

You Get What You Need? The Role of Credit Attribution in the Underprovision of Local Goods

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Abstract

The unequal distribution of local public goods has long been explained using partisan political networks. However, in many developing democracies, political parties lack the capacity to coordinate partisan redistribution. I argue that in weak party environments, concerns about credit hijacking will influence distributive strategies. I use a signaling model to isolate the relationship between a national politician with access to discretionary funds and a mayor. While ambitious mayors, aspiring for higher level office, are more likely to attribute credit to national politicians, national politicians can rarely identify these mayors. Thus, national politicians will moderate their use of targeted benefits to maximize their likelihood of receiving credit for providing goods. I explore these theoretical results using the case of Colombia.

One of the most pressing problems in developing democracies is that many citizens lack access to basic resources due to the underprovision of public goods (Cox & McCubbins 1986, Dixit & Londegan 1996, Finan & Mazzocco 2016, Golden & Min 2013, Lizzeri & Persico 2001, Robinson & Verdier 2013). Many of these democracies have undergone extensive decentralization reforms in order to bring the government closer to citizens and improve government responsiveness. The logic behind these reforms is twofold. First, smaller governments are better able to respond to local conditions, improving both outcomes and efficiency (Faguet 2004, Hooghe & Marks 2009). Second, bringing the government closer to citizens improves accountability by clarifying which political actors respond to different areas of governance (Faguet 2014, Faguet, Fox & Pöschl 2015, León & Orriols 2016, Martinez-Bravo, i Miquel, Qian & Yao 2011).

However, many decentralization reforms fail to deliver on these promises. Multitiered governments can actually undermine subnational autonomy (Rodden 2006), and political decentralization alone will not improve lines of accountability (Escobar-Lemmon & Ross 2014). As a result, decentralization reforms do not necessarily improve public goods provision. How can we understand the continued underprovision of public goods despite reforms intended to help alleviate barriers to addressing local needs?

Existing explanations emphasize the asymmetry of decentralization reforms. Decentralization reforms often do not produce equally autonomous subnational states, and some regions are likely to be favored because they have stronger subnational elites (Ardanaz, Leiras & Tommasi 2014, Zuber 2011). This inequality, and the limits of fiscal decentralization, have been used to explain the underprovision of goods in two ways. First, politicians have strong incentives to use targeted redistribution in order to maximize their electoral gains from providing necessary resources. In winner-take-all political systems, it is easier to target voters using pork-barrel resources than public goods (Lizzeri & Persico 2001). Moreover, politicians will often consider geography when determining where to allocate resources. For example, national politicians are more likely to provide communal resources to lower competition en-

vironments in order to mobilize voters (Bahamonde 2018, Rosas, Johnston & Hawkins 2014) and to provide targeted resources to opposition strongholds in order to persuade voters (Casas 2018). In both cases, politicians are likely to prioritize copartisans in order to improve cooperation across levels of government and maximize the benefits for parties with a strong party brands (Bohlken 2018, Mazzalay, Nazareno & Cingolani 2017, Schneider 2020). Notably, these increased transfers for copartisans do not improve economic development (Bonilla-Mejía & Higuera-Mendieta 2017).

Second, targeting citizens using clientelism is often more successful in decentralized contexts because clientelist agreements can be more easily enforced (Devarajan, Khemani & Shah 2009, Khemani 2010, Rueda 2017). Distinct from targeting geographic areas, clientelist benefits target the poorest citizens, who are most likely to rely on government resources, using private goods in exchange for public support (Holland 2015, Lucciasano & Macdonald 2012, Penfold-Becerra 2007, Stokes, Dunning, Nazareno & Brusco 2013, Weitz-Shapiro 2012). An important caveat is that clientelism cannot provide enough resources to break the cycle of poverty. If citizens can no longer be incentivized with private benefits, then clientelism ceases to be a viable electoral strategy (Frey 2020, Stokes et al. 2013, Weitz-Shapiro 2012, Weitz-Shapiro 2014). As a result, clientelism will lead to the underprovision of public goods because it provides small benefits directly to individuals.

What both of these explanations have in common is that resource allocation is driven by political parties who can coordinate redistributive strategies in order to improve future electoral returns. However, public goods are still underprovided in weak party environments. I propose an alternative explanation for why politicians will underprovide resources to local governments: concerns about credit attribution. The effects of targeted local public goods on electoral returns is often the result of increased campaign donations (Samuels 2002). This suggests that local goods are most likely to be effective tools for national politicians when the national politician can receive credit for the resources they bring to local governments. Where copartisanship is not a sufficient incentive to attribute credit, politicians have addi-

tional concerns about possible credit hijacking (Bueno 2017, Feierherd 2020) since multiple politicians can benefit from credit claiming behavior (Cruz & Schneider 2017). As a result, concerns about credit hijacking are a powerful mechanism for understanding national politician behavior.

In order to analyze the relationship between credit attribution and the underprovision of resources, I develop a formal signaling model that focuses on the relationship between national-level and local-level politicians. I argue that national-level politicians are motivated by maximizing their likelihood of receiving credit when determining where to provide local public goods. This model draws insights from studies of clientelism focused on the importance of party brokers for coordinating how targeted benefits are distributed (Camp 2017, Holland & Palmer-Rubin 2015, Kitschelt & Wilkinson 2007, Mazzalay, Nazareno & Cingolani 2017, Novaes 2018, Stokes et al. 2013). However, in my signaling model the brokers are replaced with local-level politicians¹ who have their own incentives to claim credit—rather than attribute credit—to further their own political careers (Novaes 2014, Novaes 2018).

The basic model has three stages. Prior to the start of the game, nature determines whether a mayor is ambitious or unambitious. I define ambition broadly as the desire to run for higher-level office in the future. Ambitious and unambitious mayors have different utilities from attributing credit. In the first stage of the game, the mayor sends a signal of their investment in building and maintaining political networks. The national politician observes this signal and decides whether to provide a local public good to the mayor’s municipality. Finally, the mayor decides whether to attribute credit.

I find that when the size of the local public good is sufficiently low, both ambitious and unambitious mayors are likely to attribute credit. However, for moderately sized benefits, ambitious mayors are more likely to attribute credit than unambitious mayors. Moreover, when the fixed cost of investing in network building is moderate, such as when mayors rely on their own use of patronage to maintain their network, the ambitious mayor is more likely

¹Henceforth, I will refer to local-level politicians as mayors

to pay the cost of investing in building a voter network than the unambitious mayor. Despite these differences in behavior between ambitious and unambitious mayors, unambitious mayors will often pay the cost of network building in order to increase their likelihood of receiving benefits. Since this propensity to imitate ambitious mayors decreases the national politician's ability to select the mayor most likely to attribute credit, the national politician will moderate their² use of targeted benefits in order to reduce the risk of credit hijacking by unambitious mayors. Since providing fewer resources increases the likelihood that national politicians receive credit for their investments, national politicians will prefer to provide small benefits, like green spaces, rather than larger local public goods, like water treatment facilities. I illustrate the implications of my theory using the case of Colombia, an extensively decentralized country where political parties are weakly institutionalized.

A Signaling Model of Credit Attribution

I use a signaling model in order to determine when a mayor is likely to attribute credit to a national politician for providing a local public good in their municipality. In order to focus on weak party environments, where politicians are less swayed by party preferences and have more responsibility for building and maintaining their personal political networks, I omit political parties from the model. This assumption builds from the separation of national and subnational party systems in decentralized contexts. In these environments, parties pursue independent strategies at different levels of government in order to maximize vote share at the national or subnational level (Gibson & Suárez-Cao 2010, Ribeiro & Borges 2020). Where parties are poorly institutionalized, I expect a similar trend where parties will not cooperate across levels of government. Moreover, low levels of party discipline mean that copartisanship will not guarantee cooperation (Dargent & Muñoz 2011, Feierherd 2020).

National politicians prefer to provide goods efficiently. That is, in order to avoid providing local goods to areas with minimal electoral returns, national politicians will prioritize

²I use their as a gender neutral singular pronoun.

municipalities where the mayor has a stable, preexisting voter network that can be mobilized. Ideally, a cooperative mayor will assist the national politician in two ways. First, the mayor will use information about local constituents in order to make sure a new local public good is implemented in a way that maximizes potential voter returns. Second, the mayor will attribute credit to the national politician so that constituents know who to reward for improvements in their municipality. Receiving credit is particularly important since, when there is ambiguity about who provides local goods, national politicians cannot assume electoral returns from providing resources alone (Gélineau & Remmer 2006).

I treat credit as a discrete good. If the mayor claims credit, the mayor receives a personal benefit for bringing a public good to the municipality and a reputational benefit from voters, who will see the mayor as responsible for providing the public goods. This reputational benefit can translate into future votes because the mayor has shown what they can deliver. However, the benefits of claiming credit are costly: by claiming credit, the mayor damages their reputation with the national politician and reduces their potential access to goods in the future.

On the other hand, the mayor can attribute credit to the national politician. Attributing credit can take a variety of forms, from highlighting the role that the national politician plays in providing the good to a municipality to inviting the national politician to be part of a ceremony for the new local public good. The cost of attributing credit is that the mayor will not have the same reputational benefits with their voters, who will no longer see the mayor as the only actor who provides goods. However, attributing credit does create the potential for the mayor to be further integrated in a national politician's network. As a result, the mayor does not lose their potential for future rewards.

In this model, I do not distinguish between credit attribution and credit sharing, but rather refer to any acknowledgment of the national politician as credit attribution. In doing so, I assert that the national politician needs the mayor to signal the politician's role in providing additional resources in order for those resources to have electoral payoffs. This

is important since subnational outcomes are unlikely to influence national political results (Rodden & Wibbels 2010).

Not all mayors are likely to assign credit to national politicians. In this model, I focus on two types of mayors with different preferences. Ambitious mayors aspire for higher office and benefit from building a personal network with the national politician. These mayors need to extend their reputations beyond their own municipality in order to advance their political career. Thus, ambitious mayors receive a larger benefit from being in a national politician's network because of their ability to send the signal that they are competent to additional political actors. While ambitious mayors may ultimately compete with the national politician, building alliances with politicians at higher levels of government is an important first step to advancing a political career. This is especially true for ambitious mayors in smaller municipalities who would otherwise be less visible.

In contrast, unambitious mayors may hope to stay in local-level politics, and thus receive a larger payoff from showing their constituents how much they do for the municipality. Since they are only worried about their own constituents, being in a national politician's network is only helpful for securing future goods— a future which is not guaranteed if the national politician is not reelected. Thus, while credit sharing can help to signal competence (Brollo & Nannicini 2012, Cruz & Schneider 2017), the benefits of credit claiming are more immediate and less likely to diminish over time. As a result, unambitious mayors prioritize their relationship with voters over their relationships with national politicians.

I model the interactions between the national politician and the mayor using a signaling game. First, nature decides whether a mayor is the ambitious or unambitious type. A mayor is an ambitious type with a probability, p . The mayor's type determines their preferences. Then, the mayor determines whether to pay to signal their ambition.

I specifically treat the ambition signal as the decision to invest in maintaining a strong political and voter network. For simplicity, I refer to this as the network investment signal. Network investment is costly since in order to maintain a network, a mayor needs to exert a

considerable amount of effort connecting to both their voters and to other politicians. This signal can be sent in several ways, such as building local clientelist networks using strategies like patronage (Kemahlioglu 2011) or creating coalitions with mayors in other municipalities to collectively lobby for resources. Conversely, the absence of a signal implies that the mayor is not engaged in network maintenance between electoral cycles. These mayors do not signal ambition because they are not using their position, their finances, or their energy in order to maintain voter networks or become central figures in the broader political landscape. These mayors are more likely to maintain their reputation with voters based solely on their performance or personal charisma.

The national politician, who prefers to target stable constituencies, will observe the network investment signal. After observing the signal, the national politician decides whether to provide a local benefit of exogenously determined size, k .³

Finally, a mayor decides whether to attribute credit to the national politician or claim credit for themselves when advertising the local public good to citizens. When mayors attribute credit, they advertise their relationship with the national politician. This can include performative credit attribution such as inviting politicians to ceremonies for the new good or advertising the good as a joint venture. However, if mayors claim credit, they assume complete responsibility for the local good either by abstaining from commenting on the new good, visiting the site of the good, or hosting their own ribbon cutting ceremonies. When mayors do not advertise projects, the voters are unlikely to update their beliefs about who provides a resource and are, on average, likely to credit the local government (Johannessen 2019). The extensive form of the game can be seen in Figure 1.

The utility functions for national politicians and the ambitious and unambitious mayors are a function of the size of the local public good, k , a multiplicative benefit, σ , for

³This fixed amount k reflects the idea that the national politician has access to a specific local public good that can be provided to one area. This is a departure from other inter-governmental transfers literature that looks at the complete budget and analyzes how goods are allocated within that fixed amount. I chose instead to present a good of an exogenously determined size in order to focus on the individual decision of whether to provide, or not provide, a resource to one particular municipality rather than the broader strategy of how to allocate resources across municipalities.

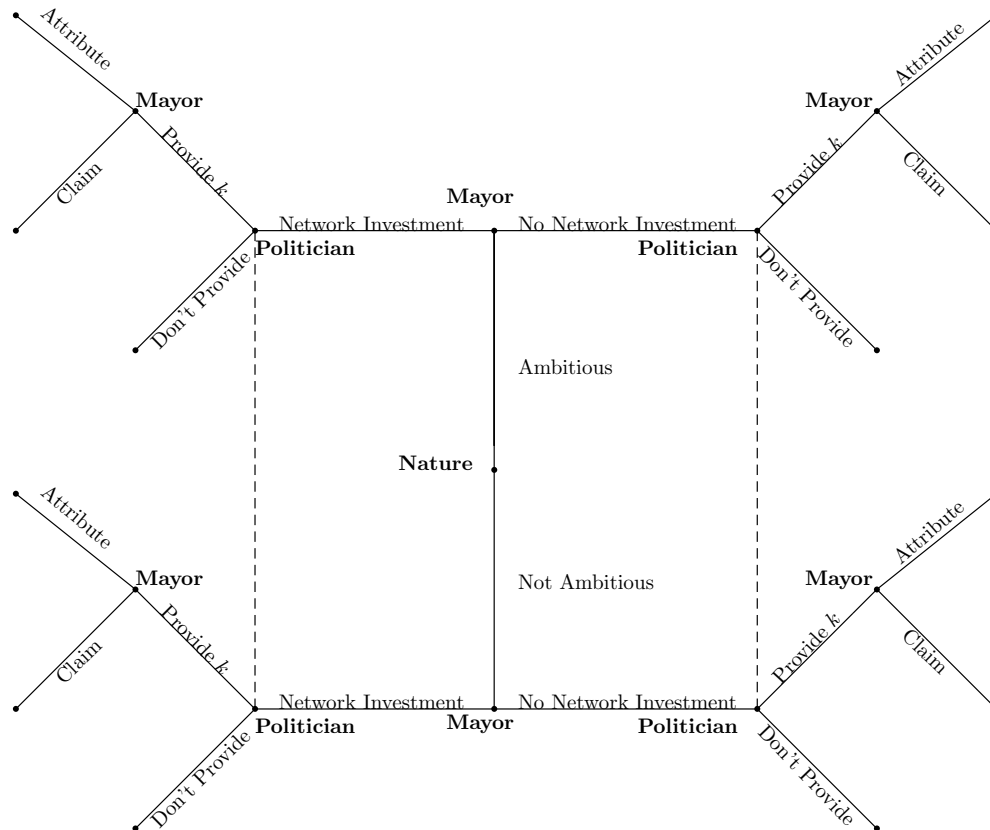


Figure 1: Signaling Game

receiving credit, and a base payoff, α , that is a proportion of the local public good that the mayor receives because of the new good in their municipality. Table 1 defines each of these parameters.

The national politician’s utility is a function of whether or not they receive credit and the size of the benefit they provide. The national politician will always pay the cost of providing the benefit. However, if the national politician receives credit, they receive a multiplicative benefit, $\sigma > 1$ because the voters know the national politician provided the local good. This payoff can reflect both reputational benefits and future electoral gains since local goods can effectively persuade voters (Bahamonde 2018, Casas 2018, Rosas, Johnston & Hawkins 2014). The national politician’s utility, therefore, is expressed as $k(I_{c_N}\sigma_N - 1)$ where I_{c_N} is an indicator function that determines whether the national politician receives

Parameter	Definition	Range of Values
k	Size of the local public good	$\in [0, 1]$
σ	Additional benefit for receiving credit	> 1
α	Payoff for receiving a local public good	$\in (0, 1)$
c	Cost of network investment	> 0
I_c	Indicator for receiving credit	$\{0, 1\}$
I_s	Indicator for network investment	$\{0, 1\}$
N	Subscript referring to the national politician	
L	Subscript referring to a low value	
H	Subscript referring to a high value	

Table 1: Model Parameters

credit. When the national politician does not receive credit, their payoff is negative.⁴

The mayor's utility functions are a function of a base benefit for receiving a local good in their municipality and an additional benefit for credit claiming, insuring that voters see the mayor as responsible for providing the local good. The benefit for receiving a good, α , reflects the value the mayor places on bringing additional local goods to their municipality. The mayor will receive their valuation of the good, as well as any additional benefit for credit claiming. However, the mayor will also pay a normalized reputation cost, 1, as a punishment for failing to attribute credit.⁵ In practice, this reputation cost is a reduced likelihood of receiving funds for local public goods in the future. The mayor's utility can be expressed as $k(I_c\sigma + \alpha) - I_c1 - I_sc$. In this function, I_c is one if the mayor receives credit and zero otherwise while I_s assumes the value of one when the mayor sends the network investment signal. The mayor will receive a larger payoff for claiming credit whenever the value of the public good times their credit claiming benefit is greater than 1 ($k\sigma > 1$). For example, if the public good has a value of 0.5, the mayor receives a higher utility for claiming credit whenever $\sigma > 2$.

Since the ambitious mayor is concerned about their reputation beyond their own munic-

⁴Providing a good without receiving credit always leads to a negative payoff because it increases the uncertainty around who provides the goods, making it difficult for citizens to practice dual accountability during elections (Baumann, Ecker & Gross 2020, Devarajan, Khemani & Shah 2009, Gélinau & Remmer 2006, Lago-Peñas & Lago-Peñas 2010, León & Orriols 2016).

⁵While attributing credit will also require effort, I treat this cost as zero, indicating that the cost of attributing credit is lower than the reputational loss that a mayor faces if they claim credit.

pality, they value receiving a benefit, regardless of credit, more than an unambitious mayor. This is because, for the ambitious mayor, receiving a local good is a sign that they are a potential member of a national politician's network. Moreover, receiving local goods can signal competence to actors outside of their municipality. The ambitious mayor will receive a larger benefit α for any local good of size k . The ambitious mayor will always receive α_H . The unambitious mayor places more value on credit than the local public good itself and receives α_L for any new local public good. While both types of mayors benefit from receiving additional resources from the national government, the ambitious mayor benefits more because they are more invested in their broader political network.

Likewise, the unambitious mayor receives a higher benefit, σ , when they claim credit. For the unambitious mayor, maintaining their local reputation is the most important consideration, so they will receive a payoff of σ_H when they claim credit. On the other hand, the ambitious mayor will be more concerned about the risks associated with boosting their reputation at the expense of being part of a national politician's network and will place less value on receiving credit from voters. Thus, they will receive a benefit of σ_L when they claim credit. As with receiving benefits, both mayors benefit from claiming credit, but the payoff for the unambitious mayor is higher because they are most focused on receiving credit. The full utility functions can be seen in Table 2

National Politician Strategy	Mayor Strategy	National Politician Payoff	Ambitious Mayor Payoff	Unambitious Mayor Payoff
Don't Provide	-	0	$-I_s c$	$-I_s c$
Provide $k \in (0, 1]$	Attribute Credit	$k(\sigma_N - 1)$	$k\alpha_H - I_s c$	$k\alpha_L - I_s c$
Provide $k \in (0, 1]$	Claim Credit	$-k$	$k(\sigma_L + \alpha_H) - 1 - I_s c$	$k(\sigma_H + \alpha_L) - 1 - I_s c$

Table 2: Payoffs

This model is solved using the Perfect Bayesian Equilibrium (PBE) solutions concept. In order to determine the PBE equilibria, I highlight the best responses for the mayor and the national politician at each stage of the signaling game.

Stage 3: Credit Attribution

In the final stage of the game, the mayor decides whether to attribute credit of claim credit. The mayor will attribute credit only where the utility from attributing credit is greater than the utility from claiming credit.

Lemma 1: *The ambitious mayor is more likely to attribute credit than the unambitious mayor.*

Proof. For the ambitious mayor, the condition is met when $k \leq \frac{1}{\sigma_L}$ while for the unambitious mayor, this occurs when $k \leq \frac{1}{\sigma_H}$. $\frac{1}{\sigma_L} > \frac{1}{\sigma_H} \forall \sigma_L < \sigma_H$ □

When $k > \frac{1}{\sigma_L}$, neither the ambitious nor the unambitious mayor will attribute credit. When $k < \frac{1}{\sigma_H}$ both types of mayors will attribute credit. The third region, where $\frac{1}{\sigma_H} < k \leq \frac{1}{\sigma_L}$, is most interesting because in this range of benefits, k , the two types of mayors will behave differently. In this range, the ambitious mayor will attribute credit while the unambitious mayor will claim credit.⁶ This lemma suggests that in the range $\frac{1}{\sigma_H} < k \leq \frac{1}{\sigma_L}$, the effort to attribute credit is more costly than the reputational loss that comes from credit claiming, but only for the unambitious politician.

Stage 2: Deciding Whether to Provide the Benefit

The national politician will always provide the benefit if they know they will receive credit. The national politician will always provide the benefit if $k \leq \frac{1}{\sigma_H}$. The national politician will never provide the benefit if they will not receive credit. So, the national politician will never provide the benefit if $k > \frac{1}{\sigma_L}$.

When $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$, whether the national politician provides the benefit is a function of their belief that the mayor is ambitious. If the mayor sends the signal, the national politician holds a belief, μ_s , that the mayor is ambitious while if the mayor does not send the signal, the national politician holds a belief, μ , that the mayor is ambitious.

⁶Full proofs of all lemmas and propositions can be found in the online appendix

Lemma 2: *The national politician will provide the benefit to a municipality where the mayor sends the signal if $\mu_s \geq \frac{1}{\sigma_N}$ and will provide the benefit to a municipality where the mayor does not send the signal if $\mu \geq \frac{1}{\sigma_N}$.*

This lemma shows that the national politician will provide a benefit when their belief that the mayor is ambitious is at least as large as the inverse of their benefit for receiving credit.

Stage 1: Deciding to Pay the Network Investment

If the mayor receives a benefit regardless of sending the network investment signal, then the mayor will always prefer not to pay the investment. However, if the network investment is the only way to receive a benefit, then the two types of mayors will only invest in the network if the fixed cost of doing so is sufficiently low.

When the size of the benefit, k , incentivizes the two types of mayors to behave differently, $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$, then the mayors have different considerations when deciding whether to pay the cost of network investment. Since the ambitious mayor will attribute credit, they will pay the cost whenever $c < k\alpha_H$. The unambitious mayor, on the other hand, will pay to send the signal when the network investment is less than the benefit for claiming credit: $c < k(\sigma_H + \alpha_L) - 1$.

Equilibria

As seen in stage 3, whether a mayor attributes credit depends solely on the size of the benefit, k . An ambitious mayor will attribute credit whenever the size of the benefit is less than the inverse of the additional payoff for credit claiming, when $k \leq \frac{1}{\sigma_L}$. The unambitious mayor will attribute credit whenever the benefit is less than the inverse of the additional payoff for credit claiming, or $k \leq \frac{1}{\sigma_H}$. Thus, the national politician's optimal decision can be determined based on the size of the benefit, k , that the national politician can provide to

a municipality.

This implies that, whenever the benefit, k is sufficiently small, the national politician will always provide the benefit to a municipality. As a result, the mayor will never send the signal in order to avoid paying an additional cost. Despite this, the national politician will still expect to receive credit. This is the safest strategy for a national politician: While they don't provide a large benefit that can impact a large number of voters, they will always receive credit.

However, when a national politician has the ability to provide a larger benefit, they only have a positive payoff if they receives credit. This means they may provide a benefit, $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$ depending on their beliefs. The national politician will only provide a benefit if they believe that the mayor of the municipality is ambitious with a probability of $\mu > \frac{1}{\sigma_N}$ or $\mu_s > \frac{1}{\sigma_N}$. A rational politician will only provide a benefit when the probability the mayor is ambitious is greater than the inverse of her benefit for receiving credit.

In the range of benefits where the two mayors behave differently, it is possible for the national politician to perfectly predict which mayors are ambitious, and therefore likely to attribute credit, under a narrow set of conditions. When the national politician decides to only provide benefits to mayors who pay the cost of network investment, and the cost of network investment is sufficiently high that the unambitious mayor will not send the signal ($c > k(\sigma_H + \alpha_L) - 1$) and sufficiently low that the ambitious mayor will send the signal ($c \leq k(\alpha_H)$), then only the ambitious mayors will invest in his network.

Proposition 1: *When the ambitious mayor pays the cost of network investment and the non-ambitious mayor does not pay the cost of network investment, there exists a separating equilibrium where the national politician can identify the mayors who will attribute credit.*

This equilibrium represents an ideal situation for the national politician for two reasons. First, as when the national politician provides smaller goods, it is a safe strategy where the national politician will always receive credit for the benefits they provide to a municipality. Second, because the equilibrium is possible for larger goods, the national politician can

extract a higher utility.

However, this result is relatively unlikely: when the cost of network investment is sufficiently low ($c \leq k(\sigma_H + \alpha_L) - 1$ and $c \leq k(\alpha_H)$), the unambitious mayor will imitate the ambitious mayor in order to receive access to additional local public goods. In this condition, providing a benefit is a risky strategy where a national politician will not always receive credit.

Proposition 2: *When the cost of network investment is sufficiently low that both types of mayors will send the signal, there exists a pooling equilibrium where both types of mayors will send the signal and receive the benefit. However, only the ambitious mayor will attribute credit. This equilibrium occurs when the belief that the mayor who does not send the signal is ambitious is $\mu < \frac{1}{\sigma_N}$. This occurs when $\mu_s = p$ and $p \geq \frac{1}{\sigma_N}$.*

Comparative Statics

Given the national politician's focus on receiving credit, the national politician will prioritize providing benefits to municipalities where the mayor is more likely to attribute credit. This yields two likely outcomes. First, the national politician will prioritize very small benefits $k < \frac{1}{\sigma_H}$ because it is never rational for mayors to claim credit for these goods. Second, the national politician will condition their decision about whether to provide benefits based on the observed network investment. While observing the network investment does not guarantee credit, it does create a condition where the national politician may be able to distinguish between ambitious and unambitious mayors.

When the national politician relies on an observed investment in a network in order to decide where to target goods, it is possible to observe three different equilibria: a pooling equilibrium where both types of mayors will pay the cost of network investment and receive the good, a pooling equilibrium where neither type of mayor will pay the network investment and will not receive the good, and a separating equilibrium where only the ambitious mayor

pays the cost of network investment and receives the good. The regions can be seen in Figure 2.

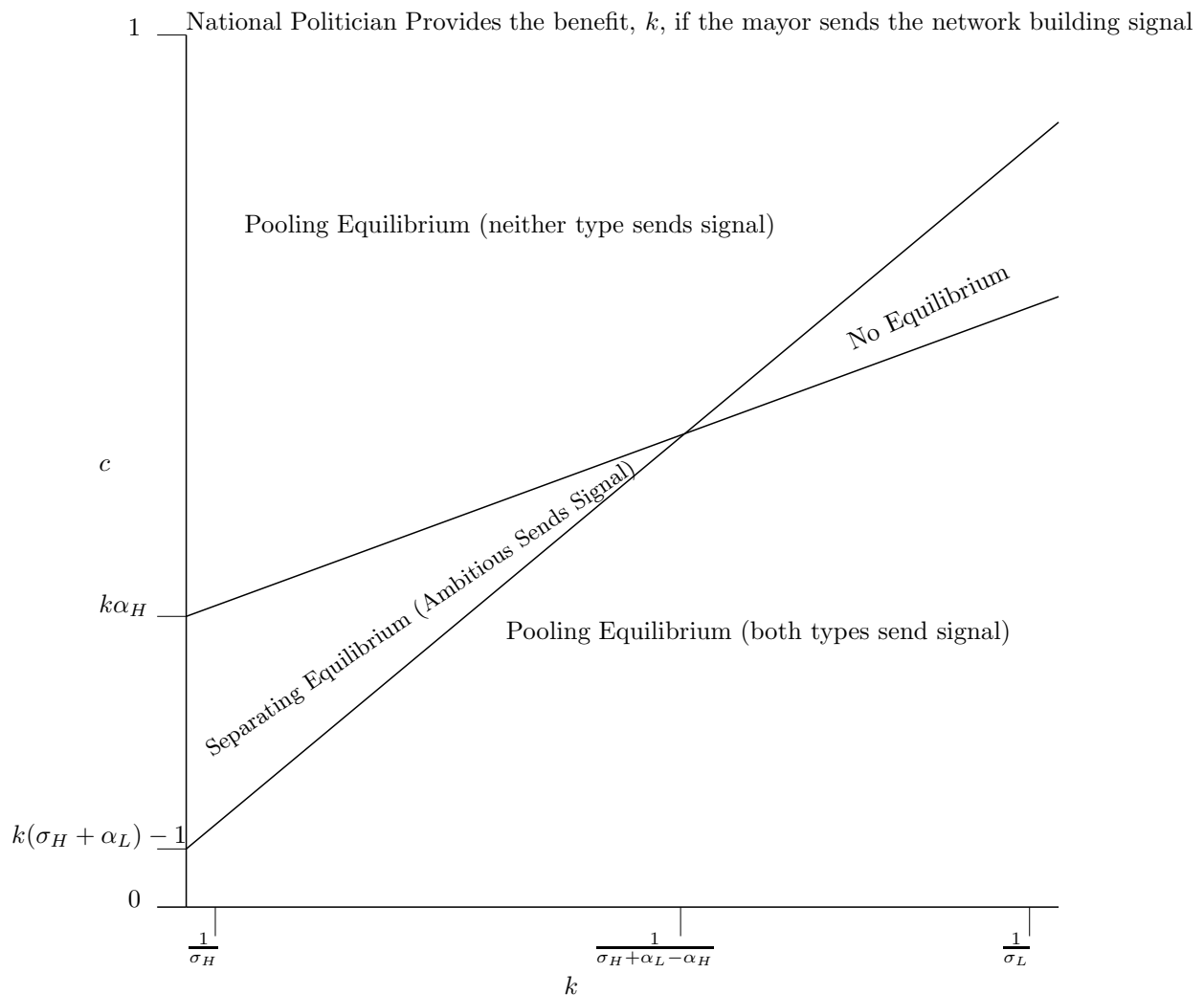


Figure 2: Equilibrium Space

In Figure 2, it is clear that the desired separating equilibrium, where the national politician can perfectly identify which mayors are ambitious, is most likely for smaller local benefits. Thus, while providing larger benefits has the potential for larger payoffs, national politicians are more likely to receive their desired outcome for smaller resources. As a result, national politicians will provide smaller goods in order to maximize the likelihood that they receive credit.

I explore two changes in the parameter space that increase the likelihood of observing

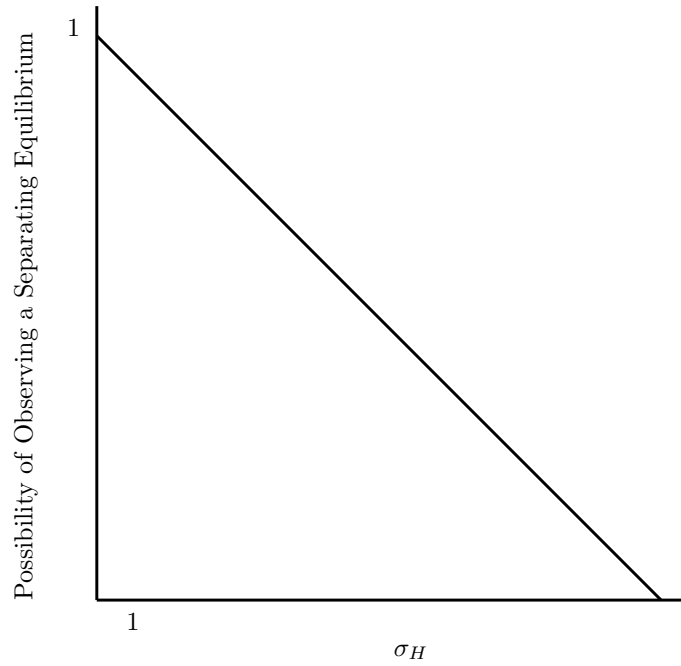
a separating equilibrium. First, when considering the cost of the network investment, the separating equilibrium can only occur between the payoff the unambitious mayor and the ambitious mayor have for receiving a local public good: $c \in (k(\sigma_H + \alpha_L) - 1, k\alpha_H)$. In order to increase the likelihood of observing the separating equilibrium, therefore, the difference between $k\alpha_H$ and $k(\sigma_H + \alpha_L) - 1$ must increase. This occurs when $\alpha_H - \alpha_L$, the difference between the baseline benefits of receiving local goods for each mayor type, increases or when σ_H , the credit claiming benefit for the unambitious mayor, decreases. When σ_H decreases, attributing credit is less costly for the unambitious politician.⁷

Second, when considering the size of the benefit, k , the separating equilibrium can only occur when $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L})$. The difference between these values is not fixed. Within this range, the desired separating equilibrium is only possible from the smallest possible benefit, $k = \frac{1}{\sigma_H}$ until the expected utilities of the ambitious and unambitious mayors are equal at $k = \frac{1}{\sigma_H + \alpha_L - \alpha_H}$. As in the cost condition, as the difference between α_H and α_L increases, the possibility of observing the separating equilibrium also increases. Likewise, when the value of σ_H increases, the possibility of observing a separating equilibrium decreases.

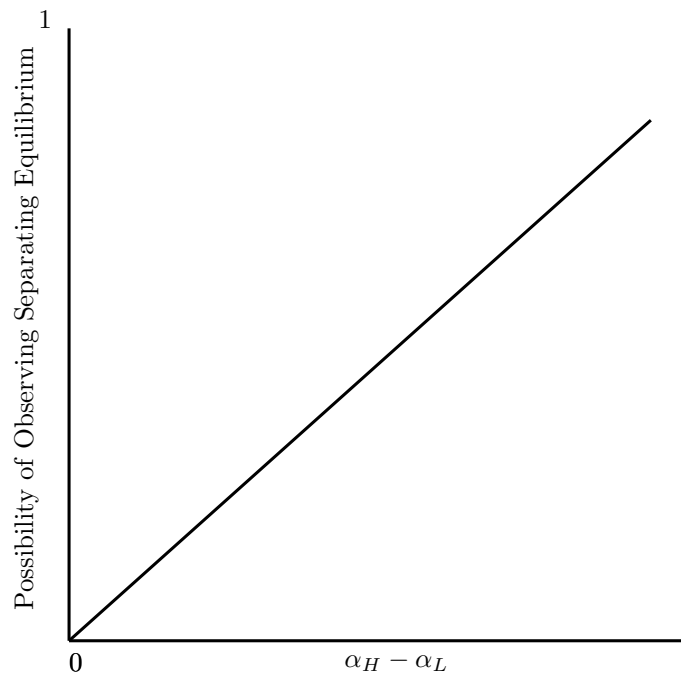
As seen in Figure 3, when a national politician can provide a larger benefit, there are two characteristics that reduce the risk of the unambitious mayor imitating the ambitious mayor. First, when the unambitious mayor receives a lower benefit from credit claiming, the national politician is more likely to have the desirable separating equilibrium. Similarly, when the difference between how the ambitious and unambitious mayors value the local public good increases, the likelihood that a national politician observes a separating equilibrium increases.

In practice, this means that a risk averse politician will be most likely to provide benefits when the available good is small, like a new green space within a municipality. This occurs because it is easier for the national politician to distinguish between ambitious and unambitious mayors when providing smaller local public goods. Thus, even though the national politician who receives credit can maximize their utility by providing larger goods, the risk

⁷See Proof in Online Appendix



(a) Possibility of Observing a Separating Equilibrium Across the Credit Claiming Benefit for the Unambitious Mayor



(b) Possibility of Observing a Separating Equilibrium Across the Difference in Baseline Benefits for Ambitious and Unambitious Mayor

Figure 3: Possibility of Observing a Separating Equilibrium

associated with providing these goods makes providing large local public goods an irrational strategy. Instead, national politicians will provide small benefits in order to minimize the loss that occurs when they provide local public goods to unambitious mayors.

Illustrating the Equilibria: The Case of Colombia

Colombia is an excellent case for exploring the implications of the above model. First, the uneven fiscal decentralization in Colombia means that local governments are heavily dependent on transfers from the national government. Due to the structure of decentralization, the smallest and poorest municipalities have the lowest level of autonomy in controlling their finances and are most shaped by national interests. Nevertheless, there is still a large variation in how well needs are met in rural municipalities. The political party system is weakly institutionalized, and political parties merely serve as a “name on the list”⁸ for candidates to receive a position on the ballot. In the Colombian party system, multiple political parties occupy the same ideological space and citizens are more responsive to individual candidates than party identities: in a survey of 2000 Colombian citizens, 22.5% of respondents said they sympathize with a political party. As a result, citizen perceptions of which politician deserves credit for providing local public goods is unlikely to be explained by their own partisan biases (Marsh & Tilley 2010). The structure of decentralization and the political party dynamics, therefore, make Colombia an illustrative case for understanding how concerns about credit contribute to the underprovision of resources.

The most common way national politicians distribute targeted local public goods is through *cupos indicativos*, also referred to as *jam*. This is a central feature to Colombian politics, where many legislators, mayors, and bureaucrats refer to jam as the “grease in the wheels of Colombian politics”.⁹ The process of receiving jam is direct: a legislator has a particular good that they’d like to provide to a municipality and the ability to secure

⁸Interview conducted in the Valle de Cauca Department in July 2016

⁹Interview conducted July 2018 in Bogota

those funds through the necessary national ministries (La Silla Vacía 2018). For a legislator, providing goods is a strategy for reaching voters. For ministers, providing goods allows the ministry to show that it has invested in relevant projects. For example, a legislator can hope to build a soccer field with their access to funds from the recreation department or a new wing on a hospital with their access to funds from the health ministry. The legislator contacts a mayor, usually a member of their personal network who is located in a municipality in their department, and offers to fund the new project. The mayor agrees and the money is transferred. Very rarely will a mayor decline a project funded through jam. According to mayors interviewed, access to these funds is a crucial form of investment. While many mayors decry the practice as corrupt, they argue that it's a necessary corruption that improves local conditions, improves relationships across levels of government, and helps both actors politically.¹⁰ Newspapers and citizens alike complain that jam needs to be reformed, but they agree that it is a prominent strategy that Colombian legislators use to cultivate votes.

Since implementing projects funded by jam requires the coordination of local governments, national politicians will work alongside mayors to implement projects funded by jam. For legislators, jam is an important tool for reelection since it allows them to reach a large range of voters. However, in order to translate funds into new projects that can help them win votes, they need to cooperate with mayors in order to make sure the new resource is provided where it can help cultivate the most votes. Moreover, the legislator needs the mayor to agree to attribute credit for the new good. The pressure to select municipalities where the mayor will willingly attribute credit is crucial given that, in decentralized states, citizens have trouble identifying which level of government is responsible for different local projects (Baumann, Ecker & Gross 2020, Gélinau & Remmer 2006, Rodden & Wibbels 2010).

For ambitious mayors, attributing credit incentivizes cooperation across levels of government (Bohlken 2018). This cooperation provides access to the national politician's network

¹⁰The mechanics of this exchange, and attitudes towards the exchange, were explained by mayors in multiple municipalities in different districts, local bureaucrats, department level bureaucrats, and local academics through over 60 interviews. The interviews took place in July-August 2016 and July-December 2018 in Bogota, the department of Antioquia, and the department of Valle de Cauca.

that will assist the mayor throughout their future political career. Moreover, this access helps create a web of political allies across party lines. Finally, cooperating and attributing credit may improve the likelihood of receiving future transfers. However, for unambitious mayors, greater access to the national politician's network is less important than receiving immediate credit from their constituents and maintaining their local popularity. The tradeoff between becoming a member of a national politicians network and credit claiming is evident based on the timing of elections. Mayors cannot run for immediate reelection, so they need to wait four years before running again. During this time, there is a risk that legislators will be replaced, rendering their credit attribution less meaningful, or that legislators will have built stronger relationships elsewhere. However, since ambitious mayors have higher level political aspirations, this time may be spent preparing for future political campaigns where the legislators network can prove useful.

Extensive administrative decentralization in Colombia highlights the challenges faced by legislators who need to receive credit for the goods they provide. For example, health and education are funded by the national government, but mayors implement projects. In the aforementioned survey, I asked who deserved credit for a series of local public goods, including road maintenance, water and sewage, schools, hospitals, parks, or electricity. When asked who funded education, only 9.17% of respondents correctly identified the legislature while 22.49% believed mayors were responsible. These results map onto voters' expectations for electoral returns. When asked how school improvements would affect the candidates the next time they ran for office, 25.3% of respondents thought a legislator would receive more votes while 82.4% of respondents thought the mayor would receive more votes.¹¹

The survey results highlight the difficulty that citizens face holding their elected officials accountable: Without the ability to readily discern which level of government is responsible for a given project or improvement, citizens cannot practice dual accountability. For local politicians, interacting with a project through site visits or ribbon cutting ceremonies is

¹¹A table comparing the demographics of my survey sample to the demographics throughout Colombia are available in the online appendix.

likely to be viewed as credit claiming (Cruz & Schneider 2017). Due to the local nature of the implementation of local public goods, mayors have more opportunities to claim credit using these means. Thus, in order to attribute credit, the mayor must chose to publicly acknowledge the national politician's role in funding a new local good. In particular, ribbon cutting ceremonies are a meaningful signal that a national politician deserves credit for the project that can help the national politician overcome the propensity to only reward the mayor for local improvements. Since mayors benefit from the assumption that they are responsible for local goods, attributing credit to national politicians is not immediately appealing (Johannessen 2019).

Mayor Behavior Across Types

Throughout interviews, the most common example of jam was a new soccer field. This type of project can completed quickly and is relatively small. As a result, it increases the likelihood of receiving credit. However, when national politicians provide larger benefits, they will rely on observing a mayor's network investment signal. As one legislator from the Valle de Cauca department explained "I don't use [jam] to reach my constituents, but every other legislator has their mayors who they like to work with because they know [the mayor] will work for them".¹²

In order to confirm that these mayors are investing in their political networks, I conducted interviews with mayors and local-level bureaucrats in the Antioquia and Valle de Cauca departments in Colombia. During these interviews, we discussed the process of receiving additional funds for local-level projects, interactions with officials at additional levels of government, future political aspirations, and maintaining relationships with citizens. We discussed network maintenance broadly, but both ambitious and unambitious mayors referenced patronage as a specific tool of network maintenance that everyone participates in. The acceptance of patronage as central to Colombian politics supports the idea that a costly

¹²Interview conducted October 2018 in Bogota.

network-building signal is a frequent- and important- occurrence. In interviews, legislators further emphasized the idea that legislators have favored mayors because those mayors are better able to help the legislator increase their vote share.

The main risk associated with providing larger benefits is that unambitious mayors, who are less likely to attribute credit, are likely to pay the cost of network investment in order to imitate ambitious mayors. As a result, national politicians are unlikely to receive credit for every local benefit they provide. In Colombia, identifying ambitious mayors is particularly challenging. Any political official must resign and spend a full year out of office before running for a different political post. In the elections from 1997 through 2015, 30.47% of mayors would ultimately seek reelection at the local level, labeling them as unambitious mayors. However, only 4.7% of eligible mayors chose to run for a position in the Colombian House of Representatives, the *Cámara de Representantes*, during the same period.¹³ As a result, national politicians are looking to identify a relatively small proportion of mayors, but most mayors still choose to invest in network building.

In the Valle de Cauca department, one bureaucrat noted the importance of using patronage in order to signal an investment in building a maintaining a political network even though mayors spend at least two years out of office before they run for national office. The bureaucrat explained, “In good politics, you make sure all the temporary positions are filled with your friends, or you make positions for them. Everyone needs to do it.” Later, when discussing relationships with national-level politicians, the bureaucrat reiterated the importance of patronage, saying “The government likes when you provide jobs” and said “They help you more when you show you keep supporters, and that helps you”.¹⁴ The conclusion was clear: the more a mayor did to maintain their network, the better off they were.

Evidence of unambitious mayors sending the network building signal to mimic ambitious mayors were also evident in the Antioquia department. I interviewed several mayors from

¹³This number underestimates the total number of ambitious mayors because it does not include mayors who would later run for department-level office, the Colombian Senate, or the Presidency.

¹⁴Interview conducted in the Valle de Cauca Department, July 2016

small municipalities outside of Medellin. These municipalities can all be classified as predominately rural and are heavily dependent on transfers from the central government. Moreover, they have relatively low costs for network maintenance because they have small populations and high levels of need, making clientelism a feasible strategy that can be used as a network investment. In both contexts, small projects funded through jam would improve the quality of life in the municipalities.

In the first municipality, the former mayor was adamant in his insistence that he would only ever want to serve in municipal-level political office. The mayor was passionate about local issues and improving his municipality's economy, but felt that any step towards department or national government would hurt his ability focus on giving back to his hometown. This mayor would be classified as an unambitious type. Due to the laws preventing mayors from serving consecutive terms, the mayor ran whenever he was eligible and his personal friend and ally ran in the off terms. A friend of both mayors served in a bureaucratic role to help maintain consistency across mayoral terms. Despite his local popularity, strong municipal network, and desire to remain in local-level politics, the mayor still invested in network maintenance and played an instrumental role in connecting the mayors of several municipalities to form an alliance. When asked how he discusses new local projects with citizens, the mayor stated that any new project in the municipality was his success. He put work into building the relationships and generating the funds, and he did what needed to be done to encourage investments in the municipality. Even when discussing projects that were joint efforts across several municipalities, the mayor claimed credit, explaining "I put together a group of mayors...". Rather than attributing credit to the national politicians who provided local public goods, this mayor chose to emphasize his own role in attracting additional funds to the municipality.¹⁵ To the national politician, this mayor appears ambitious. Thus, providing smaller goods reduces the loss to the national politician when this mayor claims credit.

¹⁵Interview conducted in the Antioquia Department, October 2018

In the second municipality, another mayor, when asked about receiving fiscal transfers from the central government, lamented just how difficult it is to receive those transfers. The official channels for inter-governmental funds, where the municipalities can apply for specific projects, are “almost impossible” and she explained that the only way to get these funds is to focus on building relationships with legislators who would be able to help her. This mayor regularly talked about her desire to run for higher level government because only in department or national government would she have the power to do what she wanted to do for Colombia. She emphasized that any new project in the municipality came from a relationship with another politician. For her, new investments in the municipality were joint efforts. This mayor noted that she liked working with national politicians because it helped her increase the size of her political network while also providing necessary benefits to her constituents.¹⁶ A national politician prefers to provide larger benefits to this municipality, but cannot differentiate between the above ambitious mayor and the unambitious mayor since both engage in expensive network building.

The above case illustrates that when investing in networks is relatively inexpensive, it is likely that both types of mayors will invest in building networks and the legislator will have trouble separating the ambitious and unambitious mayors. As a result, the national politician will want to provide small benefits that maximize their likelihood of receiving credit or, at minimum, increase their likelihood of identifying the small number of ambitious mayors. The clear difficulties separating ambitious and unambitious mayors decreases a national politicians desire to risk providing larger benefits.

Discussion

The Colombian case highlights two important scope conditions: subnational dependence on national transfers and weakly institutionalized political parties. When both conditions are met, the above signaling model provides insight into why local public goods are underpro-

¹⁶Interview conducted in the Antioquia Department, October 2018

vided. Without extensive decentralization reforms where municipalities are dependent on national transfers, there would be less incentive for unambitious mayors to mimic ambitious mayors. Moreover, without weakly institutionalized political parties, national politicians could use partisan alignments in order to allocate all discretionary resources. However, the assumption about weakly institutionalized parties can be relaxed to include decentralized party systems (Bowles, Larreguy & Liu 2020). With these slightly more institutionalized party systems, national politicians may favor copartisans, but will need to identify which copartisans are more likely to cooperate with the national party systems.

While any mayor can be ambitious, not all ambitious mayors actually have the potential to win elections at higher levels of government. Mayors from particularly small municipalities may never be able to accrue the necessary political clout to run a successful campaign outside their own municipalities. This does not pose a challenge for the model: ambitious mayors do not need to be able to win, they only need the desire to run for office outside their municipalities. Moreover, since mayors from more influential municipalities may be more ambitious *because* they have more opportunities to build political clout, this model is consistent with the idea that influential local elites are better able to attract national resources (Ardanaz, Leiras & Tommasi 2014).

A limitation of this study is that it does not account for the national politician's ability to claim credit. In many contexts, citizen distrust of the national government will reduce their ability to independently claim credit. However, the effects of independent credit claiming by national government merits further study in an experimental setting.

Conclusion

When national politicians decide how to allocate limited resources, they can use several different strategies. First, in programmatic and clientelist systems alike, these politicians may chose to prioritize areas with high levels of need. Second,these politicians may chose

to prioritize copartisans. However, neither of these explanations fully explains how national politicians determine where to allocate goods in weak party systems. I argue that an important mechanism for understanding where national politicians chose to allocate local public goods is their assessment over whether they will receive credit from local politicians.

While receiving credit is an important consideration for national politicians, determining which mayors are likely to attribute credit is particularly challenging. As a result, the risk averse national politician will provide smaller local public goods in order to increase the likelihood of receiving credit. I demonstrate that concerns over receiving credit will cause national politicians to attempt to identify ambitious mayors who are more likely to attribute credit, and I illustrate through comparative statics and interviews in Colombia how rarely national politicians will be able to make the distinction between ambitious and unambitious mayors.

Concerns over credit attribution explain the underprovision of goods in contexts where weakly institutionalized parties and a dependence on targeted benefits coexist. In the unlikely event that national politicians can distinguish between ambitious and unambitious mayors, national politicians will provide larger benefits regardless of the actual needs of the municipality. As a result, additional discretionary resources may be available to wealthier municipalities. In the more likely scenario, where national politicians cannot distinguish between types of mayors, national politicians will provide smaller resources.

This model can be extended to allow the cost of network building to change for different types of mayors. Introducing more variation in the cost of network building will help explain when it is more likely for national politicians to need to moderate their use of resources. Moreover, this model can be expanded to separate credit sharing from credit attribution, creating more nuance in determining when different types of mayors are likely to attribute credit. Further exploration of how the role of credit affects the underprovision of resources can provide important insights about ongoing territorial inequalities.

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Appendices

A Full Model Solution and Proofs

Parameters

Utility Functions

National Politician: $U_N = k(I_c\sigma_N - 1)$

Mayor: $U = k(I_c\sigma + \alpha) - I_c - I_s$

For the ambitious mayor, they value their reputation with the national government, so they have α_H while the unambitious mayor has α_L . This means that the ambitious mayor will a higher payoff for attributing credit than the unambitious mayor.

Parameter	Definition	Range of Values
k	Size of the benefit provided	$\in [0, 1]$
σ	Additional benefit of receiving credit	> 0
α	Base payoff as fraction of k	$\in (0, 1)$
c	Cost of investing in network maintenance	> 0
I_c	Indicator for receiving credit	$\{0, 1\}$
I_s	Indicator for paying cost of network investment	$\{0, 1\}$
N	Subscript referring to the national government	
L	Subscript referring to a low value	
H	Subscript referring to a high value	

Table A.1: Model Parameters

The ambitious mayor is less focused on their local reputation, so if they claim credit, they receive σ_L while the unambitious mayor receives σ_H .

National Politician Strategy	Mayor Strategy	National Politician Payoff	Ambitious Mayor Payoff	Unambitious Mayor Payoff
$k \in [0, 1]$	Attribute credit	$k(\sigma_N - 1)$	$k\alpha_H - I_s c$	$k\alpha_L - I_s c$
$k \in [0, 1]$	Claim Credit	$-k$	$k(\sigma_L + \alpha_H) - 1 - I_s c$	$k(\sigma_H + \alpha_L) - 1 - I_s c$

Table A.2: Payoffs

A.1 Stage 3: Mayor Attributes Credit

Proof of Lemma 1. The mayor will attribute if:

$$k\alpha \geq k(\sigma + \alpha) - 1$$

$$1 \geq k\sigma$$

$$k \leq \frac{1}{\sigma}$$

This means that the ambitious mayor will attribute credit when $k \leq \frac{1}{\sigma_L}$ and the unambitious mayor will attribute credit when $k \leq \frac{1}{\sigma_H}$. The unambitious mayor will attribute credit for larger projects than the ambitious mayor for all $\sigma_H > \sigma_L$

□

A.2 Stage 2: The National Politician Determines Whether to Provide the Benefit, k

Proof of Lemma 2. The national politician will always provide the benefit if they know that they will receive credit. So, the national politician will provide the benefit if $k \leq \frac{1}{\sigma_H}$. The national politician will never provide the benefit if they will not receive credit. So, they will never provide the benefit if $k > \frac{1}{\sigma_L}$.

If the benefit $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$, whether the national politician provides the benefit is a function of their belief, μ , that the mayor is ambitious. The national politician will provide the benefit if:

$$\begin{aligned} \mu(k(\sigma_N - 1)) + (1 - \mu)(-k) &\geq 0 \\ \mu k \sigma_N - k &\geq 0 \\ \mu \sigma_N - 1 &\geq 0 \\ \mu &\geq \frac{1}{\sigma_N} \end{aligned}$$

The national politician provides the benefit whenever μ or $\mu_s \geq \frac{1}{\sigma_N}$

□

A.3 Stage 1: The Mayor Decides Whether to Send the Network Investment Signal

All else equal, a mayor will never send the network building signal in order to receive the same payoff without the additional cost.

If the mayor can only receive the benefit without sending the signal, then they will send

the cost of sending the signal is sufficiently low.

When both types of mayors attribute credit ($k < \frac{1}{\sigma_H}$), the cost must be less than the benefit the mayor receives for having the benefit in their municipality. For the ambitious mayor, this occurs when $c < k\alpha_H$ and for the unambitious mayor, it occurs when $c < k\alpha_L$. The ambitious mayor will pay a larger cost for all $\alpha_H > \alpha_L$.

When the two types of mayors behave differently ($k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$), then the ambitious mayor will attribute credit whenever the cost is less than their benefit for receiving the good $c < k\alpha_H$. For the unambitious mayor, this cost must be less than their benefit of claiming credit, $c < k(\sigma_H + \alpha_L) - 1$. The ambitious mayor is willing to pay a higher cost whenever $\alpha_H - \alpha_L - \sigma_H > \frac{-1}{k}$

A.4 Best Responses and Equilibrium

The national politician has several best responses that need to be checked based on the size of the benefit, k , and the national politician's beliefs, μ .

The national politician's best responses are to:

1. $k \leq \frac{1}{\sigma_H}$, the best response is always to provide k
2. $k > \frac{1}{\sigma_L}$, the best response is never to provide k
3. $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$ the best response is to provide k if $\mu \geq \frac{1}{\sigma_N}$

If $k \leq \frac{1}{\sigma_H}$, there exists an equilibrium where both types of mayors will attribute credit, the national politician will always provide the benefit, and neither type of mayor will pay the network investment cost.

If $k > \frac{1}{\sigma_L}$, there exists an equilibrium where both types of mayors will claim credit, the national politician will never provide the benefit, and neither type of mayor will pay the cost of network investment.

The interesting range to study occurs when $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$ and the best response depends on the national politician's beliefs.

Under this circumstance, the national politician has four possible pure strategies.

1. The national politician never provides the benefit, k .
2. The national politician provides the benefit, k , both when they observe the network investment signal and when they do not observe the network investment signal.
3. The national politician does not provide a benefit when they observe the network investment signal but does provide a benefit when they do not observe the network investment signal.
4. The national politician provides the benefit when they observe the network investment signal and does not provide the benefit when they do not observe the network investment signal.

Let μ_s = the belief that the mayor who pays the cost of network investment is ambitious and μ = the belief that the mayor who does not pay the cost of network investment is ambitious. The probability that a mayor is ambitious is simply p . This leads to 4 conditions to check:

1. $\mu_s < \frac{1}{\sigma_N}$ and $\mu < \frac{1}{\sigma_N}$
2. $\mu_s \geq \frac{1}{\sigma_N}$ and $\mu \geq \frac{1}{\sigma_N}$
3. $\mu_s < \frac{1}{\sigma_N}$ and $\mu \geq \frac{1}{\sigma_N}$
4. $\mu_s \geq \frac{1}{\sigma_N}$ and $\mu < \frac{1}{\sigma_N}$

A.4.1 Case 1: $\mu_s < \frac{1}{\sigma_N}$ and $\mu < \frac{1}{\sigma_N}$

In this condition, the national politician will not provide the benefit regardless of the signal. Neither type of mayor will send the signal in order to avoid paying the cost, c .

Proof. Given the best responses, the national politician's updated beliefs are:

$$\begin{aligned}\mu_s &= \frac{0p}{0p + 0(1-p)} \\ &= \text{All Beliefs Consistent}\end{aligned}$$

$$\begin{aligned}\mu &= \frac{1p}{1p + 1(1-p)} \\ &= p\end{aligned}$$

If $p < \frac{1}{\sigma_N}$ there is an equilibrium where neither mayor sends a signal and the national politician never provides the benefit k. $\mu_s < \frac{1}{\sigma_N}$ and $\mu = p < \frac{1}{N}$.

□

A.4.2 Case 2: $\mu_s > \frac{1}{\sigma_N}$ and $\mu \geq \frac{1}{\sigma_N}$

In this condition, the national politician's best response is to provide the benefit regardless of the signal. Since they will receive the benefit, neither type of mayor will pay the cost, c , of sending the signal in order to maximize their payoff.

Proof. Given the best responses, the updated beliefs are:

$$\begin{aligned}\mu_s &= \frac{0p}{0p + 0(1-p)} \\ &= \text{All Beliefs Consistent}\end{aligned}$$

$$\begin{aligned}\mu &= \frac{1p}{1p + 1(1-p)} \\ &= p\end{aligned}$$

If $p \geq \frac{1}{\sigma_N}$ there is an equilibrium where neither mayor sends a signal and the national politician provides the benefit $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$. The ambitious mayor will attribute credit and the unambitious mayor will claim credit. $\mu_s \geq \frac{1}{\sigma_N}$ and $\mu = p > \frac{1}{N}$.

□

A.4.3 Case 3: $\mu_s < \frac{1}{\sigma_N}$ and $\mu \geq \frac{1}{\sigma_N}$

In this condition, the national politician's best response is to not provide a benefit if they observe the clientelist signal and to provide the benefit if they do not observe the clientelist signal.

Proof. If the ambitious mayor sends the signal, they receive $-c$ and if they do not send the signal, they receive $k\alpha_H$. The ambitious mayor will never pay the cost of network investment

If the unambitious mayor sends the signal, they receive $-c$ and if they do not send the signal, they receive $k(\sigma_H + \alpha_L) - 1$. The unambitious mayor will never send the network building signal.

The updated beliefs are:

$$\begin{aligned}\mu_s &= \frac{0p}{0p + 0(1-p)} \\ &= \text{All Beliefs Consistent}\end{aligned}$$

$$\begin{aligned}\mu &= \frac{1p}{1p + 1(1-p)} \\ &= p\end{aligned}$$

If $p \geq \frac{1}{\sigma_N}$ then there is a pooling equilibrium where neither mayor sends a signal and the national politician provides the benefit $k \in (\frac{1}{\sigma_H}, \frac{1}{\sigma_L}]$ when they do not observe the signal and do not provide the benefit when they observe the signal. The ambitious mayor will attribute credit and the unambitious mayor will claim credit. $\mu_s < \frac{1}{\sigma_N}$ and $\mu = p \geq \frac{1}{\sigma_N}$.

□

A.5 Case 4: $\mu_s \geq \frac{1}{\sigma_N}$ and $\mu < \frac{1}{\sigma_N}$

In this condition, the national politician's best response is to provide the benefit if they observe the network building signal and not to provide the benefit if they do not observe the network building signal.

Proof of Lemma 4. If the ambitious mayor sends the signal, they receive $k\alpha_H - c$ and if they do not send the signal they will receive 0. The ambitious mayor will send the signal as long as $c \leq k\alpha_H$. Given the possible range of values, k , the ambitious mayor will always send the signal if $c < \frac{\alpha_H}{\sigma_L}$.

If the unambitious mayor sends the signal, they receive $k(\sigma_H + \alpha_L) - 1 - c$ and if they do not send the signal they will receive 0. The unambitious mayor will send the signal as long as $c \leq k(\sigma_H + \alpha_L) - 1$. Given the possible range of values, k , the unambitious mayor will always send the signal if $c < \frac{\alpha_L + \sigma_H - \sigma_L}{\sigma_L}$.

□

A.5.1 Case 4a: Both mayors are willing to pay the cost of network building, $c \leq k\alpha_H$ and $c \leq k(\sigma_H + \alpha_L) - 1$, Proof of Proposition 2

Proof of Proposition 4. Given that both mayor are willing to pay the cost of network maintenance, the national politician's updated beliefs are:

$$\begin{aligned}\mu_s &= \frac{1p}{1p + 1(1 - p)} \\ &= p\end{aligned}$$

$$\begin{aligned}\mu &= \frac{0p}{0p + 0(1 - p)} \\ &= \text{All Beliefs Consistent}\end{aligned}$$

If $p \geq \frac{1}{\sigma_N}$ there exists a pooling equilibrium where both types of mayors send the network building signal. The national politician will provide the benefit if they observe the signal and will not provide the benefit if they do not observe the signal. The ambitious mayor attributes credit and the unambitious mayor claims credit. $\mu_s = p \geq \frac{1}{\sigma_N}$ and $\mu < \frac{1}{\sigma_N}$

□

A.5.2 Case 4b: Neither mayor pays the cost of network building, $c > k\alpha_H$ and $c > k(\sigma_H + \alpha_L) - 1$

Proof. Given that neither mayor will pay to maintain a network, the national politician's updated beliefs are:

$$\begin{aligned}\mu_s &= \frac{0p}{0p + 0(1-p)} \\ &= \text{All Beliefs Consistent}\end{aligned}$$

$$\begin{aligned}\mu &= \frac{1p}{1p + 1(1-p)} \\ \mu &= p\end{aligned}$$

If $p < \frac{1}{\sigma_N}$ there is a pooling equilibrium where neither mayor pays the cost of network investment, the national politician will provide the benefit if they observe the signal and will not provide the benefit if they do not observe the signal, and the ambitious mayor will attribute credit if they received the benefit while the unambitious mayor would claim credit if they received the benefit. $\mu_s \geq \frac{1}{\sigma_N}$ and $\mu = p < \frac{1}{\sigma_N}$.

□

A.5.3 Case 4c: The ambitious mayor does not pay the cost of network building and the unambitious mayor pays the cost network building, $c > k\alpha_H$, $c \leq k(\sigma_H + \alpha_L) - 1$, and $\alpha_H - \alpha_L - \sigma_H < \frac{-1}{k}$

Proof. Given that only the not-ambitious mayor is willing to pay to build a network, the national politician's updated beliefs are:

$$\begin{aligned}\mu_s &= \frac{0p}{0p + 1(1-p)} \\ &= 0\end{aligned}$$

These beliefs are not consistent and there is no equilibrium.

□

A.5.4 Case 4d: If the ambitious mayor pays the cost of network building and the unambitious mayor does not, $c \leq k\alpha_H$, $c > k(\sigma_H + \alpha_L) - 1$, and $\alpha_H - \alpha_L - \sigma_H > \frac{-1}{k}$, Proof of Proposition 1

Proof of Proposition 1. Given that only the ambitious mayor will be willing to pay to maintain a network, the national politician's updated beliefs are:

$$\begin{aligned}\mu_s &= \frac{1p}{1p + 0(1 - p)} \\ &= 1\end{aligned}$$

$$\begin{aligned}\mu &= \frac{0p}{0p + 1(1 - p)} \\ &= 0\end{aligned}$$

These beliefs are consistent. So, if $c < k\alpha_H$, $c > k(\sigma_H + \alpha_L) - 1$, and the ambitious mayor is willing to pay a higher cost of network investment, there is a separating equilibrium where the ambitious mayor pays the network investment cost and the unambitious mayor does not. The national politician will provide the good if they observe the network investment and will not provide the good if they do not observe the network investment. The ambitious mayor will attribute credit and the unambitious mayor would claim credit if they sent the signal. $\mu_s = 1$ and $\mu = 0$.

□

B Proof of Comparative Static Outcome

B.1 Cost of Network Investment

Proof. The ambitious mayor will invest in their network when $c < k\alpha_H$ and the unambitious mayor will invest in their network if $c < k(\sigma_H + \alpha_L) - 1$. The separating equilibrium can exist when the difference between these two values is greater than 0:

$$\begin{aligned} k\alpha_H - k(\sigma_H + \alpha_L) - 1 &> 0 \\ k(\alpha_H - \sigma_H + \alpha_L) &> 1 \\ \alpha_H - \alpha_L - \sigma_H &> \frac{1}{k} \end{aligned}$$

Holding k constant, I evaluate how to increase the difference between terms on the left, making it more likely the difference is greater than 0 and is larger. This occurs when either $\alpha_H - \alpha_L$ increases and/or σ_H decreases. \square

B.2 Size of Benefit

I repeat the exercise to show the same relationship holds when we consider the size of the benefit.

Proof. A separating equilibrium is only possible until the intersection of the two utility functions, $\frac{1}{\sigma_H} < k \leq \frac{1}{\sigma_H - \alpha_H + \alpha_L}$. Since the lower bound is always $\frac{1}{\sigma_H}$, the value of the upperbound can increase when $\sigma_H - \alpha_H + \alpha_L$ decreases. This occurs when $\alpha_H - \alpha_L$ increases or σ_H decreases as long as $\sigma_H - (\alpha_H - \alpha_L) > 0$. \square

C Compare Survey Demographics to National Demographics

D Survey Demographics vs. Colombia's Population Demographics

In this section, I present tables comparing my sample to the general population in Colombia according to the 2018 Census. In the census, age is binned in 5 year ranges. I include citizens from ages 15-19 to those 70-75 in order to capture the full range of my survey (18-72 years old). Due to the binning, I expect that my survey will undersample in the smallest and largest bins since all five years are not represented in my sample.

	Survey Percent	Population Percent
Female	55.38	51.56
Age		
15-19	5.04	11.84
20-24	16.97	12.11
25-29	18.97	11.35
30-34	14.88	10.30
35-39	14.63	9.89
40-44	10.08	8.44
45-49	9.64	8.13
50-54	8.19	7.98
55-59	0.45	7.01
60-64	0.40	5.61
65-69	0.20	4.27
70-74	0.55	3.09
Education		
Primary	1.00	22.19
Secondary	5.49	14.62
Media	10.93	30.51
Advanced	57.11	10.68
University Degree	5.34	12.69
Professional Degree	20.12	3.45
Employment		
Employed	70.04	52.17
Student	12.73	10.79
Unemployed	11.68	6.16
Retired	1.30	2.90
Disabled	0.50	0.93
Housework	3.30	20.03
Household Strata		
1	9.86	28.4
2	33.10	27.18
3	37.96	16.51
4	14.62	4.84
5	2.95	1.87
6	1.05	1.03