Transparency & Legislative Behavior

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Abstract

How does transparency affects the behavior of legislators? Specifically, are representatives' proposals and decisions more public-serving when the policy making process is more visible to the public than when it is less so? How does transparency affect constituents' ability and inclination to punish self-serving behavior and reward public-serving behavior by representatives?

Good-government reformers and many (but not all) theorists of representation share an intuition that by facilitating monitoring, transparency mitigates politicians' pursuit of self-interest at the expense of some broader conception of the public good, and so improves the quality of representation. Testing this proposition empirically is difficult, however, because non-transparent legislative procedures are, by definition, unobservable. This project uses experimental methods to compare legislative proposals and decisions, as well as legislators' accountability to the public, in bargaining environments where levels of transparency systematically vary.

The experiment is a repeated game in which legislators propose and vote on a budget that can be divided among themselves as well as the public; and the public, in turn, rewards or punishes the legislators. Preliminary runs of the experiment suggest important effects of varying transparency on how public-serving budgets are, as well as on the mechanics of legislative accountability. The basic experiment offers a range of opportunities for extensions to broader participant pools, innovative platforms for running the game, and variations on the legislator-constituent relationship as well as the options available to participants.

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Is transparency a good thing? Empirical, formal, and experimental perspectives

Do legislators behave differently when their actions can and cannot be observed by citizens? Many theorists of representation and good-government reformers share an intuition that transparency facilitates monitoring of politicians by citizens and mitigates the pursuit of representatives' self-interest at the expense of some broader conception of the public good (Bentham 1791; Llanos & Figueroa Schibber 2008; Open.Secrets.org; CongresoVisible.org). The proposition that transparency can affect democratic performance is of practical as well as theoretical interest because although transparency is low in many legislatures, it is relatively easy to do something about it. Machines that record votes can be installed at modest costs (Carey 2009). Attendance and voting records can be disseminated to citizens through simple and cheap media (Humphreys & Weinstein 2008, Hix, Hagemann, and Frantescu 2011). This project aims to test by experiment the impact of transparency on the extent to which legislative decisions serve the public's interest.

High levels of legislative voting transparency have long been taken for granted in the United States, where individual-level voting records on most important motions in both chambers have been made public since shortly after the founding. For just as long, legislators have expected electoral punishment for voting against their constituents' interests (Odegard 1928; Kile 1948; Skeen 1986; Smith 1989; Bianco, Spence and Wilkerson 1996). The prevalent logic in the United States regarding transparency versus anonymity in voting has been that anonymity is necessary for voters, through the secret ballot, in order to free citizens from intimidation in elections, but that transparency in legislative voting enhances democratic accountability. In effect, legislators ought to be subject to pressure on their votes but citizens should not (Lepore 2008; United States Supreme Court 1958).

Not all observers of legislative representation are sanguine about full transparency. Edmund Burke (1774) famously reproached the idea that his constituents' interests, properly conceived, were best served by closely monitoring his behavior in parliament and demanding responsiveness. Schumpeter (1942) advanced a similar point of view nearly two centuries later. Some contemporary empirical accounts make the case that closed-door decision-making produces better policy by freeing legislators from pressures to pursue parochial interests (Birnbaum and Murray 1988). Malesky, Schuler, and Tran (2010) present evidence from an authoritarian setting, the Vietnamese National Assembly, that transparency fosters conformity during deliberations and may therefore discourage the transmission of valuable information among lawmakers. Crisp and Driscoll (2010) present evidence from Argentina and Mexico that legislative decisions on whether or not to make votes transparent are shaped by legislators' desires about which audiences they want to observe their votes.

Formal analyses identify more precisely the conditions under which transparency in legislative deliberations and actions can be either normatively attractive or unattractive. Snyder and Ting (2005) argue that voting transparency ought to be appealing both to citizens and legislators, to the former because transparency exposes potential betrayals of citizens' interests, and to the latter because it makes enforceable commitments to constituent interests possible, and the rewards that might follow from such commitments attainable. Stasavage (2004 and 2007), by contrast, specifies conditions under which

transparency can produce worse public policy outcomes than non-transparency, and foster polarization among representatives that prevents citizens from learning through observation of the policy-making process. Transparency's key liability is that legislators may possess – or be in a position to acquire – a better understanding of policy problems, and of proposed solutions, than do their constituents but fail to deploy that knowledge when doing so in the limelight could damage their reputations as faithful representatives.

The literature on legislative voting transparency, then, is partly historical and partly formal, with relatively little contemporary empirical work. Advocates and skeptics alike concur that transparency should tighten legislator responsiveness to constituent interests, with skeptics warning of the potential for pandering and posturing to offset that advantage. Yet the posited responsiveness bonus has never been directly observed nor have its mechanics been examined. Purely observational studies are constrained partly by the challenge of comparing observable behavior (for example, recorded votes) with unobservable behavior (non-recorded votes), and partly because the votes that are visible are almost certainly not representative of the population of all votes (Carrubba, Gabel, & Hug 2008).[1]

Meanwhile, there is an extensive literature in experimental economics and anthropology on bargaining and cooperation games that bear some resemblance to what goes on in legislatures. This work examines a variety of games in which players are selected either to propose a division of some fixed budget, or to contribute resources to a common pool, and other players must decide whether to accept the proposals. In some variants, responding players may also punish 'selfish' proposers. This scholarship demonstrates that budget proposers are less selfish when they are susceptible to punishment (Fehr and Gachter 2000; Fischbacher et.al. 2001), and also that there is variance across players in different societies about how selfish a proposal must be to warrant punishment (Henrich et.al. 2005, 2006, & 2010; Herrmann et.al. 2008).

So far, so good, but this scholarship has been primarily concerned with identifying norms of cooperation, fairness, and selfishness in interactions among individuals, rather than between citizens and representatives, or within representative institutions, and the staple experiments at the heart of this literature -- ultimatum, dictator, and public goods games -- lack key characteristics that would better approximate legislative environments.

A smaller experimental literature examines the predictions of the Baron and Ferejohn (1989) model of budget division by a legislature with three parties (or participants, in the experimental set-up) that are allocated varying voting weights, although any combination of two of the three is necessary to form a majority. The game is generally played with a finite number of periods, and with the proposal power assigned by some fixed rule (e.g. by probabilities corresponding to voting weights), and reassigned if a proposal is

[1] Humphreys & Weinstein (2008) describe research in progress in Uganda in which annual 'parliamentary scorecards' -- audits and reports on the activities of legislators produced by a Kampala-based NGO -- are generated for all legislators during the 2007-2011 term, with active dissemination campaigns to deliver the information in the scorecards are conducted in some legislators' districts, but not in others. This agenda promises a quantum leap in measuring how the transmission of information to citizens affects legislative behavior, but the scorecards themselves focus on indicators of legislators' efforts (attendance, motions introduced, speeches, etc.) rather than specific information about legislative decision-making, precisely because votes are not recorded in Uganda (p.27).

rejected. The focus of investigation in these experiments is the division of spoils among the legislators, and the central result is that proposers exploit their advantage less than predicted by the Baron and Ferejohn model, forming fewer minimim-winning and more universal coalitions, and dividing the budget more equally with coalition partners, than the non-cooperative model would anticipate (Diermeier and Morton 2003; Fréchette, Kagel, and Lehrer 2003; Fréchette, Kagel, and Morelli 2005a & 2005b).

The experiment proposed in this project varies these bargaining games in a couple of simple ways that aim to simulate the monitoring of representatives by citizens. The goal is to shed light on the extent to which transparency affects how public-serving budgets are, and the ability and inclination of the public to reward and punish individual legislators. The experiment also aims to determine whether the public has a preference between minimal versus universalistic coalitions.

How much transparency is there? Counting visible votes

Transparency has been little explored in empirical studies of legislatures outside the United States. One can find general claims that voting against constituent interests risks electoral punishment (Rose-Ackerman 1999). Such an expectation clearly hinges on citizens knowing how their representatives vote. Yet there is huge variation in transparency across legislatures. In most legislatures, the votes of individual representatives are not recorded on most proposals. In many cases, there is no transparency in legislative voting at all.

Almost all national legislatures publish transcripts of their plenary proceedings, including schedules of business, floor speeches, motions and amendments presented, and some information about the results of votes on those motions. Those transcripts are generally published in an official *Record* (or *Hansard, Gazette, Gaceta, Diario Oficial*, etc.). In recent years, these records tend to be published online in the form of PDF documents on legislative websites.

The published records vary substantially in how they present vote results. The two most common formats are aggregate results and individual-level results.[2] For example:

- Aggregate: 75 aye, 10 nay, 5 abstain, 10 not voting/absent.
- Individual-level:
    - 75 aye: Theo Arnold, Linda Bixby, Felix Chalmers, Evelyn Dutton, …
    - 10 nay: Alan Evers, Barney Frank, …
    - 5 abstain: Rafael Garcia, …
    - 10 not voting/absent: Lucia Hernandez, Manuel Irrigoyen, …

Published records in many countries include mixtures of aggregate and individual-level results, although in some countries all votes are published one way or the other.[3]

[2] Other formats are rare. El Salvador's record notes only motions that were approved, and only the number of votes in favor. I have not yet encountered instances in which the record provides vote totals disaggregated by party, but not individual legislator.

By “visible votes” (VVs), I mean votes on motions taken in plenary sessions of legislatures for which the vote (e.g. aye, nay, abstain, absent) of each representative is recorded and published.

The data on the incidence of VVs presented here come from two distinct waves of data collection. The first extended from about 2000-2006, and involved a combination of:

- field research to eight Latin American countries to visit legislative archives and recover VVs where possible;
- work by research assistants in archives in other countries to recover VVs;
- data exchanges of VVs with scholars in other countries.
- work by research assistants in the United States to recover VVs from legislative websites, where available.

The second is an effort, beginning in 2011, I have undertaken with research assistants in the United States to recover VVs from legislative websites, where available.

In both waves, data from some countries are comprehensive counts of published VVs, whereas in other countries they are estimates. The difference is driven by how hard it is to hunt VVs, and whether comprehensive counts are feasible. In cases where electronic records of votes are available – in particular, where vote records are presented separately from full plenary records– it can be relatively easy to arrive at a comprehensive count. Where it is necessary to download each plenary transcript and search manually (even using word sequence searches) to find votes, comprehensive counts are not feasible, so the approach is to search records from a subset of sessions in a given year and extrapolate an estimate.

Thus, there are gaps in the data collected so far, and there is an asymmetry insofar as the data collected in the recent effort are exclusively from the internet, whereas many of the data from the 1980s and 1990s were originally collected from non-web-based sources, and may not still be available online.

With those caveats on the table, Figure 1 shows the number of VVs recorded and published in the lower or only chamber of 28 national legislatures in recent decades. The general pattern is of low levels of voting transparency a couple of decades ago but increasing variance in recent years as the numbers of VVs in many countries rises.

[Figure 1]

Of course, it would be hard to find any web-based resource that did not increase by an order of magnitude in quantity during the first decade of this century. Yet the increase in web-based VVs is not exclusively a product of blossoming websites. Equally important as a technological factor is the adoption of electronic voting in many chambers, the equipment for which has grown more accessible and affordable. Figure 2 shows the

[3] … or at least they appear to be. The search-ability of the electronic records varies. In most cases, it is feasible to search samples of the records, but not to search every record for every possible vote, so it is not possible to say with 100% certainty that there are no exceptions to the predominant format.

steady increase in VVs for a group of Latin American legislatures that installed electronic voting equipment in the 1990s and adopted it as standard practice. The one exception to this pattern is Peru where, shortly after installation, pro-transparency reformers won a battle, over the objections of the majority party's leaders, to have votes recorded and full records published online. Fro 1998 until at least 2000, all votes were recorded and published immediately on the Peruvian Congress's website (Carey 2003). The electronic equipment is still in place, but at some subsequent point, the practice was terminated, and in recent years Peruvian votes are non-transparent again.

[Figure 2]

Figure 3 shows the even more dramatic increases in voting transparency in a couple of Latin American chambers – Colombia and Honduras – both of which went from nearly no VVs to producing several hundred VVs or more in recent years immediately after adopting the use of electronic voting. Figure 4, by contrast, shows the minimal levels of voting transparency among a number of Latin American chambers that do not employ electronic voting. Recording individual legislators' votes without the use of automated technology is time consuming, procedurally costly, and rare. In short, technology clearly can reduce obstacles to legislative voting transparency, but does not necessarily eliminate political obstacles.

[Figures 3 and 4]

Figure 5 shows VV levels for a series of legislatures outside Latin America.

[Figure 5]

Figure 6 summarizes what is already evident from the previous graphs and narrative – that the production of VVS is strongly correlated with the use of electronic voting technology. But note that there is much higher variance among the electronic than among the manual voters. Some legislatures that installed electronic voting technology either fail to use it, relying instead on traditional methods of voting by show of hands, or use it but fail to publish the individual-level records the machines automatically produce. Venezuela is an example of the former practice, and Nicaragua of the latter (Carey 2009).

[Figure 6]

Figures 7, 8, and 9 show that, among the countries from which data have been collected, lower and upper chambers do not differ markedly in the number of VVs produced, nor to presidential and parliamentary regimes, nor do the Latin American legislatures from those outside the region.

[Figures 7, 8, and 9]

On the whole, transparency has been rising in recent years, but enormous variance remains across countries. For example, the Comparative Political Agendas Project is a vast effort to collect, organize, and disseminate data on policymaking processes in an array of European countries and the United States. Yet although data on the content of

legislation, executive orders, and judicial decisions, the substance of party manifestos, parliamentary questions, and government statements, and more are available on the CPAP website, individual-level legislative voting data are available only from the United States and Italy (Baumgartner, Jones, and Wilkerson 2011). Research from other scholars confirms that the widely variant levels of transparency in legislative voting are the norm (Saalfeld 1995; Hug 2010).

The key point, even from this admittedly incomplete exercise in counting VVs, is that individual-level transparency varies enormously across legislatures. Increasing voting transparency dramatically is possible using technologies that are, by now, widely available and not prohibitively expensive. Yet many countries nevertheless fall well short of making votes visible as a matter of course. Questions that follow from this are whether there is reason to think variations in transparency matters and, if so, how? More pointedly, should we think legislators behave differently when a record of their votes will be visible to the public from when it will not? The rest of this paper is an attempt to answer that question, not by comparing transparent and non-transparent behavior from real legislatures – non-transparent behavior being, by definition, unobservable – but through an experiment intended to approximate varying levels of legislative transparency.

The experiment

Basic structure

The experiment is a game played among participants who are divided between Legislators and member(s) of the Public. It involves a proposal for division of a budget by one legislator, then a vote on whether to approve the proposal by all Legislators (including the Proposer), then budget payouts (if the budget passes), and finally an opportunity for the public to reward or punish each legislator.

The treatments manipulate what information regarding the identity of the proposer, the nature of the proposal, and the legislators' votes are observable by the Public. The 3 different transparency conditions describe what the Public observes:

NT: Non-Transparency

- only its own payout.

ST: Semi-Transparency

- own payout; and
- the identity of the Proposer

FT: Full Transparency

- own payout;
- the identity of the Proposer;
- how much the proposed budget offered to each Legislator; and
- how each Legislator voted (Approve/Reject) on the budget proposal.

The transparency conditions

It is worth saying a few words about what the experimental manipulation of transparency seeks to approximate. Full transparency mirrors the availability of information on most consequential votes in the U.S. Congress, where bill sponsors, party leaders, and floor managers, in amalgamation, are analogous to the Proposer, and where roll call voting records expose every legislator to demands from actors outside the legislative chamber to justify his or her vote.

Semi-transparency is analogous to legislative decision-making without the comprehensive transmission of information that characterizes the U.S Congress, but in the presence of effective legislative parties. That is, even where votes are not recorded and published at the individual level, party leaders generally make their parties' positions known on important proposals before legislatures. Where parties are the main vehicles of policy initiatives, and legislators from the same party vote in concert, then knowing what initiatives party leaders advance or oppose provides citizens with reliable information about how their representatives behave. In the context of this experiment, for the Public to know what s/he got and who the proposer was, as under semi-transparency, is akin to knowing which party championed a policy in political system with strong parties.

Non-transparency is a closer approximation of the legislative process where the full transmission of information is absent and parties are ineffective, either because they are not the main source policy proposals, or because legislative copartisans do not reliably vote in unison, or both. For example, in most Latin American systems, the most important legislative proposals issue directly from the executive branch rather than being formally introduced by specific legislators or parties (Crisp & Driscoll 2010; Morgenstern 2003; Siavelis 2000). Where the president has clear ties to a legislative party, executive initiatives might reasonably be attributed to that party, but in many presidential systems these ties are loose or even non-existent. Presidents' parties are often factionalized precisely by the different demands of competition in executive versus legislative elections (Samuels 2002). Presidents often rely on non-partisan or coalition cabinets, or reject traditional party labels altogether (Linz 1994; Cox & Morgenstern 2001). Under these circumstances, connections between policy proposals and any proposer inside the legislature itself can be obscure. Moreover, when party unity in legislative voting is low, as is often the case in presidential systems, failure to provide a recorded vote can render responsibility for legislative decisions thoroughly opaque (Carey 2009). In short, in many Latin American polities (and I suspect others as well), citizens often find themselves effectively in the experiment's non-transparency mode; they know what they got, but not much else about where it came from.

Versions of the Game

Various versions of a legislative budgeting game, all sharing the basic structure described above, are possible. I discuss a variety of versions briefly in the concluding section, but this paper reports results from the Basic version of the game, although from two related – and quite imperfect— variants of it:

- Basic (web-based)
- Beta (lab-based)

Basic Version

Players and Preparation

1. Participants are recruited and informed under what transparency conditions the game will be played – NT, ST, or FT. All periods of each experiment are played under the same transparency conditions.
2. 1 of the 4 participants is drawn at random to act as the Public for all periods of the game. 3 are Legislators (L1, L2, L3).

Sequence of Play in Each Period

1. Of the 3 Legislators, the computer selects 1 at random to be the Proposer.
2. The Proposer is prompted to divide a budget of 24 units among any combination of the 4 players (L1, L2, L3, and Public).
3. The Legislators observe the proposal and vote to approve or reject it.
    - If a majority approves, the budget passes, so all players are awarded their budget shares for that period.
    - If a majority rejects, the budget fails, so all players receive zero for that period.
4. The Public is informed of the outcome, according to transparency condition, and votes "Thumbs Up" or "Thumbs Down" on each Legislator.
5. Each Legislator is informed of the Public's vote (Thumbs Up/Down) for that period, and of her/his running tally of Thumbs Up/Down votes.

Completing the Experiment

- After all 10 periods are complete, the computer determines, on the basis of each Legislator's "Thumbs Up" and "Thumbs Down" tally, whether her/his total budget payoff is doubled.
- Each "Thumbs Up" vote increases by 10% his chance of being doubled. For example:
    - 10 Thumbs Downs means zero chance of doubling;
    - 10 Thumbs Up means 100% chance of doubling;
    - 5 Thumbs Downs and 5 Thumbs Ups mean 50% chance of doubling;
    - ... and so on.

Beta Version

A variant of the experiment – what I refer to here as the Beta Version – was run in a lab at Dartmouth College in July-August 2010, using networked computers running z-Tree experimental software (Fischbacher 2007), that had been adapted to run the game.

The Beta Version differed from Basic in the following ways:

- Beta involved 10 participants: the Public, plus 9 potential Legislators, 3 of whom were active for any given period.

- The Public's means of rewarding or punishing Legislators was to reelect or not for the very next period, rather than to cast a vote that affected a Legislator's probability of a subsequent reward (doubling payoffs).
- After each period except the last, the Public could reelect (or not) each active Legislator. A Legislator not reelected was replaced by one randomly selected from the non-active pool.

Logistics and considerations: Lab-based versus web-based versions

The obvious advantage of Beta was that the mechanism for the Public to sanction Legislators was directly analogous to that provided by competitive elections. A key disadvantage, however, was that, for the threat of non-reelection to carry weight required a substantial pool of non-active potential replacements. This is both expensive and logistically unwieldy, even in the context of a computer lab in which all participants can be monitored throughout the experiment. Beyond the confines of the lab, a set-up that involves non-active Legislators who must remain engaged and ready to step in – although they might well never be called – is not feasible. Taking the experiment outside the lab with a web-based platform, however, is essential to broadening the participant pool. Moving to "Thumbs Up/Down" as a mechanism for the Public to sanction Legislators allows for this. For a Legislator, the prospect of doubling total payoff is analogous to reelection which, in the context of this game, is an opportunity to amass more budget points, and so a larger payout.

Mechanical Turk

For the web-based experiments, subjects were recruited via Amazon.com's Mechanical Turk (MTurk). MTurk is an online labor market open to anyone with internet access. MTurk employers post discrete jobs – or Human Intelligence Tasks (HITs), in MTurk parlance – and MTurk workers choose HITs according to the job description, the time required, and the payment offered. Amazon takes a 3% commission for operating the market. MTurk is increasingly used by social scientists as a cost-effective way of recruiting subjects for surveys and survey-based experiments. The MTurk worker population, of course, is not a random draw from any population. Yet Berinsky, Huber, and Lenz (2012) replicated a number of seminal experimental studies using samples of US-based MTurk workers and found that it provided pretty good correspondence with in-person convenience samples. MTurk workers were slightly younger, more secular, more educated, and with lower incomes (thus, their participation in an on-line labor market) than face-to-face samples. Moreover, the authors replicated results from published survey experiments on public policy preferences and risk acceptance using the MTurk sample (Berinsky, Huber, and Lenz 2012).

Bots

The web-based version of the game cannot guarantee the participation of a full complement of four live players at all times, for two reasons. First, at the outset, fewer than a full complement may "arrive" at the game within a reasonable period, requiring those who are prepared to begin to wait to round out their foursome (potentially producing attrition among waiting players). Second, players who begin the game may abandon it before completing it. The basic problem is that live players have limited attention spans, and will drop out of games if forced to wait too long for other participants to act.

To address the problem of non-response, the web-based version can be populated by robot (or Bot) players who substitute in for absentees. At the start of any game, once the first player completes the instructions and quiz and is prepared to begin, a 60-second timer begins. Any other players, up to four, who arrive at that game within the 60 seconds, are channeled into that game. Once the time elapses, the game begins with those who arrived within the 60-second window. Subsequently, players are required to respond to each prompt in the game (e.g. for the Public to vote Thumbs Up/Down on Legislators, to absorb the information in a screen presenting results from a budget, etc.) within specified periods of time. The specified periods are calibrated to the complexity of the prompt (e.g. Proposers are allowed a bit longer to formulate a budget proposal among four players than the non-Proposer Legislators are allowed to vote on it), and players are allowed a bit more time in earlier periods, when they are learning the game, than in later ones. In all cases, players are made aware of how much time they have to respond to a prompt by a countdown timer on their screen. Players who fail to respond to a prompt within the allotted time are removed from the game, and are seamlessly replaced by a Bot player so the game may continue without disrupting the other live players. Live players are not informed when other participant(s) in the experiment are Bots.

The Bots solve two major potential problems confronting the experiment. First, because the experiment depends on participation in real time among full complements of players, chronic non-response would be devastating. The Bots guarantee responses, and so maintain forward momentum in each game, allowing live players to complete the experiment. The Bots may also serve a more subtle purpose, however, of shedding light on out-of-equilibrium behaviors among live players. That is, in experiments involving all live players, some actions may be rarely observed. The Bots can be scripted to deliver such actions on occasion, allowing us to observe other players' responses to them. I return to this topic below in discussing the comparison between results from the Beta and Basic versions of the experiment.

Finally, it is important to note that the scripted behavior for the Bots used in the August 2012 experiments was extremely crude, such that their "Bot-ness" was obvious to live players (see Appendix B). This, in turn, created some problems for how live players learned about and developed their own strategies. The main change needed here is to alter the Bots' script such that, rather than playing one of three strategies with .33 probability, they would play one of twenty strategies with .05 probability (see Appendix C).

Density of live players

Given the limitations of the Bots in their current scripts, "live player density" – the proportion of the 4 players in any given game who are live as opposed to Bots – was a salient factor in the August 2012 experiments. The challenge is in recruiting via MT, because MT "workers" select tasks (HITs) independently. The strategy adopted for the August 2012 experiments was to post HITs with short time windows and with sufficiently attractive compensation that MT workers flock into them during brief windows of opportunity. This approach was partially successful, as illustrated by Figure 10, which shows the distribution of live player density across all periods of play by MT workers

[Figure 10]

Note that Density is 0 for periods played with no live players (e.g. if a game were triggered but no players survived the instructions and quiz, or if a lone live player dropped out), .25 for a period with one live player and three Bots, and so forth. The histogram shows that the modal period had low Density, but note also that the preponderance of action by live players is in the higher Density periods. The average Density for a period played by any given live player is .52, so most live players were facing at least some other live players. Nevertheless, Density presents a serious logistical challenge in the web-based experiment, and it will be worth considering whether live player Density affects behavior systematically. The potential problem of live Density can also be mitigated by improving the scripts that govern Bot play. That is, by improving the Bot scripts so that Bots behave in ways more akin to live players, the premium on achieving high live Density diminishes.

Payment levels and sufficient incentives

In the lab-based Beta version, players were highly motivated by the payment of US$.50 for each budget unit they earned in the experiment. By contrast, the MT players recruited for the web-based Basic version conducted in August 2012 faced far weaker incentives to win each marginal budget unit, with an "exchange rate" of US$.01 per budget unit. The reasons for the paltry payoffs in those initial Basic version runs were more logistical than intellectual. In August 2012, I was testing the feasibility of recruiting and paying participants via MT, as well as testing the operation of the new web-based platform. Until resolving various uncertainties about the viability of the technology, I put relatively little money on the table. Having confirmed that MT and the platform are vaible, I will raise the exchange rate, and so the stakes of the game, in future runs of the Basic version. It is important to note for now, however, that the marginal gain to MT workers for winning additional budget units in the experiments reported here was low, and that participants might have been insufficiently motivated to "play for keeps."

Summing up

Each of the versions of the game, Beta and Basic, from which data have been collected to date, was imperfect in important ways. The Beta version had a small number of runs – 2 groups of 10 participants playing a 20-period game under each of the 3 transparency conditions. The Basic version delivers more iterations of the game, but those are populated by a mixture of live players and Bots. The live players performed well in lots of ways (to be discussed below), but their financial motivations (given the budget unit exchange rate) were weak, and they were often outnumbered within a given experiment by Bots (i.e. Live_Density was often low). The Bots, in turn, were behaviorally crude. In future iterations, and I will also take measures to increase Live_Density, increase the financial incentives for live players, and improve the Bot scripts. For now, the results to date should be viewed with these limitations in mind.

Expectations

The experiment aims to shed light whether transparency affects two general types of budget distribution outcomes:

- the extent to which budgets serve the Public relative to the Legislators; and

- budget divisions among the Legislators themselves.

The fundamental expectation is that transparency should make the threat of sanction by the Public more effective, so should generate more Public-serving budgets. Specifically:

> ***H1: The higher transparency, the greater the Public's share of budgets.***

There are two ways this might come about, which I refer to as first-order and second-order accountability. The former operates through Proposers' budget offers to the Public, as a result of Proposers' fear of a Thumbs Down vote, and should manifest itself under both ST and FT -- that is, when the proposer is visible to the Public -- but not under NT:

> ***H2: Public Offers should be higher under ST and FT than under NT.***

What I call second-order accountability operates through non-Proposer Legislators' desire to be seen as voting for Public-serving budgets and against budgets that ill-serve the Public when votes are visible, so should manifest itself only under FT:

> ***H3: Budget votes by non-Proposer Legislators should be positively correlated with POs (other things equal) under FT, but not under NT or ST.***

Prior expectations regarding whether and how transparency should affect budget divisions among Legislators are more ambiguous. Previous research on budget division games focuses on the magnitude of the Proposers's advantage and, more generally, whether budget divisions are mimimal (paying off the smallest number of legislators necessary to approve a budget) or universalistic. Incorporating a Public and sanctioning by Thumbs Up/Down voting in this experiment, coupled with the transparency manipulations, means that if the Public has preferences about the inclusiveness of legislative coalitions, then the Public's ability to observe the details of budget proposals could affect their inclusiveness.

First, consider the basic versions that include a unitary Public assessing 3 Legislators. There are two ways to think about Public preferences over inclusiveness. In principle, minimal coalitions should be less expensive in terms of payments to Legislators, leaving more resources for the Public, so we might expect the Public to reward minimal coalitions -- perhaps inferring that her own budget share is larger than it might have been had the legislative coalition been universalistic. On the other hand, results from experimental budget division games indicate that players subscribe to norms of universalism to a greater degree than non-cooperative game theoretical models would suggest (Diermeier and Morton 2003; although see also Niou and Ordeshook 1985). In short, previous experimental research suggests that the unitary Public may prefer universalistic coalitions to minimal ones. If this is the case, then we should observe an effect on legislative behavior only when the Public can see legislative proposals:

H4a: When the Public is unitary, legislative coalitions should be more universalistic under FT than under NT or ST.

The SMD-versions of the experiment push the Public further from universalism by dividing the Public and tying each P to a separate Legislator. First, I expect universalism (or minimal-ness) among Legislators' payoffs to correlate with universalism (or minimal-ness) among Public payoffs. That is, I do not expect a budget that distributes payoffs among Legislators evenly to distribute payoffs among P1, P2, and P3 in minimal fashion, or vice-versa. Second, with each P's payoffs directly at stake, notions of universalism that are attributed *Legislators'* payoffs should be weakened, and Public's interest in the value of minimum coalitions should rise. Thus, I expect legislative coalitions to be less universalistic in the SMD versions than in the unitary-Public versions. To the extent transparency facilitates accountability, moreover, I expect FT should have the opposite effect under SMD versions than in the unitary-Public versions:

H4b: Under SMD versions, legislative coalitions should be less universalistic under FT than under NT or ST.

Descriptives on players and performance

Characteristics of MT Workers

Among the paid MT participants in the Basic web-based experiments, the overwhelming majority were either from the United States (61%) or from India (33%). 65% were men; 35% were women. The median age was 28, and the distribution was skewed left as illustrated in Figure 11, although there were players across the range from 18 to 63.

[Figure 11]

The modal participant reported years of formal education corresponding with having completed a bachelor's degree, with the large majority of respondents reporting levels of education above high school – a pattern duplicated among both Indian and US MT workers. Figures 12 and 13 also illustrate the similar patterns of reported political awareness among both US and Indian MT workers, with the US respondents reporting slightly higher levels of general attention, whereas Indian respondents reported marginally greater awareness of how their own legislative representatives vote on important measures.

[Figures 12 and 13]

Completion rates

Beta: There were 10 participants in each experiment – one playing the Public, plus three active Legislators in any given period, six inactive Legislators – and the researcher plus one assistant were present in the lab at all times. In that closely controlled environment, 100% of the 90 participants (three 20-period games under each of three transparency conditions) completed the experiments.

Basic: In the web-based version, 72% (168 or 232) paid MT workers who signed on for the experiment completed the 10-period game. Of those who did not complete the experiment, one-third did not complete the instructions and screening quiz, and the other two-thirds dropped out at some point during play.[4]

Learning

In both the Beta and Basic versions of the experiment, players' response times decreased as periods progressed and they learned the game. Figure 14 shows the pattern for budgets proposed by live Proposers in the web-based Basic experiment. The patterns for voting and rendering Thumbs Up/Down judgments demonstrate the same pattern.

[Figure 14]

Budget Approval

In both the Beta and Basic versions, the vast majority of budgets were approved – 97% in Beta, 93% in Basic. Because budget rejections in the Beta version were so rare, I present information only on budget proposals, without parallel data on budget outcomes, for the Beta version. In discussing the results of the Basic version, I distinguish between proposals and outcomes where relevant.

Results

In reporting from the Basic version, I report on the behavior of Live players only. Thus, the budget offers reported are only those made by Live Proposers, of budget votes only those of Live Legislators, of Thumbs Up/Down only those by Live Publics, etc. In the Beta version, all players were Live, so this distinction does not apply.

How are budgets divided?

Beta: Overall, budget divisions tended to favor the Public and the Proposer, with the former averaging just over 8 units per period and the latter just under 9, while the high offer to non-Proposer Legislators averaged just over 5 and the low offer just below 2. 47% of budget proposals were minimum-winning, offering some positive amount to the High Legislator and 0 to the Low Legislator. The most frequent POs were at 0, 8, 10, and 12 budget units, with a density in the range around 10, fewer POs in the 2-7 range, very few POs above 12.

Basic: Budget divisions were similar to the Beta version, although less variant by player type. Mean offers to Public and Proposer were just below 7 each, whereas mean offers to the High and Low Legislators were 5.4 and 4.8, respectively. Minimum coalitions were also far less frequent in the Basic version, with only 14% of budgets offering zero units to the Low Legislator. The distribution of POs in the Basic version was much more heavily concentrated at the modal value of 6 budget units (43%), with another 30% of offers falling in the 7 to 12 range.

[4] During this same period, I also opened the game up to students and some colleagues to play as unpaid volunteers. Of the 30 who entered the game, 23 (76%) completed it.

What do Legislators approve/reject?

As one would expect, Proposers virtually always (99% of cases) vote to approve the budgets they propose in the Basic version. (The 1% of Nay votes might reflect errors.) Non-Proposers, by contrast, are more discriminating, casting 61% Aye and 39% Nay votes. Also as expected, Non-Proposers' likelihood of casting Aye votes corresponded with their budget offers, as illustrated in Figure 15. Live non-Proposers uniformly voted Nay on budgets when they were offered 0 units, and voted Nay most of the time when offered 1 unit, but at offers above 1, they were more apt to vote Aye to approve the budget than to vote Nay. (The pattern in the Beta version was the same.)

[Figure 15]

What follows naturally is that budgets that offer at least one non-Proposer Legislator more than 2 units virtually always pass, whereas those that offer both legislators less than 2 units rarely pass, as illustrated in Figure 16.

[Figure 16]

What does the Public reward/punish?

As one would expect, the probabilities that the Public rejects Legislators (not reelecting under Beta; rendering a Thumbs Down judgment in Basic) declined as the PO rose. PO = 6 appeared to be an inflection point for the probability of electoral punishment. For Proposers, PO<6 triggered rejection 80% of the time, whereas PO>=6 triggered rejection only 20% of the time. Figure 17 illustrates the rate of Thumbs Up verdicts rendered by the Public on Proposers, by the Public Offer in that period.

[Figure 17]

Non-Proposers were only minimally insulated from retribution, with rejection at 68% when PO<6, and at 32% when PO>=6. (Here again, the pattern in the Beta version was the same.)

How does transparency affect how each type of player fares?

The central result from the experiment is that transparency matters to the relative distribution of the budget among players, and that transparency is the Public's friend.

Figure 18 illustrates the distribution of budget offers to the Public, the Proposer, and to non-Proposer Legislators, under each of the transparency conditions, for the Beta version, and Figure 19 for the Basic version.

[Figures 18 and 19]

In the Beta version, moving from NT to ST mode almost doubled the mean PO, with an additional boost from the move to FT. Proposers' Offers, by contrast dropped with transparency, but in a non-symmetrical way, falling off only slightly with a shift from NT to ST, but then dropping substantially with the shift to FT. The non-Proposer Legislators,

finally, did best under NT (mean high = 6.7, mean low = 2.2), then FT (high=4.5, low=1.8), and worst under ST (4.3 and 0.7).

In the Basic version, the pattern for the Public was similar, with the shift from NT to ST corresponding with a jump in the mean offer of 5.6 to 6.8, and then the further shift to FT with a jump to 7.3. As in the Beta version, Proposers in Basic also offered themselves the most (8.8 units on average) under NT, but the precipitous drop was from NT to ST, and Proposers actually offered slightly more under FT (mean 7.0) than under ST (mean 6.3). Finally, the offers to non-Proposers were less responsive to transparency in the Basic version than in Beta. The mean offers to each type are shown in Table 1.

[Table 1]

Patterns and learning across periods

Figures 20 shows linear estimations of expected offers to each type of player across all periods, with a separate graph for each transparency condition. The top panel show the 20 periods played in the Beta version, whereas the middle and bottom panels show the 10 periods played in the Basic version. The lower shows just the expected offers to the Public and the Proposer so these can be examined more closely.

[Figure 20]

Some key patterns are consistent across all the experiments. Under NT, the Proposer's expected offer is higher than the Public's Offer at the outset, and the expected offers diverge from there, with the Proposer's increasing across periods and the Public Offer decreasing (in Beta, finishing even below the high non-Proposer Legislator). Under ST, by contrast, the Public's and the Proposer's offers are statistically indistinguishable. Finally, under FT, the Public Offers start off higher than the Proposer's (by a statistically discernible amount in the Beta version) and the Public maintains that advantage throughout the game. The pattern over periods suggests that transparency may be an even greater friend to the Public than the aggregate results across all periods suggest, insofar as both the NT and ST graphs suggest that as time horizons stretch, the Proposer's expected share grows relative to the Public's, whereas under FT, the Public's initial advantage appears stable.

First-order accountability: Proposers and bad budget offers

The risk that Proposers run for offering the Public too little grows with transparency.

Beta: Very low POs (0-2) were a death wish for Proposers under all transparency modes. Under NT, punishment of Proposers was uncorrelated with Public Offers in the 3-12 range (above which point all Legislators were uniformly reelected), whereas punishment of Proposers decreased steadily as Public Offers grew in both ST and FT modes, where the identity of the Proposer was revealed. That said, in ST and FT modes, low Public Offers were rarely observed as Proposers, anticipating punishment, offered far more Public-serving budgets.

[Figure 21]

Basic: The Bot Proposers in the Basic version regularly made low-ball Public Offers, even under ST and FT modes. Thus, the Basic version offers the opportunity to observe Public responses to out of equilibrium behavior by Proposers. The three panels of Figure 22 show the rate of Thumbs Up judgments by Public Offer on both Non-Proposer and Proposer Legislators, in NT, ST, and FT mode, respectively.

[Figure 22]

Consider NT mode first. The Public knows what she received, but cannot distinguish among the Legislators. The rate of Thumbs Up judgments should rise with the Public Offer, but should not differ from non-Proposers and Proposers. This is, in fact the case, confirmed by logit regression (not shown) that shows a positive relationship between PO and Thumbs Up verdicts ($p<.02$) that is statistically indistinguishable for Proposers versus non-Proposers. If transparency affects first-order accountability, however, we should expect a divergence between the verdicts rendered on Proposers and non-Proposers once Proposers can be identified, under ST and FT. Although the Beta results suggested such a distinction, the second and third panels of Figure 21, however, do not provide any supplementary evidence. The patterns of Thumbs Up/Down verdicts across Public Offers are not readily distinguishable, and while logits show stronger relationships between Public Offers and Thumbs Up under ST and FT modes ($p<.00$), the relationship is no stronger for Proposers than for non-Proposers.

Second-order accountability: Non-proposers and bad budgets

Proposers catered to the Public more assiduously when they were visible. But what about non-Proposer Legislators? Part of the logic of the treatment conditions is to expose the non-Proposers to possible electoral sanction for voting in favor of budgets that serve the Public poorly (or voting against ones that serve the Public well).

Under NT or ST, non-Proposers are anonymous, so we might expect their voting decisions to be driven exclusively by how well the budget offer treats them. Recall that if a proposed budget fails, all players receive nothing. Under NT, non-Proposers have no reason to vote against a budget that serves the Public poorly because even causing such a budget to fail delivers zero to the Public, while all legislators -- Proposer and non-Proposers alike -- are indistinguishable to the Public. Assuming the Public will punish a failed budget (and zero payoff) by rejecting the team of legislators that engineered it, there is no reason for non-Proposers to vote against budgets under NT. Under ST, the Public can distinguish the non-Proposers from the Proposer, but does not see individual votes (or the offers, other than the PO), so has limited ability to reward good legislative behavior beyond the proposal.

FT, by contrast, is designed to confront non-Proposers facing budgets that serve the Public poorly (and in doing so, that may serve themselves well) with the dilemma that approving 'bad' budgets may invite electoral punishment. Is there evidence that such budgets put non-Proposers in a tough spot? One can estimate of the effect of transparency on non-Proposer votes by comparing logit regressions of:

$$\Pr(\text{Vote}=1) = a(\text{Constant}) + b1(\text{Legislator's Budget Offer}) + b2(\text{PO}).$$

under the various transparency conditions.

Table 2 shows – for both Beta and Basic versions – the coefficients and standard errors for the variables of interest in these logit regressions, along with the estimated change in the likelihood of a Yes vote from shifting each independent variable from its 20th percentile value to its 80th percentile value, with other variables in the equation held constant at their mean values.[5]

[Table 2]

It comes as no surprise that raising a legislator's budget offer increases her propensity to support that budget under all transparency conditions. The estimated effects of greater interest, however, are the responsiveness of non-Proposers' votes to Public Offers – and particularly, the difference between that responsiveness under FT versus under NT and ST modes. The expectation associated with H3, recall, is that Public Offers should affect non-Proposers' votes under FT, but not under NT or ST. Instead, there is evidence of sensitivity to Public Offers in all transparency modes. In both Beta and Basic, under FT, non-Proposers were more likely to vote Aye on budget proposals that treated the Public generously. Shifting from stingy (20^{th} percentile) to generous (80^{th} percentile) Public Offers increased the likelihood of Aye votes by 12% in Beta, and 16% in Basic, even when the Legislators' own budget offer was held constant. Surprisingly, however, under NT, non-Proposes were also strongly responsive to Public Offers in both Beta and Basic, and in the Basic version, the estimate on Public Offer is also positive and significant under ST mode.

Non-Proposers appear not to think the Public is monitoring their votes under FT, but are they correct? If the Public is monitoring non-Proposer votes where they are visible, and rewarding or punishing accordingly, then under FT, we should see:

- high Thumbs Up rates among Legislators who vote Nay on low-Public Offer budgets;
- rates declining among Nay-voters as Public Offers rise;
- low rates among non-Proposers who vote Aye on low-Public Offer budgets; and
- rates rising among Aye-voters as POs rise.

And we should not expect to see such patterns under either NT or ST, where the Public cannot monitor non-Proposers' votes. Figure 23 suggests that Live Publics are watching non-Proposers where they can. The panels of the figure show, for each transparency mode, the rates of Thumbs Up verdicts passed by Live Publics on non-Proposers, by the Public Offer for the period and the Legislator's vote on the budget. Under NT and ST, where votes are not visible, there is no apparent relationship between how a non-Proposer voted and the Public's verdict. Under FT, however, non-Proposers who voted Nay on low-ball Public Offer budgets get Thumbs Up verdicts at higher rates, whereas those who voted against more generous offers get Thumbs Down, with the pattern reversed for Aye votes.

[5] For the Beta version, the votes from the last period of each 20-period experiment were dropped because no threat of electoral punishment existed in last periods of that version.

[Figure 23]

These preliminary results regarding second-order accountability, in short, are unclear. Publics show signs of monitoring votes under FT in a way that would produce such accountability, but Legislators do not appear consistently to distinguish FT from other transparency conditions. It may be that the implications of the transparency conditions are too subtle for non-Proposers to appreciate the differences in their exposure to punishment – or to expect that Publics will distinguish non-Proposers from Proposers. That is, they may simply expect that Publics will punish all Legislators for low Public Offers, and therefore vote to encourage Proposers to treat the Public generously. Alternatively, it might be that the current versions of the game have not sufficiently motivated non-Proposers to scrutinize offers and transparency conditions, or that players' strategies will grow more sophisticated with repeated exposure to the game. For now, the estimated positive effect of the Public Offer on Legislators' votes under modes other than FT is unexpected and puzzling.

Minimum coalitions versus universalism

Apart from effects on the Public, my expectation was that the budgetary fates of non-Proposer Legislators would differ across transparency modes – specifically, that minimum coalitions, in which the Low Legislator's offer is zero, would be less prevalent under FT than under NT or ST, where the Public cannot observe the set of offers to all players. This expectation was borne out clearly in the Beta version of the experiment, but not in the Basic version. Table 2 shows that the proportion of minimum coalitions and the mean variance among offers to Legislators (Proposer, High Legislator, Low Legislator) for both the Beta and Basic versions.

[Table 3]

The first thing to note is that variance among offers, and the incidence of minimum coalition offers, were far higher in the Beta than the Basic. Proposers in the Beta version, where each budget unit was worth US$.25, were aggressive in cutting the third Legislator out of any profits, and the distributions of offers among Legislators was consistent with H4a. When the details of budget offers were not visible to the Public, as under NT or ST, Proposers were far more inclined to form minimum coalitions, and were less egalitarian in their distributions across coalition partners, than when the details of budget offers were fully visible, under FT.

By contrast, Proporsers in the Basic version almost always cut every Legislator in on at least some piece of the budgetary pie. My suspicion is that the relative inclusiveness of Basic Proposers stems from the fact that the budget unit exchange rate was so low in those first test runs of the web-based platform. That is, at a penny a point, the cost of cutting even the Low Legislator a non-zero budget share was trivial. In future iterations of the experiment, with higher stakes, I expect the variance in Legislator offers and the incidence of minimum coalitions to rise.

Rates of punishment

Rates of reward and punishment varied substantially by transparency mode in both versions of the experiment. In Beta, rates of reelection were lower (around 50%) under NT than under ST or FT (around 75% for both Proposers and non-Proposers). In Basic, rates of doubling among live Legislators were about 60% in NT, 70% in ST, and 80% in FT, as shown in Figure 24.

[Figure 24]

The basic pattern is that the lower the transparency, the more the Public sanctioned Legislators, but to less effect, judging from the Public's budget shares under each mode. Transparency makes the Public's sanction of Legislators more effective, which in turn minimizes the need for it to be exercised, consistent with the general results from formal models of transparency and legislative responsiveness (Snyder & Ting 2005; Humphreys & Weinstein 2008), but contrary to conventional wisdom in the United States, which often equates high rates of reelection with insulation of legislators from public sanction and low levels of accountability.

Discussion

Preliminary conclusions

The pilot efforts of programming and running these experiments were reasonably successful and quite encouraging, both in the lab-based Beta and the web-based Basic version. The basic strategic problem engaged participants and the treatments strongly suggest that transparency affects Legislator behavior. Under the model of legislative representation approximated in the experiments, transparency appears to be good for the Public. The greater the transparency, the higher the Public's budget shares (H1, above) and Public Offers (H2). The direction of the effect is not particularly surprising, but the magnitude of the effect, especially in the Beta version, was impressive. Transparency appears to diminish the use of sanctions against Legislators by enabling Legislators to demonstrate unambiguously their fidelity to the Public's interest. And, in the unitary Public format tested so far, there is suggestive evidence that transparency fosters universalism (H4a), reducing the number of minimum coalitions and diminishing the spread between the lowest and highest Legislators' offers. Data produced from the preliminary runs do not allow evaluation of whether transparency fosters second-order accountability (H3). The project so far, then, has been suggestive and promising.

U.S. citizens tend to take legislative transparency for granted, but it varies tremendously around the world and is largely absent even in many democracies. Knowing whether and how transparency matters to the sort of representation legislators provide is important – to theory, but also (and moreso) to politics, not least because transparency varies tremendously and is low in many legislatures around the world, but can be modified easily relative to other elements of the relationship between constituents and legislators, such as constitutional structure, the strength of political parties, the demographics of politicians, or the financing of campaigns. Machines that record proposals and votes can instantly produce records of legislative behavior that can be made available on the internet or disseminated by other media to journalists, citizens, interest groups, other politicians, and academics. If transparency improves representation, then to the extent that non-transparent practices are due to the absence of these technologies, the remedy is straightforward. Even where obstacles to

transparency are more formidable (read: political), estimating its effects on public welfare, on the distribution of resources among politicians, and on how the accountability mechanism operates, presents a clearer picture of the potential effects of reforms to enhance, or limit, how easily and at what level of detail citizens can peer inside the legislative process.

Looking ahead

Beyond Basic and Beta, at least six variants of the game will eventually be tested, pending further development of the web-based platform.

- *SMD Version*: This version involves 6 participants – 3 members of the Public (P1, P,2, P3) and 3 Legislators (L1, L2, L3), such that, during play, P1 may sanction L1, P2 may sanction L2, and P3 may sanction L3. 10 periods with 1 budget per period.

- *Basic Multi-Budget*: 4 participants (P, L1, L2, L3), and 5 periods of play, but 3 budgets are divided per period. That is, each period consists of 3 iterations of a Proposer being randomly selected, making a proposal, the proposal being voted on, and all players being informed of the outcomes. But the Public only is offered the opportunity to vote Thumbs Up/Down on Legislators only after each third budget.

- *SMD Multi-Budget*: 6 participants and SMD-style representation, with multiple budgets per period.

- *Basic Transparency Varying*: 4 participants, 10 1-budget periods, but after the Proposer is randomly selected in each period, the Proposer selects the transparency mode in which that period will be played.

- *Basic Multi-Budget Transparency Varying*: 4 participants, 3 budgets per period. Proposer is selected for each period (3 budgets), but selects transparency mode separately for each budget.

Each different variant of the game adds at least one element of theoretical interest, although also some additional complexity. The move from 1 Public to 3 allows for Legislators' fiduciary responsibilities, and accountability, to be focused on separate subsets of citizens, so the potential for coalitions that freeze some players out (both Legislators and Publics) increases. The move to multi-budget periods more closely approximates how legislatures operate, making multiple decisions between opportunities for citizens to sanction their representatives. The cognitive load on citizens increases, and the prospects grow for passing less popular policies early in each period, with more 'populist' appeals coming near to the point of reckoning. Allowing Proposers (i.e. legislative leaders) to select their level of transparency is also a step toward external validity, as legislatures generally set their own rules regarding transparency. In this case, we can observe whether Publics are willing to punish Proposers not only for their budget decisions, but for their transparency decisions – and whether Proposers, anticipating such punishment select transparency accordingly.

References

Baron, David P. and John A. Ferejohn. 1989. "Bargaining in legislatures." *American Political Science Review* 83(4):1181-1206.

Baumgartner, Frank R., Bryan D. Jones, and John Wilkerson. 2011. "Comparative studies of policy dynamics." *Comparative Political Studies* 44(8):947-972.

Bentham, Jeremy. 1791. *Essay on political tactics containing six of the principal rules proper to be observed by a political assembly.* London: T. Payne.

Berinsky, Adam J., Gregory A. Huber, and Gabriel S. Lenz. 2012. "Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk." *Political Analysis* 20(3):351-368.

Bianco, William T., David B. Spence, and John D. Wilkerson. 1996. "The Electoral Connection in the Early Congress: The Case of the Compensation Act of 1816." *American Journal of Political Science* 40 (1): 145-71.

Birnbaum, Jeffrey and Alan Murray. 1988. *Showdown at Gucci Gulch: Lawmakers, lobbyists, and the unlikely triumph of tax reform.* New York: Vintage.

Burke, Edmond. 1774. *The Works of the Right Honourable Edmund Burke.* London: Henry G. Bohn.

Carey, John M. 2003. "Transparency Versus Collective Action: The Fujimori Legacy and the Peruvian Congress." *Comparative Political Studies* 36(9): 983-1006.

Carey, John M. 2009. *Legislative Voting and Accountability.* Cambridge University Press.

Carrubba Clifford J., Matthew Gabel, and Simon Hug. 2008. "Legislative voting behavior, seen and unseen: A theory of roll-call vote selection." Legislative Studies Quarterly 33(4):543-572.

Cox, Gary W. and Scott Morgenstern. 2001. "Latin America's reactive assemblies and proactive presidents." *Comparative Politics* 33(2):171-190.

Crisp, Brian F. and Amanda Driscoll. 2010. "The importance of legislative voting procedures." Unpublished paper.

Diermeier, Daniel and Rebecca Morton. 2003. " Proportionality versus Perfectness: Experiments in Majoritarian Bargaining. Unpublished paper.

Dumitrescu, Delia, and Andres Blais. 2011. "Increased realism at lower cost: The case for the hybrid experiment." *PS: Political Science & Politics* 44(3):521-523.

Fehr, E. and Gachter, S. 2000. "Cooperation and punishment in public goods experiments." *American Economic Review* 90:980–994.

Fischbacher, Urs, et.al. 2001. "Are people conditionally cooperative? Evidence from a public goods experiment." *Economic Letters* 71:397–404.

Fischbacher, Urs. 2007. "z-Tree: Zurich toolbox for ready-made economic experiments." *Experimental Economics* 10(2):171-178.

Fréchette, Guillaume R., John H. Kagel, and Steven F. Lehrer. 2003. "Bargaining in Legislatures: An Experimental Investigation of Open versus Closed Amendment Rules." *American Political Science Review* 97(2):221-232.

Fréchette, Guillaume R., John H. Kagel, and Massimo Morelli. 2005a. "Nominal bargaining power, selection protocol, and discounting in legislative bargaining ." *Journal of Public Economics* 89(8):1497-1517.

Fréchette, Guillaume R., John H. Kagel, and Massimo Morelli. 2005b. "Gamson's Law versus non-cooperative bargaining theory." *Games & Economic Behavior* 51(2):365-390.

Henrich, J. et. al. 2005. "Economic man" in cross-cultural perspective: Behavioral experiments in 15 small-scale societies." *Behavioral and Brain Sciences* 28:795-855.

Henrich, J. et.al. 2010a. "Costly punishment across societies." *Science* 312:1467-1470.

Henrich, J. et.al. 2010b. "Markets, Religion, Community Size, and the Evolution of Fairness and Punishment." *Science* 327:1480-1484.

Herrmann, Benedikt, Christian Thöni, and Simon Gächter. 2008. "Anti-social punishment across societies." *Science* 319:1362-1367.

Hix, Simon, Sara Hagemann, and Doru Frantescu. 2011. "The Effect of Transparency on Legislative Behaviour: Report on an Experiment in the European Parliament." American Political Science Association conference paper.

Hug, Simon. 2010. "Selection effects in roll call votes." *British Journal of Political Science* 40(1):225-235.

Humphreys, Macartan and Jeremy Weinstein. 2008. "Policing politicians: Citizen empowerment and political accountability in Uganda." Unpublished paper.

Kile, Orville M. 1948. *The Farm Bureau through three decades.* Baltimore: Waverly Press.

Lepore, Jill. 2008. "Rock, paper, scissors: How we used to vote." *The New Yorker*, October 13.

Linz, Juan J. 1994. Presidentialism or Parliamentarism: Does It Make a Difference? In *The Failure of Presidential Democracy: The Case of Latin America*, vol. 2, ed. Juan J. Linz and Arturo Valenzuela. Baltimore: Johns Hopkins University Press. 3-87.

Llanos, Mariana, and Constaza Figueroa Schibber. 2008. "La participacion de la presidencia y el senado en el nombramiento del poder judicial." *Desarrollo Economico* 47(188):607-637.

Malesky, Edmund, Paul Schuler, and Ngoc Anh Tran. 2010. "The adverse effects of sunshine: A field experiment testing the impact of transparency on delegate performance in an authoritarian assembly." American Political Science Association conference paper.

Morgenstern, Scott. 2003. *Patterns of legislative politics : Roll call voting in Latin America and the United States.* New York: Cambridge University Press.

Morton, Rebecca and Kenneth Williams. 2010. Experimental political science and the study of causality: From nature to the lab. New York: Cambridge UP.

Niou, Emerson M.S. and Peter C. Ordeshook. 1985. "Universalism in Congress." *American Journal of Political Science* 29(2):246-258.

Odegard, Peter H. 1928. *Pressure politics: The story of the Anti-Saloon League.* New York: Columbia University Press.

Rose-Ackerman, Susan. 1999. *Corruption and government: Causes, consequences, and reform.* New York: Cambridge University Press.

Saalfeld, Thomas. 1995. "On Dogs and Whips: Recorded Votes." *Parliaments and majority rule in Western Europe.* Herbert Doring, ed. New York: St Martin's Press: 528–565.

Samuels, David J. 2002. "Presidentialized parties." *Comparative Political Studies* 35:461-483.

Schumpeter, Joseph Alois. 1942. *Capitalism, socialism, and democracy*. New York: Harper.

Siavelis, Peter. 2000. *The president and congress in postauthoritarian Chile : institutional constraints to democratic consolidation.* University Park: Pennsylvania State University Press.

Skeen, C. Edward. 1986. "Vox Populi, Vox Dei: The Compensation Act of 1816 and the Rise of Popular Politics." *Journal of the Early Republic* 6 (253).

Smith, Steven S. 1989. *Call to order: Floor politics in the House and Senate.* Washington, DC: Brookings Institution Press.

Snyder, James M., and Michael M. Ting. 2005. "Why Roll Calls? A Model of Position Taking in Legislative Voting and Elections." *Journal of Law, Economics, and Organization* 21 (1): 153-78.

Stasavage, David. 2004. "Open-door or closed-door? Transparency in domestic and international bargaining." *International Organization* 58(4):667-703.

Stasavagae, David. 2007. "Polarization and publicity: Rethinkng the benefits of deliberative democracy." *Journal of Politics* 69(1):59-72.

United States Supreme Court. 1958. *Majority Decision in NAACP v. Alabama Ex Rel. Patterson, Attorney General.* No.91 Supreme Court of the United States 357 U.S. 449; 78 S. Ct. 1163.

APPENDIX A: INSTRUCTIONS TO PARTICIPANTS

BETA VERSION: Conducted July-August 2010

Legislative Budgeting Experiment Instructions

Experiment ID#_____

This experiment is part of a study of decision making in legislatures. As a participant, you stand to make a substantial amount of money, which will be paid *in cash* at the end of the experiment. We expect your full participation in the experiment will take about 1 hour.

Materials. You have 4 types of handouts -- all stapled together (for now).

1. A copy of these instructions which you can look at anytime during the experiment. You will see your ID# for the experiment at the top of these instructions.
2. Two copies of a Consent Form on the experiment that you must sign in our presence. You keep one copy; the other stays with us.
3. Your receipt for payment in the experiment. Do not fill in the receipt now. At the end of the experiment we will tell you how to fill in the receipt.
4. A brief questionnaire on your individual characteristics.

No talking or communicating. One important rule of this experiment is that once we begin, no one is allowed to talk or communicate in any way with anyone else. *If you talk or communicate to someone else, you lose your right to payment.*

How will you be paid? Your payment depends partly on your decisions, partly on the decisions of others, and partly on chance. The payoffs are not necessarily fair, and we cannot guarantee that you will earn any specified amount beyond a minimum of $10 that everyone will receive for participating. However, most participants can expect to make substantially more. The experiment consists of a series of group decision-making periods in which you will participate with others in deciding how to divide ***24 budget units***. *In this experiment, each budget unit equals 50 cents ($0.50).* At the end of the experiment, you will be paid in cash what you earned in those periods, plus $10.

How does the experiment work? This experiment is conducted using the networked computers in the Carson Computer Lab. There are 10 participants, and the experiment will take place in a series of 20 periods.

Before the first period begins, here is what will happen:

- 1 of the 10 participants will be chosen at random to play the part of the ***Public***. The other 9 will be ***Legislators***.
- Of the 9 Legislators, 3 will be chosen at random by the computer to be active for the first period. The other 6 will initially be non-active, but remain standing by.

- All participants will be informed whether the experiment will be conducted under conditions of ***Transparency*** or ***Non-Transparency***, which refers to how much information the Public receives about the Legislators' actions. (The details of Transparency and Non-Transparency are explained further below.) Once the condition is assigned, all periods will be played under that condition.

In each period, here is what will happen:

- Of the 3 active Legislators, the computer will choose one at random to be the ***Proposer*** for that period.
- The Proposer will be prompted to divide a budget, however she or he wants, among the 4 active players -- the Public and the 3 active Legislators (one of whom is the Proposer). The available budget in every round is 24 units. Units may not be divided; proposals must be made in full units. The Proposer may give some part of the budget to every player, but is not required to do so.
- All Legislators see the full proposal -- that is, how many budget units the Proposer suggests for each active Legislator, and for the Public.
- Each active Legislator is prompted to vote either to Approve or Reject the proposed budget. [Note that the Proposer is an active Legislator, so the Proposer will have 1 of the 3 votes. Note also that the Public does *not* vote on whether the budget passes.]
    - If a majority (2 or 3) of the Legislators votes to Approve, then the budget passes, and players receive payoffs according to the proposal.
    - If less than a majority (0 or 1) of the Legislators votes to Approve, then the budget is rejected, and all players get zero payoff for that period.

Transparency Condition

- The Public is informed of:
    - the identity of the Proposer;
    - how much the proposed budget offered to each of the Legislators, as well as the Public;
    - how each Legislator voted (Approve or Reject) on the budget proposal;
    - whether the budget was approved or rejected.

Semi-Transparency Condition

- The Public is informed of:
    - the identity of the Proposer;
    - whether the budget was approved or rejected;

Non-Transparency Condition

- The Public is informed only of:
    - whether the budget was approved or rejected.

Note: Under Non-Transparency, the Public receives no information about the Proposer, what each legislator was offered under the proposed budget, or how Legislators voted.

- Each player (the Public and the 3 active Legislators) is informed of her/his payoff for that period -- that is, how much, if anything, s/he will receive as a result of the budget outcome -- and what her/his current total profit is from all decision periods up to now.
- For each active Legislator, the Public is given the option to Approve or Reject that Legislator for "reelection" to participate in the next decision period.
    - If an active Legislator is approved, s/he will continue as active in the next period.
    - If an active Legislator is rejected, s/he will be sent to the pool of non-active Legislators.
    - Note: The Public does not vote to Approve/Reject Legislators in the last period of the experiment.

In between each period, here is what will happen:

- Any Legislator(s) from the previous period who were rejected are replaced by previously non-active Legislator(s), chosen at random by the computer.
- Note: A rejected Legislator is not eligible to be selected for the period immediately following her/his rejection. In future periods, the Legislator is eligible to be drawn at random again.
- Each of the 9 Legislators is informed whether s/he will play in the next period.

After all 20 periods are over:

- Each participant will be informed by the computer of her/his total payoff from the experiment. Participants should stay at their computer screens while a member of the experiment staff comes around to help fill in the receipt form. You may also fill out the participant information questionnaire at this time.
- The staff and participant will both confirm that the amount is correct, will fill in the amount on the receipt, and each will sign the receipt to confirm the amount.
- The participant may then take her/his receipt and questionnaire to the experiment cashier, who will make payment in cash. The participant will sign once more to confirm receipt, and the cashier will collect the receipt.

BASIC VERSION: Fall 2012

Instructions for Online Legislative Budget Experiment

Basic Version

This experiment is part of a study of decision making in legislatures. You will play a game in which players divide a budget. At the end, participants will get paid according to how many budget units they accumulate.

It should take about 5-10 minutes to read and understand the instructions, then 10-15 minutes to play the game. After you read the instructions, you must answer 2 questions about the game correctly before you can play.

The game itself consists of 10 periods of play. Before the first period begins, all participants will be informed whether the experiment will be conducted under conditions of ***Full Transparency, Semi-Transparency***, or ***Non-Transparency*** (explained below). Once the condition is assigned, all periods will be played under that condition.

There are 4 participants. At the outset, 1 will be selected at random to be the Public; the other 3 will be Legislators.

----------[NEXT SCREEN----------

<u>The Budget Proposal</u>
In each period, 1 of the Legislators will be selected at random to be the Proposer. The Proposer will be asked to divide a budget, however she or he wants, among the 4 participants -- the Public and the 3 Legislators.

- The available budget in every period is 24 units.
- Units may not be divided; proposals must be made in full units.
- The Proposer may give some part of the budget to every player, but is not required to do so.

<u>The Legislative Vote</u>
The Legislators then see the budget proposal and vote to approve or reject it. (Note that the Proposer is a Legislator and has a vote, but the Public does *not* vote on whether the budget is approved.)

- If a majority (2 or 3) of the Legislators approves, then the budget passes.
- Otherwise, the budget is rejected, and all players get a zero payoff for that period.

----------[NEXT SCREEN----------

<u>The Public's Information</u>

The Public is then informed about the budget.

- If the game is being played under ***Full Transparency***, the Public is informed of:
  - the identity of the Proposer (L1, L2, or L3);
  - how much the proposed budget offered to each of the Legislators, as well as to the Public;
  - how each Legislator voted (Approve or Reject) on the budget proposal.

- If the game is being played under ***Semi-Transparency***, the Public is informed of:
  - the identity of the Proposer;
  - whether the budget was approved or rejected;
  - the Public's own share of the budget.

- If the game is being played under ***Non-Transparency***, the Public is informed of:
  - whether the budget was approved or rejected;
  - the Public's own share of the budget.

----------[NEXT SCREEN----------

The Public's Vote

After being informed, the Public votes "Thumbs Up" or "Thumbs Down" on each Legislator. For each Legislator, a "Thumbs Up" vote increases by 10% his chance of being rewarded at the end of the game. Legislators who are rewarded have their total budget payoffs doubled.

For example:

- If the Public votes "Thumbs Down" to a given Legislator in all 10 periods of the game, the Legislator has zero chance of being rewarded with a double payoff.
- If the Public votes "Thumbs Up" to a given Legislator in all 10 periods, the Legislator has 100% chance of being rewarded.
- If the Public votes "Thumbs Up" in 5 periods and "Thumbs Down" in 5, the Legislator has a 50% chance of being rewarded.
- … and so on.

After Each Period

Each participant is informed of her/his payoff for that period. Each Legislator is informed of whether the Public voted "Thumbs Up" or "Thumbs Down" for her/him.

----------[NEXT SCREEN----------

Completing the Experiment

After all 10 periods are complete, the computer determines, on the basis of each Legislator's "Thumbs Up" and "Thumbs Down" tally, whether her/his total budget payoff is doubled. Each participant is informed of her/his total payoff, then asked to fill out a short survey. Participants must complete all 10 periods, plus the survey, to be paid.

Note that completing any period requires action by all 4 participants. If one participant gets distracted, others should not be required to wait. Therefore, once the experiment begins, any participant who fails to respond to a prompt within the allowed period of time will be disqualified and immediately replaced with another player so the game may proceed. You are allowed more time in the first couple of periods, as you are learning the game, and a bit less time after that, to keep things moving. A countdown clock will be visible on your screen to let you know how much time you have left.

Payment

If you complete the experiment and the survey, you are guaranteed a payment of $1.00, plus your share of the budget payoff pool. Each budget unit is worth $.01. There are 24 budget units available in each period, and 10 periods of play, for a total of 240 budget units. But of course budget units that are awarded to Legislators can be doubled at the end of the game, so the maximum total payoff is 480 units, or $4.80 (plus $1.00 guaranteed to each participant). The total payoffs will likely be less, depending how much goes to the Public, how much goes to Legislators whose payoffs are not doubled, and how many budgets simply do not pass.

[BENNET: PLEASE ADVISE ON HOW PARTICIPANTS SHOULD COMPLETE THEIR TASK TO GET PAID.]

----------[NEXT SCREEN----------

2 QUIZ QUESTIONS

2 of the following questions should be drawn at random for each participant. If the participant does not answer *both* questions correctly, she/he should be given the option to return to the first screen of Instructions, click through them again, and then answer 2 different questions drawn from this pool. Once a participant answers a set of questions correctly, she/he may proceed to play the game. If a participant fails 3 times, she/he should be dropped from the experiment.

Questions

How many budget units are available in each budget?

a) 5
b) 24
c) 100
d) 1,000

Of the participants in the game, how many are Legislators?

a) 1
b) 2
c) 3
d) 4

True or False: The Proposer must offer some part of the budget to every player.

a) True
b) False

A player is disqualified if she/he fails to respond to a prompt within:

a) 3 seconds
b) 60 seconds
c) 30 minutes
d) 24 hours

Getting more “Thumbs Up” votes increases a Legislator’s chances of:

a) Becoming the Proposer
b) Becoming the Public
c) Being elected President
d) Getting rewarded with double budget units at the end of the game.

After the game ends, in order to get paid, a participant must:

a) Complete a short survey
b) Write a long essay
c) Have won more points than any other player

APPENDIX B: Script for Robot Player in August 2012 Experiments
(in case of need to replace an original participant during experiment)

If Robot is Proposer, offer each of the following budgets with 1/3 probability:

- 6 units for each participant
- 12 units for Proposer, 1 unit for each other Legislator, and 10 units for Public
- 12 units for Proposer, 6 units for each other Legislator, 0 for Public

If Robot is a Legislator, vote on budget proposals by following rules:

- If Legislator is Proposer, always vote Approve.
- If Legislator is non-Proposer, then vote Approve if offered > 2; else vote Reject.

If Robot is Public, give Thumbs Up/Down as follows:

Non-Transparency

- If Public pay-off <6, then Thumbs Down for all Legislators.
- If 6 <= Public pay-off <8, then Thumbs Down each Legislator with 50% probability.
- If Public pay-off >=8, then Thumbs Up all Legislators.

Semi-Transparency

- If Public pay-off <6, then Thumbs Down for Proposer and Thumbs Up/Down each at 50% probability for other Legislators.
- If 6 <= Public pay-off <8, then Thumbs Down Proposer with 50% probability. Thumbs Up other Legislators.
- If Public pay-off >=8, then Thumbs Up all Legislators.

Full Transparency

- If Public pay-off <6, then Thumbs Down Proposer and any other Legislator who voted to Approve budget. Thumbs Up to any Legislators who voted to Reject budget.
- If 6 <= Public pay-off <8, then Thumbs Down Proposer and any Legislator who votes to Approve budget with 50% probability. Thumbs Up to any Legislators who voted to Reject budget.
- If Public pay-off >=8, then Thumbs Up all Legislators.

NOTE: When a Robot plays, set response times as follows:

- Make a budget proposal: 12 seconds
- Vote to Approve/Reject a budget proposal: 5 seconds
- Enter Thumbs Up/Down votes: 15 seconds

Appendix C: Proposed Script for Robot Player (to be implemented)
(in case of need to replace an original participant during experiment)

If Robot is Proposer, offer each of the following budgets with 1/20 probability:

Public	Proposer	Non-Proposer_Leg_1	Non_Proposer_Leg_2
13	9	2	0
14	8	2	0
11	10	3	0
12	9	3	0
9	11	4	0
10	10	4	0
7	12	5	0
8	11	5	0
5	13	6	0
6	12	6	0
3	17	2	2
4	16	2	2
1	18	3	2
2	17	3	2
4	14	4	2
5	11	4	4
6	9	5	4
7	8	5	4
8	6	6	4
9	5	6	4

If Robot is a Legislator, vote on budget proposals by following rules:

- If Legislator is Proposer, always vote Approve.
- If Legislator is non-Proposer, then:
    - Under Non-Transparency or Semi-Transparency, vote Approve if offered >1; else vote Reject.
    - Under Full Transparency, vote Approve if Public is offered > 5; else vote Reject.

If Robot is Public, give Thumbs Up/Down as follows:

Non-Transparency
- If Public pay-off <6, then Thumbs Down for all Legislators.
- If 6 <= Public pay-off <8, then Thumbs Down each Legislator with 50% probability.
- If Public pay-off >=8, then Thumbs Up all Legislators.

Semi-Transparency
- If Public pay-off <6, then Thumbs Down for Proposer and Thumbs Up/Down each at 50% probability for other Legislators.

- If 6 <= Public pay-off <8, then Thumbs Down Proposer with 50% probability. Thumbs Up other Legislators.
- If Public pay-off >=8, then Thumbs Up all Legislators.

Full Transparency

- If Public pay-off <6, then Thumbs Down Proposer and any other Legislator who voted to Approve budget. Thumbs Up to any Legislators who voted to Reject budget.
- If 6 <= Public pay-off <8, then Thumbs Down Proposer and any Legislator who votes to Approve budget with 50% probability. Thumbs Up to any Legislators who voted to Reject budget.
- If Public pay-off >=8, then Thumbs Up all Legislators.

NOTE: When a Robot plays, set response times as follows:

- Make a budget proposal: 10 seconds
- Vote to Approve/Reject a budget proposal: 5 seconds
- Enter Thumbs Up/Down votes: 5 seconds

Figure 1.

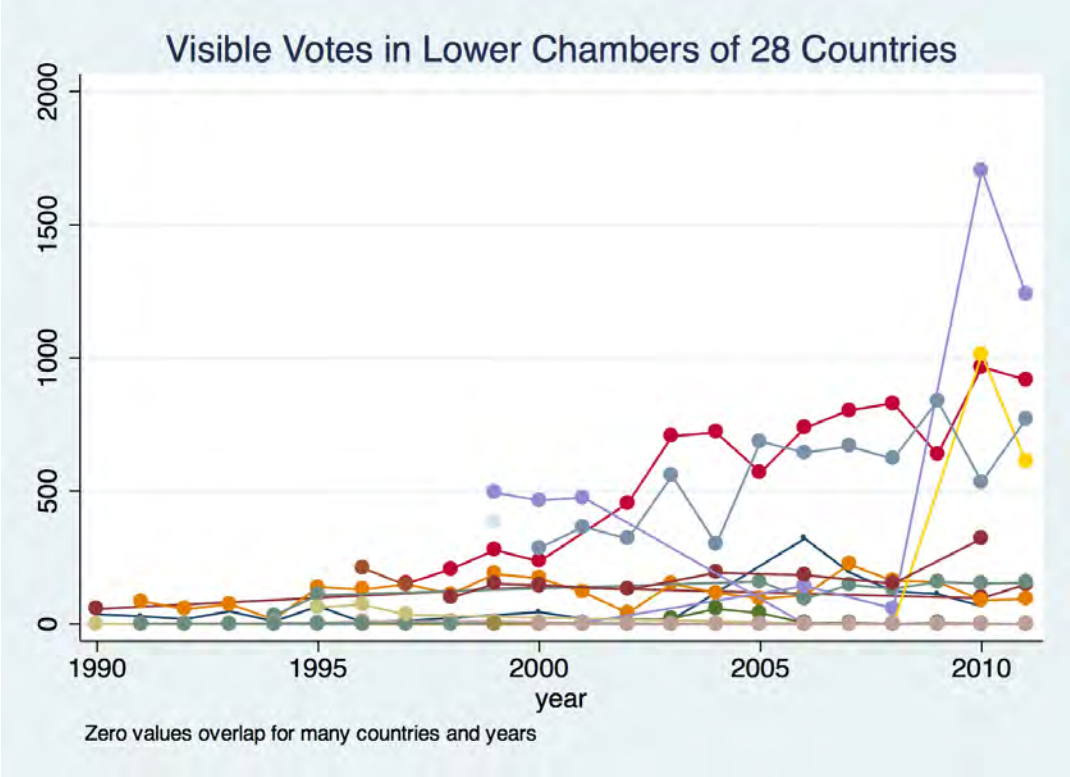


Figure 2.

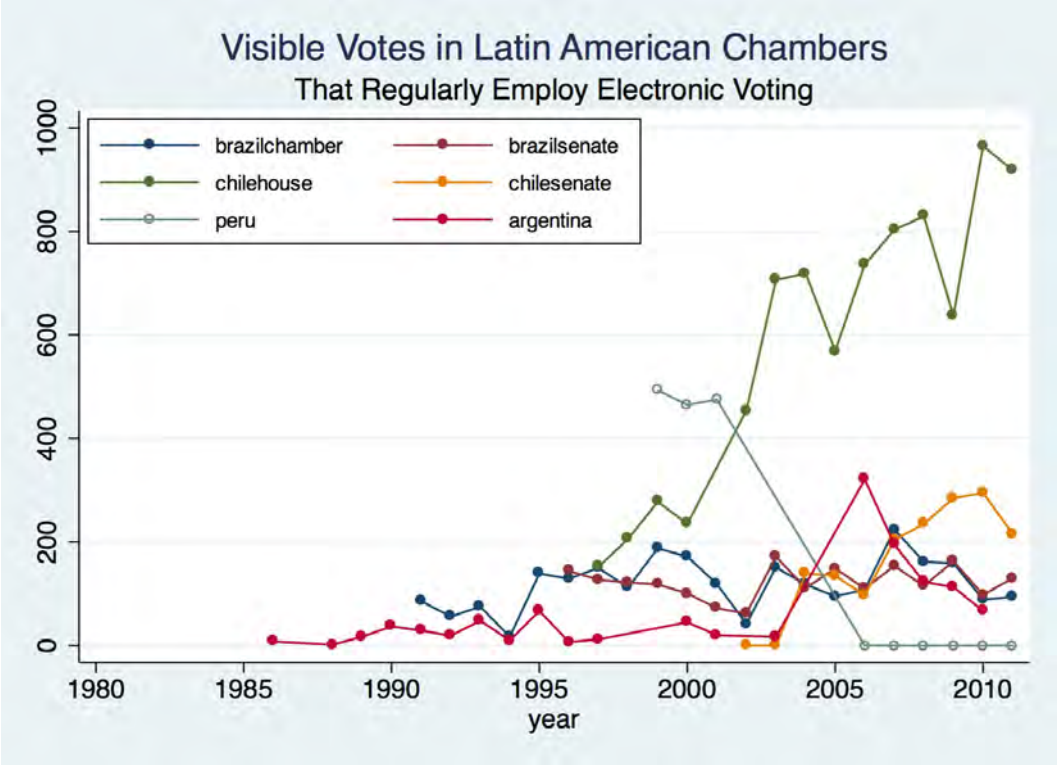


Figure 3.

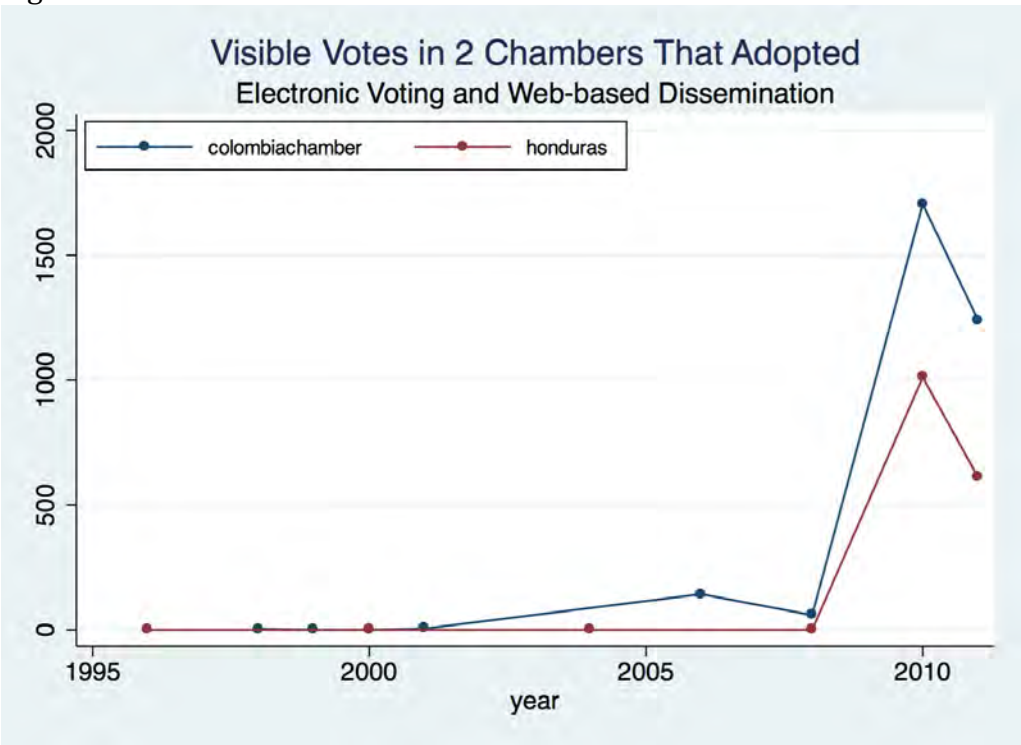


Figure 4.

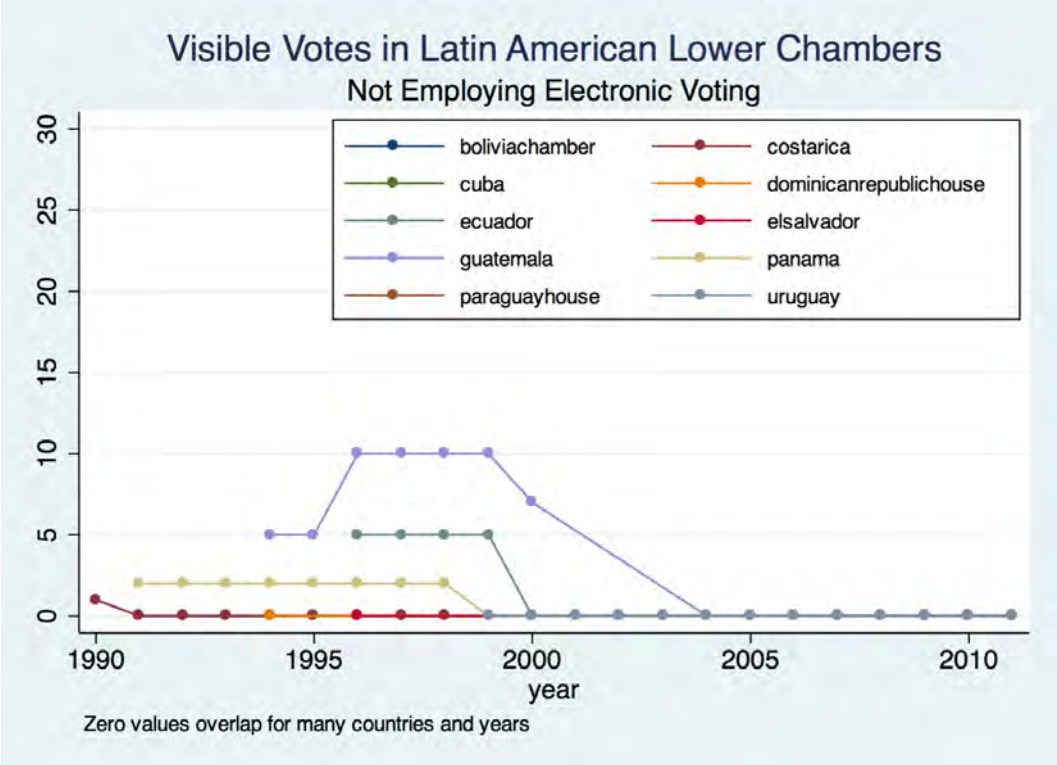


Figure 5.

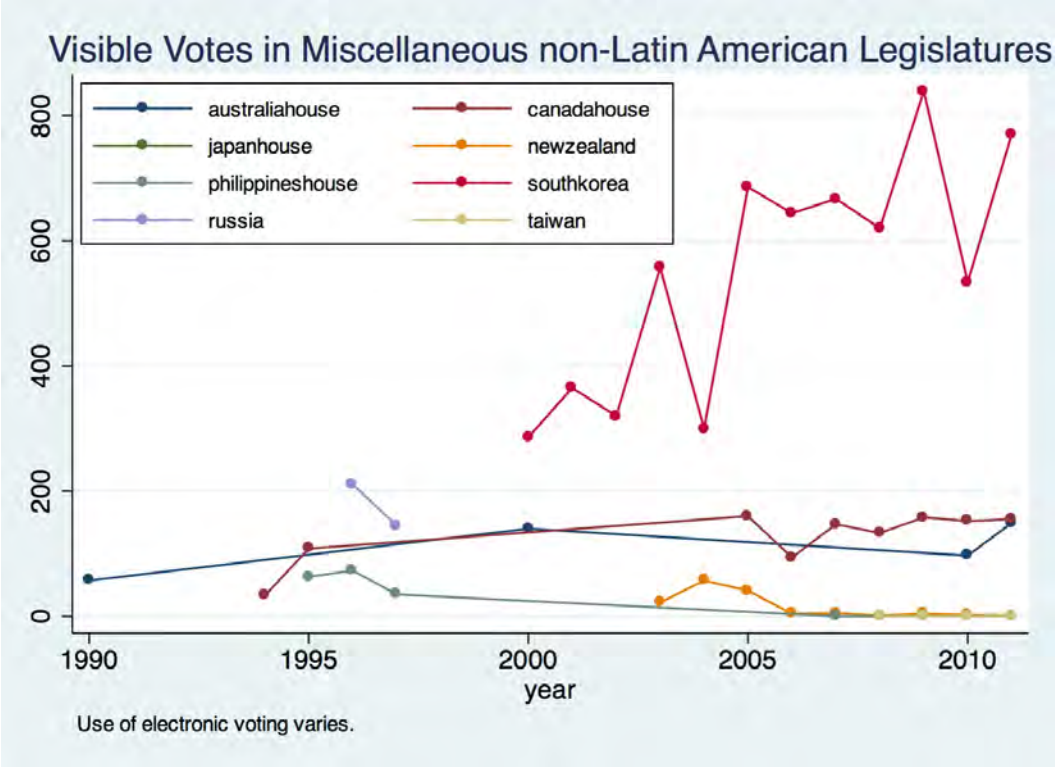


Figure 6.

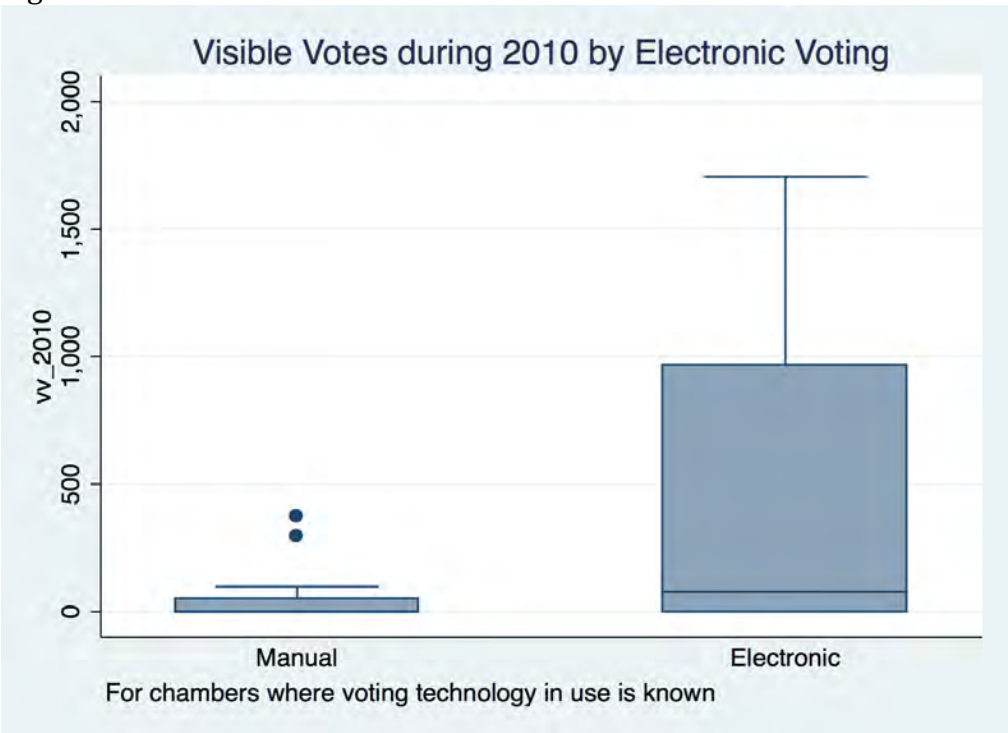


Figure 7

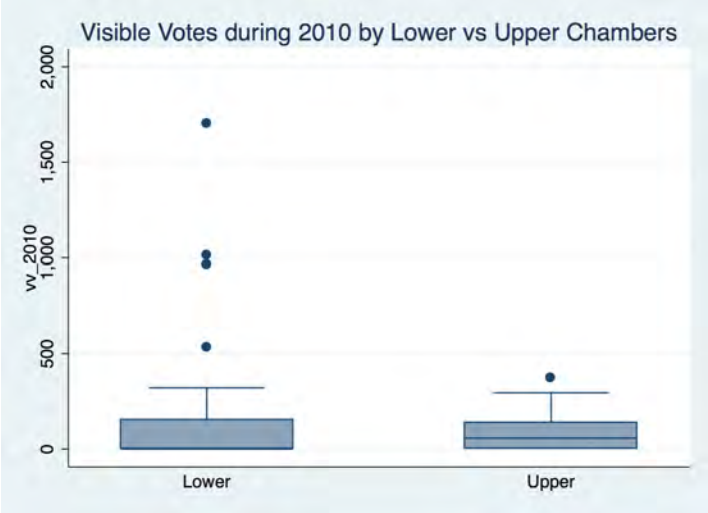


Figure 8

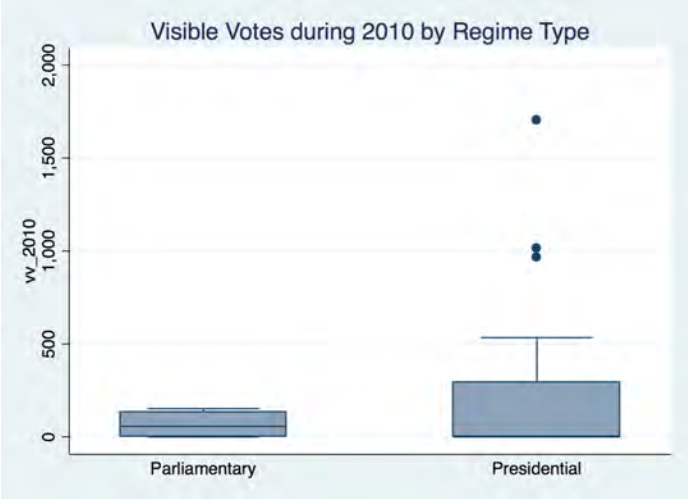


Figure 9

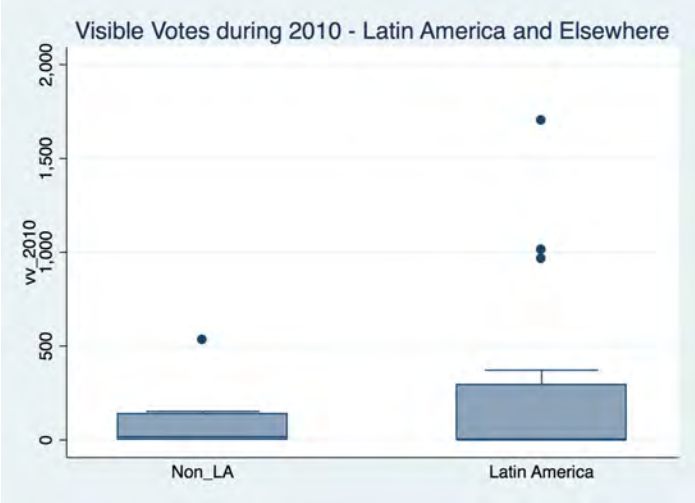


Figure 10

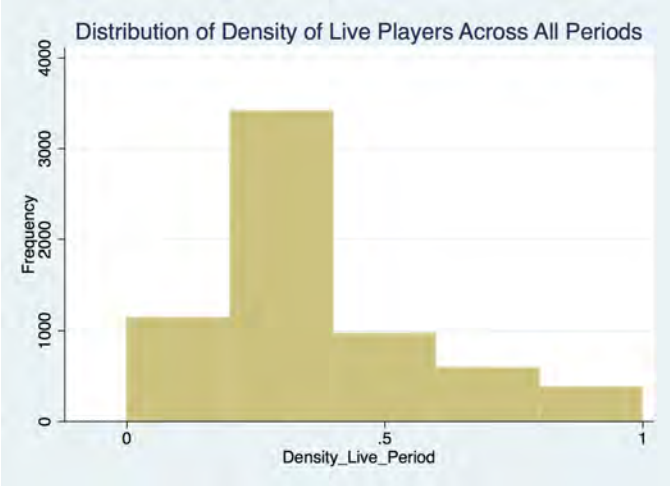


Figure 11

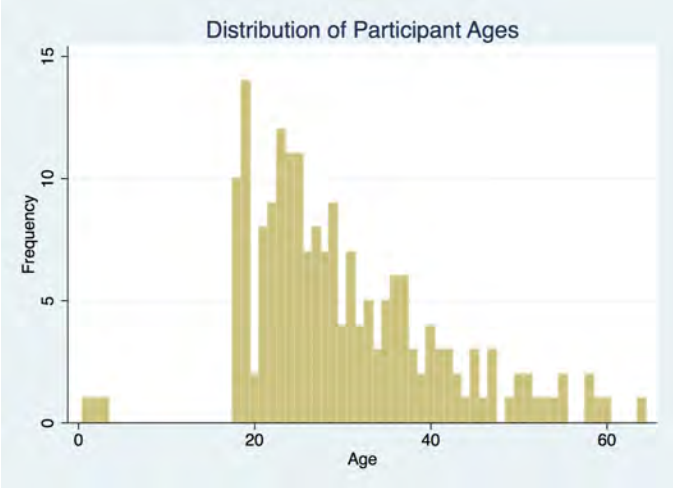


Figure 12

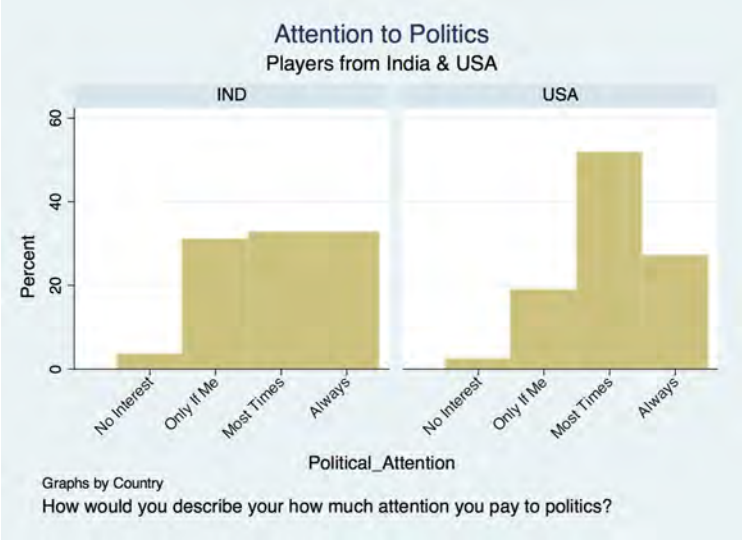


Figure 13

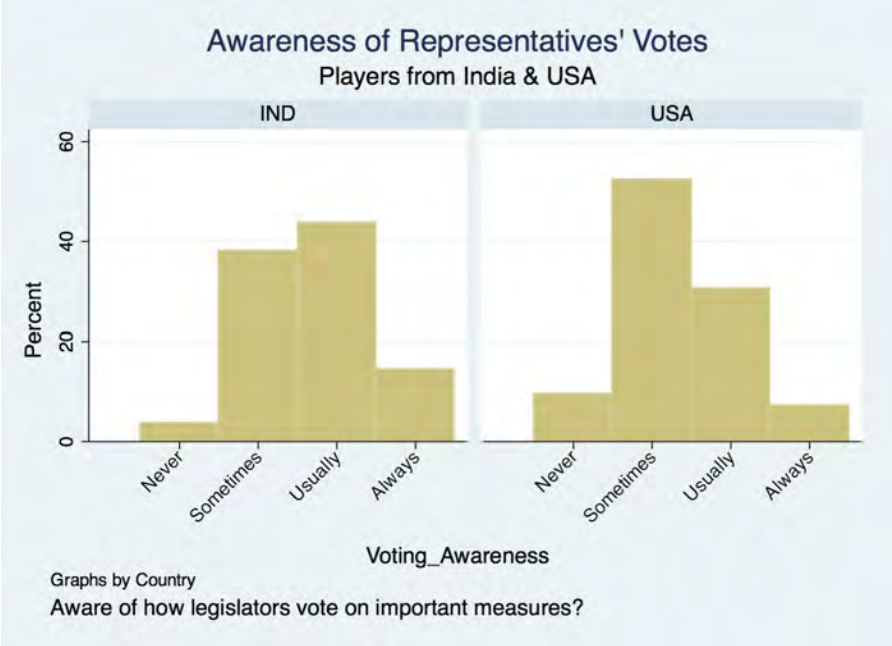


Figure 14

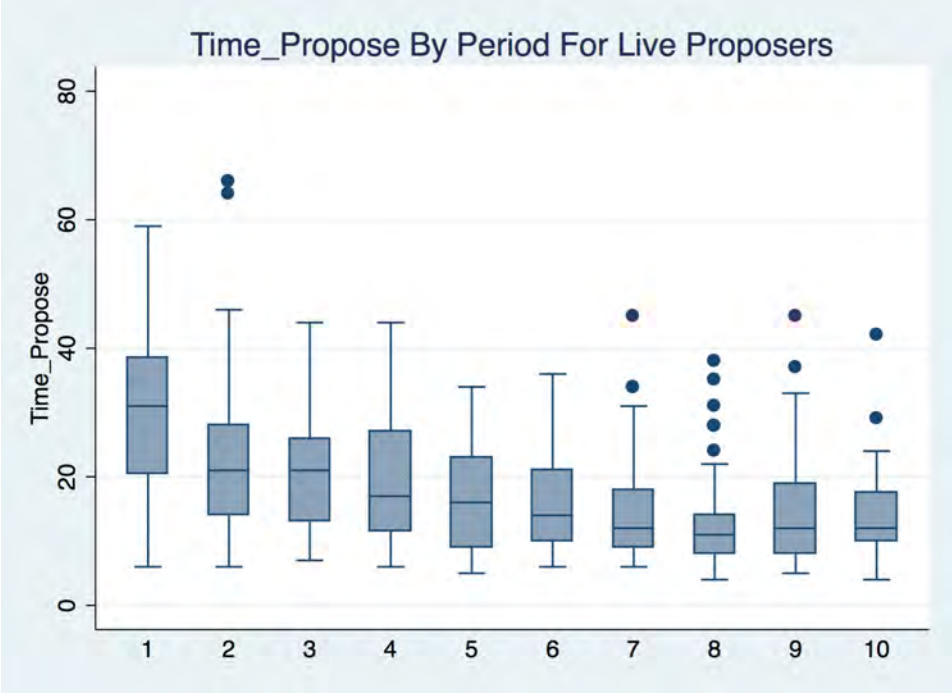


Figure 15

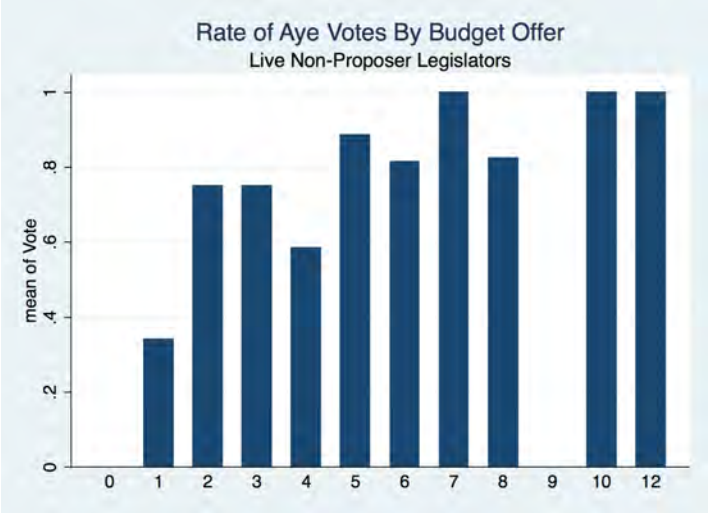


Figure 16. BASIC

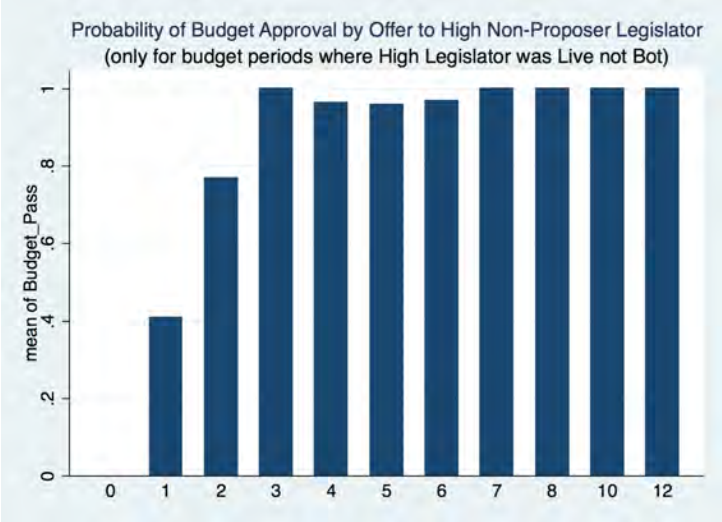


Figure 17: BASIC

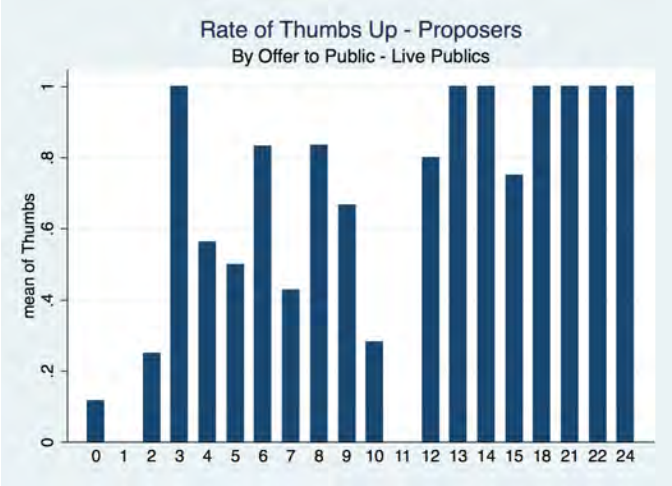


Figure 18. BETA: Offers to Public, Proposer, and non-Proposer Legislators, by Transparency

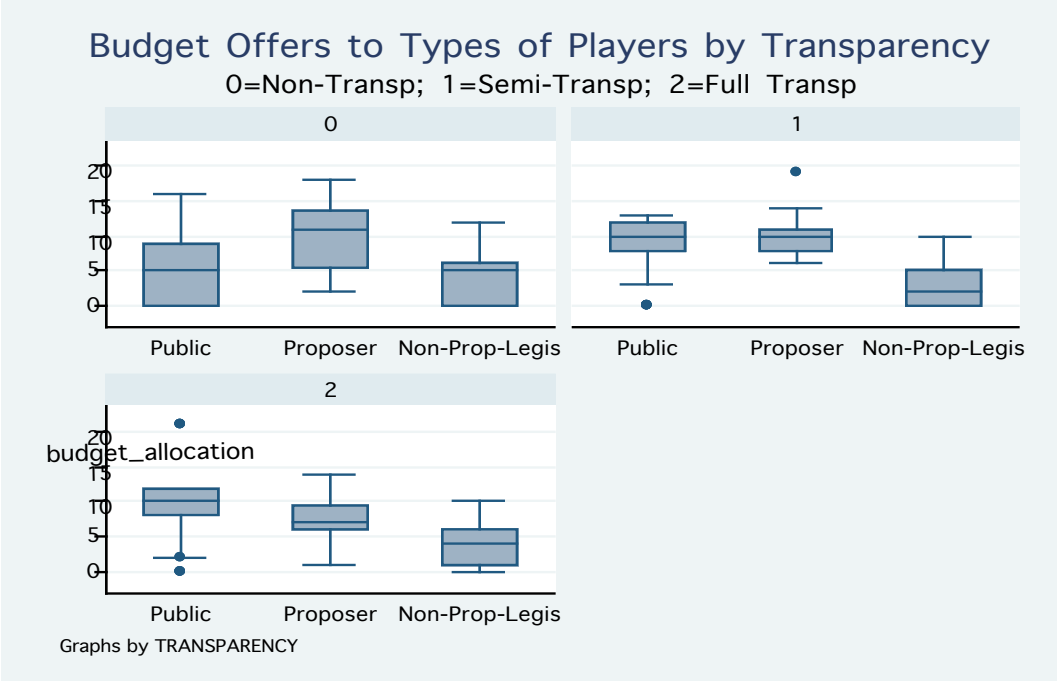


Figure 19. BASIC: Offers to Public, Proposer, and High and Low Legislators, by Transparency

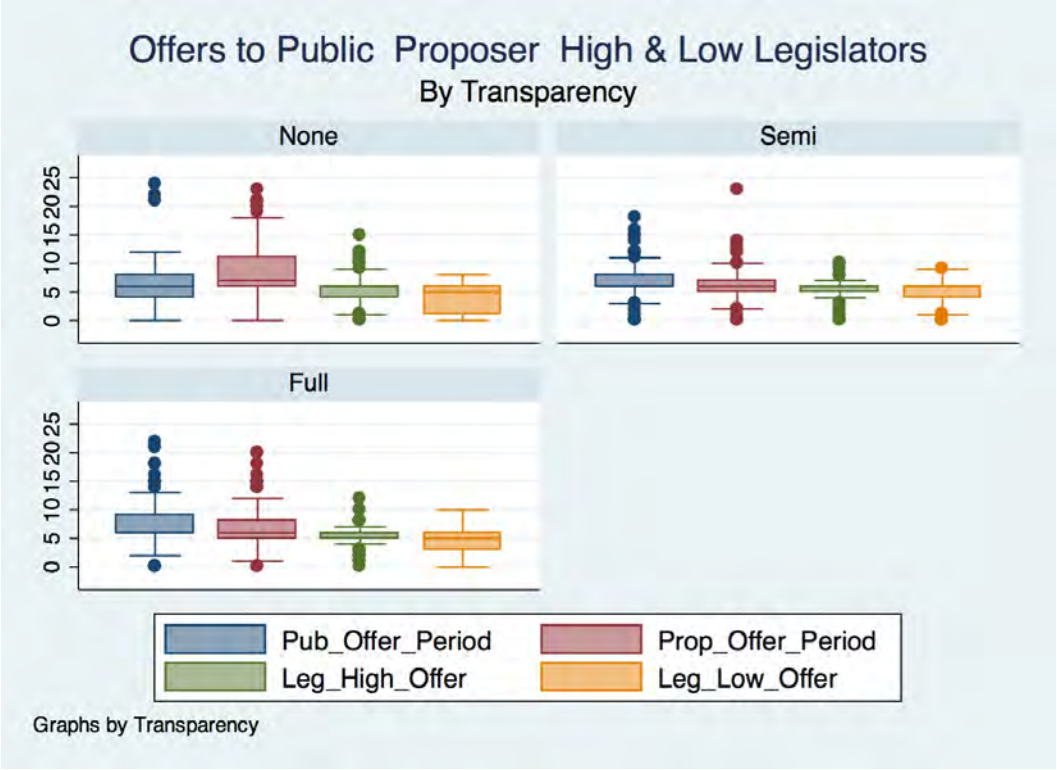
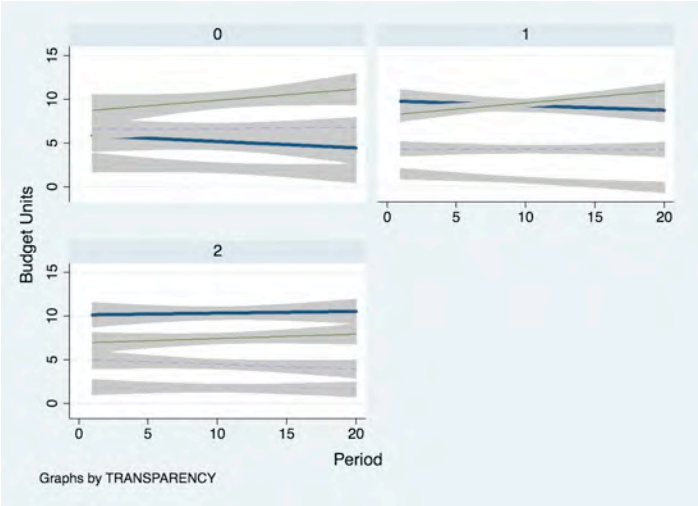


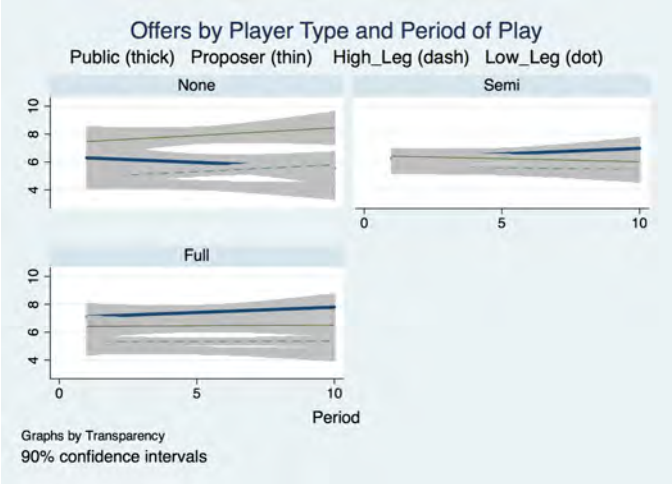
Figure 20. Linear estimation (with 90% C.I.) of offers to each type of player across periods, by transparency.

BETA



[Public: Thick; Proposer: Thin; High Legislator: Dashed; Low Legislator: Dotted]

BASIC



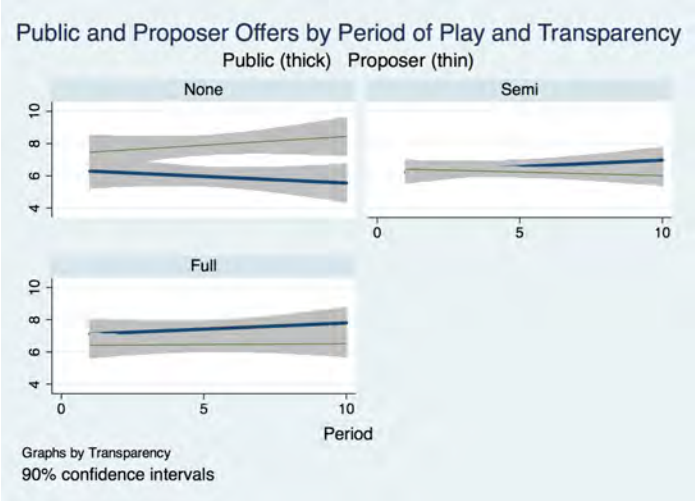


Figure 21. BETA: Rate of Proposers rejected, by Public Offer and Transparency

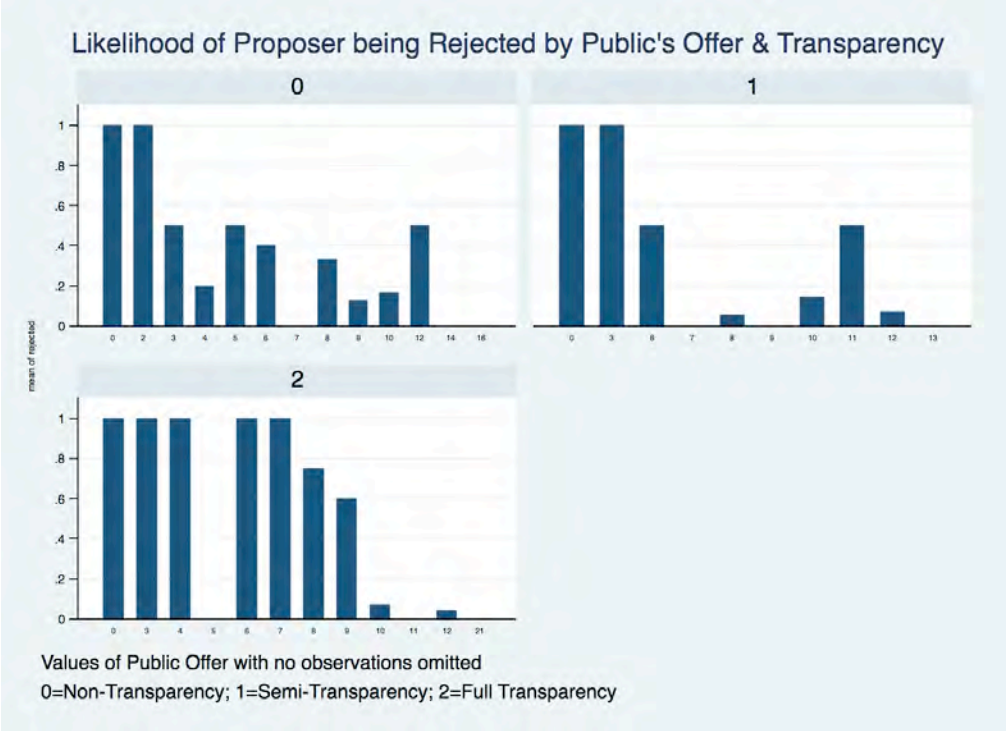
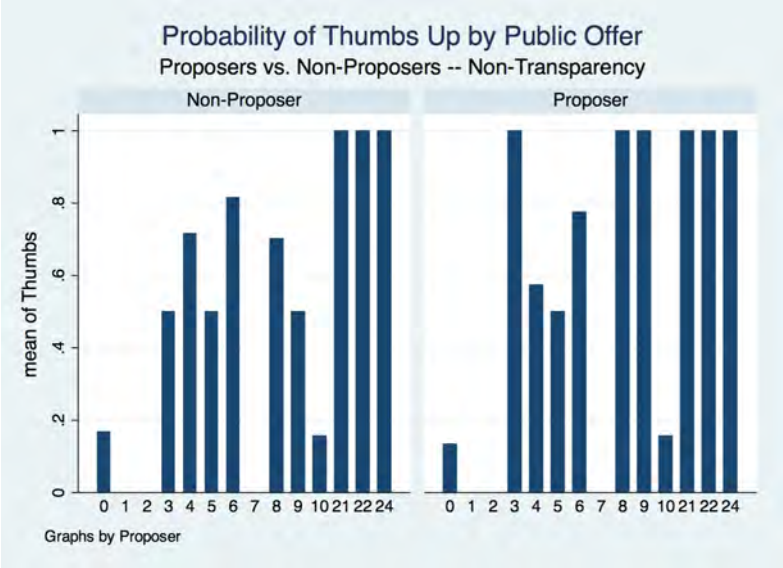
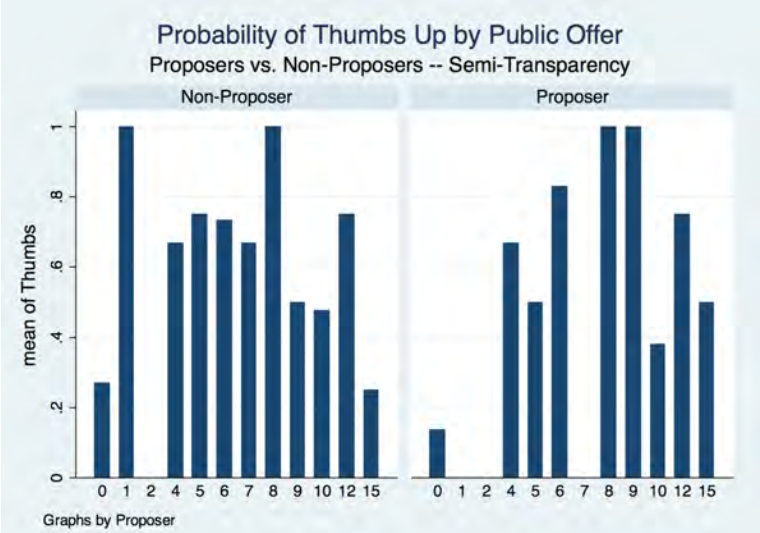


Figure 22


Probability of Thumbs Up by Public Offer
Proposers vs. Non-Proposers -- Non-Transparency
Non-Proposer
Proposer
mean of Thumbs
0 .2 .4 .6 .8 1
0 1 2 3 4 5 6 7 8 9 10 21 22 24
Graphs by Proposer


Probability of Thumbs Up by Public Offer
Proposers vs. Non-Proposers -- Semi-Transparency
Non-Proposer
Proposer
mean of Thumbs
0 .2 .4 .6 .8 1
0 1 2 4 5 6 7 8 9 10 12 15
Graphs by Proposer

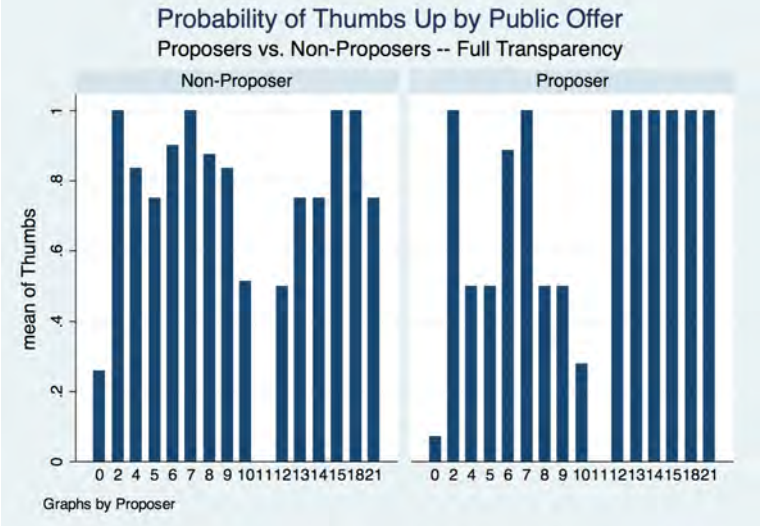

Probability of Thumbs Up by Public Offer
Proposers vs. Non-Proposers -- Full Transparency
Non-Proposer
Proposer
mean of Thumbs
0 .2 .4 .6 .8 1
0 2 4 5 6 7 8 9 10 11 12 13 14 15 18 21
Graphs by Proposer

Figure 23

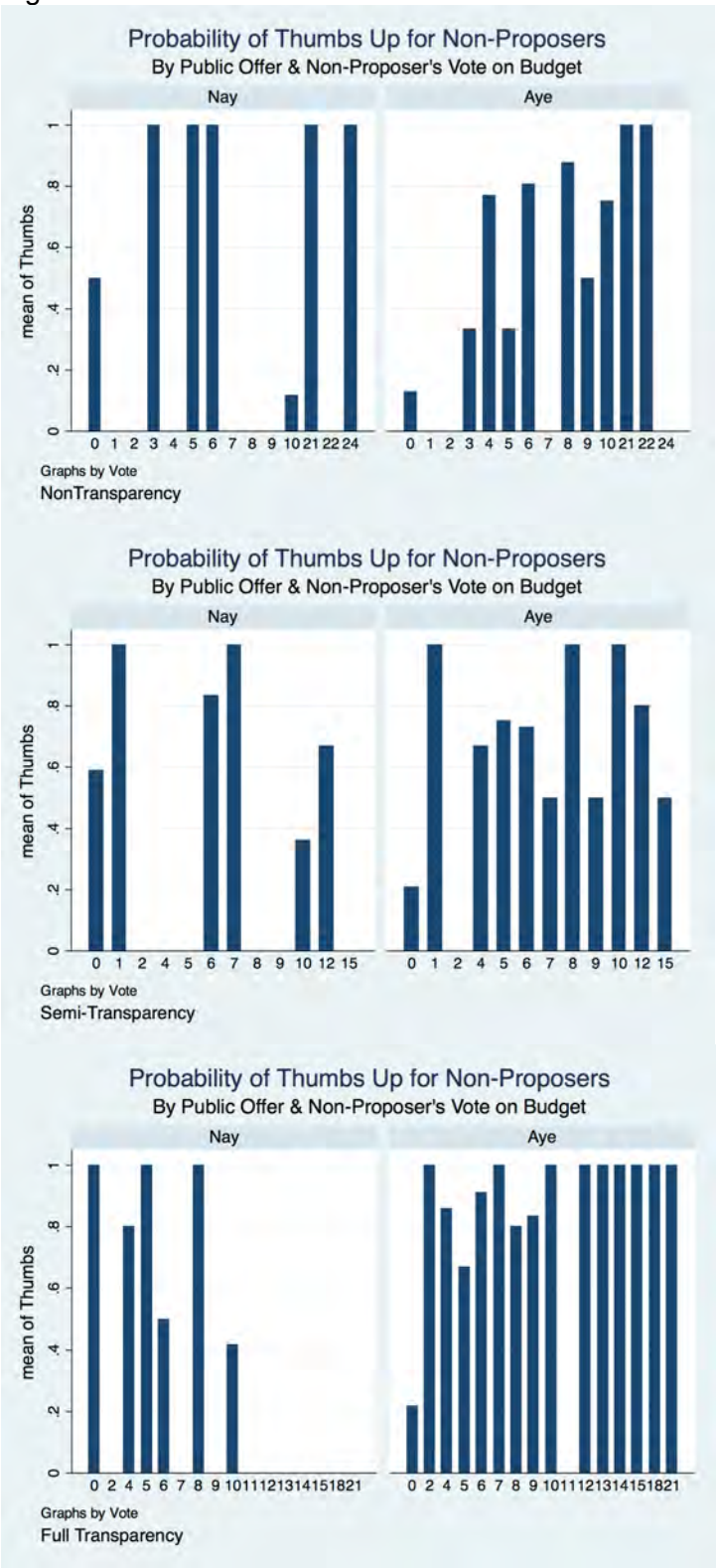

Probability of Thumbs Up for Non-Proposers
By Public Offer & Non-Proposer's Vote on Budget
Nay
Aye
mean of Thumbs
0 .2 .4 .6 .8 1
0 1 2 3 4 5 6 7 8 9 10 21 22 24
0 1 2 3 4 5 6 7 8 9 10 21 22 24
Graphs by Vote
NonTransparency
Probability of Thumbs Up for Non-Proposers
By Public Offer & Non-Proposer's Vote on Budget
Nay
Aye
mean of Thumbs
0 .2 .4 .6 .8 1
0 1 2 4 5 6 7 8 9 10 12 15
0 1 2 4 5 6 7 8 9 10 12 15
Graphs by Vote
Semi-Transparency
Probability of Thumbs Up for Non-Proposers
By Public Offer & Non-Proposer's Vote on Budget
Nay
Aye
mean of Thumbs
0 .2 .4 .6 .8 1
0 2 4 5 6 7 8 9 10 11 12 13 14 15 18 21
0 2 4 5 6 7 8 9 10 11 12 13 14 15 18 21
Graphs by Vote
Full Transparency

Figure 24. BASIC – Rate of Doubling Payoffs (analog to reelection) among Live Legislators, by Transparency.

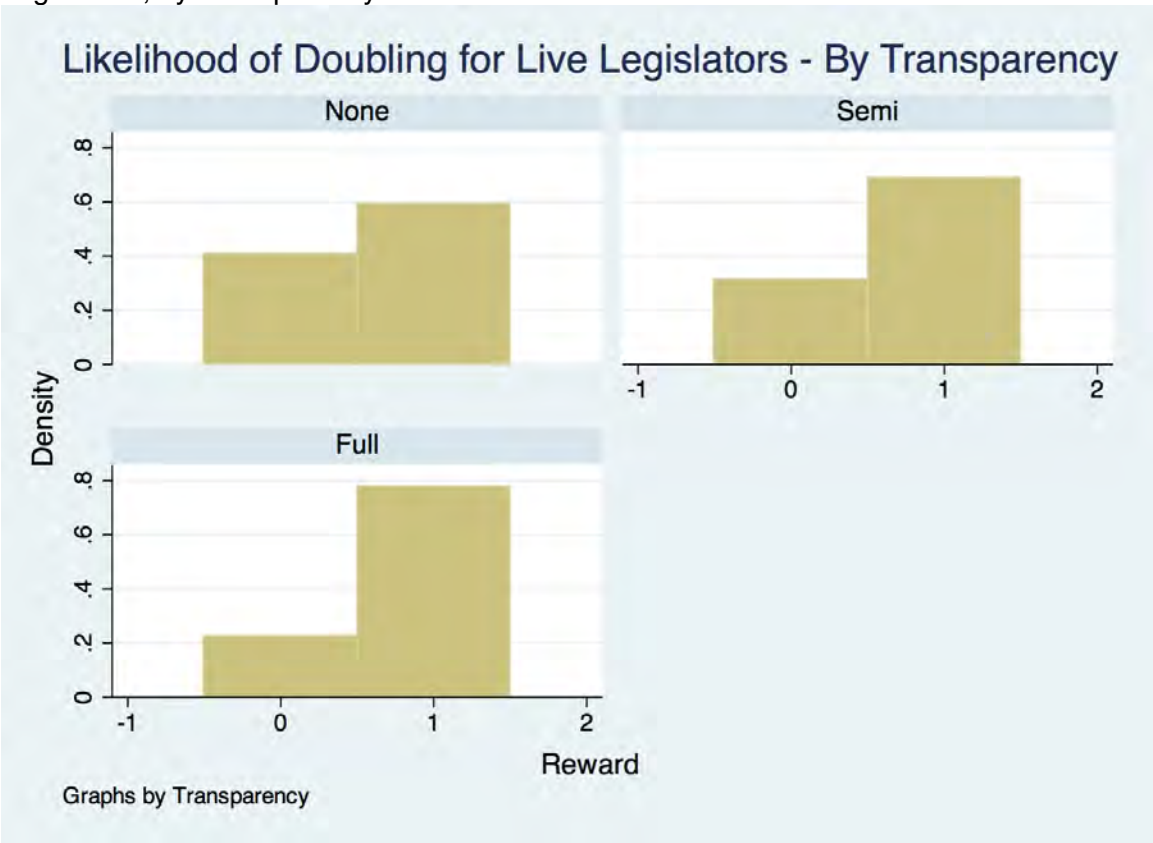


Table 1. Mean offers by Live Proposers to each type of player, by Transparency

	Transparency			
	None	Semi	Full	
Public	5.2	9.3	10.3	BETA
Proposer	10.0	9.7	7.5	
High_Legislator	6.7	4.3	4.5	
Low_Legislator	2.2	0.7	1.8	
Public	5.6	6.8	7.3	BASIC
Proposer	8.8	6.3	7.0	
High_Legislator	5.3	5.6	5.3	
Low_Legislator	3.9	5.0	4.4	

Table 2. Logistic regressions of budget approval votes by non-Proposer Legislators on their own budget offers, and Public_Offers, by transparency conditions. (N=114)

	Non-Transparency		**Semi-Transparency**		**Full Transparency**		
	Coefficient (Std.Error)	20th→80th	Coefficient (Std.Error)	20th→80th	Coefficient (Std.Error)	20th→80th	
Legislator's Budget Offer	.72 (.13)	+72% (9%)	1.65 (.40)	+69% (7%)	.41 (.14)	+19% (6%)	**BETA**
Public's Offer	.30 (.09)	+39% (13%)	-.16 (.14)	-2% (3%)	.38 (.14)	+12% (5%)	
Legislator's Budget Offer	.89 (.11)	+80% (5%)	1.14 (.13)	+.34% (3%)	.88 (.10)	+80% (5%)	**BASIC**
Public's Offer	.29 (.05)	+53% (8%)	.47 (.07)	+67% (6%)	.32 (.05)	+16% (2%)	

Table 3. Distribution of budget benefits across Legislators.

	NT	**ST**	**FT**	
% Minimum Coalitions	53%	67%	26%	**BETA**
Variance Legislators' Offers	4.3	4.7	2.8	
% Minimum Coalitions	14%	3%	6%	**BASIC**
Variance Legislators' Offers	2.4	.8	1.4	