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Legislative Coalition Auction Model

Trabalho preparado para apresentação no III Seminário Discente da Pós-Graduação em Ciência Política da USP, de 22 a 26 de abril de 2013

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São Paulo

2012

ABSTRACT: The present paper seeks to model the post-electoral process of coalition building inside the Brazilian legislative. Taking account the most recent production of political science literature regarding the Brazilian political system, this work intends to help understanding the rationality of major actors involved in negotiations to build political support for government or opposition. Legislative Coalition Auction Model (LCAM) considers a scenario in which the election for presidency and congress has already happened and its results are known to all actors. Most analysis of a so called "legislative market", and models of political bargaining as well, tries to compare the political process to economic models of both perfect and imperfect markets. However, this work suggests a different approach, once it resembles an auction (first-bid sealed auction), in which government and opposition legislative leaders seeks to buy political support from non automatically aligned legislators.

Introduction

The idea of a political market, in which people offer their support for bills in exchange of something, is neither new, nor original. Since first economic models regarding political behavior, it became a tradition in positive political science to borrow some concepts from mainstream economic theory, as costs, payment and market failure.

Nonetheless, institutional literature of legislative in the US – often called legislative studies – relied in different aspects of congressmen behavior, preferences and incentives to model US political system. Therefore, features like the role of commissions in agenda setting, also the capacity of sharing information trough commissions (Krehbiel, 2004) veto power and party behavior.

Cox and McCubbins, however, introduced the idea of modeling the political system in a way analogue to some economic cartels, which Cox, McCubbins and Amorim Neto (2003) tried to adapt to Brazilian political system. However, they concluded that Brazil fitted only partially to the cartel thesis.

Until the early 1990's, Brazilian political system was described by the literature as inefficient, with a legislative near to a decision paralysis, given the weakness and the large number of political parties (Abrucio, 1998). Those authors also stressed the extreme consociativism of the system (Stepan, 1999), as a function of institutional variables like federalism (powerful state governors) and open-list proportional elections for the legislative lower house. This paralysis could only be bypassed by president's charisma (Lamounier, 1992), or by the alleged undemocratic use of presidency legislative powers, specially Provisional Measures (*Medidas Provisórias*) – decrees that, formally, should only be used in situations of urgency and relevancy.

However, a new generation of studies took place in the mid 1990's, showing the existence of intensive coordination between executive and the majority in Brazilian Congress, that became known as the Coalition Presidentialism literature. As in parliamentary systems with coalition governments, parties have incentives to join office and coordinate actions with the president's party, supplying stability and decision-making capacities to the system. The Senate and Câmara (lower house) internal rules also favor the position of parties' leadership, reducing costs for negotiation.

This paper recalls some of those arguments to build a formal model of legislative interaction that resembles a first bid auction with imperfect information, trying to capture the essence of legislative bargaining during the post-electoral moment.

Brazilian Political System

The preliminary institutional studies over post-1988 Brazilian political system – when the last constitution took place - highlighted the exacerbated costs and even the impossibility of promoting important decisions, especially those that would help the country to stabilize its economy.

At that time, political science literature developed two lines of criticism: a) vertical – emphasizing economic and political imbalances originated from federalism; b) horizontal – focusing on political traps that resulted from the non cooperative relationship between executive and legislative powers. Almost always complementary, these two approaches criticized the institutional design that came with the 1988 constitution, like electoral rules and presidentialism.

The present paper will focus on the horizontal line of criticism, but is important to mention that part of vertical criticism was related to Brazilian legislative, once states are equally represented in the Federal Senate, each one of them having the same number of seats, while Brazilian lower house – *Câmara dos Deputados* – is elected in a way that under represents populous states. Therefore, this initial literature emphasized the high costs that small states could impose to decision making (Lamounier, 1992). Therefore, Brazil was positioned by Stepan in the consociative extreme of a continuum, that goes from federal systems that are least demos-constraining, to the ones that are most demos-constraining. Abrucio (1998) sugested that Brazilian representatives were more connected to state's interest, than to their party's interest. Mainwaring (1990) reinforced this thesis, by suggesting that electoral system in Brazil were made to weaken parties, once state governors controlled the key political resources necessary to their reelection. Scholars were almost unanimous, than, about the fragility of parties and the difficulties to produce solid coalitions, which, by their turn, would enable a low cost decision making process.

The solution suggested by many of those authors was to radically change the political system, removing proportional open list rule for lower chamber election, and flipping from presidentialism to parliamentarism as well.

However, since mid 1990's, a new generation of studies sought to explain Brazilian political system as a function of different institutional variables, until then neglected, such as the internal rules of legislative, that favored party leadership, and presidential legislative powers. According to Figueiredo, Limongi and Cheibub (2003), the Brazilian political system presented a disciplined party behavior after 1988, with high success rate of the Executive in bills of its interest.

Brazilian legislative is organized in a way that centralizes decision power in the hands of party leaders, while presidential legislative powers – such as the exclusive right to initiate some bills (like budget), urgency requests and provisional measures (decrees with immediate force of law) – helps the executive to induce coordination in legislative process. In a series of articles and books, Figueiredo and Limongi highlighted signs of cooperation between legislative and executive, that should be taken together into analytical account to correctly evaluate the Brazilian Political System. As Figueiredo, Limongi and Cheibub (2003) and Arretche (2009) show, empirical evidence suggests that party fidelity was high during all the period after the 1988 constitution.

Another set of empirical studies showed the high level of coalescence between the cabinet (ministerial nominations) and the pro-executive support in legislative, reinforcing the idea of a regular coordination between executive and legislative in Brazil, as in parliamentary coalition cabinets.

Why not an ideal market?

LCAM builds upon a *first bid sealed auction* with imperfect information, considering some important differences regarding the nature of payments and the stock of political resources at disposal of party leaders.

It is modeled as an auction, instead of an ideal market, to better capture the dynamics of political parties negotiations. Instead of price takers, few actors capable to affect prices, during the negotiations that take place after elections. This effort could lead to a comparison with models of oligopolies. Even though some validity in this comparison, it implies that actors are price takers, suggesting a bargain between strong buyers and atomized legislators.

It does not captures the fact that actors, in this form of coalition presidentialism, negotiate as blocks. Also, the valuations are private, which means that each player knows only how he values the object. As an initial result of a more broad research effort, this model makes some strong assumptions regarding individuals behavior, but maintains a strong dialogue with the most recent institutional literature regarding Brazilian political system. Also, it builds upon the idea of political support as an investment, which could be one of the explanations for change in political behavior.

Legislative Coalition Auction Model (LCAM)

In a given country, there are “n” members elected for the parliament. This politicians are divided by type of preference in two groups: “I” and “II”, in a distribution decided by nature (elections). Type I legislators have preferences regarding policy and ideology, while Type II representatives seek only political resources, like office, funding or visibility for future elections.

Type I group is itself subdivided in groups α and β, according to their proximity to the president, elected separately. Therefore, will be a member of group α every legislator that supports the Executive, while every Type I legislator that opposes the president (Executive), will be a member of group β. Groups α and β are represented only by its leaders, whose actions are all the possible set of political resources that can be offered a single time, as a bid.

Despite the individual capacity of voting, this model assumes that members of the parliament are bounded to their leaders decisions, when they manifest government or opposition desires over a particular bill. This is consistent with the idea that party leaders are strong inside the parliament, being capable of preventing defection by threatening, and also is consistent with the role of party leaders within the “leaders college” – an institution of the Brazilian parliament that allows leaders to vote on behalf of their colleagues on some bills.

When the group leader does not give any instructions of how to vote over a specific bill, it means that this bill lacks in interest for the parts, as well for this research. Therefore, this will not be a concern to the present paper, although it can be alleged that this is a strong assumption.

Type II as a Party

Type II politicians, by their turn, can adhere to α or β coalitions, depending on the resources offered. As the rules for Type II legislators are the same of Type I ones, their votes are also bound to the Type II leader decision, assuming that Type II legislators come from the same party. There are some theoretical and empirical evidence regarding one party in Brazil, PMDB, showing that it is big and centrist enough to be considered – at the same time – as a possible and a necessary partner, to any Type I party, that prefer to oppose or support the president.

Despite its shrinking share of the Brazilian parliament, since the late 1980's, PMDB supported both PSDB and PT presidencies, under Fernando Henrique Cardoso and Luiz Inácio Lula da Silva, even after campaigning for presidency on its own, before Cardoso presidency, or as partner of the defeated opposition party, before Lula took the presidency. His position as a necessary partner in Congress is favored by the fact that policy is often formulated at the constitutional level, instead of being object of infra-constitutional legislation (Couto and Arantes, 2006).

Therefore, PMDB appears as a necessary partner to form the qualified majority that constitutional changes demand. Even when a president chooses the riskier strategy of not making a coalition, as Fernando Collor de Melo did[1], he is not capable of ignoring the legislative. The presidencial legislative powers positions the executive chief as the major legislator (Figueiredo and Limongi, 2007), but all of his initiatives must pass trough majority rule – even provisional measures (Negretto, 2002).

Assuming that a party has no preferences over policy or ideology is, arguably, a strong restriction. However, the evidence of PMDB's swing behavior during the past decades, trough the center-right and center-left mandates of Cardoso and Lula, respectively, suggests that this is a reasonable way to model it.

Political Resources

An important aspect of this model is the difference between the resources available to α and β. There is a limited supply of political resources, but in Brazil, these resources are heavily concentrated in the presidency, such as shares of the cabinet (ministries), CEO positions in large public companies and nominations in regulatory agencies. Once leader α represents the president, he is in position to offer a share of the political resources held by the executive, acting as a broker. By his turn, leader β is incapable to offer any present resources, but can bid in terms of *future political resources*, that could be held after next election.

A strong assumption made by this model is that players do not discount future outcomes in a traditional fashion, demanding instead a prize for taking the risk, in any inter-temporal decision.

1 Casarões modeled the political crisis during Collor's mandate as a Stackelberg duopoly (Casarões, 2008)

Therefore, political resources does not devalue over time, but future bids are required to offer a prize. This assumption could lead to another hypothesis, regarding the motivation in government expansion, driven by the political system rational itself, instead of ideology or economics. However, this will not be a concern to the present paper.

Type II legislators behave like a single investor, demanding a prize for being risk takers. This means that any bid made by leader α can be met by leader β only when, to the same amount of present resources, another share of future resources is added.

This assumption derives from the financial notion that any capital asset bought in time *t*, must be able to pay a prize in time *t* + 1. This prize is divided in two parts: one related to a free-risk interest rate, as in a benchmark asset with no risks of default, added to another prize, related to a set of specific risks (according to its nature: bond, stock) and market risks. In financial theory, this notions can be found in Capital Assets Pricing Model, or CAPM, introduced by William Sharpe and John Lintner during the 1960's (Fama and French, 2004).

Although not fully incorporated to the present model, the assumptions regarding Type II legislators are an initial step to understand political struggle in legislative as an investment. The acceptance of an opposition offer must consider the fact that this offer is a promise, involving risks.

The higher the risk, higher the prize demanded by investors. The closest the opposition is to take the presidency in next elections, smaller is the amount of risk-prize that investors will demand, because also smaller is the risk of a default.

Therefore, if “R” is the set of political resources available to leader α, its possible bids may vary from 0 to R, while leader's β possible bids must be in the interval [0, R – r], where “r” denotes the prize demanded by Type II for taking the risk of a future political resource. This means that, excepting the highly unlikely situation in which next election's results are certain, the set of possible bids for leader α is greater than the set of possible bids for leader β. Executive has an important advantage to form the coalition.

It also generates doubts about the behavior of political leadership when expanding the size of the government is easier than in this model. Would this make opposition's life easier, in respect to the amount of political resources available to the incumbent's party?

Beliefs and Bids

However, bids in LCAM are a function of individual private valuations. As an imperfect information game, LCAM players only know their own valuations. Also, they cannot learn from other player's behavior, because the auction works as a sealed bid. Nonetheless, all players share a belief in minimum and maximum valuations, being the minimum “v” at least or higher than zero: $v \geq 0$.

As in a general auction with independent private valuations, in which no player can be informed by any other thing than his own valuation, and that states of the world are the set of all profiles of valuations, the probability that any given bidder's valuation is at most “v” is F(v), a continuous increasing function (Osborne, 2009).

Also, as any first bid auction, the price paid by the winner of the auction is exactly the largest bid. Therefore, preferences can be represented by a Bernoulli payoff function that assigns $v-b$ to the outcome in which any given player wins the auction, and 0 when it looses. One often assumption made in this kind of auction is that the expected payoff of any bidder in a tie situation is $v-b/m$, where “m” is the number of tied winners (Osborne, 2009).

In LCAM, however, there are only two players: leaders α and β. Assuming that the distribution of valuations is uniform, meaning that any valuation is as probable as any other, between minimum and maximum values, or the interval [0,1], the fraction of valuations less than *v* is also *v*.

LCAM

Considering the above description, LCAM can be summarized as following:

Players: 2 (Leaders α and β)

Actions: The set of possible bids (non-negative numbers), given present and future political resources

Preferences: Denote by "b_i" player's "i" highest bid, "b_j" player's "j" highest bid and "v_i" and "v_j" their respective valuations of Type II political support.

Their payoff functions are denoted bellow:

Leader α	$v_\alpha - b_\alpha$, if $b_\alpha > b_\beta$ $v_\alpha / 2$, if $b_\alpha = b_\beta$ 0, if $b_\alpha < b_\beta$
Leader β	$v_\beta - b_\beta$, if $b_\beta > b_\alpha$ $v_\beta / 2$, if $b_\beta = b_\alpha$ 0, if $b_\beta < b_\alpha$

Equilibria

Considering this structure of preferences, the inference is that no player has incentives to bid an amount greater than his own valuation. The "curse of the winner" takes no place in this game, as we consider only rational actors, that would rather do nothing or bid exactly their valuations, instead of any higher bid that would give them a negative payoff.

Another initial inference is that rational actors would prefer any infinitesimal lower bid than bidding exactly their valuations, because it would give them a positive payoff. Therefore, any bid lower than the valuation weakly dominates a full valuation bid.

Knowing that bids for leader α can range from 0 to 1, as a share of total political resources, the intuition in this game is that leader α will expect his opponent to bid any amount $b_\beta < 1$. In an uniform distribution, the fraction of possible valuation smaller than *v* is also *v*. Therefore, for any valuation *v* of leader α, the cases in which leader β's valuation is less than *v* are uniformly distributed from 0 to *v*, so that the expected value of leader β's valuation, conditional on its being less than *v*, is ½ *v* (Osborne, 2009).

This work does not stress the mathematical demonstration, but claims that first bid sealed auctions with imperfect information have a symmetric Nash equilibrium, where every type of player bids exactly half of its valuation.

To evaluate this claim, it is necessary to assume that leader β bids exactly half his valuation. Being "P" the probability that $b_\alpha > b_\beta$, and "Q" the probability that $b_\alpha < b_\beta$. Then, the expected payoff to leader α will be described by the following sentence:

$$EU_\alpha(b_\alpha) = Q \text{ x } 0 + P \text{ x } (v_\alpha - b_\alpha)$$

In the above sentence, the assumption of a uniform distribution of valuation probabilities means that the chance of a tie, in an infinitesimal amount of political resources, is highly unlikely.

Knowing that leader β bid was $v_\beta / 2$, then:

$$b_\alpha > v_\beta / 2$$

or

$$2b_\alpha > v_\beta$$

Once again, considering the uniform probability distribution, the probability of leader α's victory is $2b_\alpha$, or formally: P $\{2b_\alpha > v_\beta\} = 2b_\alpha$. Therefore, the new Expected Utility function will be:

$$EU_\alpha (b_\alpha) = 2b_\alpha \text{ x } (v_\alpha – b_\alpha) = -2b_\alpha^2 + 2b_\alpha v_\alpha$$

Applying first order maximization condition:

$$\frac{d \, EU_\alpha (b_\alpha)}{d \, b_\alpha} = - 4b_\alpha + 2v_\alpha = 0$$

$$b_\alpha = v_\alpha / 2$$

Meaning that leader α's best response when leader β bids half of its valuation is to also bid half of its valuation. However, differently from the base first bid sealed auction, where players are identical, leader β faces several constrains in the amount of political resources available for bidding.

LCAM x First Bid Sealed Auction

The guarantee that both players bid half their valuations in a Nash equilibrium is given by the fact that they are identical (Osborne, 2009). But in LCAM, players are not identical, what could lead to different equilibria.

Although leader β's impossibility to bid anything higher than 1 – r , or R – r , there are no restrictions regarding his valuation of Type II political support, meaning that v_β can assume any value in the interval [0,1]. However, this restriction implies that $b_\beta < 1 - r$.

A reasonable assumption is that *r*, the prize for risk, can never be greater than ½ R. Not because of the uncertainty regarding next elections, but because this would mean that leader β gives up the control of the executive to Type II legislators. This seams unreasonable according to the premisses of Type I legislators: preference over policy, instead of political resources.

This model reflects only the situation in which one of Type I parties has a president elected, fighting for the control over the legislative in his aid. Opposition tries to stop this move, but both parties must negotiate with a third part.

Once that β's valuation does not change in LCAM, it is reasonable to assume that both players biding half their valuations is a Nash Equilibrium. Also, as LCAM is a first bid auction, than leader α's has incentives to lower its bid to the point that maximizes its expected payoff, weighting the reduction of costs (bids smaller than ½) by the increasing probability of loosing the auction, exactly as if leader β had no resource constrains.

References

- ABRUCIO, Fernando Luiz. 1998. Os barões da Federação: os governadores e a redemocratização brasileira. São Paulo: Editora Hucitec.
- ARRETCHE, Marta.. 2009. Continuidades e descontinuidades da Federação Brasileira: de como 1988 facilitou 1995. Dados**,** Rio de Janeiro, vol. 52, n. 2, Junho.
- AMORIM NETO, Octavio, Cox, Gary W. and McCubbins, Mathew D. 2003. Agenda Power in Brazil's Câmara Dos Deputados, 1989–98. World Politics, 55, pp 550578
- MAINWARING, Scott. 1990. Presidentialism in Latin America. Latin America Research Review, Vol. 25. No. 1
- CASARÕES, Guilherme S. P. 2008. "A economia política do governo Collor: discutindo a viabilidade de governos minoritários sob o presidencialismo de coalizão". Dissertação de Mestrado, Faculdade de Filosofia, Letras e Ciências Humanas, Universidade de São Paulo, São Paulo.
- COUTO, Cláudio G.; ARANTES, Rogério B. 2006. "Constituição, governo e democracia no Brasil" *in* Revista brasileira de Ciências Sociais, São Paulo, vol. 21, n. 61, Junho
- FAMA, Eugene and FRENCH, Kenneth. 2004. The Capital Asset Pricing Model: Theory and Evidence: http://faculty.chicagobooth.edu/finance/papers/capm2004a.pdf
- FIANI, Ronaldo. 2006. Teoria dos Jogos. Rio de Janeiro: Elsevier Editora
- FIGUEIREDO, Argelina e LIMONGI, Fernando. (2002) "Incentivos eleitorais, partidos e política orçamentária" in Dados, Rio de Janeiro, vol. 45, n. 2
- _________ . (2007) "Instituições Políticas e Governabilidade. Desempenho do governo e apoio legislativo na democracia brasileira" in MELO, Carlos R. & SAEZ, Manual A . "A democracia brasileira: balanço e perspectivas para o século 21". Belo Horizonte: Editora UFMG.
- ________ e CHEIBUB, José Antônio. (2003) "Quem Manda em quem na esfera

federal?" in Insight/Inteligência, n. 21.

- KREHBIEL, Keith. 2004. Legislative Organization. The Journal of Economic Perspectives, Vol. 18, No. 1 , pp. 113-128

– LAMOUNIER, Bolívar. (1992) “Estrutura institucional e governabilidade na década de 90”. *In* REIS VELLOSO, João Paulo dos (org.) “O Brasil e as reformas políticas”. Rio de Janeiro: José Olympio.

– MORROW, James D. 1994. Game Theory for Political Scientists. Princeton: Princeton University Press.

- NEGRETTO, Gabriel L. (2002) “Gobierna solo el presidente? Poderes de decreto y diseño institucional en Brasil y Argentina” in *Desarrollo Económico*, Vol. 42, No. 167

- OSBORNE, Martin J. 2009. An Introduction to Game Theory. Oxford: Oxford University Press

- STEPAN, Alfred. 1999. “Para uma nova análise comparativa do federalismo e da democracia: federações que restringem ou ampliam o poder do Demos”. Dados, Rio de Janeiro, v. 42, n. 2