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Political Structure as a Legacy of Indirect Colonial Rule: Bargaining between National Governments and Rural Elites in Africa*

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Abstract

Alliances between national governments and rural elites are observed in post-colonial Africa. In such alliances, the national governments preserve rural-elite authority formed during the colonial era and cede their resources and prerogatives to the rural elites. This paper develops a model of bargaining between a national government and a rural elite, in which the bargaining power of the national government is endogenously explained by the ability of the rural elite to compel obedience from rural residents. Since indirect colonial rule is a significant source of the rural-elite control over residents, the result implies that cross-regional variations in colonial policies lead to variations in the feature of post-colonial alliances between African national governments and rural elites.

JEL classification: H11; H20; N47; P16; Q13
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1 Introduction

In post-colonial sub-Saharan Africa, some national governments forge alliances with rural elites of their national territories (e.g., chiefs and religious leaders). In such alliances, the national governments preserve rural-elite authority formed during the colonial era and cede their resources and prerogatives to the rural elites. A good example is the alliance between the postcolonial Senegalese government and religious leaders in the Sufi brotherhoods, whose influence and control over the population in the Groundnut Basin were reinforced by French colonial rule. To govern the Groundnut Basin, Leopold Senghor's regime gave preferential treatment to the religious leaders by providing direct transfers, ceding control over rural public institutions, and recognizing the leaders' control over land (O'Brien 1975:76-7, 101-9, 126-41; Boone 2003:chap. 3).

Similar alliances are also observed in countries such as Sierra Leone (Migdal 1988:129-34) and Nigeria (Miles 1987), but the degree to which African national governments provide a privileged status for rural elites varies across and within countries. Miles (1987) argues that, while Hausa chiefs in Nigeria held privileged positions in post-colonial regimes, the status of Hausa chiefs in Niger was not as privileged. Boone (2003, chap. 3) argues that the alliance similar to the one observed in the Groundnut Basin does not exist in the Lower Casamance region of Senegal.

This paper develops a game-theoretic model to discuss why and when African national governments cede their resources and authority to rural elites. In the model, a national government decides whether to cooperate with a rural elite to secure revenue. If there is cooperation, the revenue that the two parties collect is shared according to an agreement. To clarify the bargaining power of the two parties and the resulting features of the agreement, the model attempts to explain what each party gains in the case of disagreement.

The argument here departs from the standard presumption that agents in a society obey government rules (or policies). As Jackson and Rosberg (1982:1) state, the authority of national governments is weak in the rural societies of post-colonial Africa. In such societies, national governments and rural elites are rivals in the competition for resident obedience. That is, both the governments and rural elites attempt to compel residents to obey their individual rules, and the residents must choose to obey one of the two authorities (Migdal 1988).

The model considers the situation in which both the national government and the rural elite attempt to extract revenue from cash crop production. Since the colonial era, cash crops for export have been the primary products in Africa.[1] Thus, as Bates (1981:4, chap. 1) argues, the natural strategy of national governments in postcolonial Africa is to collect revenue by extracting the surplus

[1] Furthermore, governments in developing countries cannot rely on a modern tax system due to the structure of economies and weak fiscal capacity (Tanzi and Zee 2000).

from cash crop production; that is, by purchasing cash crops from farmers at prices lower than the price in the international market.[2] However, rural sectors in many African countries were subject to the influence of rural elites since the colonial era, and it would be also natural for them to seek to purchase farmers' cash crops for revenue.[3]

The model defines power as the ability of the national government and rural elite to impose sanctions on disobedient farmers and analyzes the competition for farmer obedience and control over the marketing of cash crops. Both the national government and rural elite simultaneously announce their individual purchase prices of cash crops, and farmers must choose to whom they will sell their crops. This situation represents tax competition between the two authorities, but it departs from the standard arguments of tax competition because the equilibrium revenue depends on the power to impose sanctions on disobedient farmers.[4] The model shows that the relative power of the two authorities determines the revenue of each authority and that government revenue decreases when the power of the rural elite increases.

To analyze the alliance between the national government and rural elite, the model is extended to allow for the two authorities to bargain. If they reach an agreement, they jointly announce a single purchase price and divide the revenue according to the agreement. Since the revenue obtained by the national government when negotiations collapse depends negatively on the strength of the rural elite, the bargaining position of the national government is weak when facing a powerful rural elite. Thus, the government is likely to agree to a transfer of large resources to the relatively stronger rural elite during negotiations.

The model implies that variations in colonial policies generate cross-regional variations in the form of alliances between African national governments and rural elites. Since indirect colonial rule is a significant source of rural-elite power,[5] variations in the degree of indirect rule lead to variations in the strength of the rural-elite control over rural residents. This implication of the model is consistent with the case of Hausa chiefs. While Hausa chiefs in Nigeria were empowered under British indirect rule, their power in Niger was restricted under French direct rule. These different governing policies caused differences in the

[2] See also Kasara (2007).

[3] O'Brien (1975:127) states that, during the transition to the independence of Senegal, "there had been a brief efflorescence of privately constituted marketing cooperatives", which were established by rural elites to purchase crops from their clients.

[4] Comparing this model with the literature on tax competition, rather than the standard framework by Wilson (1986) and Zodrow and Mieszkowski (1986), the model structure is similar to that in Ferrett and Wooton (2010), in which two countries bid in terms of taxes and subsidies to attract industry.

[5] Under indirect rule, colonial empires designated rural elites to administer rural areas and control rural residents. As Migdal (1988:110) argues, this colonial policy increased the rural elites' power exponentially.

postcolonial status of Hausa chiefs in Nigeria and Niger (Miles 1987). The model also shows that agricultural productivity and the costs associated with building state capacity affect the form of alliance between the national government and rural elite as well as the government's incentive to increase its power.

The remainder of this paper is organized as follows. Section 2 relates this paper to existing literature. Section 3 provides a brief description of indirect rule, the formation of rural elites during colonial rule, and the relationship of the rural elites with post-colonial national governments. Section 4 provides a model of competition for farmer obedience between the national government and rural elite. Section 5 extends the model to analyze the bargaining between the national government and rural elite. Section 6 concludes the paper.

2 Related Literature

The most related work to this paper is Boone (2003), who shares the same research question. Although a formal model is not provided, Boone (2003) also argues that rural-elite control over residents affects their bargaining position against the national government. However, this paper reaches a different conclusion. Boone (2003) argues that national governments devolve their authority to rural elites who cannot extract a surplus from rural sectors without cooperation with the governments. By contrast, this paper argues that national governments devolve their authority to rural elites who are strong rivals in the competition for revenue extraction.[6]

Baldwin (2011) also empirically analyzes the devolution between African national governments and rural elites, arguing that African national leaders transfer power to win elections. Keefer and Vlaicu (2008) provide a model of electoral competition, where political parties can commit credibly to providing transfer for voters using the intermediary of influential local figures.[7] Unlike these studies, in this paper, the motivation of national governments to give preferential treatment to rural elites is not electoral competition, but to avoid competing for the obedience of rural residents. While electoral motives are important, they do not represent all cases because even military regimes devolve their authority to rural elites.[8]

This paper is also related to the literature on the roles of rural authorities in African societies (Gennaioli and Rainer 2007; Kasara 2007; Goldstein and Udry 2008; Platteau 2009; Glennerster et al. 2010; Logan 2011; Aldashev et al. 2012; Acemoglu et al. 2013; Baldwin 2013; Fergusson 2013; Michalopoulos and

[6]Furthermore, in this paper, the rural-elite control over residents determines the capacity of rural elites to extract revenue without cooperation with national governments.

[7]Robinson and Verdier (2013) also develop a model of clientelism.

[8]See the case of Nigeria (Miles 1987).

Papaioannou 2013). Among these works, the model proposed in this paper is closely related to that of legal dualism (formal vs customary courts) developed in Aldashev et al. (2012) which analyzes how customary law responds to a change in statutory law. While this paper resembles Aldashev et al. (2012) in that formal and rural authorities overlap, they do not analyze how the structure of rural authority affects the alliances between the two authorities.

This paper also belongs to the literature on legacies of colonialism (Engerman and Sokoloff 1997; La Porta et al. 1997; 1998; Acemoglu et al. 2001).[9] In particular, Lange (2004) and Iyel (2010) empirically analyze the effects of indirect rule on development. Mizuno and Okazawa (2009) present a model showing how indirect colonial rule affects post-colonial development in Africa, but their focus excludes the effects on the alliances between national governments and rural elites.

Finally, there are influential studies outside of economics about how strong rural elites formed by indirect colonial rule play significant roles in political development after independence (Migdal 1988; Mamdani 1996). In particular, the view of this paper is based on Migdal (1988) in that national governments and rural elites compete for the obedience of rural residents.[10] This paper formalizes Migdal's argument into a game-theoretic model in the context of taxation in cash crop sectors, which serves as a basis to understand the feature of alliances between national governments and rural elites.

3 Indirect Colonial Rule and Formation of Rural Elites

Indirect rule is a form of governance in which colonial empires govern their colonies' rural regions using the authority of rural indigenous elites and rural institutions. Autonomous power is granted to the rural elites who lead the rural institutions (Crowder 1964; O'Brien 1975; Miles 1987; Migdal 1988; Mamdani 1996; Boone 2003; Lange 2009). Since the rural institutions are quite different from the institutions at the center of a colony, indirect rule draws a sharp contrast between the center and the periphery: the former is ruled by "bureau-

[9] See also, among others, the empirical studies by Bertocchi and Canova (2002), Lange (2004), Feyrer and Sacerdote (2009), Huillery (2009), Iyel (2010), and Lee and Schultz (2012), and the theoretical studies by Congdon Fors and Olsson (2007), Nunn (2007), and Mizuno and Okazawa (2009).

[10] Migdal (1988:25) contends that government agencies operate alongside various social organizations and that these "organizations-all the clans, clubs, and communities-have used a variety of sanctions, rewards, and symbols to induce people to behave in their interactions according to certain rules or norms". Migdal (1988:24-33) further argues that residents must choose between obeying the government or these social organizations as both attempt to impose their own rules.

cratic legalism" and the latter is ruled by "customary patrimonialism" (Lange 2009:28).

Indirect rule enhanced the rural-elite power. Examining British colonial rule in Sierra Leone, Migdal (1988:110) argues that the British largely restructured indigenous authorities and significantly increased the chiefs' power: "the local leaders' power grew immensely through the British formalization of chiefs' duties and privileges and through the resources the British lent to that process". Granted authority to extract revenue from their subjects, the rural elites abused this authority for their own interests. Acemoglu et al. (2013:10-1) argue that land laws put in force by colonial rule in Sierra Leone vested chiefs with authority over land that enabled them to tax agricultural production and trade. Lange (2004:907) argues that chiefs could shape customary law to serve their own interests and that "Customary law also endowed chiefs with control over communal lands and chiefdom police, both of which could be coercively employed to dominate local inhabitants."

Colonial empires in Africa generally adopted indirect rule (Mamdani 1996:72-90), but forms and intensity of indirect rule varied across regions. Crowder (1964) argues that the power of chiefs under French colonial rule was restricted and less autonomous compared to that under British rule. This argument is consistent with the case of Hausa chiefs in Nigeria and Niger presented by Miles (1987). However, the French delegated extensive and autonomous authority to the religious leaders in the Sufi brotherhoods in Senegal (O'Brien 1975:101-9; Boone 2003:54-60). The degree of indirect rule also varied across British colonies. Based on data from former British colonies, Lange (2004) constructs an objective measure of the degree of indirect rule that is defined as the percentage of customary court cases to total court cases in 1955. According to this measure, the degree of indirect rule varies across British African colonies: while the degree of indirect rule is high in Malawi (81.8), Nigeria (93.4), Sierra Leone (80.8), and Uganda (79.6), it is low in Botswana (42.5), Gambia (37.3), and Zimbabwe (39.7).

In post-colonial Africa, national governments often backed rural-elite authority. Acemoglu et al. (2013:10) note that the land laws, on which the chiefs' control over land is based, remain in force in Sierra Leone. Migdal (1988:132) writes that,

> With social control of the population largely vested in the chiefs' organizations, Margai [the first prime minister of Sierra Leone] "bought" social stability and security of his own tenure by refusing to attack the prerogatives of the chiefs....the array of rewards and sanctions in the hands of the chiefs to maintain their social control remained very impressive.

Herbst (2000:174-6) argues that African national government leaders had "ambivalence toward traditional leaders": although some distrusted the chiefs, the national governments had to accommodate them to control the rural areas. Herbst (2000:176-7) further notes that,

> As a result, postindependence African states were often schizophrenic in their approach to chiefs....in Mauritania, Niger, and Chad, states abolished or marginalized chiefs after independence only to invite them back a few years later in the face of extraordinary difficulties in governing the rural areas.

As previously mentioned, similar alliances between national governments and rural elites can be also found in Nigeria and Senegal.

4 Baseline Model

As a result of colonial rule, rural residents in former African colonies faced two distinct authorities after independence: rural elites, who were obeyed by the rural residents during the colonial era, and post-colonial national governments. The model introduced in this section describes how a powerful rural elite impede a national government from collecting revenue.

4.1 Environment

Consider a dynamic game of complete information with three players: a national government, a rural elite, and rural residents (treated as a single entity here). The residents choose whether to engage in cash crop production. Those who choose cash crop production can grow y units of cash crops. The income level of those who do not choose cash crop production is normalized to zero.

Cash crop producers sell their crops to either the national government or the rural elite. The national government and the rural elite announce their respective purchase prices denoted by p and $\tilde{p}$, respectively. The international price of the cash crop is normalized to one. Thus, both the national government and rural elite have no incentive to purchase the crops at prices higher than one. Hence, the national government obtains $(1-p)y$ if the producers sell their crops to the national government. Similarly, the rural elite obtain $(1-\tilde{p})y$ if the producers sell their crops to the rural elite. The model assumes that the farmers cannot directly access the international market for the cash crops. The authority that cannot purchase the crops obtains no revenue.

Cash crop producers who sell their crops to the national government face sanctions by the rural elite and lose $\tilde{b}y$, where $\tilde{b} \in [0, 1]$. Exogenous parameter $\tilde{b}$ represents the strength of the rural elite, who can impose high sanctions on the residents when their power is great. Sanctions by the rural elite include, for example, a ban on the use of communal land and sentences based on customary law. Because indirect colonial rule largely enhanced the power of rural elites, $\tilde{b}$ can be interpreted as the degree of indirect rule.

Similarly, the national government sanctions the producers who sell their crops to the rural elite. To gather information on rural producers who violate official orders, the national government needs to locate its agencies in rural regions. As the government expands its local agencies, it can detect offenders with a higher probability. Sanctions by the national government are, for example, the withdrawal of government assistance such as farm subsidies. As the government assistance becomes more effective, a ban on the access to such assistance will have increasingly severe repercussions for farmers. To implement such effective agricultural assistance, the national government needs to increase its bureaucratic capacity. Let q denote the probability that the national government detects a farmer who sells the crops to the rural elite and let By denote the level of sanctions imposed on the offender. The farmers' expected loss from government sanctions is, therefore, $by \equiv qBy$. The variable b, which is assumed in $[0, 1]$, represents the national government's capacity to control its rural residents, hereinafter called "coercive capacity". The level of coercive capacity is endogenously determined by national government investment.[11] The cost of building coercive capacity is given by $cb^2/2$, where $c > 0$ is a cost parameter. As Herbst (2000) argues, a low population density will lead to a high cost of building state capacity.[12]

Preferences of all agents in the model are linear. The payoff to the national government is revenue minus the cost of investment in coercive capacity. The payoff to the rural elite is revenue. The payoff to the residents who choose cash crop production is $(p - \tilde{b})y$, if they sell their crops to the national government, and $(\tilde{p} - b)y$, if they sell their crops to the rural elite. The payoff to the residents is zero if they do not choose cash crop production.

The timeline of events within the model is as follows:

1. The national government invests in coercive capacity b.

2. The national government and rural elite simultaneously announce the purchase prices of cash crops.

3. The residents choose whether to engage in cash crop production. If they choose cash crop production, they also choose who will buy their cash crops.

[11] Besley and Persson (2009, 2010) provide models in which the government invests in fiscal and legal state capacity. Acemoglu (2005) analyzes the consequence of weak and strong state capacity.

[12] Low population density will lead to a large cost of monitoring resident behavior.

4. The national government and rural elite impose individual sanctions on disobedient producers.

4.2 Equilibrium

4.2.1 Residents' Choice

The game is solved by backwards induction. Given the purchase prices and sanctions, the residents choose whether to engage in cash crop production. If the residents choose cash crop production, they also choose who will buy their cash crops. If they sell to the national government, the residents receive py and lose $\tilde{b}y$ through sanctions by the rural elite. Conversely, whoever sells to the rural elite receives $\tilde{p}y$ and loses by through sanctions by the national government. Accordingly, those who produce the cash crops sell to the national government only if

$$(p - \tilde{b})y \geq (\tilde{p} - b)y. \tag{1}$$

The residents choose to grow the cash crops if and only if

$$\max\{(p - \tilde{b})y, (\tilde{p} - b)y\} \geq 0. \tag{2}$$

In this model, both the national government and rural elite sanction a resident if and only if the resident violates their respective orders. Since either party can impose sanctions without incurring any costs, this action is weakly optimal. Even if sanctioning entails costs, reputation effects will compel them to sanction the residents who disobey. Consider that some residents cannot observe the cost of the imposed sanctions. In this case, the authorities might sanction a resident to convince others that their cost of sanctioning is low. By doing so, the authorities can compel obedience.

4.2.2 Competition between the National Government and Rural Elite

Anticipating the residents' choices, the national government and the rural elite announce their purchase prices simultaneously. From (1), the national government can purchase the farmers' cash crops only if $p \geq \tilde{p} - (b - \tilde{b})$. Similarly, the rural elite can purchase the crops only if $\tilde{p} \geq p - (\tilde{b} - b)$. The price competition that the national government and rural elite engage in is similar to that in the Bertrand model.

The equilibrium purchase prices depend on b and $\tilde{b}$. If $b \geq \tilde{b}$, the national government announces $p = 1 - (b - \tilde{b})$ and the rural elite announce $\tilde{p} = 1$. If $\tilde{b} > b$, the national government announces $p = 1$ and the rural elite announce $\tilde{p} = 1 - (\tilde{b} - b)$. In equilibrium, the residents' payoff is identical, regardless of whether the residents obey the national government or the rural elite, but the residents must obey the authority who announces the lower purchase price. Otherwise, the authority with the lower price has an incentive to raise the price. In equilibrium, the authority with a stronger power to impose sanctions can purchase the farmers' crops, but the purchase price is increasing in the other authority's power. Since the equilibrium purchase prices satisfy $p \geq \tilde{b}$ and $\tilde{p} \geq b$, the residents choose to produce the cash crops in equilibrium.

4.2.3 Optimal National Government Investment

The national government invests in coercive capacity b. If $b \leq \tilde{b}$, the national government cannot obtain a positive revenue and the investment in coercive capacity generates nothing. Thus, if b is positive, it must be larger than $\tilde{b}$. When the optimal coercive capacity b^* is positive, it solves the problem

$$\max_{b \in [0,1]} (b - \tilde{b})y - \frac{c}{2}b^2 \;\text{ s.t. } b > \tilde{b}. \tag{3}$$

Ignoring the constraint $b > \tilde{b}$, the solution of this problem is $b = y/c$; the national government obtains $y^2/2c - \tilde{b}y$.[13] This payoff is positive if and only if $\tilde{b} < y/2c$. In this case, $b = y/c$ satisfies the constraint $b > \tilde{b}$. The optimal coercive capacity is positive if and only if the national government receives a positive payoff from its investment.[14] Therefore, the optimal coercive capacity b^* is given by

$$b^* = \begin{cases} \frac{y}{c} & \text{if } \tilde{b} < \frac{y}{2c}, \\ 0 & \text{if } \tilde{b} \geq \frac{y}{2c}. \end{cases} \tag{4}$$

Hence, if $\tilde{b} \geq y/2c$, the national government cannot purchase the cash crops from the farmers. In equilibrium, the national government announces

$$p^* = \begin{cases} 1 - \left(\frac{y}{c} - \tilde{b}\right) & \text{if } \tilde{b} < \frac{y}{2c}, \\ 1 & \text{if } \tilde{b} \geq \frac{y}{2c}. \end{cases} \tag{5}$$

The equilibrium national government revenue as a share of GDP is

$$1 - p^* = \begin{cases} \frac{y}{c} - \tilde{b} & \text{if } \tilde{b} < \frac{y}{2c}, \\ 0 & \text{if } \tilde{b} \geq \frac{y}{2c}, \end{cases} \tag{6}$$

which is nonincreasing in $\tilde{b}$. The rural elite revenue as a share of GDP is

$$1 - \tilde{p}^* = \begin{cases} 0 & \text{if } \tilde{b} < \frac{y}{2c}, \\ \tilde{b} & \text{if } \tilde{b} \geq \frac{y}{2c}, \end{cases} \tag{7}$$

which is nondecreasing in $\tilde{b}$.

[13] The model assumes that $y/c \leq 1$, so that the constraint $b \leq 1$ does not bind.

[14] Note that the national government can obtain zero payoff by setting $b = 0$.

Proposition 1. *The national government cannot compel the farmers to obey when the strength of the rural elite (the degree of indirect rule) $\tilde{b}$ is large. The share of national government revenue in GDP is low in the following situations:*

- *Production level y is low.*
- *The cost of the national government building coercive capacity c is high.*
- *The strength of the rural elite (the degree of indirect rule) $\tilde{b}$ is high.*

5 Agreement between the National Government and Rural Elite

As argued in Section 3, the national government and rural elite might strike an interdependent relationship: the former relies on the latter to control the rural areas and, in return, guarantees a degree of authority and revenue. This section extends the baseline model to allow for negotiation between the national government and rural elite. If they reach an agreement, they jointly announce a purchase price. In this case, the national government can control the marketing of cash crops exclusively in cooperation with the rural elite.

In fact, public monopsony prevails in the domestic cash crop markets of post-colonial Africa. Bates (1981:12) notes that,

> In Africa, public agencies are by law sanctioned to serve as sole buyers of major agricultural exports. These agencies, bequeathed to the governments of the independent states by their colonial predecessors, purchase cash crops for export at administratively determined domestic prices, and then sell them at the prevailing world market prices. By using their market power to keep the price paid to the farmer below the price set by the world market, they accumulate funds from the agricultural sector.

In Senegal, the national government devolves the control of the government's marketing institutions to the rural elite and, thereby, transfers resources extracted from the rural sectors to the rural elite (O'Brien 1975:126-41; Boone 2003:70-2).

Since the income of residents who do not grow the cash crops is zero in the model, the national government and rural elite can set the purchase price at zero, if they cooperate. During negotiations, they bargain the allocation of revenues. If the negotiations collapse, they announce individual purchase prices and the events indicated in the baseline model occur. The bargaining outcome is determined by the Nash bargaining solution (Nash 1950). The timing of events is as follows:

1. The national government invests in coercive capacity b.
2. The national government and the rural elite bargain.
3. Upon reaching an agreement, they jointly set the purchase price at zero and divide the resulting revenue y as per the agreement. If negotiations collapse, events 2, 3, and 4 in the baseline model follow.

5.1 Equilibrium

5.1.1 Bargaining Outcomes

If the national government and rural elite reach an agreement, they monopolize the purchase of cash crops and collect revenue equal to y. The national government and rural elite bargain to divide this revenue. The agreement point is denoted by $(y - x, x)$, where $y - x$ is the national government's revenue and x is the rural elite's revenue.

Consider the case of $b \geq \tilde{b}$. If the parties involved cannot agree, the national government and the rural elite obtain $(b - \tilde{b})y$ and 0, respectively, from the results of the baseline model. Thus, the Nash bargaining solution x^* solves

$$\max_x [y - x - (b - \tilde{b})y]x. \tag{8}$$

The solution is $x^* = (1 - b + \tilde{b})y/2$, and the national government receives $(1 + b - \tilde{b})y/2$. When an agreement is reached, the total wealth extracted from the residents increases by $y - (b - \tilde{b})y$. In the Nash solution, the authorities equally divide this surplus. The power of the two authorities affects the bargaining outcome through the payoff they receive when they do not reach an agreement. The revenue obtained by the national government after negotiations fail is decreasing in the strength of rural elite $\tilde{b}$ and is increasing in its coercive capacity b. Accordingly, a large $\tilde{b}$ and a small b lead to a weak bargaining position of the national government and result in a small share in the agreement.

Next, consider the case of $b < \tilde{b}$. If no agreement is reached, the national government and the rural elite obtain 0 and $(\tilde{b} - b)y$, respectively. Thus, the Nash bargaining solution x^* solves

$$\max_x [y - x][x - (\tilde{b} - b)y]. \tag{9}$$

The solution is $x^* = (1 + \tilde{b} - b)y/2$, and the national government receives $(1 + b - \tilde{b})y/2$. As the rural elite's revenue in the revenue competition $(\tilde{b} - b)y$ increases, the national government's share of the agreement decreases.

Summarizing the results, the national government's revenue in both cases is $(1 + b - \tilde{b})y/2$, which is increasing in b and decreasing in $\tilde{b}$.

5.1.2 Optimal National Government Investment

The optimal coercive capacity b^* solves

$$\max_{b\in[0,1]} \frac{1+b-\tilde{b}}{2}y - \frac{c}{2}b^2, \tag{10}$$

and is equal to $y/2c$. When the national government and rural elite negotiate, the national government invests in coercive capacity to affect the bargaining outcome. The optimal coercive capacity is independent of the strength of the rural elite $\tilde{b}$.

The equilibrium national government revenue as a share of GDP is

$$\left(1+\frac{y}{2c}-\tilde{b}\right)\frac{1}{2}, \tag{11}$$

which is decreasing in $\tilde{b}$. The equilibrium rural elite revenue as a share of GDP is

$$\left(1-\frac{y}{2c}+\tilde{b}\right)\frac{1}{2}, \tag{12}$$

which is increasing in $\tilde{b}$.

When the rural elite has a strong capacity to sanction disobedient residents, it is difficult for the national government to compel obedience and gain revenue. Due to this weak position, the national government agrees to transfer large resources to the rural elite.

Proposition 2. *When the national government and the rural elite bargain, the following results hold:*

- *The coercive capacity b^* is $y/2c$.*
- *The national government revenue as a share of GDP is increasing in y and decreasing in c and $\tilde{b}$.*
- *The rural elite's revenue as a share of GDP is decreasing in y and increasing in c and $\tilde{b}$.*

6 Conclusion

This paper presents a model of competition between a national government and a rural elite for revenue gained from cash crop production. The model shows that each party's revenue is nonincreasing in the other party's power to impose sanctions on rural residents and nondecreasing in its own power. Extending this baseline model to allow for bargaining between the two parties, this paper provides an explanation on when the national government cedes large resources to the rural elite. When the national government faces a rural elite with strong capacity to compel resident obedience, it agrees to transfer a large amount of resources to the rural elite because its bargaining position is weak. Furthermore, when there is high agricultural productivity and a low cost of building coercive capacity, the national government will invest in more coercive capacity, strengthen its bargaining position, and decrease the rural-elite share in the agreement.

As many previous studies argue, indirect colonial rule is a significant source of rural-elite power. Thus, the result of the model implies that national governments will cede many resources and prerogatives to rural elites in regions where colonial powers intensively implemented indirect rule.[15]

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[15] Thus, the determinants that made colonial powers adopt indirect rule are more deep roots of the post-colonial political structure. Clarifying these determinants is beyond the scope of this paper and can be a topic for future research.

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