to GDP. The resulting empirical specification is linearized and presented as follows.

Empirical specification 1

$$\Delta Debt_ratio_t = \alpha + \beta_1 Dgov_t + \beta_2 Dleg_t + \beta_3 div(scope)_t + \beta_4 div(level)_t + Z_t\gamma + \varepsilon_t \qquad (2)$$

where $\Delta Debt_ratio_t$ is the dependent variable defined above; the first four terms are included as regressors following our theory to be explained right below; Z_t is a vector of usual control variables used in fiscal studies, e.g., the unemployment rate and the current account surplus relative to GDP. Further discussion of the empirical specification is warranted. We first define *Dgov* as a dummy variable that captures the degree of government liberalism, reflecting the tendency of a given type of government (e.g., a liberal government) to spend more fiscal expenditures. We used the data on the ideological orientation of governments, so $Dgov = 1$ if the government's ideological stance is liberal (e.g., similar to Democrats) and 0 if it is conservative (e.g., similar to Republicans). We may expect to obtain $\hat{\beta}_1 > 0$ if a liberal government spends more expenditures, which will be tested later. Similarly, we also control for the ideological orientation of legislatures, using a dummy variable $Dleg$: $Dleg = 1$, if the legislature is liberal, meaning more than 50% of elected congressmen have liberal views, and 0 otherwise.

There are two types of divergence measure in equation (2): one is divergence in policy scope, $div(scope)$ and the other is in budget level preferences, $div(level)$. For the sake of exposition, we discuss the latter first, which indicates a difference in preferred budget level between L and G. This can be proxied by whether or not two branches hold similar political views. Liberal branches tend to prefer different (e.g., greater) budget levels than their conservative counterparts, so divergence in budget levels arises naturally. According to Theorem 2, we expect the estimated coefficient of $div(level)$ to be positive: $\hat{\beta}_4 < 0$, which will also be tested later. Specifically, we define the divergence-in-level variable, $div(level)$, as follows:

$$div(level) \equiv \text{Difference in preferred budget level between } L \text{ and } G$$

$$= |Dleg - Dgov| \qquad (3)$$

where $Dleg$ and $Dgov$ were defined above. This absolute gap measure can capture whether both branches share a common view or hold a differential view at the budget level, resulting in variations from 0 to 1. If both share a common view, the check-and-balance mechanism does not hold. If their views conflict, the check-and-balance mechanism applies, leading us to expect the budget to be tightly managed, holding other factors constant. Next, we define the divergence in policy priority using the variable $div(scope)$, constructed as follows:

$$div(scope) \equiv \text{Difference in budgetary focus between } L \text{ and } G$$

$$= h(\text{number of impeachment trials}) \text{ with } h' > 0 \qquad (4)$$

According to our theory, the $div(scope)$ measure reflects the divergence between the legislature and the government regarding budgetary priorities, with a higher value of $div(scope)$ indicating a more divergent view of fiscal spending. While we cannot directly observe the specific sets of fiscal priorities of the two branches of *L* and *G*, the incidence of severe conflicts between them, if measurable, can serve as a useful proxy for divergence in fiscal priorities.

The gap in views regarding which areas of the budget each branch prefers is a novel notion in this paper, but it is empirically difficult to measure. We think that the number of impeachment trials by a legislature can be a useful proxy reflecting the intensity of budgetary priority differences between *L* and *G*. The direction a society should take determines the budget priority for both *L* and *G*, and if the preferred directions are so different, impeachment trials can occur as a result. The function $h(.)$ in (4) assigns a value of 1, 1.5, or 2 if the legislature's impeachment attempts on government officials are fewer than 3, between 3 and 5, or exceed 5 (i.e., six or more times) during the parliamentary term, respectively. That is, more impeachment trials indicate severe conflicts in budgetary focus between the two branches, leading to more divergent views on the budget. The variations in $div(scope)$ are set within the interval of 1 to 2, yielding a comparable magnitude of variations to $div(level)$, facilitating comparative inference of estimation results. Based on the data we analyze, the number of impeachment counts is zero under the regime of President Kim, four under President Roh, one under President Lee, two under President Park, six under President Moon, and 30 under President Yoon in chronological order. By specifying the empirical model as described above, where all variables used are stationary, we can assert that standard regression analysis will yield consistent estimates as long as the explanatory variables are external to the errors in the dependent variable. According to Theorem 1, we expect to obtain $\hat{\beta}_3 > 0$, which will also be tested later.

It should be noted that our two divergence measures do not simply capture the gap in the degree of liberalness between the two branches. By measuring the absolute gaps using $|DLeg - DGov|$ for $div(level)$, we intend to reflect whether there is room for the check-and-balance mechanism to work, not who is more liberal than the other. Similarly, by measuring h(number of impeachment trials) for $div(scope)$, we can examine how severe the gaps in policy focus are between *L* and *G*, not who is more liberal. Since the degree of liberalism often affects the level of fiscal expenditures, we should explicitly control for the political preferences of both branches in our empirical specification. To deal with this, we will therefore include the liberalness of both the government and the legislature in Specification 1 using the two variables, *Dgov* and *Dleg*.

Empirical specification 2

We now consider an alternative specification that allows us to indirectly assess how two essential mechanisms interact, given the specific political environment of the Republic of Korea, which experienced a civil war in the past. In principle, our theory shows that the divergence-in-scope mechanism boosts fiscal deficits, while the check-and-balance mechanism depresses them. These two forces operate differently across governments at a

given point in time, depending on the combinations of L and G, which provides an opportunity to examine whether the implications from the estimation results in this subsection align with the previous empirical results based on Specification 1. To this end, we consider the following four combinations of government and legislature: (i) liberal government and liberal legislature; (ii) conservative government and conservative legislature; (iii) liberal government and conservative legislature; and (iv) conservative government and liberal legislature. The classification of governments is made by the dummy variable *Dgov*, as defined earlier, while that of legislatures is by *Dleg*: whether or not the proportion of liberal party congressmen exceeds 50% of the congress at a point in time. We thus create four corresponding dummy variables to indicate the cases of (i), (ii), (iii), and (iv), namely Dlgov_lleg, Dcgov_cleg, Dlgov_cleg, and Dcgov_lleg.

In general, checks and balances may be weak among pairs with similar political beliefs. For instance, if the two liberal pairs (Dlgov_lleg $= 1$) tend to spend a lot, we expect the largest estimated coefficient for Dlgov_lleg. Under liberal government and conservative legislature (Dlgov_cleg $= 1$), and under conservative government and liberal legislature (Dcgov_lleg $= 1$), checks and balances are in place to reduce fiscal deficits. However, conflicting political views may also be associated with differing budget priorities, which might increase fiscal deficits. These two opposing effects make the overall budget impact uncertain beforehand. Meanwhile, under both conservative governments and legislatures (Dcgov_cleg $= 1$), there is no mechanism of checks and balances, but if each branch prefers not to have a big government, the budget deficit might be low despite the lack of checks and balances. We will test whether empirical analysis supports these predictions. The resulting empirical specification 2 is given by:

$$\Delta Debt_ratio_t = \beta_1 D\text{lgov_lleg}_t + \beta_2 D\text{cgov_lleg}_t + \beta_3 D\text{lgov_cleg}_t + \beta_4 D\text{cgov_cleg}_t + Z_t\gamma + \varepsilon_t \quad (5)$$

where Dlgov_lleg $= 1$ if both Government and Legislature are liberal

Dcgov_lleg $= 1$ if Government is conservative and Legislature is liberal

Dlgov_cleg = 1 if Government is liberal and Legislature is conservative

Dcgov_cleg $= 1$ if both Government and Legislature are conservative.

Z_t = other control variables, e.g., unemployment rate, current account surplus relative to GDP

In addition to these theoretical elements, we also attempt to incorporate Korea's specific political context into the interpretation of empirical results. We present Table 1, in which columns (1)~(3) represent the presence of the two mechanisms mentioned earlier and the degree of liberalism of pairs, respectively.

Table 1. Two mechanisms at work in the government-legislature interactions

Combinations of G and L	(1) Divergence-in-scope mechanism	(2) Check-and-balance mechanism	(3) Liberalness	(4) Sum
Dlgov_lleg	0	+	++	+++
Dcgov_lleg	+	-	+	+? (++/-)
Dlgov_cleg	+	-	+	+? (++/-)
Dcgov_cleg	0	+	0	+

Notes. See the definitions of the four *G* and *L* combinations in (5). Notations in the table are as follows: 0 = no effect on the fiscal deficit, += a positive effect, and −= a negative effect. The sum involves a straightforward addition of non-zero signs to obtain rough intuitions.

Table 1 provides a rough intuition for what we may obtain from empirical analysis using Specification 2. The first two columns (1) and (2) indicate whether there is a divergence-in-scope mechanism and a check-and-balance mechanism, respectively. Zeros mean no effect, while + or – signifies a positive or negative effect on real deficits. The third column (3) represents how liberal the two branches are by simply recording ++ if both branches are liberal, + if only one branch is liberal, and zero if neither is liberal. The final column simply adds up the + and – signs along with zeros to provide intuition for how large fiscal deficit pressures are for each type of combination. We first expect the highest deficit for both liberal branch pairs, which is quite compelling given the last summation column (4). Second, given the nature of a divided nation that went through a civil war (i.e., the Korean War during 1950~1953), conservative pairs of *G* and *L* have paid special attention to a small government with a focus on economic growth, traditionally keeping budget deficits low. We will test this prediction, too. Third, the cases of conflicting pairs, i.e., one is liberal while the other is conservative, may have ex ante ambiguous effects on budget deficits because the positive and negative effects offset each other. However, the liberal branch in Korea has recently emerged and tends to focus on redistribution, often resulting in budget deficits. We therefore expect some moderate deficit in these pairs. We expect that the two fiscal deficits of conflicting combinations might be nested within both liberal and conservative pairs.

Empirical results

We present empirical results based on the specifications 1 and 2 below. Before delving into the effects of the two mechanisms of interest, we first assess the empirical relevance of our approach. To this end, Table 2 presents results using the usual control variables, such as business cycle factors and political background variables.

Table 2. Results using the usual control variables

	(1)	(2)	(3)	(4)	(5)	(6)
unemp	0.005	---	0.003	0.004	0.008**	0.004

	(0.003)		(0.004)	(0.003)	(0.003)	(0.004)
CAS/GDP	---	2.150*	1.460	---	---	2.333
		(1.244)	(1.512)			(1.439)
Dgov	---	---	---	0.003	-0.004	0.000
				(0.007)	(0.006)	(0.007)
Dleg	---	---	---	---	0.018***	0.019***
					(0.006)	(0.006)
Constant	-0.004	0.007	-0.002	-0.003	-0.017	-0.012
	(0.011)	(0.005)	(0.012)	(0.012)	(0.011)	(0.011)
Obs.	26	26	26	26	26	26

Notes. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

As expected, business-cycle factors, e.g., the unemployment rate and the current account surplus relative to GDP, appear to account for some of the variations in real fiscal deficits as shown in columns (1)~(3). In subsequent columns, we begin to include political environment variables, such as whether governments and legislatures reflect liberal or conservative beliefs; see the estimated coefficients for *Dgov* and *Dleg*. The regression results show that the liberalness of legislatures is crucial in explaining variation in fiscal deficits. While governments prepare the budget and legislatures retain only the right to review and reduce it, the empirical results show that legislatures still have the power to increase fiscal deficits. At least, this fact motivates our bargaining approach and seems to align with our bargaining intuition. Now, Table 3 presents estimation results based on Specification 1.

Table 3. Results using Specification 1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
div(level)	-0.004	---	-0.003	-0.006	-0.012	-0.014**	-0.012*
	(0.006)		(0.005)	(0.006)	(0.007)	(0.006)	(0.006)
div(scope)	---	0.020***	0.020**	0.019**	0.042**	0.044***	0.041**
		(0.007)	(0.007)	(0.007)	(0.018)	(0.015)	(0.015)
Dgov	---	---	---	0.007	0.012	0.004	0.006
				(0.006)	(0.007)	(0.006)	(0.006)
Dleg	---	---	---	---	-0.022	-0.019	-0.016
					(0.016)	(0.013)	(0.014)
unemp	---	---	---	---	---	0.009***	0.006
						(0.003)	(0.004)
CAS/GDP	---	---	---	---	---	---	1.402
							(1.355)

Constant	0.016***	-0.012	-0.010	-0.011	-0.033*	-0.062***	-0.056***
	(0.004)	(0.009)	(0.010)	(0.010)	(0.018)	(0.018)	(0.019)
Obs.	26	26	26	26	26	26	26

Notes. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The first three columns (1)~(3) of Table 3 present estimates of *div(level)* and *div(scope)* measured by equations (3) and (4), respectively, without any control variables. Still, they show some predicted effects of the check-and-balance mechanism and divergent budget priorities between branches: the signs of the estimates are consistent with the earlier theory (see Theorems 1 and 2). In subsequent columns (4)~(5), we additionally control for the political stances of governments and legislatures, in line with Table 2, which boosts the estimates of *div(level)* and *div(scope)* in magnitude. Finally, in columns (6)~(7), we additionally control for business-cycle factors; the magnitudes of the estimates of *div(level)* and *div(scope)* remain similar, with much higher statistical significance. The overall results confirm our theory very well. The divergence in policy priority is indeed a crucial factor that raises fiscal deficits through negotiations, eventually leading to concessions by both sides in the areas of the other's budget priority. At the same time, the check-and-balance mechanism seems to work, depressing fiscal deficits. The quantitative importance of *div(scope)* is estimated to be greater than that of *div(level)*, and the implications will be discussed later.

Meanwhile, we obtain $\hat{\beta}_1 > 0$, as expected, implying that liberal governments have larger deficits on average. When we analyze the negotiation mechanisms between L and G in more detail, the estimate of the legislature's fiscal stance (*Dleg*) becomes negligible and statistically insignificant. When we incorporate business-cycle factors into the model, the unemployment coefficient in column (6) turns out to be highly significant with the correct sign and magnitude, implying that governments tend to actively implement counter-cyclical fiscal policies during recessionary periods. The external factor, denoted by the current account surplus relative to GDP, has a positive estimated impact with the correct sign, but its significance weakens, possibly because this variable is closely correlated with the unemployment rate. When it is controlled for without the unemployment rate, it becomes statistically significant. This reflects the reality of a small open economy, where significant trade surpluses allow the economy to sustain some fiscal deficit, signaling to international financial markets that it is not in trouble. Conversely, if trade deficits are substantial, the government cannot afford a fiscal spending spree, all else being equal. It is notable that both the coefficients related to bargaining mechanisms and business cycle effects become more salient when both factors are considered jointly in estimation, revealing that they are two essential factors accounting for fiscal deficits.

The overall estimation results show that, after controlling for the political stances of both the government and the legislature and business-cycle factors in the Korean context, the two essential mechanisms of the paper, i.e., divergence in scope and divergence at the budget level, are successfully identified as predicted by our theory. The economic impacts implied by the two mechanisms also seem reasonable. The estimate of *div(level)* suggests

that adopting a check-and-balance position (relative to non-adopting) is associated with a decline in fiscal deficits of more than one percentage point. The estimate of *div(scope)* suggests a much larger impact, with a one-unit change in the gap between *L* and *G* regarding how public resources are spent (i.e., moving from a cooperative state with fewer than 3 impeachment trials to a conflicting one with more than 5 impeachment trials) leading to an increase in fiscal deficits of more than four percentage points, a magnitude that accounts for most of the recent rapid rise in Korea's fiscal deficits.

We also present empirical findings using Specification 2 in Table 4.

Table 4. Results using Specification 2

	(1)	(2)	(3)	(4)
Dlgov_lleg	0.026***	-0.002	0.018***	0.006
	(0.006)	(0.012)	(0.006)	(0.014)
Dcgov_lleg	0.016	-0.006	0.011	0.001
	(0.010)	(0.013)	(0.009)	(0.014)
Dlgov_cleg	0.011**	-0.024	0.000	-0.015
	(0.005)	(0.015)	(0.006)	(0.016)
Dcgov_cleg	0.009*	-0.017	-0.003	-0.013
	(0.005)	(0.011)	(0.006)	(0.011)
unemp	---	0.008**	---	0.004
		(0.003)		(0.004)
CAS/GDP	---	---	3.116**	2.124
			(1.130)	(1.512)
Observations	26	26	26	26

Notes. Dlgov_lleg $= 1$ if both the government and the legislature are liberal. Dcgov_lleg $= 1$ if the government is conservative and the legislature is liberal. See other definitions in equation (5). Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The first column of Table 4 controls for four possible combinations of government and legislature, while the subsequent columns add additional control variables unless they are perfectly correlated with existing explanatory variables. We expected that both liberal branches would spend substantially under no checks and balances, while their conservative counterparts might spend significantly less, reflecting a preference for small government, even under no checks and balances. This pattern has generally emerged in the regression results, confirming our theoretical predictions. Empirical results also align with those of Table 3, viewed from a different angle. In the two pairs with shared political beliefs, divergence in priorities is negligible; instead, fiscal stances affect the overall levels of fiscal deficits. Notably, both liberal pairs of government and legislature can lead to large deficits because they are unlikely to follow the principle of "checks and balances." In fact, Korea has

not yet seen the rise of right-wing populism, so this set of empirical results is intuitively reasonable.

Under a liberal government with a conservative legislature and a conservative government with a liberal legislature, the check-and-balance mechanism collides with the divergence-in-scope mechanism, producing two counterbalancing effects that make the overall budget effects uncertain ex ante. Empirical results from Specification 1 suggest the latter effect might be quantitatively more important than the former. Hence, the point estimates for conflicting pairs here tend to be somewhat larger, though statistical significance is not high enough to say definitively. As shown in Table 4, the estimates for conflicting pairs (i.e., pairs with different political stances) tend to fall between those for all-conservative and all-liberal pairs, indicating the presence of both the check-and-balance mechanism and a possible divergence in policy focus, with the latter effect greater than the former. This evidence is at least consistent with our previous results in Table 3. Therefore, neither too small nor too large deficits are observed in the two conflicting pairs in the empirical analysis.

This pattern of empirical results remains roughly unchanged after controlling for business-cycle factors, i.e., the unemployment rate and the current account surplus (CAS/GDP). Statistical significance naturally decreases as more control variables are added, but we observe quite similar results across columns. Meanwhile, we test the null hypothesis that fiscal effects are identical across the four regimes: $\beta_1 = \beta_2 = \beta_3 = \beta_4$, using the estimates in the first column. The test rejects the null hypothesis of no differences in fiscal stances across the four government-legislature pairs at the 5% significance level.

Discussion of empirical results

Based on the empirical analysis above, we identified three key findings. First, preference divergence in fiscal focus among institutions leads to budget expansion. Second, "checks and balances" are effective at keeping the budget relatively sound despite preference divergence in budget size. Third, shared expansionary preferences weaken fiscal discipline, causing budgets to expand rapidly. These findings are significant and consistent with the theory section.

A greater divergence in policy focus between governments and legislatures, leading to a larger fiscal deficit, aligns with the common-pool and fragmentation literature and offers useful insights for modern societies with growing income gaps and social diversity. A more liberal fiscal stance by both governments and legislatures leads to a higher fiscal deficit, underscoring the importance of check-and-balance in budget bargaining. Specifically, in a "harmonious" setting where both government and legislature are liberal, the fiscal deficit increases significantly compared with when both are conservative. In a "conflictive" setting where the government is conservative and the legislature is liberal, the fiscal deficit rises only mildly. Our empirical analysis also shows that both the divergence-in-priorities and check-and-balance mechanisms coexist, which seems to advance the theoretical literature on the budget process. Finally, external factors contribute substantially to fiscal deficits,

suggesting that fiscal spending sprees are more likely when external conditions are favorable to the parties determining budgets.

5. Conclusion

Our analysis highlights how the interplay between institutional roles and policy preferences can fundamentally shape fiscal outcomes. We developed a formal bargaining model of budget determination in a separation-of-powers system and showed that the model accounts for both excessive deficits and fiscal prudence under different conditions. In particular, the classic "checks and balances" mechanism succeeds in containing spending only when the government and the legislature disagree solely over the magnitude of expenditure. In such cases, the more fiscally conservative side effectively limits budget growth. However, when the conflict between branches concerns the scope of spending (that is, each side prioritizes different budget areas, such as equity vs. efficiency), the bargaining process leads to mutual accommodation and significantly higher total spending. We also found that when both branches adopt a strongly expansionary stance, fiscal discipline breaks down, leading to large deficits.

Our empirical evidence, drawn from data on a country that recently experienced rapid changes in public debt and political regimes/preferences, with tax revenues to GDP remaining relatively stable over time, confirms these theoretical predictions. Budget outcomes under different political configurations align closely with the model's nuanced predictions. Cases of divided government do not uniformly produce gridlock or discipline: instead, the nature of the division (over policy scope or spending levels) tends to determine whether deficits emerge. This finding helps reconcile mixed results in the prior literature and emphasizes that simply having institutional "checks and balances" is not sufficient to ensure fiscal responsibility: what matters is what the different branches are checking and balancing.

These conclusions have implications for both policy design and future research. From a policy perspective, our results suggest that improving fiscal outcomes may require addressing underlying preference divergences between branches. For example, greater transparency in budget negotiations or rules that enforce trade-offs within a fixed budget envelope could mitigate the common-pool bargaining problem that arises when each branch champions separate spending priorities. Additionally, recognizing that unified branches with shared expansionary goals pose a distinct risk to fiscal discipline underscores the importance of independent fiscal watchdogs or constraints (such as an independent fiscal organization or budget-balance requirements) in those scenarios.

Future research could extend our framework in several directions. One avenue would be to incorporate dynamic considerations: for instance, examining how repeated budget bargaining or electoral incentives might alter the strategies of the government and the legislature over time. Another extension could involve multiple spending categories or

additional actors (such as a second legislative chamber or subnational governments) to explore how broader institutional complexity affects fiscal bargaining outcomes. Finally, while our empirical analysis focused on a single-country case with rich variation in political conditions, applying our theoretical insights to cross-country data or other institutional settings would be valuable. Such studies could further evaluate the applicability of our theory and offer guidance for appropriate reforms aimed at reducing deficit bias under different governance structures.

In conclusion, separation-of-powers systems restrain spending primarily when the government and the legislature disagree on budget size. However, when each branch pursues its own spending agenda, mutual concessions can inflate the budget beyond either's original intention. Our bargaining model highlights this risk and provides a framework for identifying when "checks and balances" lose their disciplinary force. By showing, with both theory and evidence, that fiscal outcomes depend on the alignment (or misalignment) of policy goals across branches, this study deepens our understanding of institutional design and clarifies how political conflict can either safeguard or undermine fiscal discipline.

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