Indirect Election and Government Spending∗

Nels Christiansen†
Department of Economics, Trinity University

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Abstract
This paper analyzes institutions that may mitigate or exacerbate the increased spending associated with the legislative common pool budget problem. We solve a simple theoretical model in which voters from four districts in two states separately elect state and federal legislators, and voters care about state and federal public spending. Voters exaggerate their preferences for spending because of the budgetary externality, but they overstate their preference more at the federal level because spending is financed across a broader tax base. We then compare these results to a system in which state legislators are directly elected, but federal legislators are appointed by the state legislature. This mechanism reduces the incentive of voters to exaggerate preferences because the state legislature will amplify its own preferences when making its selection. This leads to less state spending but more federal spending than under direct election. (JEL classification: C78, D71, D72, H4)

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†One Trinity Place, San Antonio, TX 78212. nels.christiansen@trinity.edu
1 Introduction

The federal budget has long been identified as a common pool resource. Consider a collection of districts with a governing body that finances its spending through uniform taxes. The idea is that because an additional dollar of district spending is financed across all of the districts, each district has an incentive to pursue inefficiently large projects. A corollary is the Law of $1/n$, which claims that as the number of districts increases, projects pursued by the districts become even more inefficiently large, and total spending rises. In light of recent evidence showing support for these predictions, it is reasonable to ask whether there are institutions which might mitigate the effects of the common pool problem. This paper makes an attempt in this direction by analyzing two systems for selecting federal legislators: direct and indirect election. In the former, voters elect legislators by popular vote, while in the latter voters elect state legislators who in turn select the federal legislators. This is how many states selected their U.S. senators prior to the passage of the 17th Amendment in 1913 which stipulated that voters elect senators directly.

Indirect election is also worth studying because in recent years some conservatives and members of the “Tea Party” have advocated for repealing the 17th Amendment. Their motivation is to return more government accountability to the states. Recent proponents of such a measure include two candidates seeking the presidential nomination from the Republican Party, Gov. Rick Perry (TX) and Rep. Ron Paul (TX). Additionally, in 2004 Sen. Zell Miller (GA) introduced legislation to the Senate floor which would have repealed the amendment. While it would be an exaggeration to say this issue has mainstream support, it does have prominent backers at all levels of government.

This paper investigates a closely related consequence of indirect election, namely its effects on government spending at the state and federal levels. It is closely tied to two streams of the economics and political sciences literatures. First, there is a literature on elected versus appointed officials. In a recent paper Knight and Coate (2011) theoretically analyze differences in policy between two forms of city government: mayor-council and council-manager. Unlike this paper, the indirectly elected

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1For early work, see Weingast et al. (1981).
2For recent evidence see Knight (2006) and Schaltegger and Feld (2009).
3See a recent editorial in the Los Angeles Times, October 21, 2010.
4During a discussion of the Bill of Rights in 1879, James Madison argued, “[T]he State Legislatures will jealously and closely watch the operations of this Government, and be able to resist with more effect every assumption of power, than any other power on earth can do; and the greatest opponents to a Federal Government admit the State Legislatures to be sure guardians of the peoples liberty.” (The Annals of Congress)
5Sen. Miller characterized the futility of his efforts by saying he was “jumping off the Golden Gate Bridge of political reality.”
officials do not have authority over the policy chosen. Other papers deal with regulation policy and principal-agent concerns. Second, the paper is related to the literature on the federal budget as a common pool resource and the Law of $1/n$. To the best of our knowledge, this is the first paper to link indirect election with government spending via the common pool problem.

Contrary to the conventional wisdom, we show that if voters behave strategically repealing the 17th amendment may do exactly the opposite of what its proponents hope to accomplish. That is, indirect election may lead to more federal spending, not less, while at the same time reducing state spending. The intuition is relatively straightforward. Federal spending is financed across a larger tax base than is state spending. When electing legislators directly to each body, rational voters exaggerate their preferences for public goods spending more in their choice of federal legislator because they pay a smaller share of each dollar spent on their public goods consumption. This logic is consistent with the Law of $1/n$. When voters can only elect one state legislator who then together with other state legislators appoints a federal legislator, that choice is a blunt instrument for controlling the different levels of public goods spending voters want at the state and federal levels. If voters were to elect a state legislator with the same public goods preferences under indirect election as they do under direct election, this would give rise to federal legislators with extremely high preferences for federal public goods spending, higher than the voters want. Voters must respond by electing state legislators with less exaggerated preferences for public spending than they would choose under direct election of federal representatives. The result is lower state spending under indirect election but higher federal spending.

The paper proceeds as follows. Section 2 builds the basic framework for the model. Section 3 solves for the efficient amounts of public goods spending at the state and federal levels. It then analyzes the voter’s problem, which is to find the optimal public goods preference for a legislator given the bargaining process at the legislative level. This in turn can be used to calculate the amount of public goods spending under direct and indirect election. Section 4 discusses the results and the underlying assumptions of the model.

2 Preliminaries

Suppose there are two states, $A$ and $B$, each of which is divided into two districts. State $A$ contains districts $A1$ and $A2$, and state $B$ contains $B1$ and $B2$. There are two levels of government: state government which provides public goods to the districts within its own state, and the federal government which provides public goods to each state. Denote the

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6See, for example, Besley and Coate (2003b) and Alesina and Tabellini (2007).
7In the paper we will use $i$ to denote states and $j$ to denote districts. That is, $i \in \{A, B\}$ and $j \in \{1, 2\}$. 
public goods provided by state A’s legislature as \( g_{A,1} \) and \( g_{A,2} \) and the public goods provided by state B’s legislature as \( g_{B,1} \) and \( g_{B,2} \) ("state public goods"). The federal government provides \( g_A \) to state A and \( g_B \) to state B ("federal public goods"). To keep things simple, we assume both levels of government have unicameral legislatures.

Within each district there is a continuum of voters with unit mass. A voter in state \( i \) district \( j \) cares about the public good in her own district, the public good in the neighboring district, the public good provided to her state, and a private good, \( x \). Utility for this voter is given by,

\[
U = x + \lambda (w_l \ln g_{i,j} + w_n \ln g_{i,-j} + w_s \ln g_i),
\]

where \( \lambda \geq 0 \) is the preference for public good spending, \( w_l \) is the weight the voter places on the local public good, \( w_n \) is the weight she places on the neighboring public good, and \( w_s \) is the weight placed on the state level public good. We assume \( w_l + w_n + w_s = 1 \) and \( w_l \geq w_n \). The larger is \( w_n \) the higher the degree of spillovers between the public goods in the two districts. Voters’ locations are fixed and they can not move between districts as in Tiebout (1956).

Voters elect representatives to the state and federal legislatures based on their public goods preferences. The state legislature consists of two legislators, one elected by each district. Let \((\lambda_{i,1}, \lambda_{i,2})\) denote the public good preferences for the legislators elected from districts 1 and 2 in state \( i \), respectively. These legislators are always elected directly by the voters. The federal legislature also has two members, one from each state, whose preferences for the public good we denote \((\lambda_A, \lambda_B)\). We consider two different mechanisms for electing federal legislators. First, federal legislators can be elected directly by the voters in a given state as is done for state legislators. Second, they can be elected indirectly, in which case the members of the state legislature choose what type of representative to send to the federal legislature. Figure 1 shows both mechanisms.

We do not model how voters choose the candidate for the legislature. Instead, we assume that either all of the citizens in a district have the same preferences or that there is single median voter in state \( i \) district \( j \), with public good preference \( m_{i,j} \), who is pivotal in deciding the election. Importantly, voters are strategic in the sense that they understand that the type of representative sent to the legislature affects the amount of public good produced. Candidates for the legislature have the same utility function as voters. There is no uncertainty over the preferences of these candidates, nor is there uncertainty over the preferences of other districts. The elected representatives choose how many units of the public good to provide based on their own preferences.

\[\text{Notice that voters do not receive utility from public goods provided in the other state. For this reason, the other state’s public good levels will play almost no role in the analysis. The model is written in this way to allow for the possibility of including state spillovers in a future version of the paper.}\]
To produce any of the units of a public good costs $p$ units of the private good. The main modeling issue is how legislators decide on public goods levels. One possibility is that legislators in need of a majority of votes form minimum-winning coalitions.\footnote{Among other papers to employ this type of legislative bargaining, see Baron and Ferejohn (1989), Volden and Wiseman (2007), and Jackson and Moselle (2002).} There are two criticisms of this approach. One, universalism is much more prevalent in legislatures than would be predicted under a minimum-winning coalition approach, possibly because legislators care about government policy’s effect on their colleagues.\footnote{See Inman and Fitts (1990).} Second, in this type of bargaining there is always uncertainty over which legislators will be included in the winning coalition. This means legislators can do better than their expected continuation value for the bargaining game by cooperating and forming binding agreements. A natural alternative, then, is to assume the legislature behaves cooperatively as in the political economy approach of Besley and Coate (2003a). That is to say, we assume each legislature chooses the levels of the public goods to maximize the social surplus of the legislators.\footnote{Without this assumption, the analysis in the next section will not go through. That being said, all one needs is some degree of cooperation to make the general results hold.}

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**Figure 1.** Direct and indirect election
3 Results

For reasons of tractability, we assume the median voters in each state have the same preference for the public good, \( m_{i,1} = m_{i,2} \).\(^{12}\) We will have more to say about this assumption in section 4. Denote the preferences of the medians in state \( i \) as \( m_i \).

Before we turn to predicted public goods levels under direct and indirect election, let us solve for the efficient levels of \( g_{i,1} \), \( g_{i,2} \), and \( g_i \). The social surplus in state \( i \) is given by,

\[
S(g_{i,1}, g_{i,2}, g_i) = m_i(w_l \ln g_{i,1} + w_n \ln g_{i,2} + w_s \ln g_i) + m_i(w_l \ln g_{i,2} + w_n \ln g_{i,1} + w_s \ln g_i) - p(g_{i,1} + g_{i,2} + g_i).
\]

Denote the efficient levels as \( g_{i,1}^*, g_{i,2}^*, \) and \( g_i^* \). They can be written,

\[
g_{i,1}^* = \frac{m_i(w_l + w_n)}{p},
\]

\[
g_{i,2}^* = \frac{m_i(w_l + w_n)}{p},
\]

\[
g_i^* = \frac{2m_iw_s}{p}.
\]

Because of public goods spillovers, the efficient level of \( g_{i,1} \) (\( g_{i,2} \)) incorporates the weighted marginal benefit to both districts from another dollar to \( g_{i,1} \) (\( g_{i,2} \)). Notice that if \( w_n = 0 \) the efficient level is solely a function of the marginal benefit and marginal cost to the district which receives the public good. Combined district spending should be higher than federal spending in state \( i \) only if \( w_l + w_n > w_s \).

Next we find the levels of spending chosen at the state and federal levels for legislators with given preferences for the public good. Suppose \( \lambda_{i,1} \) and \( \lambda_{i,2} \) are elected by voters in state \( i \) in districts 1 and 2, respectively, to the state legislature. The state legislators choose \( g_{i,1} \) and \( g_{i,2} \) to maximize their social surplus,

\[
\sum_{j \in \{1,2\}} \left\{ \lambda_{i,j} \left( w_l \ln g_{i,j} + w_n \ln g_{i,-j} \right) - p \left( \frac{g_{i,1} + g_{i,2}}{2} \right) \right\}.
\]

Spending on state \( i \) district \( j \) is,

\[
g_{i,j} = \frac{\lambda_{i,j}w_l + \lambda_{i,-j}w_n}{p}.
\]

Note that these are the same as \( g_{i,1}^* \) and \( g_{i,2}^* \) if voters do not behave strategically, that is, \( \lambda_{i,1} = m_i \) and \( \lambda_{i,2} = m_i \).

\(^{12}\)Work is ongoing to solve the more general version of the model.
Similarly, legislators at the federal level maximize their combined social surplus. Suppose \( \lambda_A \) and \( \lambda_B \) are elected by states \( A \) and \( B \). Each legislator can be thought of as a citizen in one of the four districts so that the marginal cost of an additional dollar of federal spending is 1/4. The federal legislators choose \( g_A \) and \( g_B \) to maximize,

\[
\sum_{i \in \{A, B\}} \left\{ \lambda_i (w_s \ln g_i) - p \left( \frac{g_A + g_B}{4} \right) \right\}.
\]

This implies that legislators \( \lambda_A \) and \( \lambda_B \) choose

\[
g_i = \frac{2\lambda_i w_s}{p}.
\]  

These values are also efficient if the districts select legislators with \( \lambda_i = m_i \).

### 3.1 Direct Election

Voters understand how their choice of representative is mapped into state public spending, which is given by equation (5). For the median voter in state \( i \) district \( j \) it is only a matter of choosing \( \lambda_{i,j} \) to maximize her utility. Denote \( R_{i,j}(\lambda_{i,-j}) \) as the best response for the median in district \( j \) given the preferences of the legislator elected by the other district in the state. An equilibrium is a pair of representative types, \((\lambda_{i,1}, \lambda_{i,2})\) for districts in state \( i \), such that neither median voter can improve her payoff by choosing a representative of a different type. That is, an equilibrium requires \( R_{i,1}(\lambda_{i,2}) = \lambda_{i,1} \) and \( R_{i,2}(\lambda_{i,1}) = \lambda_{i,2} \).

**Lemma 1.** Suppose federal legislators are elected directly. In state \( i \) the preferences of legislators elected to the state legislature are\(^{13}\)

\[
\lambda^d_{i,1} = \lambda^d_{i,2} = \lambda^d_{i,j} = 2m_i \left( \frac{w^2_l + w^2_n}{(w_l + w_n)^2} \right).
\]

The amount of state level public goods spending is,

\[
g^d_{i,1} = g^d_{i,2} = g^d_{i,j} = 2m_i \left( \frac{w^2_l + w^2_n}{(w_l + w_n)^2} \right) \left( \frac{w_l + w_n}{p} \right).
\]

**Proof.** Consider the median voter in state \( i \) in district 1 with public goods preference \( m_{i,1} \). We maximize her utility over her choice of state representative, \( \lambda_{i,1} \), to get her best response,

\(^{13}\)We use a \( d \) superscript to denote direct election and an \( id \) superscript to denote indirect election.
\[ R_{i,1}(\lambda_{i,2}) : \]
\[
\max_{\lambda_{i,j}} m_{i,j} \left\{ w_l \ln \left( \frac{\lambda_{i,j} w_l + \lambda_{i,-j} w_n}{p} \right) + w_n \ln \left( \frac{\lambda_{i,j} w_n + \lambda_{i,-j} w_l}{p} \right) \right\} \\
- \frac{p}{2} \left( \frac{\lambda_{i,j} w_l + \lambda_{i,-j} w_n + \lambda_{i,j} w_n + \lambda_{i,-j} w_l}{p} \right).
\]

This voter gets utility from both state level public goods, weighted by the degree of spillovers, and she only pays half of the cost of public spending since the other district picks up the remainder. The first-order condition is,

\[
0 = \frac{m_{i,1} w_l^2}{\lambda_{i,1} w_l + \lambda_{i,2} w_n} + \frac{m_{i,1} w_n^2}{\lambda_{i,1} w_n + \lambda_{i,2} w_l} - \frac{w_l + w_n}{2}.
\]

Doing the same maximization for \( m_{i,2} \), substituting \( m_{i,1} = m_{i,2} = m_i \), solving for the best responses, and finding their intersection yields the values of \( \lambda_{i,1} \) and \( \lambda_{i,2} \) in the proposition.

The level of state public goods spending is found by substituting the equilibrium values of \( \lambda_{i,1} = \lambda_{i,2} \) into equation (5).

This is a version of Lemma 3 in Besley and Coate (2003a), modified to fit our assumption of homogeneous median district preferences and the inclusion of a federal public good. The term in brackets in the equation for \( \lambda_{i,j}^d \) is between 1/2 and 1. This means the equilibrium public good preference for state legislators is at least as high as the median’s preference and could be up to two times \( m_i \) under direct election. The latter case occurs when there are no public goods spillovers (\( w_n = 0 \)). The reason this leads to the greatest preference exaggeration is that a district’s representative has no effect on the level of public good provided in the other district. Thus, she can be free to inflate her representative’s preference without having to pay more for the neighboring public good. This is not the case as spillovers increase. Consider the extreme case when \( w_l = w_n \) and voters value both state level public goods equally. Now a higher value of \( \lambda_{i,j} \) increases both districts’ state level public goods equally so that the cost is double what it was with zero spillovers. The result is that the term in brackets in the equation of \( \lambda_{i,j}^d \) is 1, medians elect representatives with the same preference, and the efficient outcome is reached.

Not only is the preference of the state legislator between one and two times that of the median voter, but the amount of state public goods spending is also between one and two times what is efficient. Using the logic above, public goods spending is efficient if \( w_l = w_n \) and it is twice the efficient level when spillovers are zero, \( w_n = 0 \).

We use a similar approach to find the optimal legislator choice to the federal government under direct election. A rational voter in state \( i \) understands that the federal public goods levels are determined by equation (6). The difference now is that each voter only pays 1/4
of the cost of a dollar spent on each public good since the tax base is larger with federal public goods spending. In addition, because there are no spillovers across state lines, the median’s choice does not depend on the legislator elected from the other state. For the election in state $i$, the type of legislator chosen should reflect the preferences of the median voter in the state. Note that since the median preferences of districts 1 and 2 are the same ($m_i$), the median of the state as a whole will also be $m_i$.

**Lemma 2.** Suppose federal legislators are elected directly. In state $i$ the preference of the legislator elected to the federal legislature is $\lambda_i^d = 2m_i$. The federal public goods level is $g_i^d = 4m_iw_s/p$.

**Proof.** Consider the median voter in state $i$ with public goods preference $m_i$. We maximize her utility over her choice of federal representative, $\lambda_i$:

$$
\max_{\lambda_i} m_iw_s \ln \left( \frac{2\lambda_iw_s}{p} \right) - \frac{p}{4} \left( \frac{2\lambda_iw_s}{p} \right) - \frac{p}{4} \left( \frac{2\lambda_{-i}w_s}{p} \right).
$$

The first-order condition is,

$$
\frac{\partial U_i}{\partial \lambda_i} = 0 = \frac{m_iw_s}{\lambda_i} - \frac{w_s}{2}.
$$

Solving for $\lambda_i$ yields $\lambda_i = 2m_i$. Substituting this into equation (6) for $g_i$ gives the equation above.

Under direct election to the federal legislature the median voter chooses a representative who has twice as strong a preference for the public good, and federal spending is twice the efficient level. One way to compare the degree of preference exaggeration in Lemmas 1 and 2 is to ask how much more public good is produced than the districts would provide if they had to fund the full cost themselves. In the case of state level public goods, if $w_n = 0$ then $g_{i,j}^d = 2m_iw_l/p$ while a district funding its own public good would produce half of that amount, $w_lm_i/p$. In the case of federal level public goods, $g_i^d = 4m_iw_s/p$ while a district funding the public good alone would only provide a quarter of this amount, $m_iw_s/p$. Spreading the cost over more districts means more public goods spending than if the cost were borne directly by the district.

### 3.2 Indirect Election

With indirect election voters elect state representatives who in turn elect federal representatives. In order to solve for the voter’s choice of state representative, we first need to know what type of federal legislator is appointed by the state legislature. Consider state $i$ and suppose legislators with preferences $(\lambda_{i,1}, \lambda_{i,2})$ are elected by the districts. As with public
goods levels, we assume the legislature maximizes the joint surplus of its members by choosing \( \lambda_i \). Using equation (6) for the level of \( g_i \) chosen by legislators with given preferences for public spending, the state legislators’ problem is,

\[
\max_{\lambda_i} \left( \lambda_{i,1} + \lambda_{i,2} \right) \left\{ w_s \ln \left( \frac{2\lambda_i w_s}{p} \right) \right\} - \frac{p}{4} \left( \frac{2\lambda_i w_s}{p} \right) - \frac{p}{4} \left( \frac{2\lambda_i w_s}{p} \right).
\]

The solution is to choose \( \lambda_i = \lambda_{i,1} + \lambda_{i,2} \). Equation (6) implies that \( g_i = 2(\lambda_{i,1} + \lambda_{i,2})w_s/p \) which according to Lemma 2 is the same amount of federal public good for state \( i \) as under direct election provided that the median voters in districts 1 and 2 do not behave strategically. To the extent that they exaggerate their preferences for public spending, however, federal spending will be higher under indirect election.

Forward-looking voters now have a more complicated choice to make. Their choice of state representative determines not only the amount of state level public goods, but it also affects the type of legislator appointed to serve in the federal government. Recall that under direct election, a voter wanted a federal representative with twice as large a preference for public spending but a state representative with between 1 and 2 times the voter’s preference. Note that if the districts still appoint the same type of state representative, the state legislature chooses a federal representative by summing the legislators’ preferences so that the preferences of the federal legislator are at least twice the district’s preference (and likely higher). This incentivizes districts to decrease the extent to which they exaggerate their preference for public spending when electing a state legislator.

For the median voter in state \( i \) district \( j \), she now has only one instrument, \( \lambda_{i,j} \), to control two levels of spending. As before, denote \( R_{i,j}(\lambda_{i,-j}) \) as the best response for the median in district \( j \) given the preferences of the legislator elected by the other district in the state. An equilibrium is a pair of representative types, \( (\lambda_{i,1}, \lambda_{i,2}) \) for districts in state \( i \), such that neither median voter can improve her payoff by choosing a representative of a different type.

**Lemma 3.** Suppose federal legislators are elected indirectly. In state \( i \) the preferences of legislators elected to the state legislature are

\[
\lambda_{i,1}^{id} = \lambda_{i,2}^{id} = \lambda_{i,j}^{id} = 2m_i \left( \frac{w_l^2 + w_n^2}{(w_l + w_n)} + \frac{w_s}{2} \right),
\]

and the state level public goods are

\[
g_{i,1}^{id} = g_{i,2}^{id} = g_{i,j}^{id} = 2m_i \left( \frac{w_l^2 + w_n^2}{(w_l + w_n)} + \frac{w_s}{2} \right) \left( \frac{w_l + w_n}{p} \right).
\]
The preference of the legislator appointed by the state legislature to the federal legislature is

\[ \lambda_i^{id} = 4m_i \left( \frac{w_l^2 + w_n^2}{w_l + w_n} + \frac{w_s}{2} \right), \]

and the federal level of public good is

\[ g_i^{id} = \left( \frac{4m_i w_s}{p} \right) \left\{ 2 \left( \frac{w_l^2 + w_n^2}{w_l + w_n} + \frac{w_s}{2} \right) \right\}. \]

**Proof.** For the median in state \( i \) district 1, \( R_{i,1}(\lambda_{i,2}) \) is the solution to the maximization problem,

\[
\max_{\lambda_{i,1}} m_{i,1} \left\{ w_l \ln \left( \frac{\lambda_{i,1} w_l + \lambda_{i,2} w_n}{p} \right) + w_n \ln \left( \frac{\lambda_{i,1} w_n + \lambda_{i,2} w_l}{p} \right) + w_s \ln \left( \frac{2w_s(\lambda_{i,1} + \lambda_{i,2})}{p} \right) \right\} \\
- \frac{p}{4} \left( \frac{\lambda_{i,1} w_l + \lambda_{i,2} w_n + \lambda_{i,1} w_n + \lambda_{i,2} w_l}{p} \right) - \frac{p}{4} \left( \frac{2w_s(\lambda_{i,1} + \lambda_{i,2})}{p} \right).
\]

The first-order condition is,

\[ 0 = \frac{m_{i,1} w_l^2}{\lambda_i,1 w_l + \lambda_i,2 w_n} + \frac{m_{i,1} w_n^2}{\lambda_i,1 w_n + \lambda_i,2 w_l} + \frac{m_{i,1} w_s}{\lambda_i,1 + \lambda_i,2} - \frac{w_l + w_n + w_s}{2}. \]

Doing the same maximization for the median in district 2, substituting \( m_{i,1} = m_{i,2} = m_i \), solving for the best responses, and finding their intersection yields the values of \( \lambda_{i,1} \) and \( \lambda_{i,2} \) in the proposition. We then insert this into equation (5) to get state public goods levels. The preferences of the legislature appointed to the federal legislature are the sum of these state legislator preferences, and the corresponding level of the federal public good is given by equation (6).

As in Lemma 1, it is clear these are not the efficient amounts of state or federal public goods. Looking at the preferences of the state legislator, it is easy to show that the term in brackets in the equation for \( \lambda_{i,j}^{id} \) lies in the closed interval between 1/2 and 1. Just as in the direct election case, voters elect state representatives with preferences for public spending at least as great as their own, and up to two times their own preference. Comparing \( \lambda_{i,j}^{id} \) to \( \lambda_{i,j}^d \), it is straightforward to show that \( \lambda_{i,j}^{id} \leq \lambda_{i,j}^d \). The two are equal only if voters do not care about the public good, \( w_s = 0 \), or voters care equally about state public goods in their own district and the neighboring district, \( w_l = w_n \). The upshot is that \( g_{i,j}^{id} \leq g_{i,j}^d \).

The difference in the public goods preferences of the federal legislators is even starker. Recall that \( \lambda_i^d = 2m_i \) in the direct election case. Because the bracketed term in the equation for \( \lambda_i^{id} \) is between 1/2 and 1, the preference of the federal legislator in the indirect case is between 2 and 4 times as great as the median’s preference. This increases federal spending.
under indirect election. We formalize these results in a proposition.

**Proposition 1.** Suppose the assumptions of the model are satisfied and the median voters in each state have the same public goods preferences.

1. If $w_s = 0$ then state level public goods spending is the same under direct or indirect election. Federal public goods spending is higher under indirect election.

2. If $w_l = w_n$ then state and federal public goods spending is the same under both direct and indirect election.

3. If $w_s > 0$ and $w_l > w_n$ state public goods spending is lower and federal public goods spending is higher under indirect election.

### 3.3 Example with No Spillovers

The differences between direct and indirect election can be seen easily within a simple case of the model. Suppose the districts have identical preferences for the public good, $m_{i,1} = m_{i,2} = m_i$, and suppose there are no spillovers, $w_n = 0$. The efficient levels of state and federal spending are $g_{i,j}^* = m_i w_l/p$ and $g_i^* = 2m_i w_s/p$, respectively.

Under direct election voters are free to exaggerate their preferences when electing legislators because those legislators do not increase spending in other states or districts. Voters elect legislators with public goods preferences twice their own, and $g^d_{i,j} = 2m_i w_l/p = 2g_{i,j}^*$. They do the same at the federal level where $g_i^d = 4m_i w_s/p = 2g_i^*$. State and federal spending are twice as high as what is efficient under direct election.

With indirect election voters face a trade-off: they desire to appoint a state representative with strong preferences to get the state public goods they want, but doing so will result in a federal legislature run by legislators with extremely high public goods preferences who fund too much federal public good. How the voters manage this trade-off will depend on their preferences for state and federal public goods. It is easy to show that under indirect election $g^d_{i,j} = (1 + w_l)m_i w_l/p \leq g^d_{i,j}$, and $g_i^d = 4m_i w_s(1 + w_l)/p \geq g_i^d$. Indirect election raises federal spending but lowers state spending.

It is not obvious what should happen to total welfare when comparing direct and indirect election. Indirect election means state spending is closer to the efficient level but federal spending is farther from its efficient level.\(^\text{(14)}\) In this example, it can be shown that direct election results in higher total welfare.

Finally, comparative statics over the differences in spending between direct and indirect election can be easily analyzed. Increasing the weight on state level public goods, $w_l$, in the

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\(^{14}\)In this model the difference in state spending between the two mechanisms is smaller than the difference in federal spending, which works against indirect election. Work is ongoing to clarify which mechanism results in higher welfare.
utility function (and therefore decreasing $w_s$) will always drive up state level public goods spending and drive down federal spending in both voting mechanisms. However, spending rises and falls at different rates. Using the equilibrium spending levels, one can show that

$$\frac{\partial g_i^d}{\partial w_l} = -8m_3w_l = (2w_l) \frac{\partial g_i^d}{\partial w_l}$$

$$\frac{\partial g_{i,j}^d}{\partial w_l} = \left(\frac{m_i}{p}\right) (1 + 2w_l) = \left(\frac{1 + 2w_l}{2}\right) \frac{\partial g_{i,j}^d}{\partial w_l}.$$

For both public goods, the rate at which spending changes under indirect election is slower than under direct election when $w_l < 1/2$ and faster when $w_l > 1/2$. The idea is that the voter is more constrained under indirect election because increasing the preference of the state legislator when $w_l$ increases will raise the amount spent at the federal level. Therefore, increasing $w_l$ when it is low does not entice the voter to change her behavior much under indirect election because she does not care much for the state level public good anyway. The opposite is true when $w_l$ is large, which makes her quicker to elect a state representative who cares more for the public good.

4 Discussion

This paper solves a simple theoretical model to compare government spending at state and federal levels under direct and indirect election of federal legislators. Assuming that the median voters in each district within a state have homogeneous preferences for public spending, we show that indirect election leads to weakly higher federal spending and weakly lower state spending than direct election. The spending levels are only equal when spillovers from public goods within a state are maximized and voters care equally about the state public good in their district and the neighboring district.

Three assumptions in the model are worth further comment. First, we assume $g_i$ benefits everyone in state $i$. To the extent that the federal government provides projects everyone can enjoy (e.g., a highway or railway) this is a reasonable assumption, but if the government can target public goods to the districts then the model must be modified.\textsuperscript{15} Second, we assume there are no public good spillovers across state borders. Modifying preferences to include such spillovers is possible, and the effect will be to lower the amount of strategic delegation to the federal legislature. The reason is that appointing a federal legislator with higher $\lambda$ will mean more public good for the voter’s state and the other state which increases the cost borne by the voter. Third, median voters of districts within a state have

\textsuperscript{15}This modification does not affect the flavor of the results in Section 3. In fact, if federal public goods are only targeted to specific districts within a state, the results should be even cleaner.
Introducing heterogeneity among the voters in a state complicates the analysis because districts with higher (lower) public goods preference will find that the legislature underprovides (overprovides) the public good relative to what they want. This can induce the median with high public goods preference to greatly exaggerate her preference upward, while the median with low public goods preference responds by exaggerating her preference downward. It is not yet clear exactly how heterogeneity will affect the results in Proposition 1, though it is likely to affect the results only when districts’ preferences are very different.

The model in the paper captures some of the important aspects of state and federal spending, but there is more to investigate with regards to direct and indirect election. For example, the federal legislature only provides public goods in the model while in reality they have the ability to also mandate the states to enact certain policies. If those mandates do not come with federal dollars attached (“unfunded mandates”) then this may decrease the state’s welfare. To the extent that indirect election would reduced unfunded mandates as its proponents argue, this could affect which mechanism is desirable from a social point of view.

References


\textsuperscript{16}At the same time, the fact that state A must comply with a mandate could increase the welfare of state B.


