Bargaining and vetoing*

Hankyoung Sung
The Ohio State University

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Abstract

This paper studies the bargaining game between the president and the congress when these two players have conflicting claims to a fixed amount of resources. I distinguish between situations of "pure divided government", that is when the congress is united "against" the president, and the situations of "impure divided government", that is when the congress itself is divided (equal power of the two parties). The pure divided government case can be represented as a bilateral bargaining game, whereas the impure case needs to be represented as a three-player game. In both situations we assume the president is a veto player, who can exercise veto power only a finite number of times, consistent with the real US constitutional constraints. I will show the consequences of these modelling choices for the equilibrium payoffs of the various players, and I will suggest interesting consequences for the optimal timing choice by the congress, i.e. for the optimal time to make an offer that needs the approval of the president. In addition, I will estimate my conjectures using the States data as an emprical application.

1 Introduction

The legislative bargaining game is one of the most popular issues in political economics. Many studies on the legislative bargaining game focus on the power or influence of the proposer or weighted players (Baron and Ferejohn, 1989; Harrington, 1990; Snyder, Ting and Ansolabehere, 2003). However, many of them stick to the power to initiate bills, and only a few papers on legislative bargaining discuss the veto right which is one of the most effective privileges for the president in a country in the legislative bargaining game between presidential party that includes president in the country and others in congress (Winter,1996; McCarty, 2000). This paper introduces the legislative bargaining models with a veto player but some distinctions from the previous research. First, the models we will show adopt a different recognition rule from those about the veto right

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in that the models in this paper adopt an alternating recognition rule for the role of a proposer (Rubinstein,1982). The random recognition rule, where the players who introduce bills being recognized randomly with the same chances, and commonly adopted for the legislative bargaining games, may be appropriate for a legislative bargaining game in the committee. However, in a real bargaining game like that between the president and congress in a country the alternating recognition rule is more plausible than the random recognition rule because the chance to introduce bills are not random, and its bargaining process after the introduction of bills is more interactive between players. Second, unlike other games with a veto player the veto right of this model is strictly restricted to a limited use; since the veto right results in a large benefit to the players who can exercise the veto right, it is commonly restricted as the proposal right is not concentrated on one player in the real legislative bargaining (Winter, 1996; McCarty, 2000).

This paper shows how restriction of the veto right affects the structure of an infinite horizon in the dollar dividing bargaining game under the alternating recognition rule. Then, it argues that the degree of division in government determines the number of bills the President of the United States has to confirm in the stationary subgame perfect Nash equilibria of the bargaining game.

The models in this paper use a single veto player and one or two non-veto players. Unlike most legislative bargaining models, players in the models are idiosyncratic. The President has the veto right that blocks the passage of the agenda but does not have a right to introduce bills while senators or representatives do not have veto power but can introduce bills according to the US Constitution. However, in the model of this paper, the veto player could have a right to propose bills because the veto player consists of the president and the presidential party or his allies in the Congress. Thus veto and non-veto players have chances to make offers in proportion to the seats occupied in the Congress, though the veto player's proposal right is always less than the non-veto players' proposal right[1].

This model describes two kinds of infinite horizon bargaining games: the multilateral and bilateral game. For simplicity, I consider only a three player version of the multilateral game. There are two non-veto players that behave non-cooperatively like a Congress that is divided into the House and Senate; each of which is controlled by a different party. There is one veto player in this multilateral game, who consists of the President and his fellow congressmen. All players in the multilateral game have one vote. When non-veto players can initiate the agendas, the proposal right in the first period is given to one of the non-veto players with equal probability. By the alternating recognition rule the veto player can propose bills in the next period. Thus, a veto player can propose his bill every even period, and the non-veto player every odd period. When a veto player initiates bills, the veto player proposes every odd period and non-veto players propose every even period. The non-veto player is determined as a

[1] If the veto player's proposal right is larger than the nonveto player, it is more like a 'dictatorship'.

proposer by one in two chances. On the other hand, in the bilateral bargaining game representing the purely divided government case where the Congress is united, the two non-veto players act like a single player. In the bilateral game the veto player consists of the President and his party, which is a minority in the Congress. The non-veto player, the majority party, has two votes, which means that it is actually equivalent to a player with an unlimited veto power.

This paper first proves that the infinite horizon game with a veto player whose veto right expires after some specific finite period has the same payoff structures as the finite horizon game with a veto player whose veto right does not expire in both multilateral and bilateral games. In other words, the restriction of the veto right changes the infinite horizon game into the finite horizon game. The payoffs of the players under the limited veto right depends on the three rights in the model; the veto right, the right to initiate agendas, and the right to propose the agenda in the last period.

With these results, we make some conjectures about the relationship between the degree of divided government and the introduction of bills in the US. This paper tests the conjecture discussed above using data from the Eisenhower and Clinton administration to test the bilateral game, while the multilateral game is applied to the Reagan data. In addtion, using State government data, we estimate the effect of the division of government on the bill production in the States.

In previous research, Baron and Ferejohn (1989) introduce noncooperative legislative bargaining games in the finite and infinite horizon with closed or open agenda amendment rules. This paper shows that being a proposer always bring better payoffs for the players. In contrast with this paper, Baron and Ferejohn assume identical players in the game. Every player has an equal chance to be a proposer, thus their the ex ante expected payoff is the same. The models of this paper have some similarities with Winter (1996) in that both papers discuss dividing a dollar voting game that includes a player with a legitimate veto right. However, Winter adopts the random recognition rule[2]. Winter (1996) assumes that the veto right is like that of a permanent member in the UN Security Council and does not expire. McCarty (2000) discusses a setting similar to this paper. He suggests a veto right that can be overridden by a 'super-majority'. However, the veto right of McCarty originates from the multiple votes whereas the veto right in this paper is given to the veto player irrespective of the number of votes the player controls although the two-vote player in the bilateral game does have a veto right through majority votes. Primo (2002) constructs a model in which only one player has proposal rights that could result in indefinite numbers of proposals. He shows that neither time preferences nor the number of periods have an effect on the equilibrium outcome. So his result is identical to Romer and Rosenthal (1978). This paper assumes, however, that the President has a proposal right although he or she cannot bring bills up to the table. It can be supported by the fact that the President expresses his opinion about the

[2] The recognition rule of Winter(1996) is different from that of Baron and Ferejohn(1989), because a proposer is randomly chosen from the winning coalitions after the winning coalition is chosen randomly in Winter(1996)

bill before it comes to him.[3]

In experimental work on the legislative bargaining game, Frechette, Kagel and Lehrer (2003) provide the results of an experiment on Baron and Ferejohn. Their experimental work shows qualitative similarities but quantitative differences with Baron and Ferejohn (1989)'s predictions in that more share for proposers, the convergence toward minimal winning coalitions under the closed amendment rule, and delays and egalitarian distributions of benefit under the open rule are observed. However, more frequent formation of minimal winning coalitions under the closed rule and more egalitarian distribution than Baron and Ferejohn are shown.

Frechette, Kagel and Morelli (2003) finds more support for Gamson's law (1961) than the proposal right in Baron and Ferejohn (1989) by comparing the effect of weighted votes in Gamson's law (1961) with the proposal right in Baron and Ferejohn (1989).

This paper proceeds as follows. The next section presents the models. Section 3 discuss the application. Conclusions and directions for future research are discussed in Section 4.

2 Model 1: Limited veto right

2.1 The multilateral bargaining game

As a multilateral bargaining game, this paper considers a three player dollar dividing game. One of the three players is uniquely allowed to exercise his own veto right on agendas a finite number of times .This game may reflect divided government in that the veto player is like the President with some of his party members in Congress who make offers for him, and the other non-veto players, are like opposing parties each of whom is a majority in either the House or Senate.

The procedure of the game is as following: provided that non-veto players can make a proposal about the division of a dollar, each of the two non-veto players has a chance to make an offer in period 1 with probability $\frac{1}{2}$. If the majority of the players, including the veto player, vote for the offer, it is accepted and the dollar is divided as proposed. Otherwise, the game moves on to a new period.

By the alternating recognition rule the veto player makes an offer in period 2. If a winning majority is formed, the game is over and the pie is distributed as proposed by the veto player. If not, the game moves on again. Because the veto player includes some Congressmen affiliated with the President, the veto player proposes bills every odd period and one of the non-veto players proposes bills with probability $\frac{1}{2}$ every even period if the veto player proposes in period 1. We assume that the game continues until players form a winning majority coalition. Before the veto right expires, the winning majority coalitions have

[3] If the veto player does not have any proposal right, his expected payoff is 0.

to include the veto player. It is, however, not necessary once the veto right is invalid.

The veto player takes the whole dollar unless the veto right is restricted according to Winter (1996). Thus in the real world most veto rights are not absolute like that at the Security Council in the United Nations. The President of the United States may exercise his veto right against the proposal but the veto right can be overridden by the Congress.

In this paper it is shown that the restriction of the veto right means the 'deadline' in the bargaining.[4]

Proposition 1. *For a three player infinite horizon game when the veto player can use his veto right within a period γ under the alternating recognition rule on the stationary subgame perfect equilibrium (hereforth, SPNE),*

(1) *If one of non-veto players introduces an offer when γ is odd, the non-veto player offers*

$$\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma}(1-k(\delta)) \tag{1}$$

to the veto player and gets

$$1-\left(\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma}(1-k(\delta))\right) \tag{2}$$

at period 1, and the veto player accepts it , where $k(\delta)=\frac{\delta}{2}$.[5]

(2) *If the veto player introduces an offer when γ is odd, the veto player offers*

$$1-\left((1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma-1}(1-k(\delta))\right) \tag{3}$$

to one of the nonveto players and gets

$$(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma-1}(1-k(\delta)) \tag{4}$$

at period 1, and the non-veto player accepts it where $k(\delta)=\frac{\delta}{2}$.[6]

(3) *If there is no discount of a total benefit, $\delta=1$, the expected payoff for the veto player is always $\frac{1}{2}$ and that of nonveto player is always $\frac{1}{4}$ without regard to γ*

Proof of Proposition 1.

[4] Winter(1996) discuss 'deadline' as the most plausible treatment to reduce the absolute veto right. The limitation of the veto right this paper suggests may be another treatment.

[5] When γ is even, γ is replaced by $\gamma-1$

[6] When γ is even, γ is replaced by $\gamma+1$

(1) and (2) can be verified by Lemma 1 and 2. (3) is a special case of (1) and (2)

Lemma 1. *Consider a three player infinite horizon bargaining game with the discounting factor $\delta \in [0,1]$. Assume that player 1 makes offers at every odd period and the player 2 and 3 have proposal rights in the even periods. In the SPNE, the proposer, player 1, forms a winning coalition with one of the other players, by offering that player $\frac{1}{2}\delta$ and himself $\frac{2-\delta}{2}$. Therefore, the expected payoff of the veto player is $\frac{2-\delta}{2}$ and that of the non-veto player is $\frac{\delta}{4}$.*

The proof of lemma 1)

Since player 2 and 3 has less chances being a proposer than player 1, their continuation value is lower than player 1's. This leads player 2 and 3 to make a winning majority coalition by themselves when one of them makes an offer. On the SPNE player 1 knows at period 1 that player 2 and 3 would make the winning majority coalition at period 2.

At period 2, the expected payoff for player 2 or 3 is

$$\frac{1}{2}(1-\varepsilon), \tag{5}$$

where ε is a benefit for another nonproposer, player 2 or 3.

Then, at period 1, player 1 offers one of player 2 and 3

$$\frac{1}{2}\delta(1-\varepsilon) \tag{6}$$

and gets

$$1-\frac{1}{2}\delta(1-\varepsilon) \tag{7}$$

As ε goes to 0, the expected payoff for player 1 is

$$1-\frac{1}{2}\delta \tag{8}$$

and that of player 2 and 3 is

$$\frac{1}{4}\delta \tag{9}$$

QED(for lemma 1).

Lemma 2. *Consider a three player game like Lemma 1, but player 1 in Lemma 2 has the veto right on the agenda in the following games. In addition, these are finite games, and end by the veto player's proposal.*

(i) *If one of the non-veto players propose bills at every odd period and the veto player has proposal rights at the even periods in the game with an even and finite horizon T, then in the SPNE the expected payoff for the veto player is*

$$\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{T-2}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{T-2}{2}}}\delta^{T-1}(1-k(\delta)) \tag{10}$$

and the expected payoff for nonveto players is

$$\frac{1}{2}\left(1-\left(\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{T-2}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{T-2}{2}}}\delta^{T-1}(1-k(\delta))\right)\right) \tag{11}$$

(ii) *If one of the non-veto players propose bills at every even period and veto player has proposal rights at the even periods in the game with an odd and finite horizon T, then in the SPNE the expected payoff for the veto player is*

$$(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{T-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{T-1}{2}}}\delta^{T-1}(1-k(\delta)) \tag{12}$$

and the expected payoff for nonveto players is

$$\frac{1}{2}\left(1-\left((1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{T-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{T-1}{2}}}\delta^{T-1}(1-k(\delta))\right)\right), \tag{13}$$

where $k(\delta)$ is the payofff of a non-veto player who is in the winning majority coalition at the final period.

Proof of lemma 2) By backward induction, we can build the veto and nonveto players payoffs.

In (i), the veto player 's payoff is

$$\delta-\frac{1}{2}\delta^2+\frac{1}{2}\delta^3-\frac{1}{4}\delta^4+\frac{1}{4}\delta^5-\cdots+\frac{1}{2^{\frac{T-2}{2}}}\delta^{T-1}-\frac{1}{2^{\frac{T-2}{2}}}\delta^{T-1}k(\delta) \tag{14}$$

and nonveto players' expected payoff is

$$\frac{1}{2}\left(1-\left(\delta-\frac{1}{2}\delta^2+\frac{1}{2}\delta^3-\frac{1}{4}\delta^4+\frac{1}{4}\delta^5-\cdots+\frac{1}{2^{\frac{T-2}{2}}}\delta^{T-1}-\frac{1}{2^{\frac{T-2}{2}}}\delta^{T-1}k(\delta)\right)\right) \tag{15}$$

In (ii), the veto player 's payoff is

$$1-\frac{1}{2}\delta+\frac{1}{2}\delta^2-\frac{1}{4}\delta^3+\frac{1}{4}\delta^4+\cdots+\frac{1}{2^{\frac{T-1}{2}}}\delta^{T-1}-\frac{1}{2^{\frac{T-1}{2}}}\delta^{T-1}k(\delta) \tag{16}$$

and nonveto players' expected payoff is

$$\frac{1}{2}\left(1-\left(1-\frac{1}{2}\delta+\frac{1}{2}\delta^2-\frac{1}{4}\delta^3+\frac{1}{4}\delta^4+\cdots+\frac{1}{2^{\frac{T-1}{2}}}\delta^{T-1}-\frac{1}{2^{\frac{T-1}{2}}}\delta^{T-1}k(\delta)\right)\right) \tag{17}$$

QED(for lemma 2)

(1) When one of nonveto players introduces a bill.
We limit our arguments to the SPNE

In this proof, we want to show the game in Proposition 1 can be divided into subgames before and after the veto right expires, and those are the same game shown in Lemma 1 and 2.

First, the subgame after the expiration of the veto right starts by the proposal of the veto player. The veto right may expire when the veto player proposes bills and when nonveto players propose bills. However, there is no difference for players whether the veto right expires at the period the veto player makes an offer or the previous period that one of non-veto player makes an offer as long as the veto right expires at the next period, because the veto player does not use his veto right when he proposes bills. Then, players' payoffs at $\gamma = t$ are the same as those $r = t-1$ if γ is an even number, and those at $\gamma = t$ are same as those at $r = t+1$ if γ is an odd number. Therefore we may conclude that the subgame after the expiration starts from the period the veto player proposes, and is identical to the game in Lemma 1.

Second, we may consider the very first period at the subgame after the expiration of the veto right like that in Lemma 1 to be the final period of the finite game like that in Lemma 2. Under the SPNE path, the game in Lemma 1 ends at period 1 by the offer of the veto player. If we consider payoffs at this period 1 in the game in Lemma 1 to be $k(\delta)$ and $1-k(\delta)$ in Lemma 2, the game in Proposition 1 can be changed as the form in Lemma 2.

Then, by Lemma 2, note that the player 1's expected payoff when γ is odd is

$$\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma}(1-k(\delta)) \tag{18}$$

and player 2's expected payoff is

$$\frac{1}{2}\left(1-\left(\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma}(1-k(\delta))\right)\right), \tag{19}$$

where $k(\delta) = \frac{\delta}{2}$.

And the player 1's expected payoff when γ is even is

$$\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-2}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-2}{2}}}\delta^{\gamma-1}(1-k(\delta)), \tag{20}$$

and player 2's expected payoff is

$$\frac{1}{2}\left(1-\left(\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-2}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-2}{2}}}\delta^{\gamma-1}(1-k(\delta))\right)\right), \tag{21}$$

where $k(\delta) = \frac{\delta}{2}$.

(2) When the veto player introduces a bill.

Still the subgame after the expriation of the veto right has the same game in Lemma 1. The arguments are similar to (1).

Then, by Lemma 2, note that the player 1's expected payoff when γ is odd is

$$(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma-1}(1-k(\delta)) \tag{22}$$

and player 2's expected payoff is

$$\frac{1}{2}\left(1-\left((1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma-1}(1-k(\delta))\right)\right), \tag{23}$$

and note that the player 1's expected payoff when γ is even is

$$(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma}{2}}}\delta^{\gamma}(1-k(\delta)) \tag{24}$$

and player 2's expected payoff is

$$\frac{1}{2}\left(1-\left((1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma}{2}}}\delta^{\gamma}(1-k(\delta))\right)\right) \tag{25}$$

QED(Proposition 1)

Remark *Now that the veto player can initiate proposals with probability α, his expected payoff is*

$$\alpha((1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma-1}(1-k(\delta))) \tag{26}$$

$$+(1-\alpha)(\delta(1-\frac{1}{2}\delta)\left(\frac{1-\left(\frac{1}{2}\delta^2\right)^{\frac{\gamma-1}{2}}}{1-\frac{1}{2}\delta^2}\right)+\frac{1}{2^{\frac{\gamma-1}{2}}}\delta^{\gamma}(1-k(\delta))), \tag{27}$$

where $k(\delta)=\frac{\delta}{2}$.

Since the President generally can use his veto right no more than once, we consider $\gamma=1$. Then the payoff function for the veto player is shown in Figure 1.[7]

[7] Since nonveto players' payoffs is negatively related to the veto player's , it is enough to analyze only the veto player's payoff.

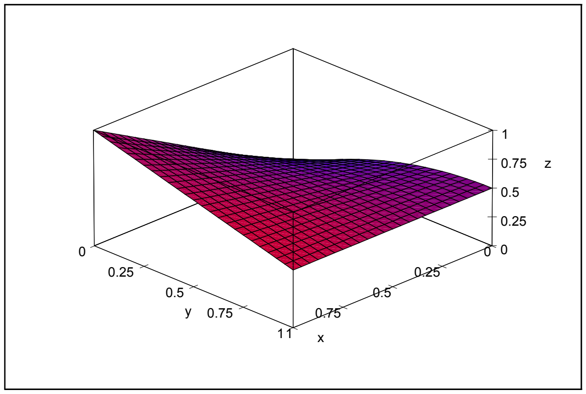

Figure 1: The veto player's payoff in the multilateral game[8]

The payoffs of the players critically depends on what kinds of rights they have in the bargaining game: There are three rights that affect the players' payoffs.

A veto right, given to the President, is more valuable with more payoff in the future. Since this game adopts the alternating recognition rule for the proposer, the veto player will be a proposer in the future with probability 1 The restriction of the veto right changes of the length of the game. More availability of the veto right enlarges the length of the game, and engender that veto player has more chances to be a proposer who would have more payoff as shown in Proposition 1. The increase of the veto player's payoff is disproportional to the restriction of his veto right.

The right to initiate bills, given to the Congressmen, is useful when more value is given to the early periods of the game. It causes the payoff of the first proposer to decrease as the discount factor δincreases. In the extreme case where the discount factor is 0, the player who introduces bills in period 1 can take all the shares if the game ends in period 1.

The last proposal right that exists in the finite horizon game, brings all of the remaining share in the last period to the player who proposes a bill in the last period. The game in Proposition 1 can be interpreted as a finite game wrapped up by the veto player's proposal if we consider the subgame after the expiration of the veto right to be the game in Lemma 1. However, in this case, the subgame would be done by the possibility of a formation of non-veto players' winning majority coalition if the veto player's offer is not satisfactory to them. Therefore, nonveto players possess the last proposal right. The payoff of the last proposer is increasing in δ.The last proposal right critically depends on how much of a share remains in the last period. If the discount factor is very small, the last proposal right is almost useless, but the game is like an ultimatum game if the discount factor is close to 1

[8] In the Figure 1 x axis is α, y axis is δ, and z axis is the veto player's payoff.

In this multilateral bargaining game the unique veto player has the first proposal right with probability α, as well as the veto right, but does not have the last proposal right. When α is small, his payoff depends on the first and last proposal of non-veto players. His payoff is then increasing in the first proposal right and decreasing in δ by the last proposal right. In this multilateral game, on the stationary subgame perfect equilibrium path, the total share that can be given to the last proposal is only $\frac{1}{2}$ even though there is no discount. Therefore, the effect of the first proposal right is dominating in this multilateral game. When, however, α is large, his payoff is decreasing in δ by the negative effects of the first proposal right and the last proposal right. As a result, the payoff of the veto player is decreasing in δ except when $\delta + 2\alpha < 1$.

This multilateral bargaining game is similar to the legislative bargaining between the President and the Congress, with impurely divided government, that the majority of the House and Senate is different. The application of this result is discussed later in this paper using Congressional data from when Reagan was the President of the United States.

2.2 The bilateral bargaining game

In the bilateral bargaining game we assume that non-veto players can behave cooperatively. This game is a two player game that has a veto player and a two-vote non-veto player. This two-vote player has more power than the veto player because he has not only veto rights but also majority power which is automatically given in this bilateral bargaining.[9] This is similar to the purely divided government between the President with his party and a non-presidential party that is a majority in the both House and Senate. The President can exercise a limited veto right over the agenda, and can introduce bills by his party, although the President has fewer chances to do so than the other player. The non-presidential party in this bilateral bargaining game is able to override the veto right of the President with his majority votes in the Congress, and has more chances to initiate bills.

The procedure of the game is similar to the multilateral game: in the case that a non-veto player can initiate bills, the veto player is able to make offers every even period and the non-veto player, the two-vote player, every odd period. In period 1 the non-veto player makes an offer. If the veto player votes for the offer of the non-veto player, the game ends. If not, the game moves on to the next period. The game continues until a winning majority coalition is formed. The winning majority coalition must include the veto player unless his veto right has expired. If the veto player cannot use his veto right any more, the two-vote player, with his two votes, can make a winning majority coalition without the approval of the veto player.

Proposition 2. *For a two player infinite horizon game when the veto player can use his veto right within a period γ under the alternating recognition rule*

[9] Although two vote player has a veto right that originates from the two votes, we call him the 'nonveto player' to distinguish from the veto player who has a legitimate veto right.

on the SPNE,

(1) *If the non-veto player who has two votes introduces an offer when γ is odd, the non-veto player offers*

$$\delta\left(\frac{1-\delta^{\gamma-1}}{1-\delta}\right)+\delta^{\gamma}(1-k(\delta)) \tag{28}$$

to the veto player and gets

$$1-\left(\delta\left(\frac{1-\delta^{\gamma-1}}{1-\delta}\right)+\delta^{\gamma}(1-k(\delta))\right), \tag{29}$$

at period 1, and the veto player accepts it , where $k(\delta)=\delta$.[10]

(2) *If the veto player introduces an offer when γ is odd, the veto player offers*

$$1-\left(\frac{1-\delta^{\gamma-1}}{1-\delta}+\delta^{\gamma-1}(1-k(\delta))\right), \tag{30}$$

to the nonveto player and gets

$$\frac{1-\delta^{\gamma-1}}{1-\delta}+\delta^{\gamma-1}(1-k(\delta)) \tag{31}$$

at period 1, and the non-veto player accepts it where $k(\delta)=\delta$.[11]

(3) *If there is no discount of a total benefit, $\delta=1$, the expected payoff for the veto player is always and that of nonveto player is always without regard to γ*

Proof of Proposition 1.

(1) and (2) can be verified by Lemma 1 and 2. (3) is a special case of (1) and (2)

Lemma 3.*Consider a two player infinite horizon bargaining game with the discounting factor $\delta\in[0,1]$. Assume that player 1 makes offers at every odd period and the player 2 and 3 have proposal rights in the even periods. In the SPNE, the proposer, player 1, forms a winning coalition with one of the other players, by offering that player δ and himself $1-\delta$. Therefore, the expected payoff of the veto player is δ and that of the non-veto player is $\frac{1-\delta}{2}$.*[12]

The proof of lemma 3)

Since player 2 has two votes, he does not need any more votes to form the winning coalition when he makes offers. Thus, at period 2, player 2 offers 0 to player 1 and gets 1. Then, at period 1, player 1 gives δ to player 2 and $1-\delta$ to himself.

QED(for lemma 3).

Lemma 4. *Consider a two player game like Lemma 3, but player 1 in Lemma 4 has the veto right on the agenda in the following games. In addition, these are finite games, and end by the veto player's proposal.*

[10] When γ is even, γ is replaced by $\gamma-1$

[11] When γ is even, γ is replaced by $\gamma+1$

[12] We consider player 2 consists of two players each of whom has one vote.

(i) *If the non-veto player proposes bills at every odd period and the veto player has proposal rights at the even periods in the game with an even and finite horizon T, then in the SPNE the expected payoff for the veto player is*

$$\delta\left(\frac{1-\delta^{T-2}}{1-\delta}\right)+\delta^{T-1}(1-k(\delta)) \tag{32}$$

and the expected payoff for nonveto players is

$$1-\left(\delta\left(\frac{1-\delta^{T-2}}{1-\delta}\right)+\delta^{T-1}(1-k(\delta))\right) \tag{33}$$

(ii) *If the non-veto player proposes bills at every even period and veto player has proposal rights at the even periods in the game with an odd and finite horizon T, then in the SPNE the expected payoff for the veto player is*

$$\frac{1-\delta^{T-1}}{1-\delta}+\delta^{T-1}(1-k(\delta)) \tag{34}$$

and the expected payoff for nonveto players is

$$1-\left(\frac{1-\delta^{T-1}}{1-\delta}+\delta^{T-1}(1-k(\delta))\right), \tag{35}$$

where $k(\delta)$ is the payoff of a non-veto player at the final period.

Proof of lemma 4) By backward induction, we can build the veto and nonveto players payoffs.

In (i), the veto player 's payoff is

$$\delta-\delta^2+\delta^3-\delta^4+\delta^5-\cdots-\delta^{T-2}+\delta^{T-1}(1-k(\delta)) \tag{36}$$

and nonveto players' expected payoff is

$$1-\left(\delta-\delta^2+\delta^3-\delta^4+\delta^5-\cdots-\delta^{T-2}+\delta^{T-1}(1-k(\delta))\right) \tag{37}$$

In (ii), the veto player 's payoff is

$$1-\delta+\delta^2-\delta^3+\delta^4+\cdots-\delta^{T-2}+\delta^{T-1}(1-k(\delta)) \tag{38}$$

and nonveto players' expected payoff is

$$1-\left(1-\delta+\delta^2-\delta^3+\delta^4+\cdots-\delta^{T-2}+\delta^{T-1}(1-k(\delta))\right) \tag{39}$$

QED(for lemma 2)

(1) When the nonveto player introduces a bill.

We limit our arguments to the SPNE. Like the proof in Proposition 1, the subgame after the expiration of the veto right starts by the proposal of the veto player.and is identical to the game in Lemma 3. So players' payoffs at $\gamma = t$ are the same as those $r = t-1$ if γ is an even number, and those at $\gamma = t$ are same as those at $r = t+1$ if γ is an odd number. In addition, we may consider the very first period at the subgame after the expiration of the veto right like that in Lemma 1 to be the final period of the finite game like that in Lemma 4. Under the SPNE path, the game in Lemma 3 ends at period 1 by the offer of the veto player. If we consider payoffs at this period 1 in the game in Lemma 1 to be $k(\delta)$ and $1-k(\delta)$ in Lemma 4, the game in Proposition 2 can be changed as the form in Lemma 4.

Then, by Lemma 4, note that the player 1's expected payoff when γ is odd is

$$\delta\left(\frac{1-\delta^{\gamma-1}}{1-\delta}\right)+\delta^{\gamma}(1-k(\delta)) \tag{40}$$

and player 2's expected payoff is

$$1-\left(\delta\left(\frac{1-\delta^{\gamma-1}}{1-\delta}\right)+\delta^{\gamma}(1-k(\delta))\right), \tag{41}$$

where $k(\delta)=\delta$.

And the player 1's expected payoff when γ is even is

$$\delta\left(\frac{1-\delta^{\gamma-2}}{1-\delta}\right)+\delta^{\gamma-1}(1-k(\delta)), \tag{42}$$

and player 2's expected payoff is

$$1-\left(\delta\left(\frac{1-\delta^{\gamma-2}}{1-\delta}\right)+\delta^{\gamma-1}(1-k(\delta))\right), \tag{43}$$

where $k(\delta)=\delta$.

(2) When the veto player introduces a bill.

Still the subgame after the expriation of the veto right has the same game in Lemma 1. The arguments are similar to (1).

Then, by Lemma 2, note that the player 1's expected payoff when γ is odd is

$$\frac{1-\delta^{\gamma-1}}{1-\delta}+\delta^{\gamma-1}(1-k(\delta)) \tag{44}$$

and player 2's expected payoff is

$$1-\left(\frac{1-\delta^{\gamma-1}}{1-\delta}+\delta^{\gamma-1}(1-k(\delta))\right), \tag{45}$$

and note that the player 1's expected payoff when γ is even is

$$\frac{1-\delta^{\gamma}}{1-\delta}+\delta^{\gamma}(1-k(\delta)) \tag{46}$$

and player 2's expected payoff is

$$1-\left(\frac{1-\delta^{\gamma}}{1-\delta}+\delta^{\gamma}(1-k(\delta))\right) \tag{47}$$

QED(Proposition 1)

Remark *Now that the veto player can initiate proposals with probability α, his expected payoff is*

$$\alpha(\frac{1-\delta^{\gamma-1}}{1-\delta}+\delta^{\gamma-1}(1-k(\delta)))+(1-\alpha)(\delta\left(\frac{1-\delta^{\gamma-1}}{1-\delta}\right)+\delta^{\gamma}(1-k(\delta))), \tag{48}$$

where $k(\delta)=\delta$.

Since the President generally can use his veto right no more than once, we consider $\gamma=1$. Then the payoff function for the veto player is shown in Figure 1.[13]

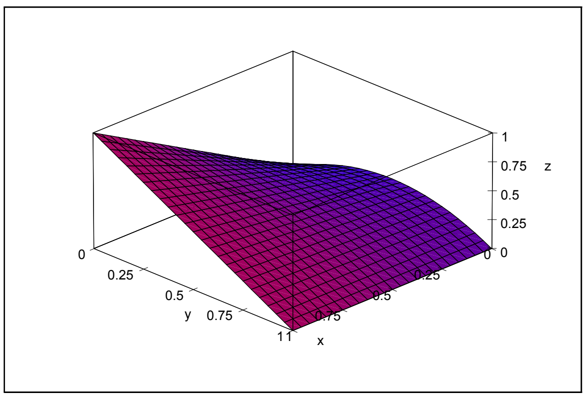

Figure 2: The veto player's payoff in the bilateral game[14]

The veto player in the bilateral game has the same rights that he has in the multilateral game. When α is small, his payoff is increasing in δ by the non-veto player's first proposal right but decreasing in δ by the non-veto player's last proposal right. However, in contrast with the multilateral game, the veto player's payoff is decreasing in δ if δ is larger than $\frac{1}{2}$though it is increasing in δ when δ is smaller than $\frac{1}{2}$, because in this bilateral game the share remaining in the last period is 1 while it is $\frac{1}{2}$in the multilateral game. When δ is small, the effect of the non-veto player's first proposal right is dominating because almost no share remains in the last period. When, however, δ is large, the non-veto player's last proposal right becomes more influential. Since the same total share

[13]Since nonveto players' payoffs is negatively related to the veto player's , it is enough to analyze only the veto player's payoff.

[14]In the Figure 1 x axis is α, y axis is δ, and z axis is the veto player's payoff.

remains in the first and last period, they would have identical influences on the player's payoff.

When α is large, like the multilateral bargaining game the veto player's payoff is decreasing in δ by the negative effects of the first proposal right and the last proposal right. As a result, the veto player's payoff is decreasing in δ except when $\delta + \alpha < \frac{1}{2}$.

This bilateral bargaining game is like purely divided government in which the presidential party is a minority in the both of the Senate and House. The applications, using data from the Eisenhower and Clinton administrations are discussed in the next section

3 An application: The President and Congress in the US

	Term	Seats		Laws enacted		
		S(R/D)	H(R/D)	Public	Private	Total
Eisenhower	53~54(83)	R(48/47)	R(221/213)	781	1002	1783
	55~56(84)	D(47/48)	D(203/232)	1028	893	1921
	57~58(85)	D(47/49)	D(201/234)	936	784	1720
	59~61(86)	D(35/65)	D(153/283)	800	492	1292
Clinton	93~94(103)	D(43/57)	D(176/258)	465	8	473
	95~96(104)	R(52/48)	R(230/204)	333	4	337
	97~98(105)	R(55/45)	R(228/206)	394	10	404
	99~00(106)	R(55/45)	R(223/211)	580	24	604

Table 1. The congressional data from the Eisenhower and Clinton administrations

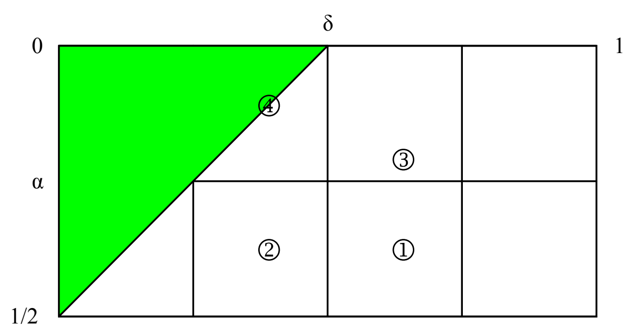

Figure 3. The veto player's payoff shown at the top in the bilateral game

In this application I analyze how the number of the bills passed depends on the level of division in government The division of the government can be pure or impure: if the government is purely divided, then there is a presidential party that is a minority in the Congress and a non-presidential party that is a majority. This purely divided government case can be modeled as the bilateral game that is discussed in the previous section. The veto player consists of the President who has a veto right against the bills and his party members that are minority in the Congress. The non-veto player is the non-presidential party that is a majority in the Congress. I assume that the first proposal right is directly related to governance in the Congress. Therefore, I assume, the presidential party, which includes the President has fewer chances to introduce bills than the non-presidential party in this bilateral game. As examples of government that is purely divided, I use the congressional data from the Eisenhower and Clinton times shown in Table 1.

	Term	Seats		Laws enacted		
		S(R/D)	H(R/D)	Public	Private	Total
Reagan(R)	81~82(97)	R(53/46)	D(192/243)	473	56	529
	83~84(98)	R(54/46)	D(167/268)	623	54	677
	85~88(99)	R(53/47)	D(182/253)	664	24	688
	87~88(100)	D(45/55)	D(177/258)	713	48	761

Table 2. The congressional data in Reagan's term

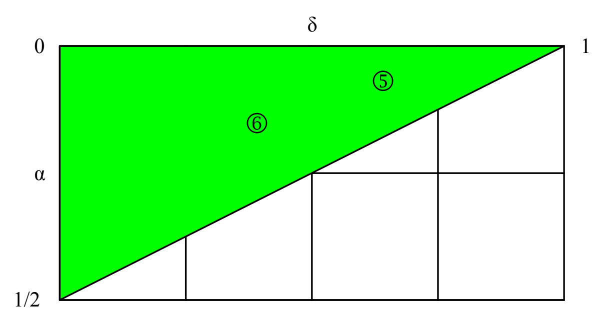

Figure 4. The veto player's payoff shown at the top in the multilateral game

When the government is impurely divided, the majority party of the Senate and House are different. The bargaining game between Congress and the President can be an example of the multilateral game discussed in the previous section. The veto player in this multilateral game includes the President and any members in the Congress and loyal to the him. The veto player's first proposal thus may be small. The non-veto players would be the parties that are majorities in either the Senate or House. This paper, as an application for the multilateral bargaining game, uses the congressional data from Reagan was President shown in Table 2.

We assume that the discount factor is decreasing from 1 to 0 as time goes on. Especially, before the presidential election that comes after the President‘s first term, we assume that , the discount factor is larger than $\frac{1}{2}$,and it is smaller than $\frac{1}{2}$ after the election. Since the congressional data I use are from periods when the President was in office for eight years, the discount factor would be apparently small after the Presidents are re-elected.

Since the payoff functions of the models are on the subgame perfect equilibrium path, we use data, on laws, approved by the both President and Congress. In addition, for clear comparison, we compare the number of the public law, approved by the President and Congress, enacted before the midterm presidential election with that after the election Before the President is reelected, there is ambiguity in the discount factor about the President‘s reelection. Therefore, the discount factor that is assumed to be decreasing may not be decreasing in their first term so that the current President may or may not be a President again. However, once the President is reelected, the discount factor is smaller than before, and decrease as time goes on since the President cannot be reelected to a third term. We focus on the last two years of the first term with the first two year of the second term

To compare the number of the laws enacted before and after the midterm presidential election, we can use the veto player‘s payoff shown at the top when $\gamma = 1.$, in Figures 3 and 4. The shaded area of Figures 3 and 4 are the veto player‘s payoff that is increasing in δ,in the non-shaded area, the veto player‘s payoff is decreasing in δ.

Eisenhower, a Republican, had been President from 1953 to 1961. There was little change in the dominance of the Congress by the Democratic party before and after the Presidential election in 1956. Thus in both periods the non-presidential party had more proposal rights than the presidential party, GOP Position 1 at (1) in Figure 3 is presumably close to the presidential party‘s payoff before the election in 1956 and position 2 is more like the presidential party‘s payoff after the election in 1956. From both positions, non–presidential party‘s payoff is decreasing as $\delta$is decreasing. [15] However, it is decreasing more rapidly from position 2 Therefore , in the Congress, its majority is the non-presidential party, the bills would be less made in the position 2. The data in Table support this argument

Clinton, a Democrat, was President from 1993 to 2000. Before and after the presidential election in 1996, the dominance by the GOP in Congress become stronger than before, because it got three more seats in the Senate that enlarged the difference of seats to 10 and implied strong dominance in the Senate. Compared with the Eisenhower administration, this definitely brought larger proposal rights for the non-presidential party. Then point 4 could approximate the presidential party‘s payoff after the election in 1996. The non-presidential

[15] Since more payoff for a veto player always means less payoff for a nonveto player, non-presidential party’s payoff is decreasing because the presidential party’s payoff is increasing in δ from the both positions.

party‘s payoff is decreasing from point 3 but increasing from point 4. Therefore, presumably, more bills would be after the 1996 election. That is consistent with the data in Table

Reagan‘s case is a little different from the others, because the governance of the Congress was divided: The GOP were the majority in the Senate, whereas the Democrats were the majority in the House. In this case, we can consider the multilateral bargaining game. We assume that the veto player consists of the President and his fellows who are the Senators or Representatives, then the veto player also has a proposal right, though it is small. The GOP and Democratic parties can be non-veto players. Before the election, the payoff for the presidential fellows is around position 5. Before and after the election in 1984, the dominance in the Congress did not change much. The payoff for the presidential fellows would be position 6 after the election in 1984. From position 6, compared with the position 5, non-presidential fellows, who have more proposal rights, would make more bills, because the payoff for non-veto players from position 6 is a little more increasing than that from position 5, although the difference between the payoffs is not large. This is supported by the data in Table.

4 Applications on the States in US

4.1 Estimations

In this chapter, to test the model with more data, we use the data on the state governments that consist of governors and congress. Using data set in the States we can bulid empirical results on the models.

Since Governors in each state has a veto right which could be overriden, we may argure governors are veto players. Except Nebraska, every 49 states have bicameral congress system, the congress is mostly governed by two party, Democratic and Republican.

Like the data of the President and Congress, we use the data on 68 governors who worked for consecutive terms but could not be in their positions more than two terms from 1967 to 2002[16].

First we can analyze it by the least square method.

$$y_i = \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + \beta_4 x_{4i} + \beta_5 x_{5i} + \beta_6 x_{6i} + \varepsilon_i{}^{17} \tag{49}$$

y is the comparsion between the sum of the number of bills at 3rd and 4th year and that of 5th and 6th year of each governor, and is qualitative binary choice variable that is 1 when the number of bill enacted decreases and 0 otherwise. x is the dummy variables that shows the dominance of the governorship and state congress. Therefore y shows the increase or decrease of the number

[16] From *the Book of the States*

[17] If we add constant term in the equation, the values of coefficients are different from Table 3. However, the interpertation on the coefficients are same.

of bills enacted right after and before the reelection of governors. x_1 is 1 if governor and both senate and house is governed by Democratic, x_2 is 1 if governor and one branch of Congress are from Democratic but the other branch is from Republican, x_3 is 1 if governor and one branch of Congress are from Republican but the other branch is from Democratic, x_4 is 1 if governor is from Democratic but Congress is dominated by Republican, x_5 is 1 if governor is from Republican but Congress is dominated by Democratic, and x_6 is 1 if governor and both senate and house is governed by Republican.

Since y is a binary variable and the explanatory variables are dummy variables, the coefficients on each variable shows the probability being that the number of bill enacted increase by the specific government form. Table 3 show the result of least squre estimation .

Variables	Coefficent	Standard Error	P-Value
x_1	0.6363636	0.1023816	0.000
x_2	0.4615385	0.1331869	0.001
x_3	0.6666667	0.1600707	0.000
x_4	0.3333333	0.2772507	0.234
x_5	0.9090909	0.1447894	0.000
x_6	0.6	0.1518564	0.000

$R^2 = 0.6675$

Table 3. The result of least square estimation

Since the endougenous variable is binary, we may use probit models to estimate the eqation. Table 4 provides the result of probit estimation.

Variables	Coefficent	Standard Error	P-Value
x_1	0.3487557	0.2731975	0.202
x_2	-0.0965586	0.3481963	0.782
x_3	0.4307273	0.4321643	0.319
x_4	-0.4307273	0.7485305	0.565
x_5	1.33517	0.5297966	0.012
x_6	0.2533471	0.4009896	0.528

Table 4. The result of probit estimation

Second, we also use the same model approach with the previous equation except that the endogenous variable is the comparison between the sum of 5th and 6th and that of 7th and 8th, which are the data on bills enacted at governors' second term. The number of observation is 62. The results of this are shown in Table 5 and 6.

Variables	Coefficent	Standard Error	P-Value
x_1	0.4285714	0.110328	0.000
x_2	0.4545455	0.15244	0.004
x_3	0.4444444	0.1685287	0.011
x_4	0.6666667	0.2919003	0.026
x_5	0.3333333	0.1685287	0.053
x_6	0.2222222	0.1685287	0.193

$R^2 = 0.4274$

Table 5. The result of least square estimation

Table 6 provides the result of probit model estimation.

Variables	Coefficent	Standard Error	P-Value
x_1	$-.1800124$	.2751119	0.513
x_2	$-.1141853$	.378785	0.763
x_3	$-.1397103$	.4192564	0.739
x_4	.4307273	.7485305	0.565
x_5	$-.4307273$	.4321643	0.319
x_6	$-.7647097$	.4653436	0.100

Table 6. The result of probit estimation

4.2 Interpretation

The least square methods provide nothing but the value of coefficients because of the heteroscedasticity of variances of the error terms in the analysis of qualitative response model. In Table 3, all explanatory variables except $x_4$and $x_4$supports the decrease of bill enacted. When both party has 'dictatorship' in the state government, like our prediction on the discount factor the bills are enacted less as time goes on. In addition, the coefficients are very similar. However, when the govenor of a states is from Democratic party, that results may not be applied. However, the result of probit model shown in Table 4 shows that only coefficent of x_5, where the Republican governor and Democratic state congress are, provides the significance result.

Contrary to the estimation on the bills before and after reelection, the result on linear square estimation at governors' 2nd term in Table 5 shows the most value of coefficients represent the different direction from those in Table 3. In probit approach shown in Table 6, only x_6 provides significant result.

Although some results are supporting the prediction on decreasing number of bill production, the degree of the decrease may not be the same as our prediction. We predict that the decrease of bill production in x_3 would be larger than that of x_5, but the result is not consistent with our prediction according to Table 3. An interesting result is that we can find the significance of coefficients where governors are Rebublican. It, however, is possible that this result may not reflect the degree of decrease in bill production because we use only qualitative data. To get result on this the quantitative approaches are necessary.

5 Conclusions and future extensions

This paper uses the multilateral and bilateral bargaining games to analyze the introduction of laws according to the division of the government. In both games, we show that the restriction of the veto right leads an infinite horizon game to a finite horizon of the game. More restrictions on the veto right results in a shorter time horizon of the game. Especially, the restriction of the veto right itself changes the player's payoff structure of the infinite horizon game to that of the finite horizon game. Using this result with the limited veto right, this paper shows that the number of bills introduced depends on the difference of the player's payoff. This is supported by congressional data from the Eisenhower, Clinton, and Reagan administration. The introduction of bills increases if higher payoffs for the proposer are expected, and vice versa. As a emprical work, the estimation on State government is conducted in the end. The result shows the number of bills are decreasing but the degree of the decrease is not consistent with our prediction. The quantative estimation should be conducted in order to be more precise.

The results of this paper can be applicable for experimental work. According to Winter (1996) the 'deadline', which means the finite horizon for the game, is a 'useful' approach for reducing the veto right. By experiment, it can be examined that the limitation of the veto right has the same effect as the 'deadline' reducing the absolute veto right. Especially, when it is very difficult to specify the deadline in the bargaining game, like implicit bargaining, the limitation on the veto right might be an alternative treatment for the 'deadline'. Relaxing the assumption about the risk neutrality could be a second extension. Then, by the recursive method, we may find the subgame perfect equilibrium path. Finally, this result may be applied to another voting setting that includes a veto player like that of corporate governance.

A Model 2: Unlimited veto right

A.1 The multilateral bargaining game

Proposition 3 *(three player) In the stationary subgame perfect equilibrium for the infinite horizon game with unlimited veto rights one of the non-veto players offers* $\frac{\delta(2-\delta)}{2-\delta^2}$ *to the veto player and gets* $\frac{2(1-\delta)}{2-\delta^2}$ *in period 1, and the veto player accepts it if one of the non-veto players introduces the bill. If the veto player introduces a bill, the veto player offers* $\frac{\delta(1-\delta)}{2-\delta^2}$ *to one of the non-veto players and gets* $\frac{2-\delta}{2-\delta^2}$ *in period 1, and the non-veto player accepts it.*

The *proof of Proposition 3)* It is proved in (i) of the proof of the lemma 1.

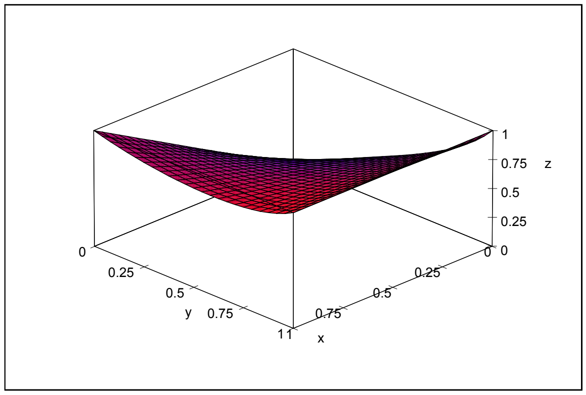

Figure 5: The veto player's payoff in the multilateral game

A.2 The bilateral bargaining game

Proposition 4 *By Rubinstein's result, in stationary subgame perfect equilibrium of the infinite horizon game with unlimited veto rights the non-veto player offers $\frac{\delta}{1+\delta}$ to the veto player and gets $\frac{1}{1+\delta}$ in period 1, and the veto player accepts it if one of non-veto players introduces the bill. If the veto player introduces a bill, the veto player offers $\frac{\delta}{1+\delta}$ to one of the non-veto players and gets $\frac{1}{1+\delta}$ in period 1, and the non-veto player accepts it.*

The proof of Proposition 4). It is the result of Rubinstein(1982).

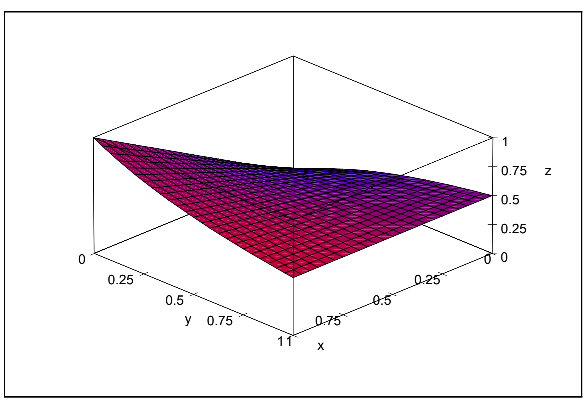

Figure 6: The veto player's payoff in the bilateral game

While the veto player‘s payoff is decreasing for large δ in Figure 2 even with the small restriction of the veto rights if one of the non-veto players introduces a bill, a veto player‘s payoff in Figure 6 is increasing in $\delta \in (0,1)$.It shows the discontinuity of the finite horizon game to the infinite horizon game.

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