ISSN 2279-9362

Collegio Carlo Alberto

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No. 596
November 2019

Carlo Alberto Notebooks

www.carloalberto.org/research/working-papers

Jam-barrel Politics*

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November 15, 2019

Abstract

We study the executive-legislative exchange of centrally-allocated and individually targeted benefits (*jam*) for legislative support in Colombia. We use data from road building contracts, roll-call votes, and a leaked document which allegedly revealed the secret assignment of road projects to specific legislators. We find that assigned projects were more expensive relative to similar non-assigned projects, legislators who appeared in the leak were more likely to be "swing" voters in the congress, and legislators increased their support for the president's party after their assigned contracts were signed. The results are stronger for legislators representing remote regions, where political institutions are weaker.

JEL Codes: D72, D73, H54, H57, R11

Keywords: legislatures; distributive politics; pork-barrel; legislative vote-buying; spatial isolation

*The opinions contained in this document are the sole responsibility of the authors and do not represent those of the *Banco de la República* or its Board of Directors. This paper was previously titled "Jam-barrel Politics: Road building and legislative voting in Colombia". We thank Aureo de Paula, Edoardo Grillo, Marit Hinnosar, Eliana La Ferrara, Jean-William P. Laliberté, Ignacio Monzón, Santiago Oliveros, Giacomo Ponzetto, Jahen Rezki, David Rivers, Yogita Shamdasani, and Albert Solé-Ollé, as well as seminar and conference participants at the Banco de la República, the Collegio Carlo Alberto, the University of Stirling, University College Dublin, the 2018 Banff Empirical Microeconomics Workshop (University of Calgary), the 2018 Nordic Conference on Development Economics (Aalto University School of Business), the 2018 Bolzano Workshop on Political Economy (Free University of Bozen-Bolzano), the 1st Annual Colombian Economics Conference (Universidad de los Andes), the 2019 IEB Workshop on Political Economy (Universitat de Barcelona), the 2019 Development Economics and Policy Conference (DIW Berlin), the 2019 SIEP Conference (University of Turin), the 2019 NEUDC conference (Northwestern University), and the 2019 LACEA Annual Meeting (Benemérita Universidad Autónoma de Puebla) for helpful comments and discussions. We also thank the Italian Society of Public Economics for the 2019 SIEP Prize awarded to this paper. Francesco Beraldi provided outstanding research assistance. All errors are our own. Corresponding author: juan.morales@carloalberto.org.

1 Introduction

The non-programmatic distribution of public resources is a common feature of democracies (Golden and Min, 2013; Stokes et al., 2013; Cruz and Keefer, 2015). Executive leaders often rely on patronage and *pork* as tools to tighten legislative cohesion and raise approval for their policy agendas (Raile, Pereira and Power, 2011). However, in environments with weak judicial institutions and low political accountability, the exchange of targeted resources for legislative support could easily undermine democratic principles, and specially so if these arrangements benefit individual legislators. That these exchanges sometimes occur "behind closed doors" further highlights these concerns, and poses a challenge for social scientists looking to understand how such transfers affect governance and policy-making.

This paper studies the executive-legislative exchange of centrally-allocated resources for congressional support in Colombia, where non-programmatically distributed public goods are colloquially referred to as "jam" ("mermelada"). Our study focuses on the 2010-2014 government, which was accused of spreading jam liberally to boost both electoral and legislative support.[1] The analysis exploits a leaked government database published in Colombian news media which allegedly revealed the secret assignment of road construction projects to specific members of congress. The process by which these assignments were made and the nature of these arrangements was never clear. The opposition declared that the information was evidence of corruption. The government clarified that politicians assigned to these projects were contract sponsors, and that it was legitimate for them to seek investment on behalf of their constituents. We study these contract sponsorships, theoretically through a political economy model of legislative decision-making with centrally-allocated jam, and empirically using data from the leaked database, the executed road construction contracts and legislators' roll-call votes.

We present a political economy model of legislative decision-making in which the executive uses targeted transfers to increase legislative support for its preferred policies. The framework highlights how the exchange of benefits for political support arises naturally in executive-legislative relations. Single-peaked and unidimensional preferences are endowed to legislators and the executive. The executive aims to pull pivotal legislators as close to its preferred position as possible. To do so, it distributes (or spreads) *jam*: non-programmatic, centrally-allocated and individually targeted resources. Legislators are willing to deviate from their bliss-point policy positions in exchange for jam. The model makes three clear predictions. First, legislators close to the median position are more likely to be targeted. Second, conditional on receiving benefits, legislators that are initially further from the executive receive more jam and shift their chosen policy more relative to legislators who are initially

[1] See Semana (2013), El Espectador (2014a), and La Silla Vacía (2014 a, b, c). Previous governments have also engaged in similar practices (Cárdenas, Mejía and Olivera, 2006).

closer to the executive. Third, as the political environment of legislators varies, those who are less accountable to their constituents (and therefore have a relatively higher taste for jam), are more responsive to the receipt of these goods.

An important feature of the political environment in Colombia is the regional disparity in the strength of the state. Robinson (2016) analyzes the co-existence of inclusive and extractive institutions in the country, documenting a distinct core-periphery geographic pattern. Differences in the quality of institutions explain why the periphery is less developed, poorer and more violent than the core. Spatial isolation makes society "easy to manage" for the elites in the core (Robinson, 2016, p. 30), where the legislature is located in the capital, Bogotá. One mechanism that reinforces these core-periphery disparities is lower political accountability and higher incidence of vote-buying and clientelism in the periphery (Robinson, 2016; Fergusson et al., 2017). If legislators face a trade-off between accurately representing their constituents' views and trading their legislative votes for jam (a point highlighted in our theoretical framework), and those representing peripheral departments are less politically accountable, then centrally-allocated benefits targeting them will be more effective in raising legislative support. The weakness of institutions in remote areas of the country is therefore a feature which can be exploited by the executive to further its legislative goals through the disbursement of jam.

The empirical analysis first describes how sponsoring legislators and sponsored road construction contracts differ from non-sponsoring legislators and non-sponsored contracts. We estimate a time-invariant measure of political alignment based on the propensity of legislators to align their votes with the position of the incumbent party. We document an inverse-U relationship between the likelihood of receiving contract sponsorships and the political alignment of legislators, such that "swing" legislators were more likely to benefit. For road construction contracts, we find that sponsored projects were more expensive than non-sponsored projects, in terms of their cost per kilometer. The differences in costs persist even after controlling for a vector of geographic characteristics of the locations where they were built, including altitude, distance to the departmental capital, ruggedness and department fixed effects.[2] Furthermore, these patterns are stronger for both legislators from and road contracts executed in peripheral departments.

We study the relationship between the road project assignments and legislators votes in congress using a difference-in-differences framework that exploits the panel structure of the data and the timing of the signature of the specific contracts. This setting allows us to study within-legislator and within-congressional-vote differences in voting behaviour. We show that in the month after individually assigned contracts were signed, legislative support for the incumbent party increased for legislators from the country's periphery. Difference-

[2]We include 33 fixed effects corresponding to 32 departments, an administrative division equivalent to states in the US, plus one for Bogotá.

in-differences analyses with continuous treatments reveal that legislative support increased differentially for legislators which have low alignment with the incumbent (i.e. those whose political position is further from the executive), and increased with the cost per kilometer of the project, but not with its overall cost or length. Both of these margins of heterogeneity are predicted by our conceptual framework. Furthermore, these relationships appear consistently stronger for legislators from the periphery of the country.

Qualitative and quantitative evidence from developing countries has shown that road building spending is frequently used to build electoral support, reward political allies, and for rent-seeking purposes.[3] However, the incentives guiding the precise allocation of these public goods across jurisdictions can vary. Ethnic (Burgess et al., 2015), hometown (Do, Nguyen and Tran, 2017), and partisan (Brollo and Nannicini, 2012; Asher and Novosad, 2017) favouritism have been documented in the allocation of infrastructure spending. Political goals have also been shown to matter in the case of India (where swing states of aligned political leaders received higher state transfers, Arulampalam et al., 2009) and for historical cases within Europe (Golden and Picci, 2008; Curto-Grau, Herranz-Loncán and Solé-Ollé, 2012).[4] We show that governments' legislative goals can also play a role in the distribution of such projects. In particular, we see that contract assignment was related to legislators' ideological position, and those more pivotal in the legislature were more likely to be project sponsors. This relationship is predicted by the model we present, and is also distinct from a partisan or legislative-coalition political dimension, as some contract sponsors were outside of the ruling coalition. Furthermore, we observe that legislators increased their support for the ruling party when they were assigned more costly road projects (as measured by cost per kilometer), suggesting that the benefits from endorsing more costly projects was particularly significant.

The distributive politics literature studying executive-legislative relations and legislative behaviour has a strong focus on the United States. The literature investigates the relationship between discretionary benefits and legislative behaviour. Alexander, Berry and Howell (2016) find that, congruent with theoretical predictions of legislative vote-buying,[5] legislators closer to the median receive more pork. Cann and Sidman (2011) document that parties reward the past loyalty of members, in particular, districts of legislators who more frequently voted with other members of their own party received more distributive benefits in the following congressional cycle. Recent work by Curto-Grau and Zudenkova (2018) also find that constituencies from legislators who were more loyal to their parties receive larger amounts of discretionary

[3]Both in Colombia (Cárdenas, Mejía and Olivera, 2006; Abente Brun and Diamond, 2014; Robinson, 2016; Bonilla-Mejía and Higuera-Mendieta, 2017) and elsewhere (Olken, 2007; Lehne, Shapiro and Eynde, 2018)

[4]Golden and Picci (2008) document that districts with legislators of higher seniority and those that had held higher offices, received more infrastructure spending in Italy in the decades after WWII. Curto-Grau, Herranz-Loncán and Solé-Ollé (2012) document that districts with higher shares of influential MPs (who had more secure seats and had held ministerial positions) received more funding for roads during the Spanish restoration (1880-1914).

[5]The theoretical literature exploring this relationship includes Snyder (1991), Groseclose and Snyder (1996), and Dekel et al. (2009), among others.

spending. Targeted benefits can be used as a way to either reward loyalty or buy new support from less-friendly (and pivotal, or swing) legislators.[6] Whether and how these findings extend to legislatures in developing countries, where political parties tend to be weaker, is not clear. We show that in the case of Colombia, pivotal legislators were more likely to benefit from the targeted allocation of central resources. In addition, the geographic heterogeneity of institutions in the Colombian setting allows us to examine whether the relationship between the executive and legislators differs depending on whether they come from a setting of (relatively) strong or weak political institutions. We find that being closer to the median for legislators representing the periphery of the country, where institutions have been historically weaker, is statistically related to contract-sponsorship, but this relationship (though still present) is not statistically significant for legislators from the country's core.

Our work also parallels the literature on political clientelism and electoral vote-buying in developing countries. Clientelism generally results in voters facing a trade-off between choosing a candidate whose preferences are closer to theirs, and giving up this privilege for some private return.[7] In a context in which the opportunities for private rent-seeking are common and enforcement is weak, legislators face a similar trade-off. A particular form of clientelistic relationship that may arise, but which few studies have investigated, is that between the executive and the legislature. While the literature on electoral vote-buying in developing countries has found little empirical support for the theoretical prediction that politicians looking to buy votes will target primarily swing voters (Finan and Schechter, 2012; Stokes et al., 2013),[8] few papers have empirically investigated legislative vote-buying.

One aim of this study is to bridge the gap between the literature on executive-legislative relations in the US and that of clientelism and vote-buying in developing countries. Closest to our work in that aim are Alston and Mueller (2005) and Zucco Jr. (2009), which document how legislators in Brazil who received patronage and budget amendment benefits from the executive were more likely to support the government's reforms. We present evidence from a similar setting, the Colombian congress, and take advantage of the media leak that allows us to observe and study a particular type of hidden arrangement.[9] By matching information from the road construction projects with legislators' voting records we can also exploit the precise timing of when benefits were disbursed (by looking at contract signature dates) and other contract characteristics. The timing of contract signature allows us to investigate in more detail the dynamics of these arrangements (i.e. were legislators rewarded for past behaviour or were they influenced after they receive their benefits). The characteristics of these contracts

[6] Vote-buying incentives, present at both the electoral and legislative levels, are reviewed in Cox (2009).

[7] See Stokes et al. (2013) for a review of this characterization in the literature and Anderson, Francois and Kotwal (2015); Bobonis et al. (2017); Fergusson, Molina and Riaño (2018) for some recent evidence.

[8] Instead, the literature has documented the role of brokers and the importance of turnout buying.

[9] For instance, Zucco Jr. (2009) documents that pork and cabinet positions were less predictive of legislators' behaviour during the Lula government in Brazil, and hypothesizes that unobserved arrangements (i.e. bribes) may explain this empirical pattern.

provide insights regarding the value of these projects for legislators, and we observe that they responded to the cost-per-km of the contracts, rather than their total length or cost.

Finally, we link our work to the literature on political institutions and the mechanisms through which these affect economic development, with a particular emphasis on spatial isolation and accountability. We show that the executive's ability to influence legislators is stronger if they represent peripheral constituencies, which have weaker political institutions and are further from the capital, where political power resides. The elite's ability to influence policy in this way represents an important mechanism that allows the core-periphery equilibrium in Colombia, as characterized in Robinson (2016) and Fergusson et al. (2017), to persist. But the relationship between isolation and political accountability is not unique to Colombia and has been documented for both US state capitals (in Campante and Do, 2014) and for world capitals (in Campante, Do and Guimaraes, 2019). While in some cases isolation may be beneficial for long-run development at the country-level (Ashraf, Özak and Galor, 2010; Nunn and Puga, 2012), our work highlights one mechanism, differences in the effectualness of legislative representation and the executive's ability to exploit these, through which spatial isolation could exacerbate intrastate inequality and geographical disparities in the strength of governance.

The paper is organized as follows. Section 2 discusses the relevant political context of Colombia and the particular event we exploit. In section 3 we propose a model of legislative decision-making which describes how jam can be used to build legislative support, and how political accountability affects these arrangements. Section 4 describes the data and presents descriptive evidence, highlighting the differences between sponsored and non-sponsored road construction projects, and between sponsoring and non-sponsoring legislators. Section 5 outlines the main empirical strategy. Section 6 presents the results, documenting how the arrangements differed for legislators representing the core and legislators representing the periphery of the country. Section 7 concludes.

2 Background

Colombia is a presidential representative democracy with independent branches of government. The President, head of state and the highest official in the executive branch, is elected popularly every four years in a two-round election (May and June).[10] Juan Manuel Santos, founding member of the *Partido de la U* (PU), was elected President in 2010 and reelected in 2014.[11] Congress is bicameral, composed of Senate (102 seats) and House of Representatives (166 seats). Senators and representatives are elected through party-lists in proportional representation every four years, two months before presidential elections (March). There are no term limits in Congress. Senators have a single national constituency and two seats are

[10]The run-off June elections occur if no candidate has attained at least 50 percent of votes in the first round.

[11]One-time presidential reelection was introduced in 2005 and eliminated in 2015. The two presidents who governed during this period, Mr. Uribe and Mr. Santos, were both reelected.

reserved for indigenous communities. House members represent 36 electoral constituencies corresponding to 32 departments, Bogotá (capital district), Indigenous communities, Afro-Colombians, and Colombians abroad.[12] In the 2010 elections, the President's party (the PU) became the largest party in Congress, with 28 Senators and 48 Representatives. Throughout the paper, when we refer to the incumbent party, or the ruling party, we refer specifically to the PU. The Government Coalition, *Unidad Nacional*, also included the Liberal, Conservative and Cambio Radical parties, accounting for 73.5% of the Senate and 93.6% of the House.

Colombia has a long tradition of using non-programmatic spending and job patronage to boost electoral and legislative support (Cárdenas, Mejía and Olivera, 2006; Abente Brun and Diamond, 2014; Robinson, 2016; Bonilla-Mejía and Higuera-Mendieta, 2017). This practice has been colloquially called "mermelada", jam. One of the most common forms of non-programmatic spending is tertiary road building. These projects are financed by the national government trough the National Road Institute (INVIAS) and executed by local governments (municipalities or departments). As funding can be used as a token of exchange in the political negotiations between the executive and legislative branches, Congress plays a key role in how these resources are distributed.

The 2010-2014 government was accused of being particularly liberal in its spreading of jam. In December 2013, criticism intensified when the opposition party *Centro Democrático* publicly denounced the systematic use of clientelistic practices in Congress, and in particular pointed to a series of leaked documents which outlined the specific assignment of seats in government cabinets as well as road construction contracts to various legislators.[13] One of the documents was an Excel spreadsheet which listed several tertiary road building projects, and included a column titled "HR" (which referred to "honorable representative"), with names of legislators matched to each contract.

After the leak, the government defended the practice as a legitimate way of governing, and argued that it was natural for legislators to suggest or direct this investment to their regions.[14] Similarly, the Office of the Inspector General of Colombia (*Procuraduría General de la Nación*), a public institution which oversees the performance of public officials, issued a statement confirming that the practice is legal as long as there is no corruption in the procurement process.[15]

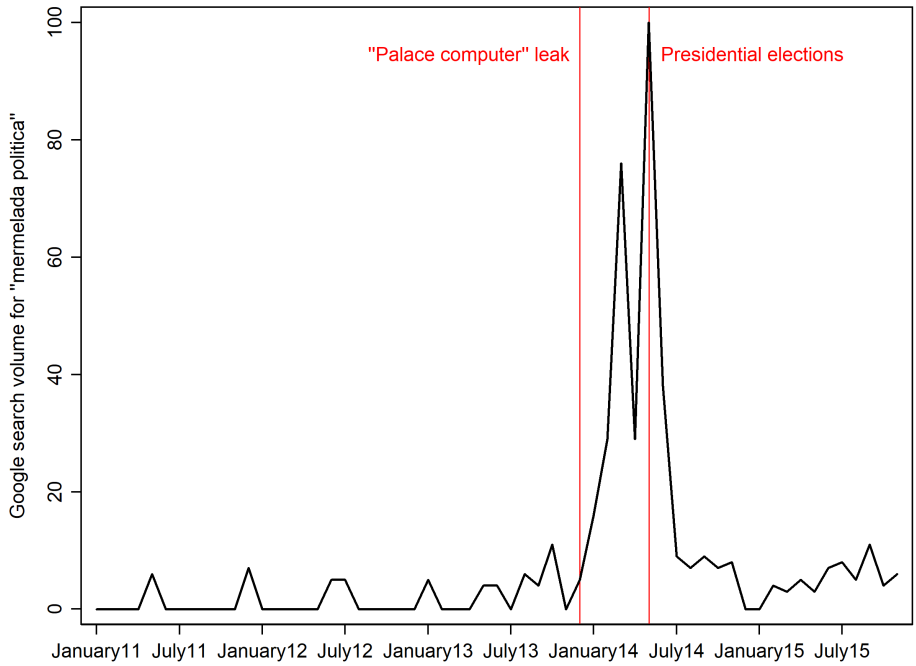
[12]This structure refers to the 2010-2014 government.

[13]See Semana (2013, 2014a), La Silla Vacía (2014 a, b, c, b, d), and Las2Orillas (2014 a,b).

[14]See El Espectador (2014). Colombian media highlighted that several contracts were assigned outside of legislators' constituencies (Caracol, 2014)

[15]See El Espectador (2014b) and Semana (2014b).

Figure 1: Internet searches of political jam in Colombia



Source: Own calculations based on Google Trends.

The increased interest in the practice was reflected in the volume of Google searches for "mermelada política" (political jam), which reached a peak during the 2014 presidential election (Figure 1). The Supreme Court announced a formal investigation in 2014 that included over 250 congressmen and numerous high-ranked members of the government.[16] In February 2018, the Supreme Court announced a new investigation that included further evidence of "political jam" and legislative clientelism occurring between 2013 and 2018.[17] These specific investigations have so far not yielded any results, but some of the congressmen allegedly involved are being prosecuted for other corruption scandals.[18]

3 Conceptual Framework

We present a theoretical framework to formalize the idea of an executive using targeted transfers to influence legislative choices. The model combines features from Alston and Mueller (2005) and Curto-Grau and Zudenkova (2018), which we then extend to settings with legislators who vary in their preferences for these benefits due to their political environment. One of

[16]See El Espectador (2014c) and Semana (2014c).

[17]See El Tiempo (2018), El Espectador (2018), and W-radio (2018).

[18]Including the Odebrecht and the judiciary corruption scandals. See El Espectador (2017) and La Silla Vacía (2017).

the main insights of the model, however, dates back to Snyder (1991): a lobbyist (or an executive) buying votes with the purpose of altering policy outcomes will target median legislators. In our framework, the executive aims to build a *majority* to support a policy position as close to its ideal point as possible. To do so, the executive uses *jam*, individually targeted transfers, as a tool to strengthen its legislative position.[19]

Legislators and the executive have single-peaked preferences over a unidimensional policy space $[0, h]$, $h > 0$.[20] There is a continuum of legislators with bliss points denoted by p^*, uniformly distributed over the policy space $[0, h]$. The bliss point p^* can be interpreted as the ideal point of the median voter in each legislators' constituency, or a weighted function of voters and other individual or party preferences (as in Levitt, 1996; Morales, 2017). Legislator l chooses a policy position p_l, receives an individual benefit, or jam b_l, and her utility is given by:

$$V_l(p_l, p_l^*, b_l) = -(p_l - p_l^*)^2 + \beta b_l$$

where β is a parameter that captures the taste for jam of legislators. We assume common knowledge regarding legislators' bliss points and taste parameter.

The government has bliss point $e^* \in [0, h]$, and without loss of generality, $e^* > \frac{h}{2} \equiv m$. When policy x is the outcome chosen by the legislature, the government receives utility:

$$V_e(x, e^*) = -(x - e^*)^2$$

If no jam is distributed ($b_l = 0$, for all l) each legislator chooses their bliss point and the median policy is the legislative outcome.[21] Before legislative decisions take place, the executive announces a non-negative contribution scheme to politicians denoted by $b(p^*, p) : [0, h] \times [0, h] \to \mathbb{R}^+$, which is a function that determines the jam that each politician receives depending on his bliss point and the policy they choose. The executive must respect a budget constraint such that the sum of all jam distributed cannot exceed an endowment B:

$$\int_0^h b(p^*, p) \frac{1}{h} dp^* \leq B$$

After the contribution scheme is announced, legislators choose their policy positions and the median policy is implemented.[22]

Suppose now that the executive targets policy $g \in (m, e^*)$. The cheapest way to obtain a

[19]The model is a stylized and simpler version of those developed in the theoretical literature on legislative bargaining and pork barrel spending, which includes Baron and Ferejohn (1989), Jackson and Moselle (2002), and Nupia (2013), among others.

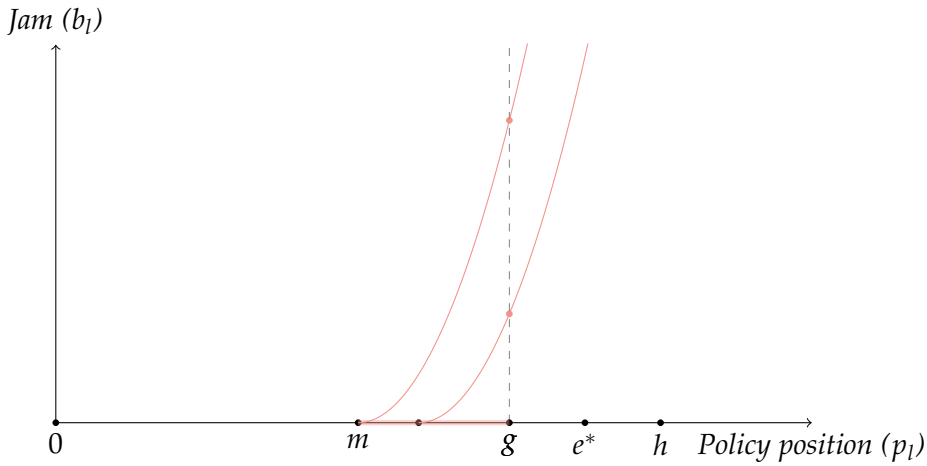
[20]See Osborne (1995) for a review of this type of spatial models.

[21]The legislative process can be thought of as a series of pairwise votes from which a majority outcome is chosen, i.e. the policy that wins over all others in this process. In each of these pairwise votes, legislators vote for the policy closest to their chosen policy p.

[22]Though the choice of policy p made by each legislator is not observed by the executive when setting the contribution scheme, the executive assumes legislators are utility maximizing and predicts their behaviour.

majority for g is to target all politicians with bliss points $p^* \in [m, g)$ and make a contribution scheme that leaves them indifferent between choosing g or their own bliss points (we assume they choose g in this case, see Figure 2).

Figure 2: The optimal contribution scheme



Notes: The executive targets legislators with bliss points between m and g, as highlighted, and convinces them to support g by offering an amount of jam given by the intersection of legislators' indifference curves with the vertical line in g. The new median policy g is then chosen by the legislature.

We indicate such a contribution scheme by b_g, which is:

$$b_g(p^*, p) = \begin{cases} c(p^*, g) & \text{if } p^* \in [m, g) \text{ and } p = g \\ 0 & \textit{otherwise} \end{cases}$$

where $c(p^*, g)$ is the contribution that makes legislator p^* indifferent between voting p^* and g:

$$c(p^*, g) = \frac{1}{\beta}(g - p^*)^2$$

We can define a function that captures the cost for the executive, in terms of jam, of making g the new median chosen policy (and the chosen policy outcome):

$$C(g) = \int_0^h b_g(p^*, p)\frac{1}{h}dp^* = \frac{(g-m)^3}{3h\beta}$$

The cost function $C(g)$ is increasing in $(g - m)$, the deviation from the median bliss point that the executive aims to introduce, and decreasing in β, the taste for jam of legislators.

If $C(e^*) \leq B$, the government will announce contribution scheme b_{e^*} and policy $g = e^*$ will be implemented (the budget constraint does not bind). If $C(e^*) > B$, it is not feasible for the executive to announce b_{e^*}, and the government will instead announce $g^* \in (m, e^*)$.

Since C is a continuous function, strictly increasing in $g, \forall g > m$, and $C(m) = 0$, then for any $B \in (0, C(e^*))$ there exists a unique $g^* \in (m, e^*)$ *s.t.* $C(g^*) = B$. Together, these relationships imply that there exists a unique optimal policy g^* chosen by the executive, defined as:

$$g^* = min\{m + \sqrt[3]{3h\beta B}, e^*\}$$

The government will thus announce b_{g^*} and g^* will be the policy outcome implemented by the legislature.

We derive three predictions from the model, which we assess empirically in the following sections:

H1: Legislators closer to the median (as defined by their bliss points) are more likely to be targeted by the executive with jam benefits. Note that in the model this is deterministic and is characterized by those with $p^* \in [m, g^*)$.

H2: Conditional on being targeted, legislators further away from the implemented policy g^* (and the executive's bliss point), shift their position more. Recall that in equilibrium, the shift is $g^* - p^*$, such that those with lower p^* will need to "move" more to reach the targeted policy.

H3: Conditional on being targeted, legislators who receive more jam, shift their position more. Note that there is a mapping between how much jam legislators receive and how far away they end up from their bliss points, this is defined by the cost function, which is increasing in distance to the targeted policy:

$$\frac{\partial c(p^*, g^*)}{\partial p^*} = -\frac{2}{\beta}(g^* - p^*) < 0, \qquad \forall p^* < g^*$$

The amount of jam that makes legislators indifferent between choosing g^* and their own bliss point p^* depends (not only on this bliss point, but) also on their taste for jam β. We now think about what happens when legislators differ in this dimension.

Heterogeneity in preferences for jam

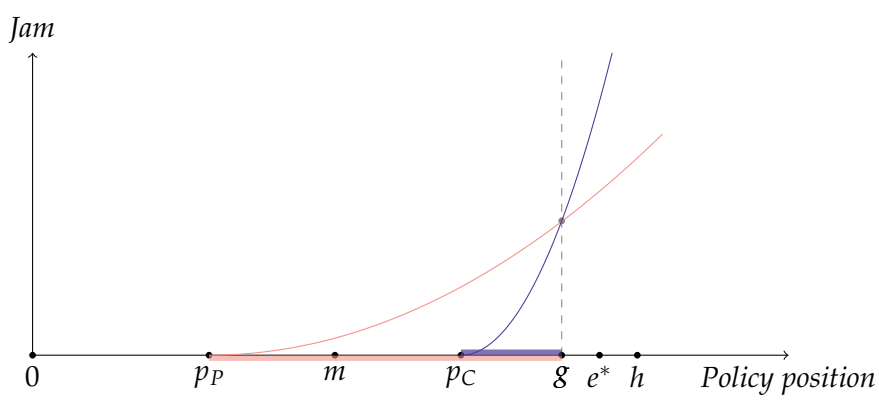
Suppose now that legislators differ in their taste for jam. One factor that could affect legislators taste for jam is their political environment. Spatially isolated environments with lower political accountability (Campante and Do, 2014; Campante, Do and Guimaraes, 2019), and higher incidence of vote-buying and clientelism (Robinson, 2016; Fergusson et al., 2017), are environments in which non-programmatic targeted benefits such as jam could be particularly valuable. In this model extension half of legislators have high taste for jam β_P, and the remaining have low taste for jam β_C, where $\beta_P > \beta_C$, and we interpret these as legislators representing the periphery of the country (P), where political institutions have been historically weaker, and legislators representing the core of the country (C). Taste for jam is assumed

to be independent of legislators' bliss points, such that we have a uniform distribution of bliss points over the policy space $[0, h]$ for both core and periphery legislators.

The executive now observes legislators' types (β_C or β_P) and announces a contribution scheme as a function of these ($b(\beta, p^*, p) : \{\beta_C, \beta_P\} \times [0, h] \times [0, h] \rightarrow \mathbb{R}^+$). In targeting a policy $g \in (m, e^*]$, the executive now considers the trade-off between legislators' taste for jam and their bliss points. We denote by $p_i, i \in \{C, P\}$ the lowest bliss point for targeted legislators of each group. Targeted legislators are thus defined by the range $[p_i, g), i \in \{C, P\}$. As before, the executive makes an offer to targeted politicians such that they are indifferent between choosing their own bliss point and policy g; all other offers would indeed be more costly.

The optimal contribution scheme, defined by p_C and p_P (the lowest targeted points for each group), must satisfy two conditions. First, g must effectively be the new median. Second, the marginal politician in each of the two groups must receive the same amount of jam. The solution to this problem is shown in Figure 3 (the details of the derivations are shown in the appendix).

Figure 3: The optimal contribution scheme with two legislator types



Notes: Legislators from the core have steeper indifference curves, they have to be paid more to choose g (since $\beta_C < \beta_P$). The executive targets legislators from the periphery with bliss points between p_P and g (highlighted in pink) and legislators from the core between p_C and g (highlighted in purple). The executive makes all targeted legislators support g by offering an amount of jam given by the intersection of legislators' indifference curves with the vertical line in g. In equilibrium, p_P and p_C require the same amount of jam. The new median policy g is then chosen by the legislature.

We highlight two further predictions from the model regarding the heterogeneity of taste for jam:

H4: Legislators with higher β (or from the periphery) are more responsive to jam. That is, for the same amount of jam, these legislators shift their policy position more. Note that in equilibrium legislators targeted from this group are "cheaper" per shift because of their higher taste for jam. For any p, g:

$$c(\beta_C, p, g) > c(\beta_P, p, g)$$

H5: Among targeted legislators, those with higher β (or from the periphery) will on average have lower p^*. That is, their ideal points will be further from the executive's before the distribution of jam. This observation comes from the fact that $p_P < p_C$, that is, the "cheaper" legislators are drawn from further away from the executive.

4 Data and descriptive results

Data sources

Our explanatory variables of interest use data from road construction projects. We focus on tertiary roads, which are discretionarily assigned by the national government. Detailed information on these projects comes from the National Road Institute (INVIAS), including location, length, and total cost. We also retrieve total cost, as well as the exact signature date of each contract from the Colombian Public Procurement System (SECOP). We compile information for over 3,500 road construction contracts which were signed between 2010 and 2014. The main variables that we look at for each contract are: total value, total length, and cost per kilometer (total value/total length).[23]

The main dependent variable aims to measure politicians' alignment with the incumbent (or ruling) party in the Colombian congress. The data is available from *congresovisible.org* for congressional votes in the 2010-2014 government, our period of study. During this time period there are 6,200 congressional votes, comprised of 465,000 individual votes of 290 politicians in both chambers of the Colombian congress.[24] An individual vote is indexed by r, for the politician, and v for the congressional vote. To quantify political-alignment with the incumbent party we use the following measures at the individual vote level:[25] i) *voteValue*, defined as 1 if approve, 0 if abstained, -1 if reject; and ii) *voteWithPU*, defined as 1 if the vote matched the majority of incumbent votes, and 0 otherwise. In particular, vote-alignment with the incumbent is defined as:

$$\begin{aligned} voteWithPU_{rv} = & \mathbb{1}(voteValue_{rv} \leq 0) \ * \ \mathbb{1}(\sum_{j \in PU_v} voteValue_{jv} \leq 0) + \\ & \mathbb{1}(voteValue_{rv} > 0) \ * \ \mathbb{1}(\sum_{j \in PU_v} voteValue_{jv} > 0) \end{aligned} \tag{1}$$

For the vote of politicians r in congressional vote v, where PU_v is the set of incumbent party politicians that participated in vote v. In other words, we say that the position of legislator r on vote v is aligned with the position of the PU if either: both the legislator and

[23]For comparability, costs are deflated using the monthly producer price index (PPI) of the construction industry, with base January 2012.

[24]The main analysis excludes six legislators, those representing Indigenous communities, Afro-Colombians, and Colombians abroad.

[25]The same measures are used in Morales (2017).

the majority of PU members vote in favor of the proposal, or both the legislator and the majority of PU members vote against it.

In addition to these data sources, we use the leaked database which allegedly revealed the government's assignment of road projects to members of congress. The database was originally released by the opposition party *Centro Democrático* in December 2013, as evidence in a broader investigation on clientelistic practices. It was then analyzed and re-published by different news media in Colombia.[26]

Though this is an unofficial source of data, there are strong reasons to believe the information is at least partly true. First, almost every contract in the leaked data was executed and can be found in the INVIAS and the SECOP administrative records. Second, some of the allegedly involved congressmen were happy to take credit for the projects (after the leak).[27] Third, the government and the Office of the Inspector General of Colombia reacted to the allegations by asserting the right of congressmen to endorse investment projects in their respective jurisdictions. Fourth, based on the evidence made public, the Supreme Court is currently investigating 250 Congressmen and high-ranked members of the government. Finally, the statistical patterns that arise in our analysis, shown below, suggest again that the information was (at least partly) accurate.

We complement these main data sources with several supporting databases. We use the CEDE Electoral Databases for information on whether politicians ran, won, and the number of votes they received for both the 2010 and 2014 legislative elections. We also collect information on municipal characteristics from different sources including the National Geographic Institute (municipal area and road density in 2005), the Digital Elevation Model (altitude, Ruggedness), the National Statistics Department (population and poverty rates in 2005, GDP by sector in 2005-2010), the National Police (2005-2010 homicide rate), the Institute for Education Evaluation (Exit exam results in 2010), and Twitter (tweets from legislators for the period of study).

Departments are classified as core or periphery based on geography, which as outlined in (Robinson, 2016; Fergusson et al., 2017), has been persistently correlated with institutional, historic and socioeconomic conditions. The core includes most of the Andean departments, where the largest colonial settlements were located and institutions have been historically stronger. All the departments from the Caribbean and Pacific coasts and the Amazon region are classified as periphery (Figure A1).[28] Municipalities in the core tend to be smaller, less poor and violent, and better educated. However, we do not find significant differences between core and periphery municipalities in the baseline provision of roads (Panel A of Table

[26]The data also included detailed information on patronage jobs and construction contracts in other sectors. The road construction database we use can be downloaded from here.

[27]See La Silla Vacía (2014 c, e).

[28]The core includes Antioquia, Boyacá, Caldas, Cundinamarca (and Bogotá), Huila, Quindío, Risaralda, Santander, and Tolima. In an alternative coding we also include Meta and Caquetá.

A2).

Legislators

Our analysis considers a government-opposition dimension as the relevant policy space to examine (as emphasized in Zucco Jr., 2009). To do this, we create a time-invariant alignment-index which aims to capture the bliss point of each politician relative to the incumbent position. In particular, we estimate the individual fixed effects of political alignment in votes that are potentially unaffected by the distribution of jam we observe. In our baseline index, we restrict the sample to votes occurring in the first two years of the congressional cycle. Only 2 percent of sponsored contracts are signed in this period.[29] Yet, this voting record is relevant as the government chooses who to target (as indicated in our conceptual framework).[30] The estimating equation using this restricted sample is simply:

$$incumbentSupport_{rv} = \gamma_r + \varepsilon_{rv} \tag{2}$$

The alignment-index of each legislator r is obtained from γ_r, the legislator fixed-effect. The political-alignment-index thus captures the share of votes in which legislator r's position was aligned with that of the incumbent party during the first two years of government. Figure A4 shows the distribution of the estimated alignment-index, separately for sponsors and non-sponsors. Consistent with the predictions from the model, sponsors seem more likely to be drawn from the middle of the distribution (we discuss this in more detail below).

Table 1 explores the characteristics of contract sponsors in Congress. There are no measurable differences in gender, age, legislative experience, Congress chamber, or political alignment. However, sponsors are more likely to run for reelection in 2014 and to be reelected, and are less likely to mention "jam" in their tweets. Sponsors are also more likely to be part of the government coalition, although the difference is marginally insignificant. Importantly, sponsors are much more likely to be under investigation for legislative clientelism while in office. There are also relatively few differences between legislators from the core and peripheral regions (Table A1). Legislators from the periphery are slightly younger, had less votes for Senate in 2014, mentioned "jam" less frequently in their tweets, and are also more likely to be under investigation from the 2018 Supreme Court proceedings.

[29]Since this spending may in turn used by legislators to boost their electoral support, this is consistent with the existence of a political spending cycle as documented for Colombia in Drazen and Eslava (2010).

[30]In an alternative construction of the index, we discard individual votes occurring within a 10-month window of the signature of a sponsored contract (as these will be presumably affected by jam). The correlation between the two measures is 0.9491 and the main results are robust to using this alternative political-alignment-index.

Table 1: Summary statistics for legislators

	Non-sponsors		Sponsors		Dif.
	Mean	S.D.	Mean	S.D.	p-value
Age	48.345	9.561	47.880	8.541	0.682
Female	0.154	0.362	0.141	0.349	0.755
President's party	0.295	0.457	0.289	0.455	0.915
Government coalition	0.769	0.423	0.844	0.365	0.112
First term in Congress	0.532	0.501	0.469	0.501	0.290
Political alignment index	0.672	0.121	0.674	0.100	0.884
Running in 2014	0.641	0.481	0.773	0.420	0.014
Reelected in 2014	0.385	0.488	0.484	0.502	0.093
Votes 2010	44.466	51.563	40.758	23.013	0.429
Votes 2014	53.097	64.251	56.752	28.214	0.687
Tweets about 'jam'	0.115	0.321	0.047	0.212	0.032
Investigation 2014	0.013	0.113	0.352	0.479	0.000
Investigation 2018	0.615	0.488	0.773	0.420	0.004
N	156	.	129	.	.

Notes: Table shows summary statistics for legislator characteristics. The last column presents the *p-value* of a group mean difference test between sponsor and non-sponsor characteristics.

Table 2 investigates the relationship between the alignment-index and the likelihood of being a contract sponsor. We regress a contract sponsor dummy, equal to 1 if the legislator appears in the leaked database, on the political-alignment-index, both linearly and quadratically. This analysis allows us to assess whether political alignment can help explain who the beneficiaries of these contracts were. In particular, we would like to assess whether party loyalists (higher alignment-index) or swing legislators (closer to the median alignment-index) were more likely to be contract sponsors. The significant results for the quadratic specification suggest that jam was targeted towards legislators closer to the median of the distribution, as opposed to party loyalists.

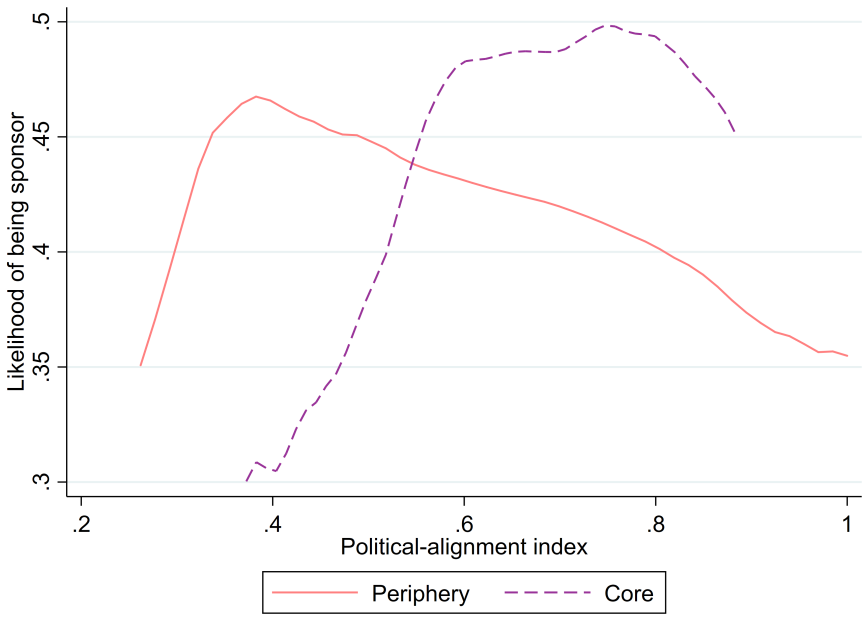
Table 2: Relationship between political-alignment-index and being a contract sponsor by constituency

	(1)	(2)	(3)	(4)	(5)	(6)
Political-alignment-index	0.038	4.400***	0.371	4.192	-0.272	4.043**
	(0.259)	(1.651)	(0.365)	(3.449)	(0.369)	(1.782)
Political-alignment-index (sq)		-3.405***		-3.027		-3.323**
		(1.304)		(2.762)		(1.382)
N	284	284	139	139	145	145
Constituents	All	All	Core	Core	Periphery	Periphery

Notes: Standard errors clustered at the politician level. Significance levels *p<0.10, ** p<0.05, ***p<0.01.

Figure 4 shows the likelihood of being a contract sponsor as a function of legislators' political-alignment-index, separately by legislators' constituency. Consistent with the predictions of the model and with the previous results, for both types of legislators, we observe an inverse-U shaped relationship (*H1*). That is, both legislators who are least aligned with the incumbent, and those that are most aligned with incumbent, are less likely to be contract sponsors. In addition, we observe that for legislators representing the country's peripheral departments, the likelihood of being a sponsor increases and peaks at relatively lower levels of the political-alignment-index. If these legislators have a higher preference for jam, then the executive will on average target relatively less aligned legislators from this particular group. On the other hand, as legislators from the core are more "expensive" to influence (because of their lower taste for jam), the executive targets legislators who are relatively closer to its position (consistent with *H5*).

Figure 4: Jam and political-alignment, by region



Notes: The figure shows the likelihood of being a contract sponsor as a function of legislators' political-alignment-index.

We further explore this pattern with a regression of political-alignment on two indicator variables, one for being a contract sponsor, and one for being a legislator from the periphery, as well as their interaction. The results are presented in Table A3 and show that legislators who represent peripheral departments and are contract sponsors have on average a lower political-alignment-index relative to contract sponsors from core departments (the relationship is marginally insignificant with p-value=0.11). However, figure 4 reveals substantial overlap in the distributions, which can explain why the differences in mean alignment may be imprecisely estimated. Therefore, we extend the analysis with a quantile regression which confirms that there are significant differences in alignment between sponsors in the core and sponsors in the periphery, but only on the left side of the distribution (column 6 and column 9), consistent with the predictions of the model (see figure 3).

Roads

We continue our descriptive analysis by exploring differences between sponsored and non-sponsored roads. Table 3 presents descriptive statistics for projects signed between 2011 and 2012. Overall, sponsored roads are built in municipalities with similar geographic and socio-economic characteristics than non-sponsored roads. Sponsored contracts have similar execution rates by the local authorities. We do observe significant differences in the costs of sponsored contracts, which are on average 33% higher than for non-sponsored contracts. De-

spite being more valuable contracts, the length of contracts (in kilometers of road) is not significantly different across categories. These two facts result in significant differences in the cost per kilometer of sponsored contracts relative to non-sponsored contracts.

The characteristics of these contracts also vary along the political alignment of the sponsoring legislator. Consistent with the predictions of the model, sponsors who are initially less aligned with the incumbent party receive more contracts, and these in turn are lengthier and more valuable (Table A5). This relationship tends to be stronger for legislators in the core (consistent with the idea of them having steeper indifference curves).

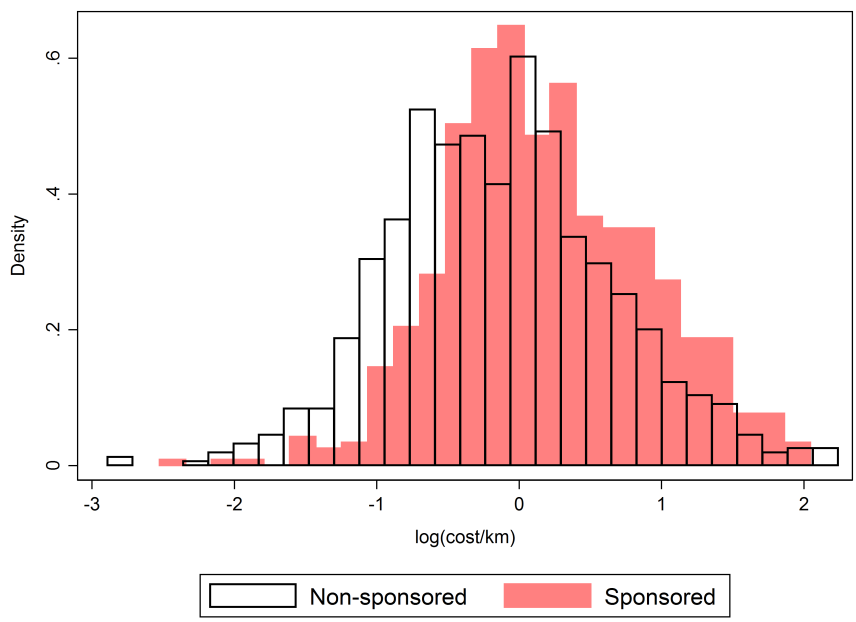
Table 3: Summary statistics for road construction projects

	Not sponsored		Sponsored		Dif.
	Mean	S.D.	Mean	S.D.	p-value
A. Municipalities					
Municipality area (log)	5.760	1.199	5.677	1.127	0.164
Altitude (log)	6.475	1.525	6.592	1.472	0.130
Ruggedness (log)	4.701	1.298	4.865	1.262	0.013
Distance to dep capital (log)	3.957	1.012	3.931	1.021	0.627
Population (log)	9.733	1.080	9.673	1.017	0.276
Poverty rate	42.940	20.088	44.443	20.258	0.153
Homicide rate	37.981	34.226	34.754	31.856	0.064
Education quality	-0.201	0.304	-0.172	0.326	0.082
Roads per capita (log)	1.788	0.773	1.781	0.774	0.869
GDP share of Agriculture	0.111	0.048	0.114	0.045	0.295
B. Road construction projects					
Contract year	2011.417	0.493	2011.981	0.135	0.000
Road length (log)	2.245	0.821	2.214	0.796	0.465
Total cost (log)	19.839	0.840	20.129	0.830	0.000
Cost/km (log)	17.595	1.094	17.915	0.960	0.000
Unexplained cost/km (log)	-0.134	0.776	0.182	0.704	0.000
Total execution time (days)	325.053	156.732	383.202	79.891	0.000
Projected time (days)	206.736	113.537	332.446	56.597	0.000
Time Extensions (days)	118.317	160.399	50.756	64.534	0.000
Executed by municipality	0.883	0.322	0.882	0.322	0.984
Executed by department	0.100	0.300	0.115	0.319	0.375
N	878	.	646	.	.

Note: Table shows summary statistics for road construction projects. The last column presents the *p-value* of a group mean difference test.

Construction costs may vary depending on the geography. To address this issue, we create an index measuring the unexplained cost by regressing the cost per kilometer on municipal geographic characteristics such as municipal area, altitude, ruggedness, distance to department capital, and baseline roads per capita and predict the unexplained cost (table A4). The difference in unexplained-cost-per-km is smaller in magnitude but remains statistically significant. Moreover, the gap is consistently larger for peripheral regions. In the most restrictive specification, which includes department and year fixed effects, the cost difference between sponsored and non-sponsored contracts is of about 17 percent in the periphery. The distributions of unexplained costs of sponsored and non-sponsored contracts are presented in figure 5. We observe a consistent gap in the costs of these contracts, suggesting that the observed differences are not driven by outliers.

Figure 5: Unexplained cost of sponsored and non-sponsored road contracts



Notes: The figure shows the distribution of the unexplained cost-per-km for both sponsored and non-sponsored contracts. Unexplained costs are estimated as the residuals of a regression of cost-per-km on a range of municipal geographic characteristics including altitude, ruggedness, distance to the department capital, and roads per capita.

5 Empirical methodology

Baseline analysis

To study the relationship between individual contract assignment and politicians' votes in congress, we use a difference-in-differences framework which exploits the panel structure

of the data and the timing of the signature of the specific contracts. We begin the analysis with a baseline regression which estimates changes in alignment in the months before and in the months after the signature of the sponsored contracts in a linear probability model. We estimate the following regression:

$$incumbentSupport_{rvt} = \alpha + \beta_{pre} pre_{rt} + \beta_{post} post_{rt} + \gamma_r + \gamma_v + \varepsilon_{rvt} \tag{3}$$

For representative r, congressional vote v, on day t. We include both the pre and post indicators to study the precise dynamics of these hidden arrangements. That is, are politicians who increase their alignment with the incumbent rewarded for this afterwards, or, do politicians change their behaviour only after the benefits are distributed (ie. after the contracts are signed). The $post_{rt}$ indicator is equal to 1 if the vote took place in the months just after the signature of the sponsored contract. We vary the length of window and include regressions for 1 or 5 months before and after contract signature. The γ_r fixed-effects capture politician time-invariant characteristics, and the γ_v capture characteristics of the vote that are common across politicians. The β coefficients can thus be interpreted as within-legislator changes in behaviour relative to non-sponsors in the time-periods of interest. The β_{pre} coefficient captures the average increase in alignment with the incumbent for legislators whose sponsored projects are signed in the following months, while the β_{post} coefficient captures the change in alignment in the months after the contract signature.

Heterogeneity across political alignment

The regression above is likely to mask heterogeneity across the ideological spectrum of politicians. Our theoretical framework suggests that conditional on receiving targeted benefits, politicians whose bliss points are further from that of the incumbent party, increase their alignment more relative to those who are naturally more in favor of the incumbent. We study this idea by interacting the contract signature pre/post indicators, with the estimated alignment-index of each politician. Specifically, we estimate the following regression:

$$\begin{aligned} incumbentSupport_{rvt} = \alpha + \beta_{pre,1} pre_{rt} + \beta_{pre,2} pre_{rt}.alignmentIndex_r + \beta_{post,1} post_{rt} + \\ \beta_{post,2} post_{rt}.alignmentIndex_r + \gamma_r + \gamma_v + \varepsilon_{rvt} \end{aligned} \tag{4}$$

The $\beta_{post,1}$ coefficient will capture the estimated increased alignment for a hypothetical politician who sponsored a road project and whose alignment-index has a value of zero (someone whose votes are never aligned with the incumbent party, recall however that there are no such politicians). If politicians further from the incumbent's position increase their alignment relatively more, then the $\beta_{post,1}$ coefficient would be positive, while the $\beta_{post,2}$ coefficient would be negative, as it would capture the differential effect for politicians at higher levels of the alignment-index.

Heterogeneity across contract characteristics

The conceptual framework also suggests that politicians who receive more jam increase their alignment differentially relative to politicians who receive less jam. However, the measure of jam is not empirically straightforward. We investigate this issue by exploiting characteristics of the sponsored contracts and studying whether legislators are more responsive to contracts with specific features. We estimate the following regression:

$$\begin{aligned} incumbentSupport_{rvt} = \alpha + \beta_{pre,1} pre_{rt} + \beta_{pre,2} pre_{rt}.X'_{rt} + \beta_{post,1} post_{rt} \\ + \beta_{post,2} post_{rt}.X'_{rt} + \gamma_r + \gamma_v + \varepsilon_{rvt} \end{aligned} \tag{5}$$

The vector of explanatory variables X'_{rt} includes three features: length of contract (log total kilometers of road), contract cost (log of total cost), and cost-per-km.[31] This framework allows us to assess the extent to which politicians behave differently in congress when contracts of different magnitudes (by the proposed measures) are signed with them as sponsors. The characteristics are meant to capture different dimensions of jam that politicians may care about: 1) the social value of the project, in the length of the road or the total value of the project and 2) the potential opportunities to engage in private rent-seeking, in the cost per kilometer of the project.

6 Results

Baseline model

The results from the baseline analysis are reported in table 4. In columns 1-2, we estimate the effect of contract signature on incumbent support for all legislators and time windows of 5 and 1 months, respectively. The coefficients are positive but generally imprecisely estimated and small. One coefficient appears significant, which indicates that in the month just before the sponsored contract is signed, legislators increase their alignment with the incumbent party. We then split the analysis between legislators representing the core and the periphery of the country (columns 3-6). The estimates reveal a statistically significant increase in alignment for legislators from the periphery, in the month following the signature of an assigned contract (column 6). On average, these legislators are about 3.9 percentage points more likely to support the incumbent party during this time window.

[31] If more than one contract was signed within the relevant time window, we take the average of these values for all relevant contracts.

Table 4: Relationship between contract signature and incumbent support

	(1)	(2)	(3)	(4)	(5)	(6)
pre contract signed	0.010	0.020*	0.012	0.026	0.007	0.010
	(0.009)	(0.012)	(0.014)	(0.018)	(0.012)	(0.016)
post contract signed	0.008	0.005	0.002	-0.029	0.017	0.039***
	(0.010)	(0.012)	(0.016)	(0.018)	(0.013)	(0.014)
N	454332	454332	222290	222290	232034	232034
N-clusters	284	284	139	139	145	145
Individual FE	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes
Time window	5-months	1-month	5-months	1-month	5-months	1-month
Constituents	All	All	Core	Core	Periphery	Periphery

Notes: Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Heterogeneity across political alignment

Table 5 presents the results from the analysis of heterogeneity by politicians' time-invariant alignment-index (equation 4). The $\beta_{post,1}$ coefficients are positive, while the $\beta_{post,2}$ coefficients are negative, both statistically significant. The results suggest that there exists substantial heterogeneity in the response of politicians depending on their alignment-index. In particular, politicians who are in general further from the positions of the incumbent party, are much more responsive to being assigned these contracts, than politicians who tend to more frequently support the incumbent position. The evidence supports the theoretical model outlined, in that if these contracts are used for the purpose of coalition building, politicians who are less supportive of the incumbent, yet receive these benefits, should respond more to being assigned these projects (*H2*).

A back of the envelope calculation suggests that a politician at the 10th percentile of the political-alignment-index (equal to 0.52), increases her alignment with the incumbent party by about 5.2 percentage points, in the month after her sponsored contract is signed ($0.215 - 0.312 \times 0.52$). A politician at the median, on the other hand, increases his alignment by only about 0.3 percentage points ($0.215 - 0.312 \times 0.68$).

Table 5: Relationship between contract signature and incumbent support by political-alignment and constituency

	(1)	(2)	(3)	(4)	(5)	(6)
pre contract signed	0.071	0.155*	0.209***	0.281***	-0.044	0.034
	(0.054)	(0.079)	(0.074)	(0.103)	(0.057)	(0.089)
post contract signed	0.222***	0.215***	0.208**	0.167	0.213***	0.225***
	(0.057)	(0.071)	(0.084)	(0.103)	(0.070)	(0.074)
pre-cs x PAindex	-0.090	-0.197*	-0.280***	-0.358**	0.079	-0.039
	(0.079)	(0.112)	(0.106)	(0.142)	(0.085)	(0.128)
post-cs x PAindex	-0.317***	-0.312***	-0.299**	-0.285*	-0.298***	-0.282**
	(0.080)	(0.102)	(0.116)	(0.147)	(0.100)	(0.108)
N	454332	454332	222290	222290	232034	232034
N-clusters	284	284	139	139	145	145
Individual FE	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes
Time window	5-months	1-month	5-months	1-month	5-months	1-month
Constituents	All	All	Core	Core	Periphery	Periphery

Notes: Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Another interesting feature of the analysis suggests that the nature of the arrangements is different depending on whether politicians are from the core or the periphery. While politicians in the core seem to change their alignment even before the contracts are signed, politicians in the periphery only do so after. One possible interpretation of this is that there is more trust between politicians in the core and the executive, such that they understand that the arrangement will take place, even if no contract has been signed. On the other hand, politicians from the periphery only increase their support after the contracts are signed.

Heterogeneity across contract characteristics

Table 6 presents the results from the analysis of heterogeneity by characteristics of the assigned projects (equation 5). We present here the analysis only for the 5-month window, separately by core and periphery (1-month window is shown in the appendix Table A6). The analysis reveals that politicians from the periphery increase their support for the ruling party in the months after more costly projects are signed, but not after more lengthy or valuable road contracts are signed. This finding is consistent with the theoretical prediction that legislators who receive more jam increase their political alignment relatively more, and this is specially true of those in the periphery, who are more responsive to these benefits due to their political environment (*H3* and *H4*). The results also tell us something about the nature of jam. Overall, legislators respond to more costly contracts, a potential measure for the opportunities for

private rent-seeking, rather than to contract length or value, a measure of the social value, or even the potential electoral returns to these projects.

Table 6: Relationship between contract characteristics and vote-alignment by constituency

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
pre contract signed	-0.084	-0.008	0.012	0.534	-0.140	-0.023	-0.003	-0.245
	(0.248)	(0.038)	(0.014)	(0.410)	(0.274)	(0.041)	(0.012)	(0.286)
post contract signed	-0.050	0.003	0.000	-0.659	-0.251	0.015	0.018	0.244
	(0.290)	(0.047)	(0.017)	(0.765)	(0.253)	(0.044)	(0.014)	(0.406)
pre-cs x log cost	0.005			-0.030	0.007			0.011
	(0.012)			(0.024)	(0.013)			(0.015)
post-cs x log cost	0.002			0.037	0.012			-0.015
	(0.014)			(0.042)	(0.012)			(0.022)
pre-cs x log KM		0.007		0.037		0.007		-0.000
		(0.011)		(0.030)		(0.012)		(0.017)
post-cs x log KM		-0.001		-0.039		0.002		0.026
		(0.013)		(0.043)		(0.011)		(0.022)
pre-cs x cost-per-km			-0.010	0.027			0.003	0.002
			(0.011)	(0.033)			(0.007)	(0.008)
post-cs x cost-per-km			-0.003	-0.036			0.015**	0.028**
			(0.018)	(0.044)			(0.008)	(0.012)
N	222290	221092	221092	221092	232034	231218	231218	231218
N-clusters	139	139	139	139	145	145	145	145
Individual FE	yes	yes	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes	yes	yes
Time window	5-months	5-months	5-months	5-months	5-months	5-months	5-months	5-months
Constituents	Core	Core	Core	Core	Periphery	Periphery	Periphery	Periphery

Notes: Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Robustness checks

We repeat our main empirical exercises using a series of alternative specifications. We first alter the definition of core/periphery by redefining Meta and Caquetá as being part of the *core* instead of the *periphery* of the country. We also run our main specifications on alternative restricted samples which exclude procedural votes and members of the government party. Table A7 shows the results of these alternative specifications for the baseline analysis. The main result we highlight here, that legisators from the periphery increase their overall support for the incumbent party in the month after their sponsored contracts are signed, are overall similar. When we exclude the members of the government party, coefficient remains positive and relatively large, however they are no longer statistically significant (Panel B, column 6). The reduction in the magnitude of the coefficient and the loss of precision (ie. larger standard

errors) suggests that the increase in support was larger for members of the ruling party.

For our analysis of heterogeneity across political alignment, we compute an alternative political-alignment-index which, instead of using the first two years of the government cycle, uses votes from both before and after the contracts were signed, but excludes a 10-month window around the signature of these contracts. Results are presented in Table A8. The heterogeneity highlighted by the model is present for all of our alternative empirical specifications. We observe in our analyses that higher support for the government is present for less-aligned politicians from the core *before* contracts are signed, while for politicians from the periphery, the relationship is concentrated *after* the signature of the sponsored contracts. This finding tend to confirm that the nature of this arrangements is likely different among these types of politicians.

Finally, for our analysis of heterogeneity across dimensions of contract characteristics, and specifically for cost-per-km, we try to disentangle the responses of legislators to the explained vs. unexplained margins of these costs in Table A9. The main result, that politicians from the periphery respond to the cost-per-km of the contracts, is robust across the alternative specifications. In column 4, we replace the observed cost-per-km with the cost-per-km *predicted* by the contracts observable characteristics (as in table 5). The coefficient remains positive and statistically significant but the magnitude is almost a third smaller (0.018 relative to the baseline 0.028). When we include both explanatory variables (predicted cost-per-km and observed cost-per-km, which will capture the residuals), neither coefficient is statistically significant but both are positive, with the latter being larger in magnitude. The evidence suggests that the relationship may be at least partially driven by unobserved factors that determined how expensive these contracts were.

Empirical extensions

Political environment and responsiveness to jam

We have so far highlighted the differences between departments in the *core* and the *periphery* of the country, as these regions differ markedly in the strength of their political institutions and their incidence of vote-buying and clientelism. Alternatively, we can examine whether direct measures of institutional strength also map into heterogeneous changes in the behaviour of legislators. We use two different indices for this exercise, the Index for Transparency in Public Entities (ITEP), and the Index for Open Government (IGA).[32] We use the 2010-2012 department-level indices (before the sponsored contracts were signed) and transform them to a 0-1 scale for ease of interpretation (from a 0 to 100 scale). The two indices are positively

[32]The ITEP, maintained by an anti-corruption NGO, is centered around measuring three specific risks: weak capacity to generate and deliver public information, low development of processes and administrative procedures for decision-making, and the ineffectiveness of management controls (see ITEP). The IGA is calculated by the Office of the Inspector General of Colombia and is founded on the OECD's fundamental characteristics of an open government: transparency and accessibility, participation, accountability and open data to the public (see IGA).

and significantly correlated (with a correlation of 0.6, see figure A2). We then estimate our baseline regression including an interaction of the pre and post contract signature indicators with the institutional strength measures for the legislators' department.

The results are shown in table 7. We see substantial heterogeneity in the relationship between contract-signature and support for the incumbent party along these institutional strength measures *after* sponsored contracts are signed. For instance, the results based on IGA (column 4) indicate that a legislator from Vichada (a peripheral department which is one of the least populated and largest of the country, with the lowest IGA index at 38) is around 10 percentage points more likely to align his votes with the incumbent party in the month following the signature of a contract he sponsored ($0.249 - 0.399 \times 0.380$). The equivalent estimation for a legislator from Quindio (a department in the core with the highest IGA index at 69.8) suggests that she would actually reduce her support for the incumbent party by about 3 percentage points (though this estimate is not statistically significant, figure A3 shows these predicted marginal effects).[33]

Overall, the results presented in this section support our hypothesis that legislators from places where political accountability is lower are more responsive to jam benefits. The results are also consistent with those looking at the core/periphery geographic margin, which we present here in columns 5-6 as an interaction (with a *core* indicator) for comparison. Legislators from departments with relatively stronger institutions do not increase their support for the incumbent party following the signature of the sponsored contracts (and the estimates suggest they may even reduce it), but those from departments with weaker institutions, do change their legislative behaviour in favour of the ruling government.

[33]Similarly, the results based on ITEP (column 2) indicate that a legislator from Chocó (lowest index at 30.2) is around 9 percentage points more likely to align his votes with the incumbent party in the month following the signature of a contract he sponsored ($0.162 - 0.234 \times 0.302$). The equivalent estimation for a legislator from Antioquia (highest index at 85.6) suggests that she reduces her support for the incumbent party (by about 3.8 percentage points).

Table 7: Relationship between contract signature and incumbent support by departments' institutional strength

	(1)	(2)	(3)	(4)	(5)	(6)
pre contract signed	0.042	0.024	-0.028	-0.090	0.011	0.015
	(0.037)	(0.050)	(0.094)	(0.128)	(0.011)	(0.015)
post contract signed	0.098**	0.162***	0.177*	0.249**	0.028**	0.040***
	(0.042)	(0.048)	(0.097)	(0.111)	(0.012)	(0.013)
pre-cs x Tranparency Index	-0.048	-0.008				
	(0.057)	(0.072)				
post-cs x Tranparency Index	-0.133**	-0.234***				
	(0.063)	(0.072)				
pre-cs x Open Gov. Index			0.062	0.180		
			(0.153)	(0.206)		
post-cs x Open Gov. Index			-0.275*	-0.399**		
			(0.158)	(0.184)		
pre-cs x Core					-0.005	0.003
					(0.015)	(0.021)
post-cs x Core					-0.038**	-0.069***
					(0.016)	(0.018)
N	454332	454332	454332	454332	454332	454332
N-clusters	284	284	284	284	284	284
Individual FE	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes
Time window	5-months	1-month	5-months	1-month	5-months	1-month
Constituents	All	All	All	All	All	All

Notes: Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Targeted legislation

We document that on average, legislators tend to increase their alignment with the incumbent party following the signature of the sponsored contracts. Our results, however, could mask heterogeneity across different congressional bills. In particular, the incumbent government may be interested in some particular legislative reforms, rather than having an overall more friendly legislature. The arrangements may therefore involve increased support only for some specific policy reforms. This section investigates this possibility.

To study this hypothesis, we start with a data-driven exercise by which we aim to uncover which congressional bills may have been targeted. In particular, we look at whether specific bills are more or less predictive of finding a positive alignment effect. To do so, we repeat our

baseline regression 6,200 times, with each iteration excluding one bill from the sample. Recall our baseline specification:

$$incumbentSupport_{rvt} = \alpha + \beta_{pre} pre_{rt} + \beta_{post} post_{rt} + \gamma_r + \gamma_v + \varepsilon_{rvt}$$

This analysis results in a vector of coefficients $\boldsymbol{\beta^v_{post}}$ where v indicates the excluded bill. We sort bills on this dimension. Lower β^v_{post} indicates that bill v is more predictive of a positive alignment effect (when the bill is excluded from the sample the size of the coefficient decreases). We classify as *targeted* the top five percent bills along this dimension, and explore the characteristics of these bills.

Table A10 shows these descriptive characteristics. We calculate a measure of vote closeness for each bill (equal to 1 if the vote was split 50-50, and 0 if the vote was unanimous). We also define a variable *incumbent win* equal to 1 if the outcome of the vote was in favour of the incumbent position. Though we observe no differences in the likelihood of the vote being in favour of the incumbent, we do observe that targeted bills are more likely to be close votes, more likely to refer to tax reform, and more likely to occur in the large assemblies (either the Senate or the Chamber of Representatives, rather than being a committee vote). These patterns suggest that these congressional votes were likely *ex-ante* more contentious and that this is precisely why they may have been targeted.

Overall, more contested votes were less likely to result in favour of the incumbent party (figure A5). To further investigate this idea we regress the *incumbent win* indicator on the targeted vote indicator, along different subsamples of congressional votes depending on how close the votes were (table A11). Votes that were closer and also targeted, were more likely to have gone in favour of the incumbent. This pattern is particularly stark for votes dealing with tax reform. At the top end, for the very close votes, a targeted vote is associated with an increased likelihood of the vote outcome being in favour of the incumbent, from around 42 percent to almost 82 percent, a substantial gain (table A11, Panel A, column 4).

The media leak and legislators' behaviour

In this section we examine whether legislators' behaviour changed following the media leak. In particular, we study a regression similar to that in our baseline analysis as follows:

$$incumbentSupport_{rvt} = \alpha + \beta post_t \times sponsor_{rt} + \gamma_r + \gamma_v + \varepsilon_{rvt} \tag{6}$$

where $post_t \times sponsor_{rt}$ is an indicator equal to one for the period after the leak in Colombian news media (after December 2013), interacted with whether the legislator was a contract sponsor.

The results are shown in Table A12. We observe that legislators who had been assigned road contracts became less likely to support the incumbent party in the legislature after the

media leak. This finding is stronger for legislators from the core departments, who as we have argued may be more politically accountable to their constituents. A possible interpretation of this finding is that the media plays an important role in disciplining the behaviour of politicians (as documented in Ferraz and Finan, 2008; Costas-Pérez, Solé-Ollé and Sorribas-Navarro, 2012; Durante and Zhuravskaya, 2018), but that the role of the media is complementary with other political institutions, such that politicians from the periphery are less responsive to the leak itself.

One important limitation of this analysis is that the post-leak time period coincides as well with the post legislative elections time-period. Another interpretation of these results is therefore that legislators were no longer accountable to the executive, and thus tended to revert back to their preferred ideal points during this time period. However, we do not observe heterogeneous effects for politicians who were re-elected, and may have an interest in maintaining a good relationship with the government, and those who were not re-elected (not shown). In addition, the fact that sponsoring politicians from the core seem to become relatively less aligned post-leak, despite being initially closer to the incumbent, suggests that the media leak indeed could have had a disciplining effect.

7 Conclusion

Stokes et al. (2013)'s question of "where does one draw the line between acceptable and unacceptable forms of distributive politics?" has been publicly debated in Colombia over the practice documented here, which we have called jam-barrel politics. While the opposition was adamant in its position that the practice constitutes a form of corruption, the government defended the practice as legal, and a legitimate way of doing politics. Though the veracity of the leaked database was never publicly acknowledged by the government, the statistical patterns outlined suggest that these hidden, private arrangements took place and had observable implications for legislative behaviour and policy outcomes.

More importantly, does this particular exchange of public resources for legislative support undermine democratic institutions? We believe the analysis presented suggests it does. Sponsored road construction projects were more expensive than non-sponsored projects. Legislators closer to the median in the legislature in terms of their alignment with the incumbent party were disproportionately targeted. In addition, legislators responding to more costly contracts, but not more lengthy projects, is unlikely to be an accurate mapping of the underlying preferences of their constituents.

We presented a model of executive-legislative relations to help us understand these private arrangements. Importantly, we highlight how political accountability, and in particular, the willingness of legislators to change their policy positions in response to jam, affect these exchanges. This dimension of analysis allows us to better understand policy-making and leg-

islative bargaining in environments with weak institutions, fragmented political parties and poor political accountability.

That the troubling empirical patterns we find are particularly salient for legislators representing the periphery of the country, where the state has been historically weaker, highlights the importance of institutions for development and inequality. Elites in the core of Colombia benefit from the existence of weak institutions in the periphery of the country through various mechanisms, including the ability of nationally elected legislators to buy (electoral) votes from these areas, resulting in a persistent core-periphery equilibrium (Robinson, 2016). We present evidence of another important mechanism that can contribute to the persistence of this equilibrium. Legislators facing low political accountability are more easily influenced through targeted jam transfers, increasing the ability of the elites in the core of the country to buy legislative support for their policy agenda, weakening the incentives to invest in state capacity in the periphery, and undermining political representation for its inhabitants. As long as jam does not "run out", the interests of spatially isolated communities will also remain peripheral to the public policy priorities of the country.

The findings are relevant more generally for spatial inequality in developing countries which have relatively weak legislatures. The case of Africa is of particular significance, where despite the fact that legislatures have become stronger over the last few decades (Ochieng' Opalo, 2019), spatial inequality has increased (Lessmann and Seidel, 2017). Spatial differences in the quality of political representation can have important implications for development outcomes (Abdulai and Hickey, 2016) and could explain these dynamics. The framework we provide formalizes and broadens this idea while further stressing the importance of effective legislative representation for spatially isolated populations.

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Appendix

Theoretical appendix

Optimality of the contribution scheme

Recall the optimal contribution scheme:

$$b_g(p^*, p) = \begin{cases} c(p^*, g) & \text{if } p^* \in [m, g) \text{ and } p = g \\ 0 & \textit{otherwise} \end{cases}$$

where $c(p^*, g)$ is the contribution that makes legislator p^* indifferent between voting p^* and g:

$$c(p^*, g) = \frac{1}{\beta}(g - p^*)^2$$

This contribution scheme is optimal, there is no cheaper way to make g the policy outcome chosen by the legislature. Note that targeting politicians with $p^* < m$ would be more costly. Indeed, the further away (to the left) from policy g a legislator is, the more jam she has to receive to be convinced to vote for g:

$$\frac{\partial c(p^*, g)}{\partial p^*} = -\frac{2}{\beta}(g - p^*) < 0, \quad \forall p^* < g$$

that is, the cost decreases as p^* gets closer to g. In addition, any jam given to legislators to the right of g would be wasteful, as it would not change the outcome.[34] The government will thus announce contribution scheme b_g, with g as close to e^* as possible, subject to the budget constraint.

Deriving the cost function for unique β

We present the derivation of the solution for the cost function of the executive in the framework with unique β.

$$C(g) = \int_0^h b_g(p^*, p)\frac{1}{h}dp^* = \int_m^g c(p^*, g)\frac{1}{h}dp^* = \frac{1}{h}\int_m^g \frac{1}{\beta}(g - p^*)^2 dp^* =$$

$$= \frac{1}{h\beta}\int_m^g (g^2 + p^{*2} - 2p^* g)dp* = \frac{1}{h\beta}\left[g^2 p^* + \frac{1}{3}p^{*3} - gp^{*2}\right]_m^g =$$

$$= \frac{1}{h\beta}\left[g^3 + \frac{1}{3}g^3 - g^3 - g^2 m - \frac{1}{3}m^3 + gm^2\right] = \frac{(g - m)^3}{3h\beta}$$

[34] These legislators will vote in favour of g in a pairwise vote against the next most popular alternative, which in equilibrium would be m.

Cost function with two types of legislators

Recall the optimal contribution scheme to implement policy g, which we rewrite here:

$$b_g(\beta_i, p^*, p) = \begin{cases} 0 & \text{if } p^* \in [0, p_i) \cup [g, h], \forall p \\ 0 & \text{if } p^* \in [p_i, g) \text{ and } p \neq g \\ c(p^*, g) & \text{if } p^* \in [p_i, g) \text{ and } p = g \end{cases}$$

for $i \in \{C, P\}$, and where $c(\beta_i, p^*, g)$ is the contribution that makes legislator (β_i, p^*) indifferent between voting p^* and g:

$$c(\beta_i, p^*, g) = \frac{1}{\beta_i}(g - p^*)^2$$

and where:

$$p_C = \theta_C h + (\theta_P - \theta_C) g$$

$$p_P = \theta_P h - (\theta_P - \theta_C) g$$

such that:

$$\theta_C = \frac{\sqrt{\beta_C}}{\sqrt{\beta_C} + \sqrt{\beta_P}}, \qquad \theta_P = \frac{\sqrt{\beta_P}}{\sqrt{\beta_C} + \sqrt{\beta_P}}$$

We now analyze the feasibility of such a contribution with respect to the executive budget constraint. We can define the total cost associated with a target policy g as:

$$C(g) = \int_0^h b_g(\beta_C, p^*, p) \frac{1}{2h} dp^* + \int_0^h b_g(\beta_P, p^*, p) \frac{1}{2h} dp^*$$

$$= \int_{p_C}^g c(\beta_C, p^*, g) \frac{1}{2h} dp^* + \int_{p_P}^g c(\beta_P, p^*, g) \frac{1}{2h} dp^* = \frac{(g - p_C)^3}{6h\beta_C} + \frac{(g - p_P)^3}{6h\beta_P}$$

$$= \frac{4(g - m)^3}{3h(\sqrt{\beta_C} + \sqrt{\beta_P})^2}(\theta_C + \theta_P) = \frac{4(g - m)^3}{3h(\sqrt{\beta_C} + \sqrt{\beta_P})^2}$$

since $(\theta_C + \theta_P) = 1$ by construction. From the above expressions we can notice that, in equilibrium, θ_i (for $i \in \{C, P\}$) captures the fraction of the budget that is spent in targeting group i.

As in the previous section, we have that if $C(e^*) \leq B$, the government will announce contribution scheme b_{e^*} and policy $g = e^*$ will be implemented. If instead $C(e^*) > B$, it is not feasible for the executive to announce b_{e^*}. Again, we can notice that B is a continuous function, strictly increasing in g $\forall g > m$. Furthermore, $C(m) = 0 < B$ and $C(e^*) > B$. Thus, there exist a unique $g^* \in (m, e^*)$ *s.t.* $C(g^*) = B$, that can be explicitly computed and yields the

following solution:

$$g^* = \begin{cases} e^* & if \quad C(e^*) \leq B \\ m + \sqrt[3]{\frac{3}{4}hB(\sqrt{\beta_C} + \sqrt{\beta_P})^2} & if \quad C(e^*) > B \end{cases}$$

Proof of equilibrium solution with two types of legislators

We again indicate the contribution scheme by b_g, given by:

$$b_g(\beta_i, p^*, p) = \begin{cases} c(\beta_i, p^*, g) & \text{if } p^* \in [p_i, g) \text{ and } p = g \\ 0 & otherwise \end{cases}$$

for $i \in \{C, P\}$, and where $c(\beta_i, p^*, g)$ is the contribution that makes legislator (β_i, p^*) indifferent between voting p^* and g:

$$c(\beta_i, p^*, g) = \frac{1}{\beta_i}(g - p^*)^2$$

The optimal contribution scheme, defined by p_C and p_P (the lowest targeted points for each group), must satisfy two conditions. First, g must effectively be the new median. That is, the mass of politicians who choose g or above must be one half:

$$\int_{p_C}^{h} \frac{1}{2h} dp^* + \int_{p_P}^{h} \frac{1}{2h} dp^* = \frac{1}{2},$$

or equivalently:

$$p_C + p_P = h \tag{7}$$

Second, the marginal politician in each of the two groups must receive the same amount of jam:

$$c(\beta_C, p_C, g) = c(\beta_P, p_P, g)$$

or equivalently:

$$\frac{1}{\beta_C}(g - p_C)^2 = \frac{1}{\beta_P}(g - p_P)^2 \tag{8}$$

Together, 7 and 8 imply:

$$p_C = \frac{\sqrt{\beta_P}g + \sqrt{\beta_C}(h - g)}{\sqrt{\beta_C} + \sqrt{\beta_P}}$$

$$p_P = \frac{\sqrt{\beta_C}g + \sqrt{\beta_P}(h - g)}{\sqrt{\beta_C} + \sqrt{\beta_P}}$$

Given a certain budget, we can define an optimal contribution scheme b_{g^*} and targeted policy g^*, which is the outcome of the legislature in equilibrium.

The equilibrium is characterized by the following two equations:

$$\begin{cases} \int_{p_C}^{h} \frac{1}{2h} dp^* + \int_{p_P}^{h} \frac{1}{2h} dp^* = \frac{1}{2} & (1) \\ c(\beta_C, p_C, g) = c(\beta_P, p_P, g) & (2) \end{cases}$$

Solving (1):

$$\frac{h - p_C}{2h} + \frac{h - p_P}{2h} = \frac{1}{2} \quad \Rightarrow \frac{p_P + p_C}{2} = \frac{h}{2} = m \quad \Rightarrow p_C = 2m - p_P$$

Solving (2):

$$c(\beta_C, p_C, g) = c(\beta_P, p_P, g) \quad \Rightarrow \frac{1}{\beta_C}(g - p_C)^2 = \frac{1}{\beta_P}(g - p_P)^2 \quad \Rightarrow p_C = g - \sqrt{\frac{\beta_C}{\beta_P}}(g - p_P)$$

Equating the two expressions for p_C yields:

$$2m - p_P = g - \sqrt{\frac{\beta_C}{\beta_P}} g + \sqrt{\frac{\beta_C}{\beta_P}} p_P \quad \Rightarrow 2m - g(1 - \sqrt{\frac{\beta_C}{\beta_P}}) = p_P(1 + \sqrt{\frac{\beta_C}{\beta_P}})$$

$$\Rightarrow p_P = \frac{1}{1 + \sqrt{\frac{\beta_C}{\beta_P}}}[2m - g(1 - \sqrt{\frac{\beta_C}{\beta_P}})] = \frac{1}{\frac{\sqrt{\beta_P} + \sqrt{\beta_C}}{\sqrt{\beta_P}}}[2m - g(\frac{\sqrt{\beta_P} - \sqrt{\beta_C}}{\sqrt{\beta_P}})]$$

$$\Rightarrow p_P = \frac{\sqrt{\beta_P}}{\sqrt{\beta_P} + \sqrt{\beta_C}} 2m - g \frac{\sqrt{\beta_P} - \sqrt{\beta_C}}{\sqrt{\beta_P} + \sqrt{\beta_C}}$$

For notational purposes, let:

$$\theta_C = \frac{\sqrt{\beta_C}}{\sqrt{\beta_C} + \sqrt{\beta_P}}, \qquad \theta_P = \frac{\sqrt{\beta_P}}{\sqrt{\beta_C} + \sqrt{\beta_P}}$$

Using the above expressions into the solution for p_P and into (1) yields the solution of the problem:

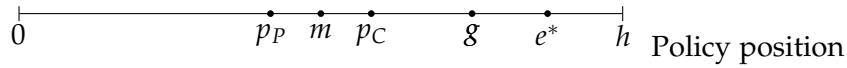
$$\begin{cases} p_P = \theta_P h - (\theta_P - \theta_C) g \\ p_C = \theta_C h + (\theta_P - \theta_C) g \end{cases}$$

Ordering conditions with two types of legislators

We claim that as long as $\beta_P > \beta_C > 0$ and $m < g \leq e^*$:

$$0 < p_P < m < p_C < g \leq h$$

Figure 6: The contribution scheme with two types



Where recall that:

$$\begin{cases} p_P = \theta_P h - (\theta_P - \theta_C)g \\ p_C = \theta_C h + (\theta_P - \theta_C)g \end{cases}$$

and that by construction: $0 < m < g \leq e^* \leq h$.

- $0 < p_p : \quad h \geq g \quad \Rightarrow h\frac{\theta_P}{\theta_P - \theta_L} > g \quad \Rightarrow \theta_P h - (\theta_P - \theta_C)g = p_P > 0$
- $p_P < m : \quad m < g \quad \Rightarrow m < \frac{\theta_P - \theta_C}{2\theta_P - 1}g \quad \Rightarrow m(2\theta_P - 1) < (\theta_P - \theta_C)g$ (since $\frac{\theta_P - \theta_C}{2\theta_P - 1} = 1$)
  $\Rightarrow \theta_P 2m - (\theta_P - \theta_C)g < m \quad \Rightarrow \theta_P h - (\theta_P - \theta_C)g < m \quad \Rightarrow p_P < m$
- $m < p_C : \quad m < g \quad \Rightarrow m < \frac{\theta_P - \theta_C}{1 - 2\theta_C}g \quad \Rightarrow m(1 - 2\theta_C) < (\theta_P - \theta_C)g$ (since $\frac{\theta_P - \theta_C}{1 - 2\theta_C} = 1$)
  $\Rightarrow m < \theta_C 2m + (\theta_P - \theta_C)g \quad \Rightarrow m < p_C$
- $p_C < g : \quad m < g \quad \Rightarrow 2\theta_C m < 2\theta_C g \quad \Rightarrow \theta_C h < (1 - \theta_P + \theta_C)g$ (since $(1 - \theta_P + \theta_C) = 2\theta_C$)
  $\Rightarrow \theta_C h + (\theta_P - \theta_C)g < g \quad \Rightarrow p_C < g$

$g \leq e^* \leq h$ follow by construction.

Appendix tables

Table A1: Summary statistics for legislators by constituency

	Core		Periphery		Dif.
	Mean	S.D.	Mean	S.D.	p-value
Age	49.323	8.246	47.015	9.724	0.041
Female	0.158	0.366	0.138	0.346	0.631
President's party	0.281	0.451	0.303	0.461	0.673
Government coalition	0.799	0.403	0.807	0.396	0.861
First term in Congress	0.475	0.501	0.531	0.501	0.345
Votes Senate 2010 (thousands)	78.452	71.341	60.327	24.556	0.080
Votes House 2010 (thousands)	25.374	10.077	25.925	14.774	0.776
Political alignment index	0.671	0.111	0.675	0.113	0.783
Running in 2014	0.683	0.467	0.717	0.452	0.536
Reelected in 2014	0.403	0.492	0.455	0.500	0.375
Votes 2014 (thousands)	54.912	64.259	54.990	31.726	0.993
Tweets about 'jam'	0.122	0.329	0.048	0.215	0.026
Investigation 2014	0.129	0.337	0.200	0.401	0.109
Investigation 2018	0.633	0.484	0.738	0.441	0.058
N	139	.	145	.	.

Notes: Table shows summary statistics for legislator characteristics. The last column presents the *p-value* of a group mean difference test between center and periphery legislators.

Table A2: Summary statistics for road construction projects by constituency

	Core		Periphery		Dif.
	Mean	S.D.	Mean	S.D.	p-value
A. Municipalities					
Municipality area (log)	5.316	0.929	6.107	1.241	0.000
Altitude (log)	7.338	0.673	5.763	1.660	0.000
Ruggedness (log)	5.405	0.618	4.177	1.453	0.000
Distance to dep capital (log)	3.916	0.902	3.973	1.111	0.267
Distance to Bogota (log)	5.156	0.622	6.100	0.397	0.000
Population (log)	9.477	1.058	9.926	1.003	0.000
Poverty rate	34.286	15.545	52.379	20.103	0.000
Homicide rate	32.174	26.879	40.992	38.066	0.000
Education quality	-0.100	0.261	-0.272	0.336	0.000
Roads per capita (log)	1.794	0.788	1.777	0.759	0.671
GDP share of Agriculture	0.111	0.041	0.113	0.052	0.358
B. Road construction projects					
Contract year	2011.707	0.455	2011.609	0.488	0.000
Road length (log)	2.149	0.762	2.309	0.846	0.000
Total cost (log)	19.727	0.685	20.182	0.923	0.000
Cost/km (log)	17.578	0.952	17.874	1.118	0.000
Unexplained cost/km (log)	-0.059	0.680	0.056	0.830	0.003
Total execution time (days)	332.799	125.493	366.732	138.382	0.000
Projected time (days)	270.130	110.444	249.231	113.659	0.001
Time Extensions (days)	62.670	102.579	117.501	153.611	0.000
Executed by municipality	0.905	0.293	0.861	0.346	0.008
Executed by department	0.095	0.293	0.117	0.322	0.164
N	738	.	789	.	.

Note: Table shows summary statistics for road construction projects. The last column presents the *p-value* of a group mean difference test.

Table A3: Relationship between political-alignment-index and being a contract sponsor

	(1) OLS	(2) OLS	(3) OLS	(4) Q25	(5) Q25	(6) Q25	(7) Q75	(8) Q75	(9) Q75
Sponsor	0.00463		0.0259	0.00894		0.0629**	-0.0127		-0.00295
	(0.0131)		(0.0186)	(0.0208)		(0.0250)	(0.0130)		(0.0121)
Periphery		0.00368	0.0222		0.00201	0.0599**		-0.00859	0.00354
		(0.0133)	(0.0191)		(0.0228)	(0.0266)		(0.0138)	(0.0146)
Sponsor x Periphery			-0.0418			-0.0971***			-0.0197
			(0.0263)			(0.0361)			(0.0242)
N	284	284	284	284	284	284	284	284	284

Notes: Dependent variable is the political-alignment-index. Columns 4-9 present results from quantile regressions at the 25th and the 75th percentiles. Robust standard errors (columns 1-3) and VCE robust standard errors (columns 4-9). Significance levels *p<0.10, ** p<0.05, ***p<0.01.

Table A4: Relationship between sponsored contracts and cost-per-km by constituency

	(1)	(2)	(3)	(4)	(5)	(6)
Sponsor	0.321***	0.128*	0.314***	0.173***	0.102**	0.024
	(0.054)	(0.067)	(0.039)	(0.051)	(0.045)	(0.056)
Sponsor X Periphery		0.388***		0.287***		0.174**
		(0.081)		(0.066)		(0.073)
Total length (log)			-0.805***	-0.807***	-0.762***	-0.764***
			(0.024)	(0.024)	(0.023)	(0.023)
Altitude (log)			-0.235***	-0.237***	0.001	-0.001
			(0.026)	(0.026)	(0.033)	(0.033)
Ruggedness (log)			0.046	0.056**	-0.081***	-0.079***
			(0.028)	(0.028)	(0.030)	(0.030)
Distance to Bogotá (log)			0.049	-0.008	-0.058	-0.050
			(0.033)	(0.035)	(0.077)	(0.077)
Distance to capital (log)			-0.090***	-0.089***	-0.077***	-0.076***
			(0.019)	(0.019)	(0.019)	(0.019)
Roads per capita (log)			0.062**	0.056**	-0.009	-0.011
			(0.026)	(0.026)	(0.027)	(0.027)
N	1524	1524	1515	1515	1515	1515
Geo-controls	no	no	yes	yes	yes	yes
Dept FE	no	no	no	no	yes	yes
Year FE	no	no	yes	yes	yes	yes

Notes: Standard errors in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Table A5: Relationship between political-alignment-index and contract characteristics by constituency

	(1) Contracts	(2) Contracts	(3) km	(4) km	(5) Value	(6) Value
Alignment-index	-7.578**	-7.727**	-88.145*	-93.779*	-12452.206**	-13493.210***
	(3.657)	(3.680)	(51.173)	(51.149)	(4944.805)	(4840.323)
Alignment x Periphery		0.548		20.777		3839.278***
		(1.078)		(14.982)		(1417.776)
N	128	128	128	128	128	128

Notes: Standard errors in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Table A6: Relationship between contract characteristics and vote-alignment by constituency

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
pre contract signed	-0.335	-0.036	0.020	1.281	-0.481	-0.047	0.000	-0.759*
	(0.344)	(0.041)	(0.017)	(0.786)	(0.358)	(0.047)	(0.016)	(0.421)
post contract signed	0.015	0.004	-0.028	-0.544	0.033	0.064*	0.039***	0.300
	(0.335)	(0.048)	(0.019)	(0.851)	(0.254)	(0.034)	(0.015)	(0.334)
pre-cs x log cost	0.018			-0.074*	0.023			0.038*
	(0.016)			(0.044)	(0.017)			(0.021)
post-cs x log cost	-0.002			0.030	0.000			-0.015
	(0.016)			(0.046)	(0.012)			(0.017)
pre-cs x log KM		0.019		0.103**		0.016		-0.012
		(0.012)		(0.046)		(0.013)		(0.019)
post-cs x log KM		-0.010		-0.036		-0.007		0.016
		(0.014)		(0.045)		(0.010)		(0.015)
pre-cs x cost-per-km			0.006	0.123**			0.005	-0.004
			(0.018)	(0.061)			(0.008)	(0.008)
post-cs x cost-per-km			0.011	-0.034			0.012***	0.020***
			(0.033)	(0.078)			(0.005)	(0.007)
N	222290	221836	221836	221836	232034	231768	231768	231768
N-clusters	139	139	139	139	145	145	145	145
Individual FE	yes	yes	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes	yes	yes
Time window	1-month	1-month	1-month	1-month	1-month	1-month	1-month	1-month
Constituents	Core	Core	Core	Core	Periphery	Periphery	Periphery	Periphery

Notes: Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Table A7: Relationship between contract signature and incumbent support (robustness checks)

	Extended Core		Key votes		Without U party	
	(1)	(2)	(3)	(4)	(5)	(6)
A. Core						
pre contract signed	0.016	0.030*	0.004	0.003	0.019	0.040**
	(0.013)	(0.017)	(0.015)	(0.019)	(0.015)	(0.017)
post contract signed	0.009	-0.015	-0.004	-0.039*	0.000	-0.019
	(0.015)	(0.017)	(0.018)	(0.020)	(0.018)	(0.020)
N	270554	270554	159148	159148	159561	159561
N-clusters	167	167	139	139	100	100
Individual FE	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes
Time window	5-months	1-month	5-months	1-month	5-months	1-month
B. Periphery						
pre contract signed	0.002	0.006	0.002	0.010	-0.002	0.007
	(0.012)	(0.016)	(0.015)	(0.019)	(0.016)	(0.022)
post contract signed	0.003	0.028*	0.012	0.039**	0.009	0.030
	(0.014)	(0.015)	(0.015)	(0.016)	(0.017)	(0.019)
N	183487	183487	166189	166189	165028	165028
N-clusters	117	117	145	145	102	102
Individual FE	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes
Time window	5-months	1-month	5-months	1-month	5-months	1-month

Notes: Columns 1-2 use an alternative definition of core/periphery. Columns 3-4 exclude procedural votes from the analysis. Columns 5-6 exclude politicians from the ruling party. Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Table A8: Relationship between contract signature and incumbent support by political-alignment and constituency (robustness checks)

	Extended Core		Key votes		Without U party		Alternative alignment	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Core								
pre contract signed	0.203***	0.287***	0.199**	0.169	0.186**	0.295**	0.223***	0.289***
	(0.072)	(0.097)	(0.084)	(0.108)	(0.091)	(0.128)	(0.082)	(0.110)
post contract signed	0.264***	0.239**	0.224**	0.188*	0.194*	0.188	0.170*	0.117
	(0.084)	(0.103)	(0.091)	(0.111)	(0.103)	(0.118)	(0.095)	(0.116)
pre-cs x PAindex	-0.268**	-0.363***	-0.275**	-0.225	-0.243*	-0.376**	-0.301**	-0.372**
	(0.105)	(0.134)	(0.120)	(0.148)	(0.134)	(0.180)	(0.119)	(0.154)
post-cs x PAindex	-0.374***	-0.373**	-0.330**	-0.331**	-0.287*	-0.308*	-0.245*	-0.212
	(0.117)	(0.148)	(0.129)	(0.162)	(0.147)	(0.173)	(0.132)	(0.165)
N	270554	270554	159148	159148	159561	159561	222290	222290
N-clusters	167	167	139	139	100	100	139	139
Individual FE	yes	yes	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes	yes	yes
Time window	5-months	1-month	5-months	1-month	5-months	1-month	5-months	1-month
B. Periphery								
pre contract signed	-0.062	0.012	-0.114*	-0.094	-0.133**	-0.049	-0.025	0.048
	(0.060)	(0.095)	(0.064)	(0.092)	(0.054)	(0.097)	(0.062)	(0.097)
post contract signed	0.166**	0.181**	0.216***	0.251***	0.137*	0.186**	0.200***	0.216***
	(0.066)	(0.071)	(0.078)	(0.084)	(0.076)	(0.083)	(0.074)	(0.080)
pre-cs x PAindex	0.096	-0.012	0.178**	0.158	0.205**	0.083	0.048	-0.060
	(0.090)	(0.137)	(0.090)	(0.129)	(0.081)	(0.138)	(0.092)	(0.140)
post-cs x PAindex	-0.247**	-0.228**	-0.310***	-0.322***	-0.195*	-0.237*	-0.276**	-0.266**
	(0.095)	(0.103)	(0.111)	(0.122)	(0.111)	(0.124)	(0.107)	(0.117)
N	183487	183487	166189	166189	165028	165028	232034	232034
N-clusters	117	117	145	145	102	102	145	145
Individual FE	yes	yes	yes	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes	yes	yes	yes
Time window	5-months	1-month	5-months	1-month	5-months	1-month	5-months	1-month

Notes: Columns 1-2 use an alternative definition of core/periphery. Columns 3-4 exclude procedural votes from the analysis. Columns 5-6 exclude politicians from the ruling party. Columns 7-8 use an alternative measure of the political-alignment-index. Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Table A9: Relationship between contract characteristics and vote-alignment by constituency (robustness checks)

	Extended Core (1)	Key votes (2)	Without U party (3)	Pred cost-per-km (4)	Horse race (5)
A. Core					
pre contract signed	0.084	0.032	0.093	0.046	0.117
	(0.086)	(0.113)	(0.100)	(0.073)	(0.093)
post contract signed	-0.183	-0.109	-0.161	-0.020	-0.147
	(0.184)	(0.186)	(0.207)	(0.111)	(0.183)
pre-cs x cost-per-km	0.021	0.009	0.001		0.029
	(0.032)	(0.041)	(0.032)		(0.033)
post-cs x cost-per-km	-0.033	-0.031	-0.057		-0.037
	(0.044)	(0.045)	(0.052)		(0.046)
pre-cs x pred cost-per-km				-0.021	-0.023
				(0.027)	(0.025)
post-cs x pred cost-per-km				-0.002	0.001
				(0.022)	(0.023)
N	269118	158383	158363	221092	221092
N-clusters	167	139	100	139	139
Individual FE	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes
Time window	5-months	5-months	5-months	5-months	5-months
B. Periphery					
pre contract signed	-0.070	-0.110	-0.050	-0.087	-0.087
	(0.097)	(0.164)	(0.119)	(0.092)	(0.094)
post contract signed	0.054	0.035	0.147	-0.070	0.007
	(0.110)	(0.128)	(0.136)	(0.100)	(0.124)
pre-cs x cost-per-km	0.005	0.004	0.005		0.001
	(0.008)	(0.019)	(0.006)		(0.010)
post-cs x cost-per-km	0.032**	0.028**	0.033***		0.019
	(0.013)	(0.013)	(0.008)		(0.017)
pre-cs x pred cost-per-km				-0.005	-0.004
				(0.008)	(0.009)
post-cs x pred cost-per-km				0.018**	0.012
				(0.008)	(0.011)
N	182909	165721	164212	231218	231218
N-clusters	117	145	102	145	145
Individual FE	yes	yes	yes	yes	yes
Congr. vote FE	yes	yes	yes	yes	yes
Time window	5-months	5-months	5-months	5-months	5-months

Notes: Column 1 use an alternative definition of core/periphery. Column 2 exclude procedural votes from the analysis. Columns 3 excludes politicians from the ruling party. Column 4 uses the predicted cost-per-km of the signed contracts. Column 5 include both the predicted cost-per-km and the observed cost-per-km. All specifications include the time-dummy indicators interacted with both cost and kilometers (not shown). Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Table A10: Characteristics of potentially targeted bills

	Non-targeted		**Targeted**		Diff
	Mean	SD	Mean	SD	p-value
Incumbent outcome	.952	.213	.952	.214	.978
Vote closeness	.171	.234	.314	.232	0
Tax reform	.024	.154	.569	.496	0
Senate	.163	.369	.457	.499	0
Representatives	.291	.454	.431	.496	0
Committee	.554	.497	.112	.316	0
N	5863		313		

Notes: The table compares descriptive characteristics of bills labeled as potentially targeted by our data-driven methodology.

Table A11: Relationship between incumbent preferred outcome and targeted vote

	(1)	(2)	(3)	(4)
A. All votes				
Targeted vote dummy	-0.000337	0.0565***	0.0781*	0.183**
	(0.0124)	(0.0198)	(0.0435)	(0.0842)
Constant	0.952***	0.885***	0.799***	0.643***
	(0.00278)	(0.00811)	(0.0152)	(0.0284)
N	6176	1722	761	309
Vote closeness $\geq$	0	0.25	0.5	0.75
B. Tax reform votes				
Targeted vote dummy	0.0279	0.0901**	0.196**	0.402**
	(0.0229)	(0.0451)	(0.0975)	(0.192)
Constant	0.944***	0.877***	0.731***	0.417**
	(0.0193)	(0.0410)	(0.0883)	(0.149)
N	321	156	67	23
Vote closeness $\geq$	0	0.25	0.5	0.75

Notes: Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Table A12: Effect of media leak on legislators' support for incumbent

	(1)	(2)	(3)	(4)	(5)	(6)
Post-leak x Sponsor	-0.0359**	-0.0504*	-0.0319	-0.0487**	-0.0654**	-0.0456*
	(0.0178)	(0.0274)	(0.0253)	(0.0192)	(0.0296)	(0.0262)
N	464995	222290	232034	184018	89561	90200
Time period	All	All	All	Last 2 yrs	Last 2 yrs	Last 2 yrs
Constituents	All	Core	Periphery	All	Core	Periphery

Notes: Standard errors clustered at the politician level in parenthesis. Significance levels shown below *p<0.10, ** p<0.05, ***p<0.01.

Appendix figures

Figure A1: Peripheral departments of Colombia

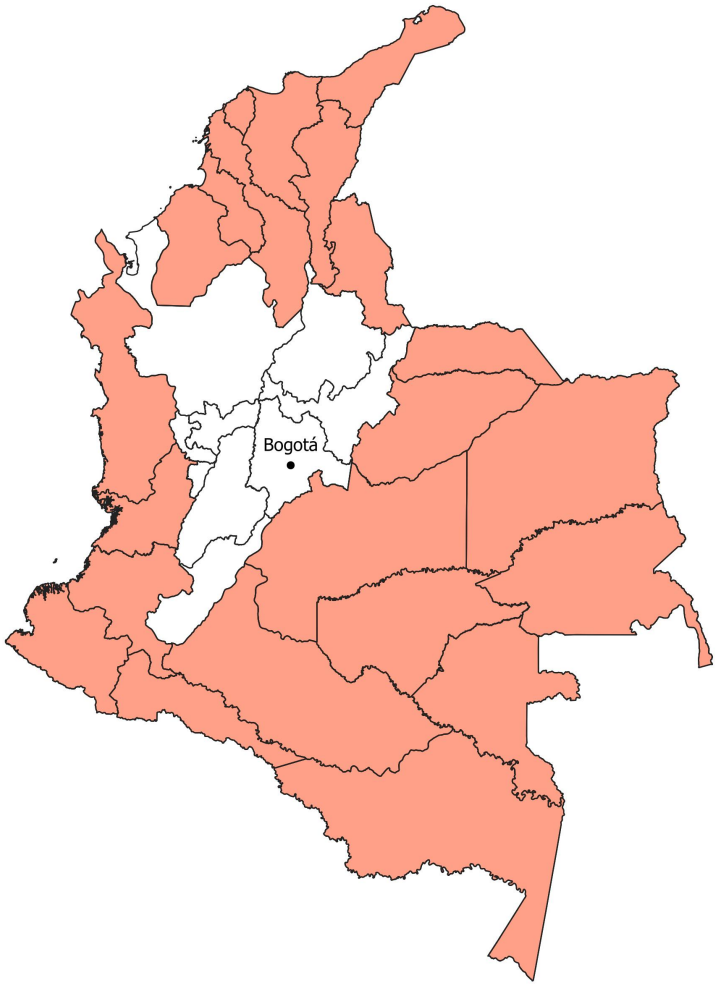


Figure A2: Indices of institutional strength

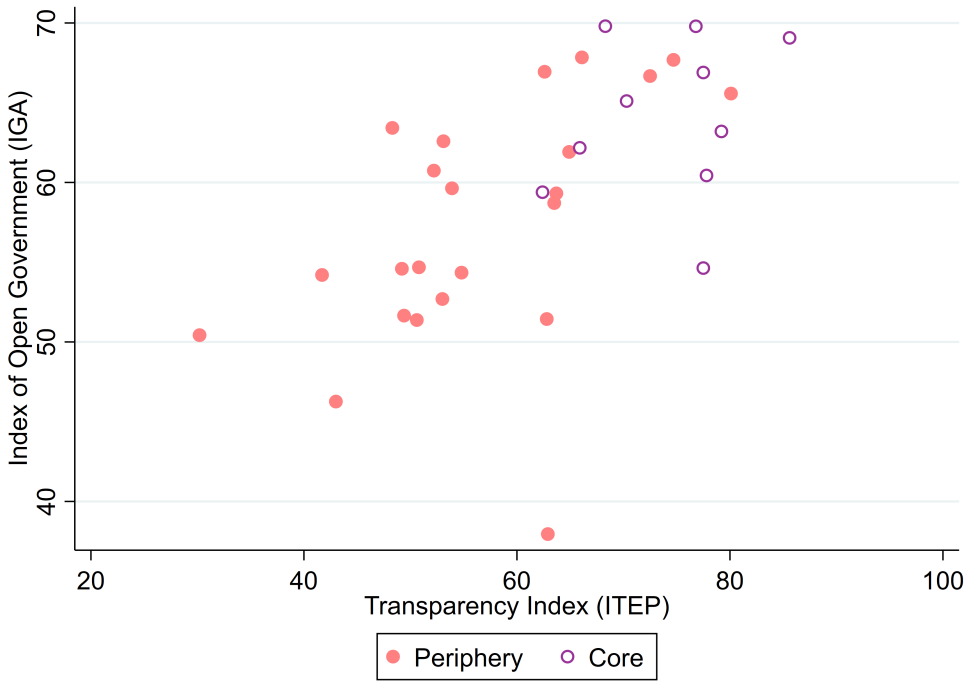
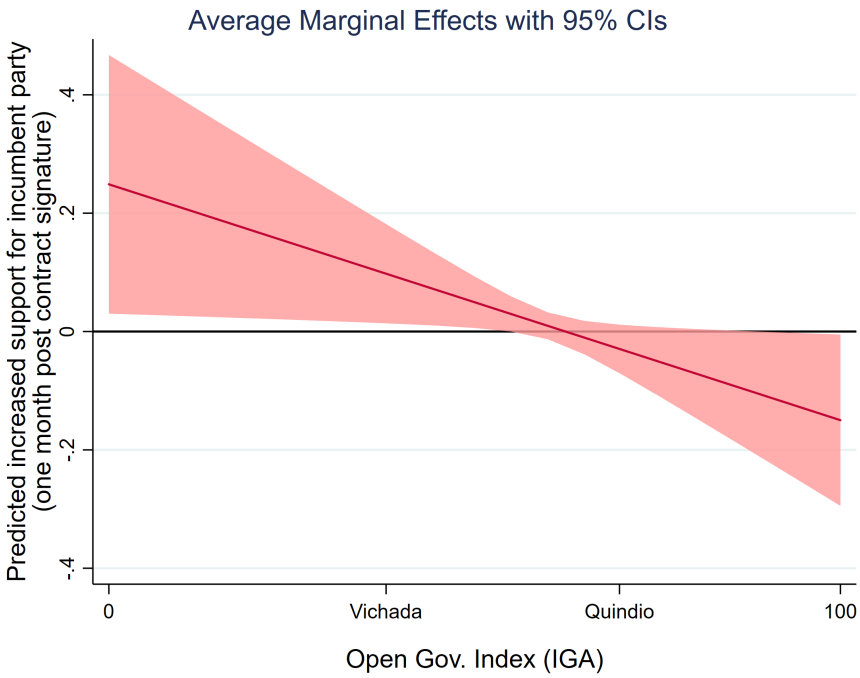


Figure A3: Heterogeneity in relationship between contract signature and incumbent support one month after signature date, by institutional strength



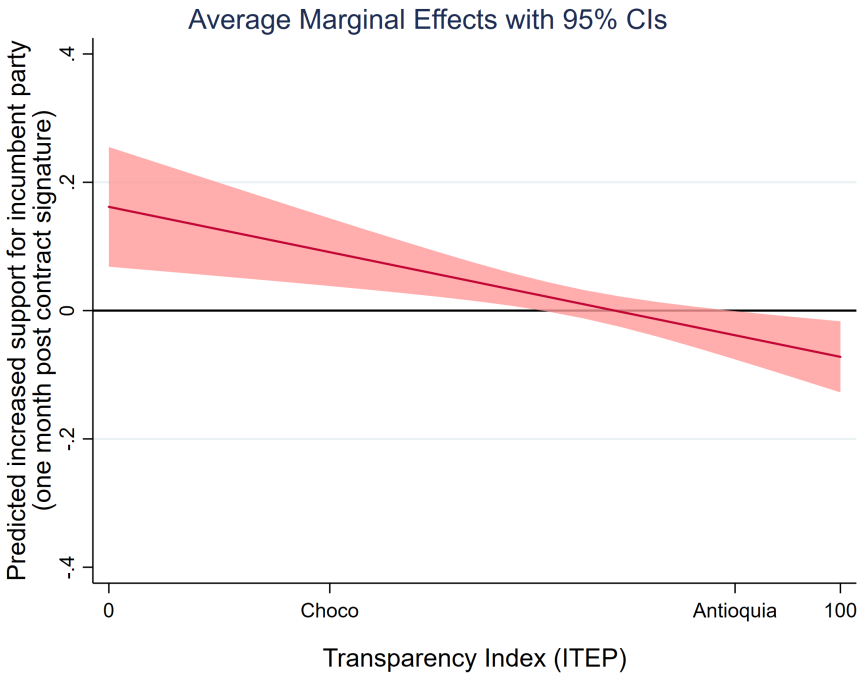


Figure A4: Political-alignment-index

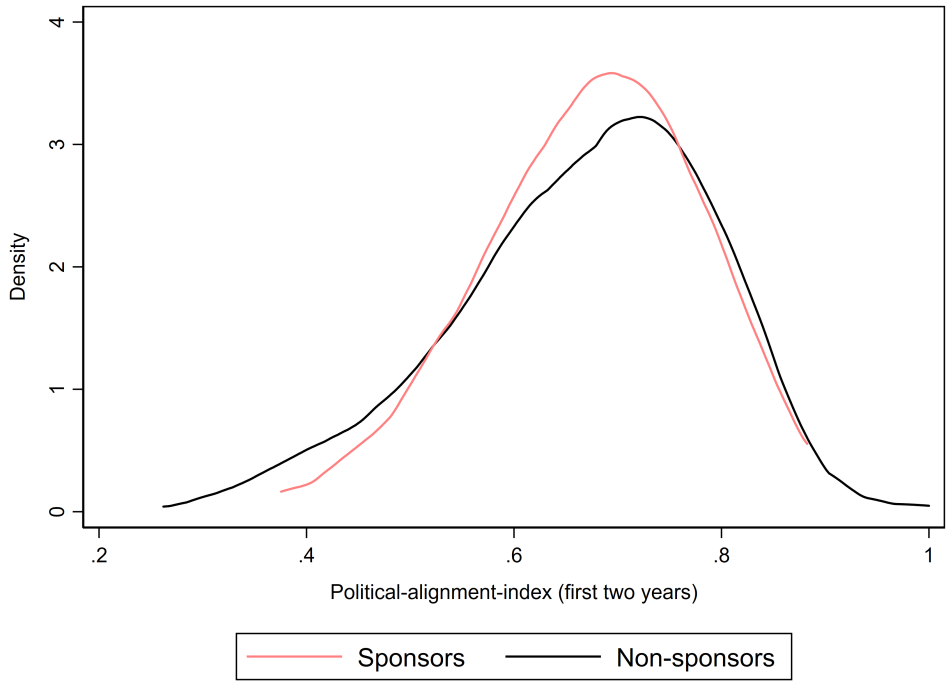


Figure A5: Incumbent win and vote closeness