Political Elites and Land Rents:

Evidence from Indonesia

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Abstract

Rural development policy is often implemented by local leaders but it is unclear how to elicit optimal effort. This paper examines the effects of awarding higher political land rents. Using a spatial regression discontinuity, I exploit a historical policy that granted elected village chiefs cultivation rights over village rice land (*bengkok*) on one side of a historical border, but not the other. Chiefs generate higher local revenue, village public goods (roads), and schooling. Using original surveys, I trace this to positive political selection and, suggestively, higher economic embeded-ness and pro-social motivation. I discuss policy implications. Awarding leaders a stable, within-village revenue stream, can have persistently positive effects on local governance and development.

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1 Introduction

Traditional local leaders are crucial for rural development: they form the last mile of service delivery and are often directly responsible for local policy implementation (Baldwin and Raffler, 2019; Balán et al., 2022; Michalopoulos and Papaioannou, 2013).[1] Most studies, however, have found an overwhemingly negative impact of traditional leaders on development outcomes – reasons for which are often traced to their authoritarian and despotic rule (Acemoglu et al., 2014; Mamdani, 1997). Yet, a simple reason could be that local leaders lack *incentives* – they are often poorly compensated and hold hereditary positions. Naturally, this raises the question: given the importance of local leaders, what is the most effective way to elicit optimal effort? Specifically, given the familiar multi-tasking problem in politics (Besley, 2004), is it possible to implement an effective, high-powered incentive scheme that does not rely solely on higher wage compensation?[2]

I answer this question in the context of village chiefs in Java, Indonesia. The Indonesian context is ideal for three reasons. First, the presence of *tanah bengkok* – an institution whereby chiefs are remunerated in the form of cultivation rights over within-village rice land during their term of office.[3] Typically, chiefs lease out *bengkok* land to local villagers on fixed rental contracts, at discounted rates, and nearly all villagers pay in-kind rents (i.e. in the form of un-husked rice).[4] As a result, a large fraction of *bengkok* chiefs' pay is tied to a within-village income source. This suggests that *bengkok* remuneration could possibly serve as a tool to align chiefs towards village development by increasing the within-village *economic embeded-ness* of local leaders (Baldwin and Raffler, 2019).

Second, Indonesia has a long history of largely free and fair village chief elections (dating back to the Dutch colonial era). The existence of elections are crucial for both disciplining and selecting leaders whose preferences are aligned with constituents (Ferraz and Finan, 2009; Dal Bó and Finan, 2018). Third, I collect a unique panel dataset from thousands of hours of qualitative interviews

[1] Close to a quarter of the world's population is governed by some form of active traditional political leadership (Baldwin and Raffler, 2019) and organizations like the World Bank have spent nearly US$80bn on local development programs, the majority of which, channel funds through these leaders (Mansuri and Rao, 2013).

[2] Studies in political science argue that leaders that are more economically embedded into their communities tend to perform better (Baldwin and Raffler, 2019) but the literature is, to the best of my knowledge, silent as to *how* best to increase the embeded-ness of local leaders.

[3] *Bengkok* land is also awarded to lesser village officials. The size of these allotments, however, are typically much smaller. In addition, chiefs are the key decision-makers. Hence, I focus on the effects of *bengkok* land awarded to chiefs.

[4] Similar discounts on land rents have also been observed in other rural Southeast Asian agrarian economies. See, for example, pp. 106-107 of Scott (1985) which describes the case of Malaysia where local landowners often provide a discount to tenants if these tenants reside in the same village. In rural agrarian economies, in-kind rents are also often thought of as being more beneficial for tenants, since the landowner takes on the arduous task of husking, milling, and transporting the de-husked rice to the nearest market.

with (ex-)village chiefs and local elites across 193 villages in West Java (January — May 2019). This allows me to pin down key mechanisms and gives me unprecedented flexibility to study the inner workings of village institutions from a bottom-up perspective. This is especially crucial given the paucity of detailed micro data on local leaders and elections.

To that end, this paper answers the following question: In the presence of elections, how do persistent differences in within-village land rents, affect chief performance and long-run economic development? I do so by taking advantage of a historical Dutch contingency which generated unique variation in *bengkok* remuneration across villages in West Java, Indonesia. I hypothesize that *bengkok* chiefs might invest more in local development, given that *bengkok* remuneration is derived directly from local rice land. As a result, *bengkok* possibly attracts better quality leaders, influencing chief performance, local public goods provision, and economic development.

For identification, I leverage plausibly exogenous variation in the persistence of *bengkok*, arising from the introduction of the Dutch Cultivation System in the early 19th Century.[5] Specifically, frequent redelineation efforts led to the split of a previously homogenous region coinciding with the introduction of differential chief remuneration systems *within* the System. Section 2.2 provides detailed evidence that this bifurcation occurred because of idiosyncratic political circumstances rather than economic, cultural, or political differences across the boundary.

Hence, my treatment group comprises of villages immediately to the north of a then-newly formed Dutch colonial border (the historical Cirebon–Priangan border, highlighted in green in Figure 1a) which, by virtue of being placed within a larger administrative unit where *bengkok* was deemed to be native, continued to pay chiefs largely in terms of *bengkok*. In contrast, my control group comprises of villages to the south where *bengkok* was not deemed to be native, and hence, chiefs are instead, today, largely paid through a small percentage of village-level informal taxes. It is important to note, however, that these informal taxes are non-compulsory and most villagers choose not to pay these taxes. Hence, chief remuneration in treated villages continues to be much

[5]On the Dutch Cultivation System in general: It is well documented that the largest and worst incidences of famine in colonial Java occurred during this time period, as farmers were forced to give up land and labor for the cultivation of lucrative cash crops for Dutch export. See, among others, Van Niel (1972) and Fasseur (1992) for an overview of the impact of the Cultivation System on Java. Notably, however, Dell and Olken (2020) document positive modern-day development outcomes from persistent effects of Dutch infrastructure constructed during the Cultivation System. In contrast, historical evidence suggests that the Cultivation System in my study areas focused largely on extraction, rather than investments in infrastructure. This allows me to better isolate the effects of higher land rents from *bengkok*, on my outcomes of interest (Michalopoulos and Papaioannou, 2020). Specifically, effects on the bottom-up provision of public goods by chiefs, vis-a-vis top-down infrastructure provision.

higher than in control villages. Average chief remuneration in treated villages is 34.4 million IDR ($2,293) per year, nearly 3 times more than that of control villages (12.2 million IDR or $813).[6]

[FIGURE 1a ABOUT HERE]

The cross-village differences in pay schemes introduced by the Dutch create a unique setting to learn about the effects of changes in political pay. Identification as described above, however, involves one key challenge. Chiefly, the *bengkok* institution is a bundle. Across most of Java, alongside *bengkok* the Dutch strengthened the chief position by introducing elections and rights to collecting informal taxes. Hence, to identify the effects of *bengkok* pay, I focus exclusively on a previously homogenous region, described above, whereby Dutch border creation that had little to do with pre-existing differences, led to villages in the north receiving *bengkok* land rents, elections and informal taxation rights, whereas those to the south only received elections and informal taxation rights.

Today, however, our survey data reveals that some villages in the control group have adopted *bengkok* land in the more recent decades (Figure 2). Reassuringly, however, qualitative fieldwork suggest that these increases came about only after the end of Dutch colonial rule, during the 1980s — 1990s in a largely ad-hoc manner. In addition, *bengkok* land in our control group are, on average, of lower productivity. This explains, as described above, why chiefs in control villages continue to receive lower remuneration. Regardless, I account for non-zero *bengkok* land on both sides of the border, using a spatial fuzzy regression discontinuity design (discussed in detail in Section 3.2).

Using a spatial fuzzy regression discontinuity design, I first show that villages on both sides of my study border are largely balanced on geographical and ethnic group characteristics. I do so using the most disaggregated set of predetermined agro-climatic and geographical variables available. For studying villages on Java, measures such as rainfall and temperature are not available at a suitable level of disaggregation (Dell and Olken, 2020).[7] Importantly, as a proxy for pre-treatment economic prosperity (Acemoglu et al., 2002), I test and show that villages are balanced on pre-treatment population density (1819). I digitize these from handwritten village-level records from the National Archives of Indonesia. Next, to measure effects on long-run development, I use the 100% count Indonesian Population Census, various rounds of the Indonesian Village Census, and

[6]The monetary-equivalent amount from these sources, however, was and continues to be much lower in comparison to *bengkok* (Breman, 2016). Section 2.6 describes persistent differences in remuneration using contemporary survey data.

[7]Disaggregated data for rainfall, temperature in the early 19th century are unavailable and, for the earliest available periods (1945 onwards) are aggregated at a much larger geographical-level than village-level polygons on Java. Javanese villages are, on average, much smaller than those in the Outer Islands studied in e.g. Bazzi et al. (2019).

primary survey data to estimate effects of *bengkok* on contemporary chief performance and long-run economic development. I find a strong positive effect of *bengkok* land rents: chiefs raise more funds – especially through informal taxes from villagers[8] – provide higher levels of public goods, such as, importantly, village roads, and this translates into higher villager education and probability of having a non-agricultural job.[9] My main results are largely robust to a variety of analyses, including alternative RD specifications and bandwidths. To address possible cross-border differences in colonial policy that evolved after the imposition of *bengkok*, I digitize 1853 and 1945 Dutch Colonial maps and find little evidence that this explains my observed results.

In addition, I document that higher levels of villager education can be traced to cohorts born as early as the 1920s (the late Dutch colonial era). These results are important for three reasons. First, in the absence of top-down school construction by the Dutch and the Indonesian state prior to INPRES (1970s), higher levels of villager education in the early 20th century is strongly suggestive of greater village school construction efforts led by village chiefs (Aritonang, 1994; Djajadiningrat, 1940).[10] Second, in the absence of top-down intervention, greater village school construction is a pure outcome of bottom-up village capacity, ruling out differential top-down provision as an alternative explanation. Last, given the lack of historical data on village chief elections during the Dutch colonial era (early 20th century), these results hint at *historical* mechanisms: *bengkok* land rents possibly exerted a positive effect on both the selection and incentives of chiefs that can be traced as far back as the early 20th century.

Next, I turn back to contemporary data to examine four possible contemporary mechanisms driving positive *bengkok* effects: First, higher *bengkok* rents may attract better quality chiefs *(political selection)*. Second, higher rents might incentivize chiefs seeking re-election to put in greater effort *(re-election incentives)* (Ferraz and Finan, 2009; Gagliarducci and Nannicini, 2013). Third, higher rents

[8] Bengkok rents are *not* and have never been considered as a form of informal taxation. See Section 4.2 for details.

[9] Following the 2000 Population Census variable definitions, I code individuals whose primary occupation involves work on their own farm, as having an agricultural job.

[10] The construction of schools might seem puzzling: why would chiefs construct schools that raise the marginal productivity and outside options of villagers who, in the absence of which, would be locked in to stay in the village and work on *bengkok* land for lower wages? In particular, evidence suggests that landowners and political elites are typically unwilling to provide public goods such as schools (Bates, 2014; Acemoglu et al., 2007). The answer is possibly institutional: *bengkok* chiefs are constrained in the prices at which they can sharecrop or lease out *bengkok* land. Qualitative fieldwork reveals that prices are often tied down by traditional agreements and hence, given fixed costs, *bengkok* chiefs, unlike traditional landlords, would have had less of an incentive to withhold investments in public goods. Furthermore, results on historical schools does not rule out the possibility that village chiefs could have, historically, constructed public goods other than village schools. Data limitations, however, prevent me from probing the effects of *bengkok* rents on the construction of other historical public goods.

might lead to greater *political competition* which could, in turn, lead to more pro-growth policies (Besley et al., 2010a). Last, given the *within-village* nature of *bengkok* rents, I test if *bengkok* might have aligned chiefs towards the interests of villagers by increasing *economic embeded-ness and pro-social motivation*, consistent with Olson (1993)'s theory regarding the positive developmental effects of granting political elites greater "ownership" or "encompassing interests".[11]

To test these mechanisms, I implement a novel primary survey data collection exercise across both sides of my study border drawn from thousands of hours of in-person, mixed-methods interviews with (ex-)village chiefs and elites. I find substantive evidence that *bengkok* leads to positive effects on political selection. Chiefs are around 22p.p. more likely to hail from an ex-civil servant background and have marginally higher years of education. I find relatively little evidence for re-election incentives and political competition. Taken together, my results suggest that *bengkok* played a key role in attracting better chiefs who shaped stronger bottom-up interactions between chiefs and villagers. These chiefs were better at raising funds for the construction of public goods, resulting in better educational and economic outcomes for *all* villagers.

I close by investigating two additional channels in line with the extant literature on political performance and incentives — economic embeded-ness (Baldwin and Raffler, 2019) and pro-social motivation (Deserranno, 2019; Fehr and Schmidt, 1999).[12] First, I show that *bengkok* chiefs are more likely to derive income from agricultural farm land after assuming office. Together with evidence of greater village road construction, I interpret this as evidence that *bengkok*, by turning chiefs into recipients of farm rental payments, incentivized chiefs to provide public goods that benefit both *bengkok* farms and villager rice fields (Munshi and Rosenzweig, 2015). Second, *bengkok* chiefs are, correlation-wise, more likely to say that they ran for office due to pro-social reasons such as to "give back to the community" and "to contribute towards village construction". Together with evidence that *bengkok* chiefs consistently collect higher informal taxes for village projects, these differences are consistent with the hypothesis that the persistently positive effects of *bengkok* might be traced to the nature of *bengkok* rents. Beyond higher levels of remuneration, *bengkok* might have led to the

[11] To clarify, I do not provide an explicit test of Olson (1993)'s theory of stationary bandits (ala Sánchez De La Sierra (2020). I.e. I do not compare stationary versus roving bandits. Instead, my findings underscore the importance of explicitly introducing incentives that strengthen the "encompassing interests" of political leaders in local development. Specifically, I show that a long time horizon is a necessary but insufficient condition: even with a long tenure (life-long pre-1979, and 6–8 years post-1979), non-*bengkok* chiefs do not invest in local development.

[12] In particular, Baldwin (2016) argues that the economic and social well-being of local chiefs who live full-time in their communities, might be more closely tied to that of their communities.

strengthening of chiefs' social incentives.

Based on key institutional features, I argue that my results are unlikely to be a result of downstream differences in (i) multi-tasking; (ii) land inequality; nor (iii) more secure land rights. First, *bengkok* land is under common ownership. Chiefs are obligated to rent or sharecrop *bengkok* land out to villagers at fixed prices and it is extremely rare for a chief to manage *bengkok* land. Second, the average size of chief *bengkok* land is small relative to total cultivable rice land: an average of 1.6ha out of 158ha. This suggests that land inequality is an unlikely channel behind observed differences in development. Third, *bengkok* exists within a context of relatively secure individual land rights of farmers and chiefs do not have the authority to allocate village land to villagers. This rules out more secure land rights from *bengkok* land as a possible mechanism.[13]

The positive association between *bengkok* rents and economic development contrasts with the well-established hypothesis that areas governed through traditional local governance (indirect colonial rule) perform more poorly, on average, than regions directly governed through colonial administrators (direct colonial rule) (Mamdani, 1997). Why did indirect colonial rule through *bengkok* chiefs not lead to worse outcomes? The reason is that across Java, the Dutch ruled entirely through local leaders. Hence, the counterfactual to *bengkok* chiefs was not direct governance by colonial administrators. Instead, as shown, the counterfactual was non-*bengkok* leaders of lower quality.[14]

This paper makes four novel contributions. First, it contributes to the literature on the role of local elites in growth and development (Basurto et al., 2017; Martinez-Bravo, 2014, 2017; Martinez-Bravo et al., 2022; Balán et al., 2022; Mamdani, 1997). Negative effects are often traced to colonial intervention and differences between direct and indirect rule (Gennaioli and Rainer, 2007; Banerjee and Iyer, 2005; Baldwin et al., 2016). Yet, these differences are often bundled with potentially confounding factors such as colonizer identity. Here, I study within-variation in indirect rule *within* Dutch-colonial Indonesia. This allows me to circumvent such confounding factors and focus on effects arising solely from differences in systems of political remuneration. In addition, through an extensive, novel, primary data collection exercise, I can more cleanly pin down mechanisms: I rule out re-election incentives and political competition, and show that selection and, suggestively,

[13]The existence of secure individual property rights of farmers in the Indonesian setting contrasts markedly from Goldstein and Udry (2008) who show that, within a context of insecure property rights, traditional political authority in Ghanaian villages gives traditional chiefs more secure land rights over agricultural land plots. With more secure land rights, chiefs are more willing to fallow their land for longer periods of time. This results in greater agricultural productivity of chief land compared to land owned by ordinary farmers.

[14]Antlöv (1994) provides qualitative accounts consistent with this.

economic embeded-ness and pro-social motivation, might be key in enabling relatively small differences in political land rents to generate disproportionately large positive effects on development outcomes.

Second, this paper ties together the literature on the personnel economics of the state (Finan et al., 2017; Deserranno, 2019; Colonnelli et al., 2020) and how (non-)monetary and social incentives affects political selection and performance (Ferraz and Finan, 2009; Kotakorpi and Poutvaara, 2011; Deserranno, 2019).[15] I provide one of the first pieces of empirical evidence for the positive effects of incentive pay for local political leaders in a pre-industrial setting. Specifically, I provide novel evidence of how economic and social embedded-ness can improve the accountability of local leaders. More broadly, my results suggests that standard political economy models (Besley et al., 2010a; Besley, 2004) — which typically emphasize electoral incentives — could consider explicitly modeling economic and social embedded-ness as key parameters in the objective function of local leaders.

Third, this paper contributes to the literature on the persistent effects of colonial institutions (see e.g. Dell and Olken, 2020). In particular, Lowes and Montero (2021) shows that weak political accountability and poor development in Africa can be traced to persistently negative effects stemming from historically coercive features of indirect colonial rule. In contrast, I provide novel evidence of the *positive* effects of *bengkok*, a remuneration system institutionalized during one of the most extractive periods of Dutch colonial rule. Importantly, my findings suggest three scope conditions for such systems: (i) the provision of repeated, direct remuneration to local leaders (ii) the design should minimize individual discretion for additional extraction (iii) remuneration should be broadly tied to easily observable development outcomes.

Hence, in contrast to much of the existing qualitative literature (Antlöv et al., 1995), I show that *bengkok* land rents outlived initially extractive motives, and continues to have positive effects on local governance and development today. These findings have broader policy implications. *Bengkok* today is widely practiced throughout most villages on Java, Indonesia's most populous island (see Figure A.1).[16] Hence, my study potentially provides a partial explanation for Indonesia's rapid growth over the past half decade – much of this growth could, perhaps, be attributed to higher

[15] My results are broadly in line with theory that underscores the importance of other-regarding preferences in motivating individual behavior (Fehr and Schmidt, 1999).

[16] In fact, the Indonesian government has made some attempts at introducing policies to expand *bengkok* practices to the Outer Islands.

village leader quality, incentives, and state capacity stemming from *bengkok*. More broadly, my results underscore the potential cost-effectiveness of land remuneration schemes relative to other development interventions.

Last, in terms of policy implications, this paper is one of the first to study and show positive empirical effects of a high-powered incentive scheme that implicitly ties political pay to local development; most existing studies are largely theoretical in nature (see e.g. Besley, 2004; Alchian and Demsetz, 1972; Holmstrom, 1982).[17] Importantly, Hanna and Wang (2017) finds the opposite: financial incentives crowd out social preferences for lucrative public sector jobs in India. How do we reconcile these results? I argue that *bengkok* is possibly an example of a well-designed remuneration scheme that crowds in social preferences (Bowles and Polania-Reyes, 2012). First, it frames the decision situation in a broad enough manner that minimizes incentives to game the system. Second, it increases pro-social motivation by transmitting a message of civic duty through an explicit social obligation of collecting below-market, in-kind rents.[18]

The remainder of the paper is organized as follows. Section 2 provides an overview of the historical context of *tanah bengkok* and its expansion across two centuries. Section 3 discusses my empirical specification. Section 4 tests whether *tanah bengkok* continues to have an impact on village chief performance and downstream development outcomes. Section 5 examines mechanisms by presenting a conceptual framework, and describing fieldwork data and results. Section 6 concludes.

2 The History of *Tanah Bengkok*

This section presents the historical natural experiment illustrating how Dutch expansion of indirect rule and *bengkok* along the Priangan-Cirebon border in West Java allows me to identify the causal effects of higher land rents. Throughout, I highlight key features of the historical episode suggesting the lack of differences across my study area during the pre-colonial, colonial, and post-colonial period. The lack of these differences supports my use of a spatial RDD.

[17] A key exception is Jacob and Levitt (2003) which finds that a high-powered incentive scheme to pay teachers bonuses for large test-score gains leads, instead, to more cheating. Relatedly, evidence from high-powered incentives schemes, mostly with regards to teacher pay remain mixed (see e.g. Glewwe et al., 2010; Muralidharan and Sundararaman, 2011). Here, village elections and social incentives possibly enhances downward accountability and ameliorates the potentially negative effect of *bengkok* in the case of political leaders.

[18] A modern-day analogue exists: Cabinet ministers in Singapore, one of the richest countries in the world, receive annual bonuses tied to four broad indicators of local development and salary is pegged to the top 1,000 Singaporean earners, with a 40% discount (Ee et al., 2012).

In addition, I describe relevant changes in the electoral and remuneration system of village chiefs. The institutionalization of village chiefs began during Dutch colonial rule. Hence, I describe these changes from colonial times until today.

2.1 Pre-colonial Roots and Determinants of *Tanah Bengkok* Across Central and East Java

The practice of *tanah bengkok* refers to cultivation rights over within-village rice land. These rights are granted to village leaders for their services and in lieu of formal remuneration. This practice dates back to the Mataram kingdom — the last native kingdom to rule Java before the expansion of Dutch colonial rule — which granted similar rights to elites.

The pre-colonial roots of *bengkok* poses two potential identification challenges for studying the causal effects of political land rents. First, the incidence and size of *bengkok* could be correlated with the strength of pre-colonial institutions linked to Mataram rule (Maurer, 1994; Moertono, 2009). Areas with stronger pre-colonial institutions could have developed different local governance structures. The strength of these institutions themselves, could also have a direct impact on contemporary development outcomes (Gennaioli and Rainer, 2007). This concern is borne out in village data. Figure A.1 shows that the biggest areas of *bengkok* land in 2000 were located in Central and East Java, where the Mataram kingdom was centered.

A second potential source of bias is pre-existing wet rice suitability and geographical elevation. *Bengkok* takes the form of village wet rice land, and hence, villages with more fertile wet rice land typically award chiefs larger plots of *bengkok* land (Maurer, 1994). Given that wet rice agriculture continues to be the main form of rice cultivation on most of Java and rice is a staple food crop, higher wet rice suitability could lead to better development outcomes.

2.2 The Cirebon-Priangan Boundary in West Java: Similarities in Pre-Colonial Institutions and (the lack of) Village Administration

To overcome these endogeneity concerns, I study a historical episode that led to persistent differences in *bengkok* that were largely unrelated to these pre-existing differences. Specifically, my treatment of interest is the differences in *bengkok* land rents that arose in the eastern-most periphery of West Java in the early 19th century. Here, the expansion of Dutch indirect rule led to the creation

of the Priangan-Cirebon border and the plausibly exogenous introduction of *bengkok* on one side of the border but not the other. Hence, elected chiefs immediately to the north (highlighted in green in Figure 1a) were compensated in terms of *bengkok*. In contrast, elected chiefs to the south were largely remunerated through informal taxes.

The relevant boundary is the southernmost one in Figure 1a, highlighted with a thick green line. In areas to the north of this boundary (the historical district of Galuh), the main source of chief remuneration was *bengkok*, whereas in areas to the south (the historical districts of Limbangan and Sukapura), the main source of chief remuneration was levies of money, produce or labor (Husken, 1994). The key identifying assumption is that differences in *bengkok* practices was a result of idiosyncratic historical factors rather than pre-existing differences in institutional or economic factors. Below, I highlight and summarize the historical evidence that supports this assumption. In Section 3.2, I formally test this assumption in a regression framework.

[FIGURE 1a ABOUT HERE]

Pre-border, pre-bengkok expansion similarities Three pre-treatment characteristics of regions around the Priangan-Cirebon border enable me to study the causal impact of *bengkok* land rents. First, prior to colonial rule, there were few institutional differences. Historians note that all three districts belonged to the same pre-colonial polity and shared a common political, religious and administrative history (Hoadley, 1994).

Second, the region was sparsely settled, lacked a village-based administration, and villagers did not grow wet rice. In particular, historians note that the area was "isolated and semi-autonomous, without any centralized ruler claiming taxes and loyalty.... settlements were small, dispersed and rarely integrated into larger villages. Isolated clusters of dry rice cultivating households lived mainly from what they themselves produced." (Antlöv et al., 1995). The lack of historical evidence for wet rice cultivation is particularly important. *Bengkok* land takes the form of wet rice. Hence, it is unlikely that *bengkok* practices existed in this region before Dutch intervention.

Third, prior to Dutch introduction of *bengkok*, households had produced the same crops and had been governed by a similar form of nascent, local village administration on both sides of the border for nearly a century. Specifically, beginning from the mid-18th century, the Dutch forced households to cultivate coffee alongside rice in both regions (Breman, 2016). In addition, the Dutch appointed village officials to supervise the production and collection of coffee. In return, village

officials received income and authority from the collection of taxes from individual households.[19] The remuneration of these officials only diverged in the early 19th century, upon the introduction of the Cultivation System and *bengkok*. I describe this bifurcation in Section 2.6

2.3 Origins of the Study Boundary: Dutch Expansion of *Bengkok* and Indirect Rule in the Early 19th Century

Post 18th Century Dutch Expansion Two historical facts regarding Dutch expansion of *bengkok* and indirect rule further supports the idiosyncratic nature of *bengkok* assignment. First, the bifurcation in cross-border *bengkok* practices resulted from an idiosyncratic redrawing of boundaries in 1810, one amongst many purportedly done for administrative efficiency. Second, the introduction of the 1832 Dutch Cultivation System was based on these boundaries despite the fact that they did not demarcate any actual institutional nor cultural differences.

The redrawing of the 1810 Priangan-Cirebon boundary was not because of pre-existing differences between the districts. Instead, it was motivated by Dutch claims of enhancing administrative efficiency[20] and salient geographical characteristics. Pre-1810, all three districts had belonged to the same administrative unit. It was only in 1810, for the first time in one and a half centuries, that the three districts were placed under different administrative units. Why? Rees (1869) writes that this decision was made on the "logic of preserving ... (contiguous) borders." and "not (by virtue) of the product or yield (of coffee)".[21] In particular, the Dutch had limited information about rural Java, and just as it was for many interior borders, drew much of the Priangan-Cirebon border following mountains and rivers (Ricklefs, 2008). Hence, in 1810, Limbangan and Sukapura were, administratively, placed under the Residency of Priangan, and Galuh was placed under the Residency of Cirebon (See Figure 1b). This was despite the lack of any pre-existing differences between the three districts.

[FIGURE 1b ABOUT HERE]

1832 Dutch Cultivation System: Bifurcation across the newly established Dutch Residency borders In 1832, the Dutch introduced *bengkok* as a form of remuneration for village chiefs all

[19] Antlöv et al. (1995): p. 19-20. It is important to note, however, that villages also had a Council of Elders who were oriented towards the needs of the village (Antlöv (1994): p. 75.)
[20] Hardjasaputra (2004): p.57
[21] Rees (1869): p. 110-111.

throughout Cirebon but not in Priangan. This was done as part of the imposition of the Cultivation System across Java (1832-1870).[22] Importantly, and as highlighted above, this was despite little to no pre-existing differences across the border regions of Galuh, Limbangan, and Sukapura. Instead, the introduction of *bengkok* was based on the Priangan-Cirebon borders drawn in 1810 and the Dutch perception of *bengkok* as an institution native only to villagers in Cirebon. In particular, the northern-most borders of Cirebon Residency included the seat of the Cirebon kingdom which had, historically, granted similar cultivation rights to princes (Figure 1b).[23] Importantly, prior to 1832, these land rights had almost certainly never been extended to the villages in my study area around the newly re-drawn Priangan-Cirebon border.[24] In short, the historiography strongly suggests that *bengkok* was introduced in Galuh, but not Limbangan nor Sukapura, by virtue of it being under the administrative jurisdiction of the Residency of Cirebon in 1832. This was a top-down, Residency-level decision that did not take into account the fact that both areas did not have a pre-existing history of *bengkok* practices.

Why did the Dutch not take into account the lack of pre-existing *bengkok* practices in Galuh? The historical evidence suggests that nearly all measures related to the Cultivation System were hastily introduced due to an urgent need for revenue following the end of the Belgian War in 1831 (Tarling, 1992). Van Vollenhoven (1931): "To get free land for forced cultivation, the whole set of cultivated fields was flung together in great confusion. ... In some places inheritance rights were abolished because they were inconvenient. The lands occupied by neighbouring villages were mixed wholesale and so badly was the Administration smitten... that it brought these measures into play in villages in no way connected with the Cultivation System."

In summary, the introduction of the Cultivation System in 1832, together with the happenstance that Galuh, had been placed under the jurisdiction of Cirebon in 1810, led to the expansion of *tanah bengkok* practices into Galuh but not across the Cirebon-Priangan border into Limbangan and Sukapura. Figure 1a illustrates the Cirebon–Priangan border in black and green and the extent

[22]The Dutch Cultivation System led to the imposition and expansion of cash crop cultivation all across Java. Due to a lack of manpower, however, the Dutch turned towards village chiefs as key local intermediaries. There were, however, no uniform set of rules for the Cultivation System – the Dutch worked with local intermediaries in ways that differed depending on pre-existing local institutions and constraints (Van Niel, 1972) (p.93) In particular, in many parts of Java, given the abundance of land and lack of labor, the Dutch sanctioned the conversion of village rice fields into *tanah bengkok* to shoulder the heavy financial costs of paying the salaries of tens of thousands of chiefs (Breman, 1983).

[23]Historians widely believe that these rights were a precursor to *bengkok* (Moertono, 1963, 2009).

[24]Hoadley (1994): pp76.

of *tanah bengkok* land at the subdistrict level using 1867 Dutch archival data.[25] The expansion of *bengkok* between Pre-1830 Cirebon (Figure 1b) to 1867 (Figure 1a) appears to align almost exactly with the extent of the border, and despite the possible imprecision of colonial statistics at that time, there is a marked discontinuity in *bengkok* across the border.

2.4 Dutch Policy During the Intermediate Colonial Period: 1832 – 1949

Intermediate Dutch colonial policy can be divided into two periods (Tarling, 1992; Booth et al., 1990): the Cultivation System (1832 – 1870) and the "Liberal Period and Ethical Years" (1870 – 1930). Notably, throughout both periods, the differences between Galuh and it's southern neighbors were so few that the administration of Galuh was transferred multiple times between Cirebon and Priangan Residency, up till the end of the colonial period (Gooszen, 1985).

Furthermore, there were largely few differences in fiscal capacity and investments across Dutch Residencies. The Dutch made few, if any, investments that were directly beneficial for "Native" interests. Moreover, Dutch Residencies often had limited fiscal capacity and investments were largely undertaken directly by central Dutch offices following overarching colonial interests (Furnivall and Furnivall, 2010).

Throughout the Cultivation System Period (1832 – 1870), Dutch colonial policy in my study regions was largely limited to infrastructural investments for the transportation of coffee from villages and highland coffee areas to warehouses and harbors (Breman, 2016). In Section 4.3, I test for differences in proxies for 1853 Dutch Colonial Policy.

From the 1920s ("Liberal Period and Ethical Years"), the Dutch Colonial State began state-building in earnest, largely in the form of broader public goods provision. These efforts at exercising greater administrative powers, especially in terms of education, public health, and sanitation, however, rarely reached down into rural villages (Tarling, 1992). Nonetheless, in Section 4.3, I test for differences in other potential proxies for 1945 Dutch Colonial Policy including (rail-)road density. Differences, if any, in such investments were more likely, Dutch colonial extraction continued

[25]The 1867 Eindresume is a historical land cadastre of 808 villages in Indonesian Java compiled by the Dutch colonial government in 1867 and contains the earliest records of *bengkok* land. The purpose of the survey was to determine the direction of colonial policy due to liberal Dutch opposition to the continued exploitation of natives through the Cultivation System (Eindresume Vol I, 1867 pp 3–6). All land under private estates was excluded. This refers to land sold by the colonial government to Europeans and Chinese. Most of this land was centered on the North Coast of West Java (present-day Cirebon) and Surabaya in East Java (Kano, 1904). Surveyors were advised to select at least 2 villages in each district (approximately equivalent to present-day subdistricts) with a preference for those that were as distinct from each other as possible.

up until Indonesian independence in 1949.

2.5 Chief Elections and the Introduction of Term Limits in 1979

Along with the expansion of *bengkok* in areas north of my study border, chief elections were introduced throughout Java and on both sides of my study border starting from the early 19th century (Raffles, 1830). This was, however, never accompanied by a commensurate increase in formal remuneration. Chiefs were never formally incorporated into the bureaucratic state but were instead paid in terms of *bengkok* land and a variety of informal taxes (Husken, 1994). Hence, elections were held in all villages on both sides of my study border, but remuneration practices, as described above, differed.

Crucially, term limits were amended in 1979. Between 1830 – 1979, chiefs were elected for life. Post-1979, however, chiefs became term-limited and were to be elected to a maximum of two terms of 6–8 years each.[26] In Section 4.4, I show that positive effects on villager education can be observed as early as the 1920s and argue that these intermediate effects suggest that, even in the absence of term limits, *bengkok* led to positive development outcomes through giving chiefs a stake in village development (*ownership*) ala Olson (1993).

2.6 Differences in the Level and Nature of *Bengkok* Remuneration

Colonial Period: Differences in components of remuneration As described in Section 2, Dutch intervention in 1830 led to a bifurcation in chief remuneration across my study border. In areas to the north, chief remuneration had four components: *bengkok*; a 8% commission from the collection of village land rent; a piece-rate tax on the delivery of coffee beans;[27] and traditional labor services from villagers.[28] In areas to the south, chief remuneration was identical except for the absence of *bengkok*. Unfortunately, quantitative data on remuneration during the colonial period is largely unavailable. In 1870, the compulsory cultivation and collection of coffee was abolished but the role of village chiefs and differences in *bengkok* practices have persisted.

Today: Persistence in *bengkok* and differences in levels of remuneration Traditional levies on produce and labor have been largely abolished and *bengkok* serves as the main component of

[26] I describe this, in further detail, in Section 5.2.
[27] 24 duit per picul of coffee delivered.
[28] Fernando (1982): pp165.

chief remuneration.[29] Based on primary survey data, chiefs in treated villages earn an average of 34.4 million IDR ($2,293) per year, about 3 times more than chiefs in control villages, who earn 12.2 million IDR ($813) per year. The bulk of this comes from *bengkok* land, with a negligible fraction from intra-village (rice) taxes levied on the population.

Outside options Hence, in the absence of *bengkok* rights, chiefs are barely paid a living wage: the average annual salary of an Indonesian civil servant is 23.4 million IDR ($1,560),[30] and the average annual wage of a day laborer is 18 million IDR ($1,180) (BPS 2019). Such levels of low compensation for local leaders, however, are not unique to my setting. 98% of municipal legislators hold a second job in Brazil (Ferraz and Finan, 2011), and the president of a *panchayat*, the equivalent of village chiefs in the Indian village government, is paid less than the minimum wage, at 50-60 dollars per month (Munshi and Rosenzweig, 2015).

3 *Bengkok* and Long-Run Development

To examine the effects of higher land rents on long-run development, I collect original survey data and combine this with various rounds of the Indonesian Village and Population Census data. Here, I provide details on core regressors and outcomes. I introduce other outcomes of interest as they arise. Appendix Table B.1 provides a summary of data sources for all variables.

3.1 Data: Measuring Contemporary Chief Performance and Village Development (1986-2000

I examine *bengkok*'s long-run impact by testing whether it affects contemporary chief performance and individual-level development outcomes. I do so using various rounds of the Indonesian Village Census and the 100% count 2000 Indonesian Population Census geo-referenced at the village level. For individual-level development, the 100% count Population Census provides measures of education and, my main measure of economic prosperity – having a non-agricultural job – in all sample villages.[31]

[29] Traditional levies of produce or labor were officially abolished on Java in 1916. See (Hup, 2021) for more details. Separately, a fixed salary for chiefs was introduced starting from 2014 but this period is outside the scope of this paper's analysis.

[30] Author's calculation from the 2010 Indonesian Work Force Labor Survey.

[31] The rural, geographical concentration of my sample limits usage of other data sources like the Indonesian Family Life Survey or the Indonesian Socioeconomic Census.

My main measures of chief performance are village revenue and public goods provision. Village chiefs bear a heavy responsibility as both agents of the state and bottom-up, elected representatives of the village community (Antlöv, 1994). As agents of the state, chiefs are expected to supervise and lobby for development projects, maintain regular contacts with higher authorities, and handle issues of security and politics at the village level. As elected representatives, chiefs are expected to collect informal taxes and settle disputes and grievances amongst villagers.

To measure village revenue and public goods provision, I merge six waves of the triennial Indonesian Village Census (*Potensi Desa, PODES*) collected between 1980 and 1996.[32] The Village Census comprises a large number of measures of public goods in villages, such as infrastructure, health and educational facilities.[33] I focus on outcomes that are consistently reported across different waves and where there is clear role of chiefs in providing these public goods. Where relevant, I supplement these measures using primary survey data. I describe these measures in Section 5.

With regards to village revenue, the major responsibilities of village government are to construct and maintain local infrastructure. Funds for doing so are typically raised from villagers (bottom-up), or by lobbying district line offices (top-down) (MacAndrews, 1986). Indonesia has four main administrative tiers: Central, Provincial, District, and Villages.[34] District governments, however, are the closest tier through which village chiefs directly obtain funds and projects, hence, we would expect that chiefs who are better at lobbying would obtain greater funds from district governments. I further describe the role of chiefs in village development in Section 4.2.

Throughout, to better interpret outcomes as a measure of chief effort, I focus on outcomes in Indonesia's pre-2000 decentralization period.[35] Post-decentralization, the increase of mandatory fund transfers to village governments (Sjahrir et al., 2014), make it harder to interpret village-level outcomes as a measure of chief effort.

[32] In particular, these waves correspond to the years 1980, 1983, 1986, 1990, 1993, 1996

[33] As discussed in Martinez-Bravo (2016), survey enumerators collect answers from members of the village administration and are expected to check these answers against village administrative records and through physical, on-the-ground surveys. Since measures of public goods such as the number of schools and health facilities are easily verifiable, this survey provides an accurate representation of public goods in all villages.

[34] Both historically and today, sub-district governments, the tier between districts and villages, have played a negligible role in administration and funding.

[35] I further exclude village-level infrastructure outcomes in 2000, given the fall of Suharto and the Asian Financial Crisis in 1998. "Big-bang" political, administrative, and fiscal decentralization took place in 1999 after the fall of Suharto in 1998 (Skoufias et al., 2011)

3.2 Estimation Framework: Spatial Fuzzy Regression Discontinuity Design

As discussed in Section 2, *bengkok* practices were expanded up to, and stopping at the Cirebon-Priangan border. We might thus be worried about the plausibly endogeneity of these borders. What then, were these borders based on? Like other interior Javanese boundaries, these borders largely followed mountain ranges and rivers as the Dutch had limited information about rural Java (Ricklefs, 2008). Hence, given the extremely mountainous terrain across both sides of the border, I further limit my sample to two segments of the southern Cirebon–Priangan border where areas on both sides are largely balanced on ruggedness and elevation. Specifically, I limit my sample to the two border segments that are largely demarcated by rivers and not mountains. Figure 2 plots the two segments of my study border. As can be seen, I exclude the left-most, black-lined district border segment and the bottom-right border segment due to the presence of mountains (shaded in white) to, respectively, the north-east and north/south of each segment.

Figure 2 plots the two segments of my study border and the contemporary size of *bengkok* across the Cirebon–Priangan border. Moving across the border, there is a marked discontinuity in *bengkok* size. There have, however, been increases in *bengkok* in villages to the south of the border. This can be seen in the northwestern corner of Figure 2, where villages to the left of the border have positive amounts of *bengkok* land today. Fieldwork suggests, however, that these increases in *bengkok* came about after the end of Dutch colonial rule, during the 80s and 90s in an ad-hoc fashion.[36] Nonetheless, I take into account positive amounts of *bengkok* land across both sides of my study border by using a spatial fuzzy regression discontinuity design.

[FIGURE 2 ABOUT HERE]

To isolate the effects of *bengkok* from a composite *border* treatment effect, I use a spatial fuzzy regression discontinuity (RD), analogous to Basten and Betz (2013), to assess differences in outcomes for villages located just to the south and to the north of the study boundary. Specifically, the fuzzy RD leverages three characteristics of (changes in) *bengkok* across the Cirebon–Priangan border. First,

[36] Typically, this adoption of *bengkok* land occurred when a rich villager passed on and pledged his rice land toward payment of village government officials. It could also take place if village elders or officials came together to purchase rice land for the same purpose. In other cases, villages received funds from supra-village government officials to purchase *bengkok* land. In sum, these increases in *bengkok* were largely ad-hoc and did not take place in a systematic manner due to the difficult of enforcement and purchasing prime plots of land in an era of high population density and land scarcity (as opposed to the land abundant early 19th century colonial period).

that the incidence of *bengkok* does not jump from zero to one at the border. Second, that the institution of *bengkok* still exists today and third, that we are able to measure, at the village level, the *size* of *bengkok* awarded to chiefs from primary survey data.[37]

Formally, let $\text{Bengkok}_{fuzzy,v}$ be the size of chief *bengkok* land in each village v. I obtain the fuzzy RD estimate of *bengkok* on the outcomes of interest by jointly estimating:

$$y_{ivtb} = \alpha^f + \gamma^f \, \text{Bengkok}_{fuzzy,v} + f(\text{location}_v) + X_v' \, \beta^f + \phi_b + \epsilon_{ivbt}, \tag{1}$$

$$\text{Bengkok}_{fuzzy,v} = \delta + \tau \, \text{Cirebon}_v + g(\text{location}_v) + X_v' \, \beta + \phi_b + \nu_{ivbt}, \tag{2}$$

where y_{ivtb} is the outcome of interest for individual i in village v at time t located along segment b of my study border. Cirebon_v is an indicator equal to 1 if village v falls to the north of the Cirebon-Priangan border, in Cirebon Residency; X_v is a vector of time-invariant covariates for village v; ϕ_b is a set of border segment fixed effects that denote each of the north and south segments of the study border. $f(\text{location}_v)$ and $g(\text{location}_v)$ are the RD polynomials which controls for smooth functions of geographic location for v. I let both polynomials have the same order in both equations (Lee and Lemieux, 2010). For all regressions, X_v includes an indicator for whether a village had ever split.[38] For all regressions at the chief(-electoral term) level, I additionally control for whether a chief's term of office included 1998, the year marking the end of Suharto's rule.[39] I describe additional, regression-specific control variables in the footnotes of each regression table. I further exclude 5 outliers from my study sample: two villages with one of the largest religious schools in West Java, and three villages where village boundaries include large areas of inhospitable, volcanic

[37] Specifically, we collect and construct a panel dataset on the size of *bengkok* awarded to each and every village chief that won office between 1979–2014. There exists, however, little variation across time and hence, we use the *average* size of *bengkok* awarded to chiefs, at the village-level as our key regressor of interest. The lack of variation across time is consistent with our qualitative fieldwork. When asked why there were few, if any, changes in sharecropping, leasing arrangements, and size of *bengkok* across time, nearly all respondents replied that this was because (the practice of) *bengkok* was *turun temurun*, an ancient practice that had been passed down from one generation to the next.

[38] Most splits occurred in the early 1980s where a single village was typically split into 2 or 3 villages. The probability of a split occurring, however, is largely balanced across my study boundary and appears to have been driven mostly by idiosyncratic factors.

[39] Kammen (2003) further describes how village life was severely disrupted even in the years prior, between 1997-1998 due to widespread protests by village chiefs in response to a Central Government announcement to postpone village chief elections.

land. Following Calonico et al. (2014); Cattaneo et al. (2019); Gelman and Imbens (2017), my baseline specification is a a local linear polynomial in distance to my study border estimated separately on each side of the border. I use a triangular weighting kernel and calculate the optimal bandwidth using the MSE-minimizing procedure suggested by Cattaneo et al. (2019). I also present results with a wider fixed bandwidth of 30km from the border. I check robustness to using various other forms of RD polynomials and bandwidths in Section 4.3.

I identify the causal effect of present-day *bengkok* by instrumenting the size of *bengkok*, bengkok$_{fuzzy,v}$, with an indicator, Cirebon$_v$, for whether a village had been assigned *bengkok* in the early nineteenth century. My coefficient of interest is γ^f: the effect of an increase of 1 hectare in the amount of *bengkok* on my outcome of interest. Under the assumption that Dutch Cirebon rule affected outcomes only via its effect on *bengkok*, the IV estimate of γ^f identifies the causal effect of *bengkok* land on downstream outcomes.

Lack of Policy Differences: Dutch Cirebon vs Dutch Priangan rule I have argued, qualitatively, that it is highly unlikely that were are any substantive policy differences in Dutch Cirebon vs Dutch Priangan rule, given (i) later-day fluidity of the border and (ii) the relatively weak fiscal capacity of Dutch administrative units (Section 2.4). Furthermore, it is important to note that the presence of any other unobserved differences in Dutch Cirebon rule would not invalidate the fuzzy RD design, it would simply change the interpretation of γ^f. Nonetheless, to assuage any possible concerns, I quantitatively test for the validity of this assumption by showing balance on measures of (i) 1853 Dutch Colonial policy; (ii) 1945 Dutch Colonial policy (Section 4.3)

3.3 Validity of RD Design

The RD approach presented in equations (1) and (2) requires two identifying assumptions. The first assumption is that all relevant factors before *bengkok* was assigned varied smoothly at the Cirebon–Priangan Residency border. This assumption is needed to ensure that villages located just north of the border are an appropriate counterfactual for those located just south of them. In other words, to identify the effect of *bengkok*, villages should have had similar economic development, geography, history, and institutions prior to the assignment of *bengkok*

A key concern for identification is that villages to the north might have been strategically chosen for certain characteristics that could affect our outcomes of interest. For example, these villages

might have been more suitable for growing certain crops or might have been more densely populated. However, whether a village was assigned *bengkok* is a deterministic and discontinuous function of whether a village fell to the north of the Priangan–Cirebon border. As described in Section 2.3, these borders were drawn when much of interior Java had not been explored. Hence, they were largely defined by salient geographic characteristics of rivers and mountains. Thus, *bengkok* villages were unlikely to have been selected based on local characteristics that also vary discontinuously at the Cirebon–Priangan border.

To assess the plausibility of this first assumption, Table 1 presents summary statistics and estimates using equation (2) and replacing $\text{Bengkok}_{fuzzy,v}$ with important geographic characteristics, share of village population that is ethnically Sunda (the main ethnic group in West Java), and a measure of pre-*bengkok* economic prosperity.[40] Geographic characteristics include elevation, ruggedness, slope, crop suitability, and river characteristics.[41] I present these results with standard errors clustered at the subdistrict level. Sub-districts continue to enjoy some small, albeit diminished, influence on funding allocations to villages located within the same subdistrict.[42]

[TABLE 1 ABOUT HERE]

Consistent with the first identification assumption, I find balance on all variables except for ruggedness and wet rice potential yield. Estimates in Table 1 suggest that *bengkok* was introduced in villages that were *more* rugged and had *lower* potential wet rice yield. These differences, however, are unlikely to explain the entirety of any positive, downstream, long-run differences in development. First, differences in wet rice potential yield are economically small. *Bengkok* villages have a 6.43kg lower potential wet rice yield relative to a mean of 2150 kg, a 0.2% difference. Second, the direction of the estimates suggest that *bengkok* was introduced in villages that were *less* suitable for development. A rich literature shows that higher ruggedness typically leads to worse development (Nunn and Puga, 2012). Similarly, wetland rice continues to be the main staple crop on Java. Hence, lower potential yield is likely to lead to worse outcomes. Importantly, wetland rice was never part of the forced Cultivation System.[43] If anything, taken together, the direction of these

[40]Note that measures of pre-treatment ethnic shares do not exist. As a proxy, I measure ethnic shares from the 2000 Population Census.

[41]Unfortunately, data on other predetermined agrocclimatic variables such as rainfall, and various measures of soil quality and texture, are too aggregated to be useful when exploiting village-level variation in my sample.

[42]Results are largely similar and, in some cases, even stronger when accounting for arbitrary spatial autocorrelation (Conley, 1999) in my reduced form specifications. Results available upon request.

[43]This suggests that, in contrast to the potentially deleterious effects of other cash crop cultivation (e.g. Uribe-Castro

estimates suggests that later results should be interpreted as a lower bound estimate of the *bengkok* effect.[44]

Nonetheless, concerns might remain that differences in potential wet rice yield or ruggedness could be driving my estimates. In Section 4.3, I test and show that results are robust to controlling for ruggedness, potential wet rice yield, a wide range of proxies for (historical) intensity of [agriculture], and structural transformation.

Importantly, I show that villages are balanced on pre-treatment economic prosperity. Data on per capita income are difficult to come by and many studies use, as a proxy, data on population density (Acemoglu et al., 2002). To this end, I hand-collect and digitize 1819 population records from Dutch colonial archives.[45] Table 1 shows that there are no significant differences between villages on both sides of the border in terms of pre-treatment population density and suggest that, if anything, villages where *bengkok* was assigned, were more sparsely populated before Dutch intervention.

The second identifying assumption is that there was no selective sorting across the RD threshold when the Cirebon–Priangan border was established. If the imposition of *bengkok* led to selective out-migration of individuals from *bengkok* villages to non-*bengkok* villages or vice versa, γ^f would be picking up this indirect effect of migration. The rigid social structure and closed nature of rural Javanese villages (McNicoll, 1968) suggests that large waves of cross-village migration were unlikely. Unfortunately, no data exists to quantify the potential magnitude of historical migration during the Dutch colonial era. As a proxy, I turn to 2000 Indonesian Census data. Across my study villages, differences in in-migration rates (in the last 5 years) are economically unimportant: in-migration into *bengkok* villages is 1.3p.p higher than in non-*bengkok* villages the the mean in-migration rate is 5.4pp.

A related concern is selective sorting at the chief-level: high-ability villagers from non-*bengkok* villages could possibly have migrated to *bengkok* villages to run for chief. This was highly unlikely.

(2019), it is unlikely that, in the absence of Dutch expansion of *bengkok* land, lower potential wet rice yield would have had a positive long-run impact on development outcomes. Furthermore, in contrast to coffee or other cash crops, rice was grown only for subsistence and the Dutch had very little incentive to intervene.

[44]That *bengkok* was introduced in places that were *less* suitable for wetland rice cultivation underscores the idiosyncratic nature of *bengkok* assignment in my study region. Across the rest of Java (Central and Eastern Java), there is a robust positive correlation between the incidence of *bengkok* and potential wet rice yield. See Figure A.1. Additional maps and tables available upon request.

[45]These population records are aggregated and reported only for the largest village located within each Indonesian subdistrict, a larger administrative unit. Hence, to construct measures consistent with present-day administrative boundaries, I match 1819 village names to contemporary village locations. I then divide the population by the size of subdistricts and in this way calculate measures of population density for 24 contemporary subdistricts.

Dutch archives suggest that, as early as 1819, it was mandatory for chief candidates to be residents of villages in which they run for office (Raffles, 1830). Today, this regulation continues to be adhered to both in regulation and in practice. The earliest post-independence village law of 1945, largely based on Dutch law, explicitly states that chiefs have to be legal residents of their village. In practice, it is also difficult for outsiders to garner votes without strong ties to the village (Maurer, 1994). Primary survey data corroborates this: 90% of village chiefs we surveyed were born in the village in which they held office.

4 Results

This section presents my main empirical results in three steps. First, I present first-stage results linking historical Dutch intervention to modern-day differences in *bengkok* prevalence across the border. Second, I estimate downstream effects on chief performance in terms of fund-raising, public goods provision and individual-level outcomes. Third, using the complete 100% sample microdata from the 2000 Census, I test and show that the persistent effects of *bengkok* chiefs can be traced back to cohorts that were educated as early as the 1920s. In each sub-section, I present core robustness checks, deferring alternative explanations and other robustness checks to Section 4.3.

4.1 First Stage

Table 2 presents first-stage results where the dependent variable is the size of chief *bengkok* land, measured from primary survey data.[46][47] Column (1) of Table 2 shows results for the optimal Calonico et al. (2014) bandwidth. Column (2) shows results under the fixed, wide bandwidth of 30km. *Bengkok* land awarded to chiefs in villages to the north of my study border are 1.9 – 2.4ha larger than those to the south – a more than two-fold increase relative to the sample mean. These estimates attest to the persistently large differences in *bengkok* across the study border. To allay any potential concerns about instrument strength, I report Kleibergen-Paap F-statistics and other relevant weak-instrument robust test statistics in all subsequent tables.

[46] To the best of my knowledge, it is not possible to estimate the effects of chief remuneration from *bengkok* land using existing administrative data. The only administrative dataset that reports village-level *bengkok* land holdings is the village census (PODES) rounds of 1983, 1986, 2000, and 2003. These rounds, however, do not report the size of *bengkok* land awarded solely to chiefs.

[47] Figure and Figure A.3 and A.4 presents, respectively, 2D and 3D spatial RD plots of raw and predicted values of chief *bengkok* land.

[TABLE 2 ABOUT HERE]

4.2 *Bengkok*, Village Chief Performance and Long-Run Economic Development

To examine the long-run effects of *bengkok* on chief performance and economic development, I proceed in four steps. First, I analyze data on the amount of funds raised by chiefs from villagers and top-down government sources. Second, I show that *bengkok* villages consistently perform better in terms of public goods provision, specifically in terms of village roads and schools. Third, I provide evidence that these effects translate into higher contemporary education and economic prosperity at the individual-level. Last, I close by showing that the persistent effects of *bengkok* can be traced back to the educational outcomes of cohorts born as early as the 1920s.

1. Bottom-Up fund-raising and Top-Down Lobbying[48] I provide two measures of bottom-up funding: the amount of funds collected from villagers (PODES 1993),[49] and the percentage of informal taxes, collected successfully by village chiefs, as a percentage of their annual target (primary survey data, 1979-1996).

Importantly, the definition of informal taxes *always excludes bengkok* rents. From qualitative fieldwork, *bengkok* rents are widely understood to be a form of recurring chief remuneration paid solely by renters of *bengkok* land. In contrast, informal taxes are paid by *all* villagers; and is largely voluntary in nature. I.e. villagers have considerable discretion and bargaining power over informal tax payments. To that end, measures of informal taxes are important for three reasons. First, primary survey data estimates that 64% of my sample villages use informal taxes for development projects (Table A.3).[50] Second, the ability to raise revenue from informal taxation is a direct measure of the level of trust and support that [chiefs enjoy from villagers]. Third, public goods constructed with greater bottom-up funds are typically of higher quality (Evers, 2000).

To measure top-down lobbying, I use data on the sources and levels of village funds from PODES 1996, the only pre-decentralization year which records the amount of funds a village obtained from each tier of upper-level government: Central, Provincial, and District. Where applicable, to account for possibly meaningful content of zeros, I apply an inverse hyperbolic sine trans-

[48] The discussion here is based on Evers (2000) and Martinez-Bravo (2017). See Martinez-Bravo (2017) for a detailed discussion of the mechanisms behind public good provision at the village level.

[49] PODES 1993 is the only round which records the level of village funds collected from villagers, that are used for development purposes.

[50] This is consistent with surveys conducted by the Indonesian Statistical Office. These surveys found that, in the late 1970s, two-thirds of development expenditure undertaken by villages was self-financed.[51]

formation (Bellemare and Wichman, 2019).

Bottom-up fund-raising Columns (1) and (2) of Table 3, Panel A present estimates for the amount of contributions, while columns (3) and (4) present estimates for the percentage of informal taxes. An additional 1ha of *tanah bengkok* leads to higher villager contributions and this is achieved through a 12.9 to 28.0pp increase in the percentage of informal taxes collected. These results suggest that *bengkok* might have led to stronger bottom-up collective action norms where *bengkok* chiefs, who are more trusted by their fellow villagers, are able to collect a higher percentage of taxes. The quantitative importance of bottom-up funding is further underscored by comparing the mean of villager contributions vis-a-vis district funding (Panels A and B). Funds raised from villager contributions are, on average, 15 to 37 times larger than that from districts.

[TABLE 3 ABOUT HERE]

Top-down lobbying De jure, government funds are channeled from Central Government Ministries directly to district line offices (MacAndrews, 1986). De facto, the competence of village chiefs in informal lobbying heavily influences the amount of funds that villages receive. (Evers, 2000). Informal lobbying was especially important during the last decades of Suharto rule (1965-1998), when structured development grants were replaced by discretionary project funding (von Benda-Beckmann and von Benda-Beckmann, 2013). To that end, I measure the amount of district funds that each village receives in PODES 1996 and I interpret this as a measure of village chief competence and connections.

Relying solely on either top-down or bottom-up funds, however, can often be ineffective for large-scale development projects. For such projects, effective management often involves the combination of government financial support with villager contributions (Raffles, 1830; Antlöv et al., 1995; Evers, 2000). For example, the INPRES school construction program is largely viewed as an example of top-down government intervention (Duflo, 2001). Yet, our qualitative interviews suggest that the Central Government largely only provided (funds for) construction materials, with bottom-up, villager community contributions playing a crucial role in providing labor and paying for teacher salaries. To that end, I construct a measure of co-production, *Govt and Own Village Funds* (primary survey data), which equals one if a development project was constructed using both top-down government and bottom-up villager contributions, and zero otherwise.

Columns (1) and (2) of Table 3, Panel B present estimates on the amount of district funds, while columns (3) and (4) presents estimates for *Govt and Own Village Funds*. Columns (1) and (2) estimate that chiefs raise more funds from district offices. Columns (3) and (4) estimate that development projects in *bengkok* villages are 12.4 to 14.2pp more likely to have been funded by both district funds and villager contributions. Together, these results suggest that *bengkok* chiefs are effective at raising funds from both top-down and bottom-up sources. They are also more effective at combining both sources of funds for development projects a and the provision of public goods.[52]

Did informal lobbying efforts extend to levels of government above districts? Panel C of Table 3 presents results on the level of Central and Provincial funds that a village obtained in 1996. There are small and statistically insignificant differences in these two sources of funding. This is in line with the political economy of this period, where the Provincial Government did not have large sources of discretionary funding and, as described above, Central Government funding was typically channeled through district offices.

2. Public Goods Provision Does more funding lead to greater public goods provision? Here, I focus on primary schools and infrastructural public goods for which chiefs play an important role. First, the provision of village primary schools (1983). The 1983 village census is the only round that reports the number of bottom-up (non-INPRES) vis-a-vis top-down (INPRES) primary schools. INPRES schools were constructed under large-scale central government efforts between 1973 and 1978 (Duflo, 2001). Hence, I interpret INPRES school construction as a measure of top-down government intervention.

The number of non-INPRES primary schools, in contrast, is a clean measure of chief effort and ability to rally villagers around the construction of an important village-level public good. Pre-INPRES, in the immediate post-colonial period (1945-1973), school construction was largely funded through local efforts. The Dutch and early post-Colonial governments constructed few, if any, primary schools (Djajadiningrat, 1940; Aritonang, 1994). The number of non-INPRES schools is important for two more reasons. First, timing-wise, it is the sole measure of chief effort during the immediate post-colonial period. Second, in combination with the 100% count Population Census data, I can trace the effects of village school construction efforts to as far back as the 1920s. I do so in Section 4.4.

[52]These results are consistent with studies in political science that emphasize the role of chiefs in the co-production of public goods (Baldwin, 2013, 2016)

Columns (1) and (2) in Table 4, Panel A show that *bengkok* villages have significantly higher levels of non-INPRES schools.[53] Reassuringly, Columns (3) and (4) find small and statistically insignificant differences in the number of INPRES schools. Columns (1) and (2) in Panel B reports estimates for a normalized index (Kling et al., 2007) of infrastructure public goods,[54] and shows a positive effect that is statistically significant at the 5% level.

[TABLE 4 ABOUT HERE]

Second, I analyze results on the provision of three types of infrastructural public goods: asphalt roads; access to safe water; and access to safe garbage disposal (1980-1996). Martinez-Bravo (2017) shows that chiefs played an important role in the provision of these public goods. Figure 5 plots the estimated index coefficient and the coefficients for each of the 3 infrastructural public goods. The point estimates for all 3 components are consistently positive – in particular, effects are concentrated on provision of asphalt roads and access to safe garbage disposal.[55] Taken together, positive results on non-INPRES schools and infrastructural public goods provide clear evidence that greater fund-raising efforts by *bengkok* chiefs have resulted in persistently higher public goods provision, both historically and today.

[FIGURE 5 ABOUT HERE]

3. Individual-level villager outcomes Does higher public goods provision lead to positive villager outcomes? Table 4, Panel C reports effects on education and, as a proxy for economic prosperity, an indicator that takes the value of 1 if a villager has an agricultural job (2000 Indonesian Population Census). Specifically, individuals whose primary occupation involves work on their own farm are coded as having an agricultural job. In line with the literature on structural transformation (see e.g. Herrendorf et al., 2014), I interpret a lower probability of having an agricultural job as an indicator of higher economic prosperity as villagers move from the lower-paying agricultural sector to the higher-paying manufacturing and services sector.

[53] To reduce the influence of outliers, I winsorize the top 95th percentile of village schools. Results remain qualitatively similar without this adjustment.

[54] These are access to safe water sources, presence of aspalt roads, and safe garbage disposal. I follow Martinez-Bravo (2017) in the construction of these variables.

[55] I view these results on infrastructure, however, as merely suggestive. Figure A.6 tests for robustness to alternative RD bandwidths and finds that, though the index coefficient remains positive, the difference is not always significant in the middle bandwidths. This result may be indicative of general equilibrium effects. Villages in the middle bandwidths on the non-*bengkok* side are slightly closer to a small city and more public goods constructed in these villages might be indicative of higher villager demand for connectivity to the city.

Columns (1) and (2) in Table 4, Panel C estimate that *bengkok* villagers have 0.30 to 0.42 more years of education relative to a mean of 7 years. Columns (3) and (4) estimate that *bengkok* villagers are somewhat less likely to hold an agricultural job but I view this result as suggestive, given that it is less precisely estimated in the wide bandwidth.[56] One possible reason for the lack of statistical significance might be due to supply constraints on the availability of non-agricultural jobs further away from the border. This would be consistent with the fact that villages in my sample become increasingly rural as we move further away from the border.

Figures 3 and 4 presents standard RD plots, with distance to border as the running variable and a local linear trend to each side of the discontinuity. For all relevant outcomes, except on the probability of having a non-agricultural job, we observe a clear discontinuity at the border.

[FIGURES 3 AND 4 ABOUT HERE]

Overall, I find evidence that chiefs from *bengkok* villages are more effective at both bottom-up fund-raising and top-down lobbying. In turn, these funds have been used for the construction of schools and infrastructural public goods which has translated into better outcomes for villages as a whole – individuals residing in *bengkok* villages have more years of education and are somewhat less likely to hold an agricultural job. In particular, the last set of results are consistent with recent work finding that increases in education have led to a global decline in agricultural employment (Porzio et al., 2022).

4.3 Robustness of Main Results

There are four main empirical concerns: Robustness to controlling for differences in ruggedness and potential wet rice yield; robustness to alternative RD specifications; the overlap between the study boundary and historical Dutch administrative borders; and the overlap between the study boundary and modern-day district borders. First, Section 3.3 documents potentially important baseline differences in ruggedness and potential wet rice yield. Tables A.4 and A.5 shows that results are robust to controlling for these differences.[57]

[56] Figure A.6 further shows that, though the coefficient on agricultural job remains negative, the estimated difference is not statistically significant across larger bandwidths.

[57] Unfortunately, I am unable to implement the procedure of Casey and Klemp (2021) due to the lack of historical, village-level data on the size of *bengkok* land awarded to chiefs in the early 19th-century.

Second, Tables A.6 and A.7 test robustness to a linear polynomial in latitude and longitude where $f(\text{location}_v)$ and $g(\text{location}_v)$ in equations (1) and (2) are modified to be a function of latitude and longitude and results are robust. In Figures A.5 and A.6, I show that the results are robust to alternative bandwidths, with the only exceptions, as described earlier, being that on *Infrastructure Index* and *Agricultural Job*.

Third, the study border overlaps with the historical Dutch administrative border of Cirebon–Priangan. Dutch administrative borders are defunct. My results may, however, reflect differences from the persistent effects of historical differences in Dutch extraction or infrastructure investment across my study border. To assess this, Table A.9 examines proxies for differences in colonial extraction and infrastructure across my study border in 1853, at the height of the colonial-period Cultivation System, and in 1945, just before the end of Dutch colonial rule, and shows that differences are minimal.[58]

The only statistically significant differences are in terms of the percentage of village land used to grow coffee in 1853 (Columns (3) - (4)). Reassuringly, coffee has not been grown in my sample villages, nor any part of Java, since the 1870s (Breman, 2016). Nonetheless, given recent evidence that historical coffee cultivation could exert negative effects on long-run development (Uribe-Castro, 2019), Table A.10 and A.11 tests and shows that results are robust to controlling for 1853 coffee cultivation.[59] Similarly, for completeness, Table A.12 and A.13 test and shows that results are robust to controlling for levels of infrastructure in 1945.

Fourth, the study boundary overlaps with a modern-day district border. This would be a concern if differences in contemporary outcomes are a result of differences in the differential top-down disbursement of funds to districts. To address this, I present three pieces of evidence. First, fieldwork suggests that the unilateral disbursement of public goods and funds from upper levels of government was extremely uncommon.[60] Second, given that the institution of *bengkok* preceded the formation of modern-day district boundaries (largely established post-independence in 1945), any observed differences could be interpreted as a downstream effect of *bengkok* chiefs on district

[58] I digitize both 1853 and 1945 measures from historical maps. Figure A.7 provides an example.

[59] In addition, I could control for additional proxies for historical intensity of agriculture and structural transformation between the mid 19th-mid 20th century. Unfortunately, pre-20th century measures of individual-level education or employment measures do not exist.

[60] Respondents frequently cited the need for chiefs to visit external village government offices to lobby for funds and public goods, without which "there would be no village development." This is reflected in my survey data, where 75% of all development projects constructed by chiefs were reported to have been secured through chiefs' lobbying efforts.

government behavior.

Nonetheless, it is possible that modern-day district cross-border differences of the magnitude of my estimates are sufficiently common to raise concerns about the validity of my interpretation. To assess this, I conduct a falsification exercise where I run my main specification, using district funds in 1996 as the outcome variable, across all adjacent, modern-day district boundary pairs on Java.[61] Figure A.8 shows that the estimated *bengkok* effect is located slightly below the 90th percentile of estimated effects across all modern-day district pairs. Magnitude-wise, the *bengkok* effect remains larger and more negative than that of most district pairs.

4.4 Intermediate Effects: Cohort-Level Educational Outcomes (1920-1980) Olson (1993)

We have found that *bengkok* villages have higher levels of historical schools and individuals living in these villages continue to have higher levels of education today. Given that many of these schools were constructed during the late colonial or early post-colonial period, it is natural to investigate if effects on years of education stretch back in time and, if so, how far back.

I dig deeper into the effects on historical villager education by using the 100% count sample of the 2000 Population Census to estimate cohort-level regressions.[62] Figure 6 plots cohort-level coefficient estimates. Across all cohorts, impacts on years of education are large and positive. Effects on earlier cohorts are slightly noisier due to the smaller sample size. In particular, cohorts born in 1920 – 1930, who completed their education in the complete absence of top-down school provision, have 0.6 more years of education relative to a mean of 3.6 years. These effects decrease somewhat across time but are still present in the most recent cohorts. Cohorts born in 1970 – 1975 have 0.3 more years of education relative to a mean of 6.9 years.[63]

[FIGURE 6 ABOUT HERE]

Historically positive effects on villager education are important for three reasons. First, given the absence of top-down intervention during this time period, higher villager education is a reflection of greater bottom-up village capacity and rules out differential top-down provision of educa-

[61] I describe this exercise in detail in Section B.1

[62] These are analogous to the cohort-level regressions on years of education estimated in Dell and Olken (2020). Specifically, I jointly estimate equation (1) and (2) beginning with the cohort born between 1920 and 1930, and ending with the cohort born between 1975 and 1980, the youngest cohort to have completed formal education by 2000.

[63] This fall in relative magnitudes might reflect the more recent, greater construction of INPRES schools in non-*bengkok* villages starting from the 1970s discussed in Section 4.2.

tional public goods. Second, these results are suggestive of *bengkok* land rents exerting a historically positive effect on the selection and incentives of chiefs, as far back as late-Dutch colonial rule. Third, up until 1979, chiefs were elected for life.[64] That we see positive *bengkok* effects accrue even in the absence of periodic elections, further clarifies the conditions under which Olson (1993)'s theory of stationary bandits holds. A sufficiently long time horizon is necessary but not sufficient in ensuring long-term performance; the further award of *bengkok* as explicitly giving chiefs a stake and encompassing interest in local development is essential to disciplining the incentives of "autocratic" leaders.

5 Testing Mechanisms with Fieldwork

I find a positive *bengkok* effect on contemporary chief performance and long-run development outcomes tracing as far back as the 1920s. Given *bengkok* still exists, this section uses rich, original survey data to disentangle, as best as possible, four contemporary mechanisms behind this relationship. Higher land rents may attract better quality chiefs *(political selection)*; incentivize chiefs seeking re-election to put in greater effort *(re-election incentives)* (Ferraz and Finan, 2009; Gagliarducci and Nannicini, 2013); lead to greater *political competition* (Besley et al., 2010a); or lead to greater *incentive alignment* between chiefs and villagers. That is, the within-village nature of *bengkok* rents might have attracted or aligned chiefs towards the interests of villagers (Baldwin and Raffler, 2019).

I find that *bengkok* led to positive political selection and greater incentive alignment. Higher *bengkok* land rents attracted higher quality chiefs who were more likely to have been ex-civil servants. In turn, these chiefs were better able to leverage their connections with upper tiers of government to provide more public goods. Furthermore, I find that *bengkok* attracted chiefs who are more pro-socially motivated and more likely to have derived income from rice land after assuming the chief position. I hypothesize that the alignment of income source between chiefs and largely rice-growing villagers could have led to a greater incentive for chiefs to provide public goods that are beneficial for both themselves and their villagers. In contrast, I find little evidence for re-election incentives or political competition.

[64] I discuss this further in Section 5.2.

5.1 Original Survey Data

Between January and May 2019, we conducted original village chief surveys to record the oral and written history for all post-1979 elections in 193 villages within 30 km of my study border. 1979 marked the implementation of the 1979 Village Law, which introduced regular, term-limited elections for chiefs of between 6 – 8 years each. The final dataset comprises detailed biographical information on all chiefs who ever ran for village office, including details on their education, occupation, land ownership, vote shares, term length, and completion.[65] For each regression table, Figure A.12 details if a variable is obtained from primary survey data or administrative data (e.g. the Indonesian Village Census or PODES) and describes the survey question from which each variable was constructed from.

Prior to implementation, I conducted qualitative fieldwork and pretesting of questionnaires, jointly with AKATIGA.[66] All our enumerators were well-trained locals who resided in each survey village and, throughout all interviews, consistently simulated a "conversation about village oral history." We interviewed 5 respondents per village and, to the best of our ability, interviewed all past and present village chiefs with quantitative, retrospective questionnaires embedded in qualitative interviews. If a chief had passed on or was no longer able to communicate, we interviewed village elders or officials who had lived under that chief's rule. This yielded a sample in which 33.5% of the respondents are past or present village chiefs.

There are two potential issues with retrospective data — recall bias and the possibility that an individual's response to questions varies systematically with local sociopolitical conditions. While it is impossible to rule these out, we control for them by collecting village administrative and archival records from village offices and village elders. We then cross-validated survey responses with both these records and the village census. Furthermore, survey responses were largely consistent across all 5 respondents in each village and almost all respondents seemed very open to our interviews. This is possibly because of the historical framing of our study and the conduct of conversational interviews within private residences.

[65] Existing data is limited to the education and age of chiefs starting from the 1986 Indonesian Village Census and the number of years that a chief had been in office in the 1992, 2000 and 2003 rounds.

[66] AKATIGA is an Indonesian NGO with extensive experience in studying rural poverty. This was done to determine how best to elicit responses to sensitive questions.

5.2 The Political Economy of Chief Elections: Term Length and Barriers to Entry

The practice of democratically electing village chiefs was a direct result of the low managerial capacity of the Dutch colonial state (Breman, 2016) and contrasts with other colonial settings where chiefs derived sole legitimacy from colonial authorities (Abraham, 2003).[67] The key difference between chief elections during the (early post-)colonial period, and today lies in term length. Under colonial rule, chiefs were elected for life. The 1979 Village Law amended this, stipulating that chiefs were to be elected to fixed terms of 6–8 years for a maximum of two terms.[68]

Ethnographic evidence suggests that villagers had relative autonomy in both who to vote for and choosing to run for elections (Antlöv, 1994). Running for the chief position, however, is one of the most expensive ventures in village society. Respondents report a mean campaign cost of 22 million Indonesian rupiah (IDR) ($1,466), and campaign costs as high as 400 million IDR ($26,667) in particularly fierce contests.[69] Husken (1994) describes village elections as "festivals of democracy": the entire election process takes less than thirty hours, during which the selection of candidates is announced, campaigning begins, and ballots are cast and counted in the village hall.

5.3 Political Selection, Re-Election Incentives, and Political Competition

For consistency with my results on chief performance and development, I focus on chief outcomes for all elections between 1979 and 1996.

1. Political Selection: Education and Occupation Table 5, Panel A estimates the *bengkok* effect on two measures of chief quality: years of education and an indicator variable that takes the value of 1 if a leader was a civil servant before running for office. Columns (1) and (2) estimate that a 1 hectare increase in *bengkok* is associated with an increase of 0.5–0.7 years of education. These effects, however, are not significant in the optimal bandwidth.

[TABLE 5 ABOUT HERE]

[67] Note that my analysis throughout this study refers to *desas* or rural villages where village heads are elected by popular vote and not *kelurahans* or urban villages in which village heads are appointed. In contrast, for example, Martinez-Bravo (2014) studies the effects of differences in political leanings between *desa* and *kelurahan* chiefs.

[68] This changed again in 2017. Today, chiefs are technically allowed to run for a third time as long as they step down a year before the third election is scheduled to take place.

[69] In the 1980s, Husken (1994) documents campaign costs ranging from 15 - 90 million rupiah ($8,000 - $50,000). A back-of-the-envelope calculation suggests that such high campaign costs would have made financial sense. The average *bengkok* chief in my sample earns $2,293 per year. Even without taking into account non-pecuniary returns (e.g. ego rents), total monetary earnings across a 8-year term would be $18,344.

Columns (3) and (4) examines the effects of *bengkok* on occupational selection. Since the likelihood of running for office is likely determined by outside options, it is useful to understand how formal compensation from the village chief position compares with that from the next-best outside options. The average annual remuneration of a *bengkok* chief is 34.4 million IDR ($2,293), approximately three times more than that of a non-*bengkok* chief, who earns 12.2 million IDR ($813). In comparison, the average annual salary of an Indonesian civil servant is 23.4 million IDR ($1,560),[70]

Given these differentials, I expect that a civil servant is more likely to run for office in a *bengkok* village. Indeed, I find strong evidence for this. An increase of 1 ha in *bengkok* land leads to a 12.1 to 27.8pp increase in the share of chiefs from a civil service background. Overall, these results suggest that *bengkok* remuneration is sufficiently high such that it attracts individuals who are more familiar with government bureaucracy and are hence, better able to leverage their knowledge and connections to provide village public goods.[71]

2. Re-election Incentives To what extent could better chief performance be driven by stronger re-election incentives from higher *bengkok* rents? Columns (1) and (2) in Panel B uses, as the dependent variable, an indicator that takes the value of one if an incumbent chief ran in the next election, immediately following from the end of his first term. The effects of *bengkok* are statistically insignificant and, if anything, are somewhat negative. This is unsurprising given the low mean: on average, only 22–28% of incumbent chiefs choose to run again for office.[72] Futhermore, the lack of re-election incentives is consistent with fieldwork. Respondents frequently cited long term lengths and low chief remuneration (in relation to heavy responsibilities) as to why they were reluctant to run for a second term.

3. Political Competition Having ruled out re-election incentives, I next test if *bengkok* had effects on political competition for the chief position. Higher political competition could have, in turn, disciplined *bengkok* chiefs into providing public goods more focused on growth and development (Besley et al., 2010b). Table 6 presents and finds no evidence of this mechanism across a range of

[70] Author's calculation from the 2010 Indonesian Work Force Labor Survey.

[71] An alternative interpretation: the election of higher quality chiefs is driven by either (i) a more educated electorate (voter-demand effects) and/or (ii) a higher quality pool of candidates (supply effects). In relation to (i), given that schools were constructed in chief-led efforts *after* the award of *bengkok* rights, I view a more educated electorate, as shown in Section 4.4 as an intermediate outcome and a direct effect of *bengkok*. Nonetheless, I could also control, respectively, for contemporaneous voter education and the quality of the candidate pool but I view these regressions as outside the scope of the current paper.

[72] On average, 66% of Italian mayors run for a second term, and 78% are re-elected (Gagliarducci and Nannicini, 2013). In Brazil, 75% of municipal legislators ran for a second term, and 40% were re-elected (Ferraz and Finan, 2009).

outcomes. Panels A and B shows that there are no statistically significant differences in the number of candidates running for chief elections (Panel A, Columns (1) and (2)) nor vote margins (Panel B, Columns (1) and (2)),[73] although there is a somewhat lower probability of *bengkok* elections being contested by a single candidate (Panel A, Columns (3) and (4)).

The lack of differences in observed political competition could, however, simply be a perverse result of *bengkok* leading to the entrenchment of traditional ruling families and the elite capture of elections (Acemoglu et al., 2014). This is unlikely given positive development outcomes. Nonetheless, in Panel B, Columns (3) and (4), I probe for this possibility by using, as a dependent variable, an indicator variable that equals 1 if villagers believe that a chief should belong to a traditional ruling family. Estimates are imprecise but suggest that *bengkok* villages are, if anything, somewhat less likely to hold this belief, suggesting that the lack of political competition is unlikely to be a spurious result of elite capture.

[TABLE 6 ABOUT HERE]

Figures A.9 and A.10 present standard RD plots. Consistent with the results in Tables 5 and 6, we observe, in Panel (b) of Figure A.9, a clear border discontinuity for whether a chief was a previous civil servant. In contrast, we do not observe a discontinuity for any other outcome. Results on whether a chief was a previous civil servant are robust to alternative RD specifications such as alternative bandwidths (Figure A.11) and a linear polynomial in latitude and longitude (Table A.8).

5.4 Discussion of Results: Economic embedded-ness and Pro-Social Motivation

Having documented positive political selection, an important question remains: why do *bengkok* chiefs continue to perform better, given that they were historically elected for life; there continues to be weak re-election incentives; and *bengkok* land is largely leased out to local villagers via fixed rental contracts? The within-village nature of *bengkok* suggests two possibilities: greater economic embedded-ness and pro-social motivation.

Economic Embeded-ness First, *bengkok* land is geographically located within the chief's village. Hence, the assumption of office and award of cultivation rights might lead to *bengkok* chiefs becoming more economically embedded in their villages. This would be in line with studies in

[73] Estimates on vote margins are slightly noisier given the inherent difficulty in asking respondents to recall precise vote margins in historical elections.

political science arguing that the derivation of income from community sources leads to stronger economic ties and incentive alignment (Baldwin and Raffler, 2019; Baldwin, 2016). For example, incentive alignment could take the form of chiefs investing more heavily in public goods construction (Munshi and Rosenzweig, 2015). I have documented quantitative evidence for this in terms of higher road construction (Section 4.2). Such investments would allow chiefs to both enjoy an uninterrupted flow of *bengkok* remuneration and villagers to potentially enjoy higher market prices for their rice harvest.

Pro-Social Motivation Second, the renting out of *bengkok* land to local villagers at below-market rates, appears to be a social obligation given (i) below-market rental rates; (ii) in-kind payments; and (iii) the tradition of *bengkok* land being subdivided into extremely small plots for rental to villager-tenants. First, primary survey data shows that nearly all chiefs rent *bengkok* land to villagers on fixed rental contracts at below-market rates (Table A.1). When asked why they chose these contracts, 65% of chiefs cited village traditions (to help villagers) (Table A.2).[74]. Second, villagers are typically allowed to make in-kind rental payments (of un-husked rice). It is well-documented that in broader agrarian economies in Southeast Asia, landlords often allow tenants to make in-kind payments in order to reduce the monetary and logistical costs in having to make up-front cash payments even before the rice harvest begins (Scott, 1985). Hence, allowing for in-kind *bengkok* rental payments could possibly serve a social welfare motive. Last, after sub-division of chief *bengkok* land, each villager rents in an average of 0.15ha. This is far below the average subsistence level for rice farmers on Java (Booth et al., 1990) and corroborates our qualitative fieldwork which finds that many *bengkok* tenants are poorer, land-less households.

Hence, taken together, I hypothesize that these characteristics of *bengkok* rents might have led to both higher economic embeded-ness and, paradoxically, the selection of more pro-socially motivated chiefs. The latter would be in line with a growing literature that emphasizes the role of non-monetary incentives in crowding in social preferences (Bowles and Polania-Reyes, 2012). Furthermore, empirical evidence suggests that, once in office, pro-socially motivated individuals might perform better (Deserranno, 2019; Finan et al., 2017) given the inherently pro-social mission of *bengkok* chiefs. To be clear: my setting does not allow me to cleanly distinguish between these two mechanisms. Instead, by exploiting rich primary survey data, I present evidence consistent

[74]This is consistent with a wider literature that suggests that such co-residency, landlord-tenant "discounts" are a widespread form of social obligation in Southeast Asia (Scott, 1985)

with both.

First, to test for greater economic embeded-ness, Table 7 shows that a *bengkok* chief is 6.0 to 7.2p.p. more likely than a non-*bengkok* chief, to have derived income from within-village rice-land after assuming office. Second, to measure pro-social motivation, I ask village chiefs: "What was your motivation for running for office."[75] I code a chief as being pro-socially motivated if their qualitative answer includes reasons related to "giving back to the community" and "contributing towards village construction". Figure 7 finds a positive correlation between pro-social motivation and the size of *bengkok* land.[76]

[TABLE 7 AND FIGURE 7 ABOUT HERE]

6 Conclusion

In this paper, I provide novel micro-level empirical evidence for the efficacy of paying chiefs higher land rents based on cultivation rights over a stable, within-village income-generating asset. Chiefs raise more community contributions through informal taxes, construct more public goods, and villagers writ large experience more positive development outcomes. In contrast to the large literature on indirect rule that emphasizes the extractive nature of traditional local governance, I document a rare case where the strengthening of local chief authority did not lead to worse outcomes. In fact, nearly 200 years later, *bengkok* continues to have a persistently positive effect on chief performance and economic development. This is striking given that the award of *bengkok* land took place during one of the most extractive colonial enterprises in history.

Using original survey data, I pin down three key mechanisms by providing evidence and arguing that the *within-village* nature of *bengkok* rents led to positive political selection, economic embeded-ness, and pro-social motivation. *Bengkok* chiefs have somewhat more years of education;

[75] I do not have sufficient observations to run an RD analysis as my sample size is limited compared to other outcomes. The reason being that we were unable to interview deceased or extremely old chiefs. Hence, for this outcome, I expand my analysis to include all curent and ex-village chiefs that ever took office, both pre- and post-2000 decentralization.

[76] This measure is possibly subject to social desirability bias but is the best we could obtain given logistical and funding constraints. A possible concern: *bengkok* chiefs simply exhibit differentially higher social desirability bias. Prima facie, there is no clear reason why this should be the case. All political leaders are possibly driven by an innate sense of social desirability and therefore, it is entirely possible that *bengkok* chiefs perform better precisely because of their having greater social desirability bias. Behavioral games would of course reduce this bias but would not completely remove it given *bengkok* chiefs are, on average, of higher quality and hence, might better understand the objective of these games. To that end, I interpret the positive slope here as reflecting both *bengkok* chiefs' higher pro-social motivation *and* greater social desirability.

are more likely to be ex-civil servants; more likely to derive their income from farm rents after assuming office; and, suggestively, more likely to cite pro-social motivations for running for office. Traditional norms are likely to play an important role in driving observed differences in political selection: nearly all chiefs rent out *bengkok* land to local villagers at discounted, in-kind, fixed rental contracts. Furthermore, after assuming office, the increase in the proportion of chiefs deriving income from rice-land is substantively higher in *bengkok* villages. Taken together, I hypothesize and provide novel evidence that the within-village nature of *bengkok* rents likely leads to greater *economic embeded-ness* (Baldwin and Raffler, 2019) of local leaders, thereby leading to greater incentive alignment and downward accountability.

My findings have direct implications for development policy. In Indonesia, under the 2014 Village Law Fund (*Undang-Undang Dana Desa 2014*), villages receive direct transfers of US$70,000 per village for development purposes. My findings suggest that concomitant increases in chief remuneration are a step in the right direction and highlights benefits that might accrue if similar attempts to raise chief remuneration in India and Africa are successful (Times of India, 2012; Daily Monitor, 2016). Crucially, I show that it might be worthwhile to consider introducing monetary incentives that explicitly tie leaders to the welfare of their constituents.[77]

[77] A case in point: An entry-level minister in Singapore, one of the richest city-states in the world, is paid (i) an annual "National Bonus" tied to four indicators: the real median income growth rate of Citizens; real growth rate of the lowest 20th percentile income of Citizens; unemployment rate of Citizens; and real GDP growth. (ii) A salary based on the median income of the top 1,000 Singaporean income earners, with a 40% discount applied to reflect the "ethos of public service" (Ee et al., 2012). Singapore has had one of the highest economic growth rates over the past half-century.

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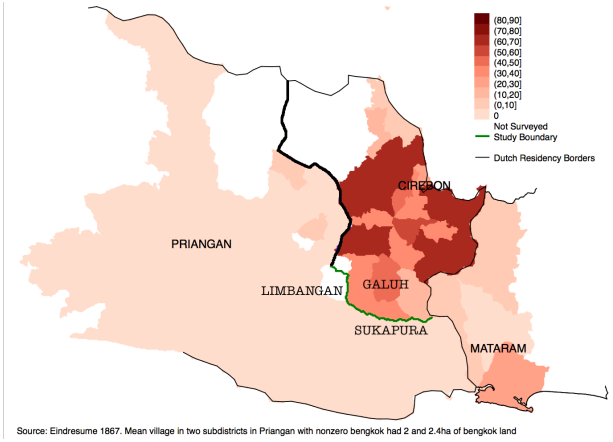
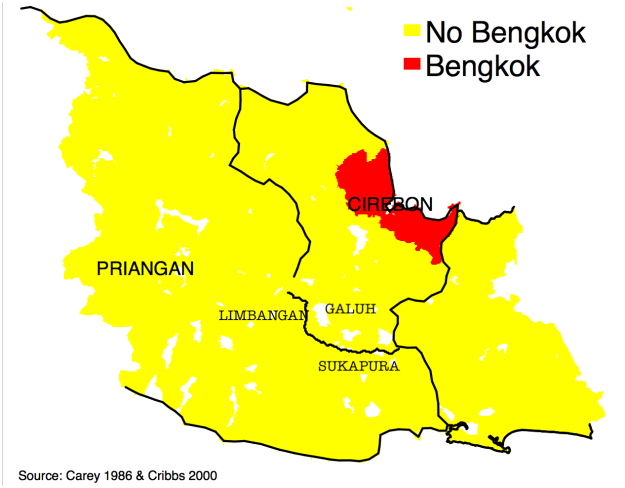
Figure 1: The Spread of *Bengkok* Land in West Java (Early to Mid-19th Century)

(a) Average *Bengkok* Land in each Village, Aggregated at the Sub-District Level 1867 (ha)



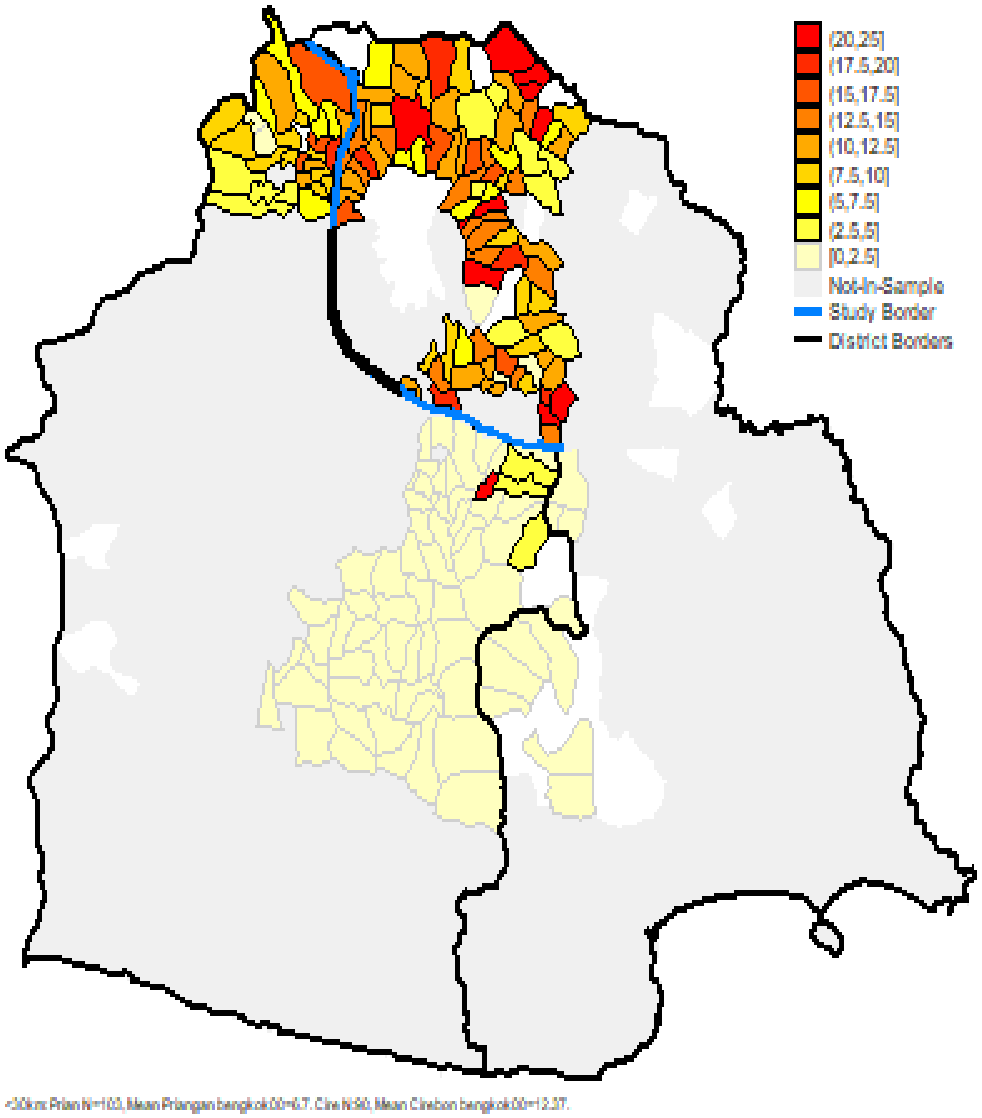
(b) Incidence of *Bengkok* Land in Cirebon–Priangan, Pre-1830



Notes: Secondary data on pre-2000 village-level *bengkok* land and breakdowns of *bengkok* land awarded to (non-)chiefs does not exist. Hence, this map plots the average, total size of *tanah bengkok* land at the village-level, across 1867 sub-districts. My study borders, along the southern-most portion of the Cirebon–Priangan boundary, are highlighted in green. I zoom in on these borders in Figure 2. *Source:* 1867 Dutch Eindresume archival data.

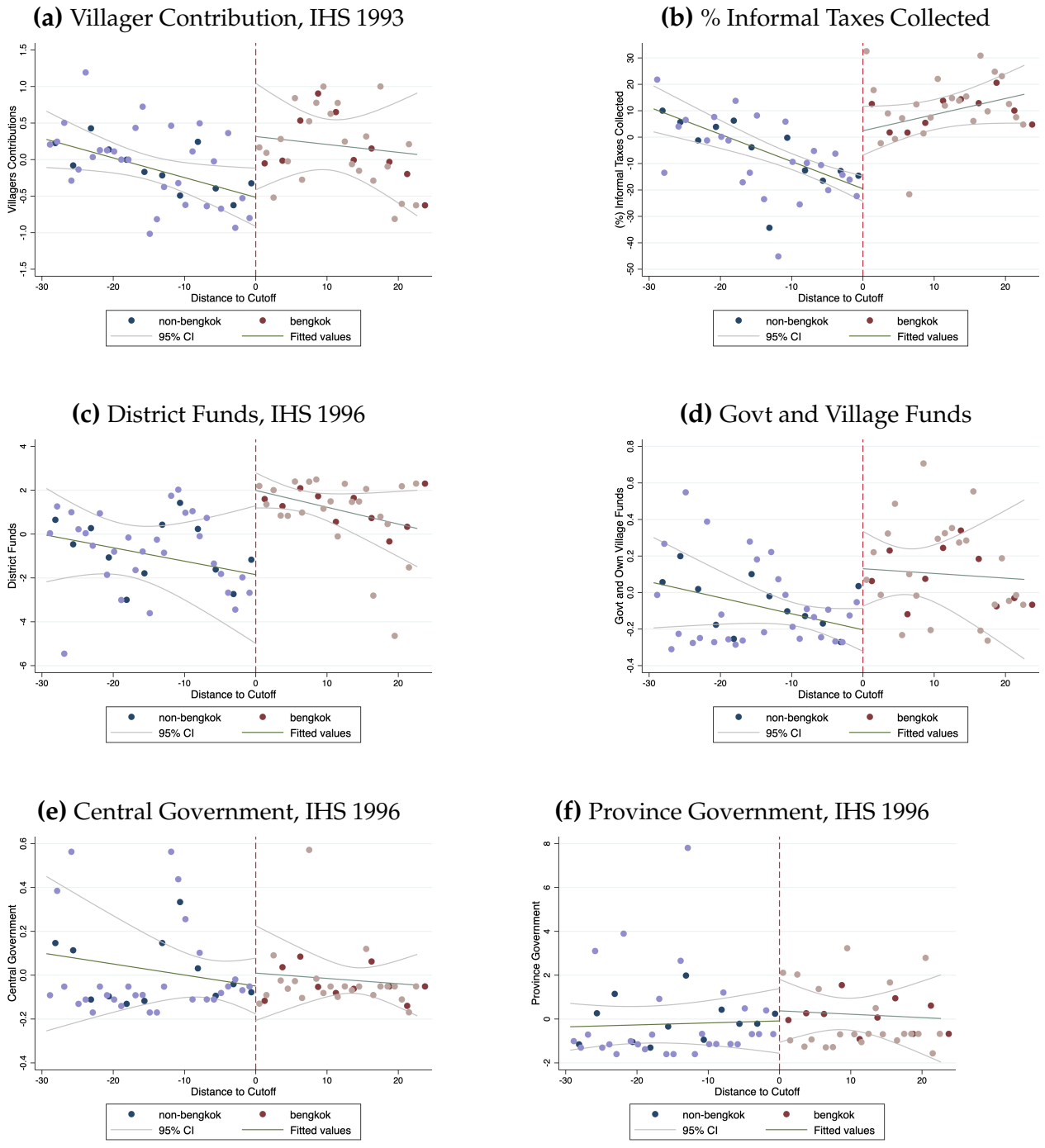
Notes: This map zooms in on the administrative units adjacent to the Cirebon–Priangan Residency border, highlighted in blue, in Figure A.1. The shaded colors in the background plot the geographical incidence of *tanah bengkok* prior to Dutch expansion of *bengkok* throughout Cirebon Residency in 1830. Areas shaded in red are those where *bengkok* was known to have been practised. Areas shaded in yellow are those where *bengkok* was not known to have practised nor existed. Hence, this map provides historical, graphical, evidence that prior to Dutch intervention in 1830, *bengkok* was known to have been practised only in and around the port city of Cirebon, the capital of Cirebon Residency (the areas shaded in red). Conversely, in the greater Cirebon Residency area, practice of *bengkok* was virtually unknown to both the Dutch administration and the local population (in areas away from the capital city of Cirebon, including those near my study border, highlighted in Figure 2). Similarly, it was virtually unknown throughout the entire Priangan Residency.

Figure 2: *Bengkok* Land in Sample Villages, 2000 (ha)



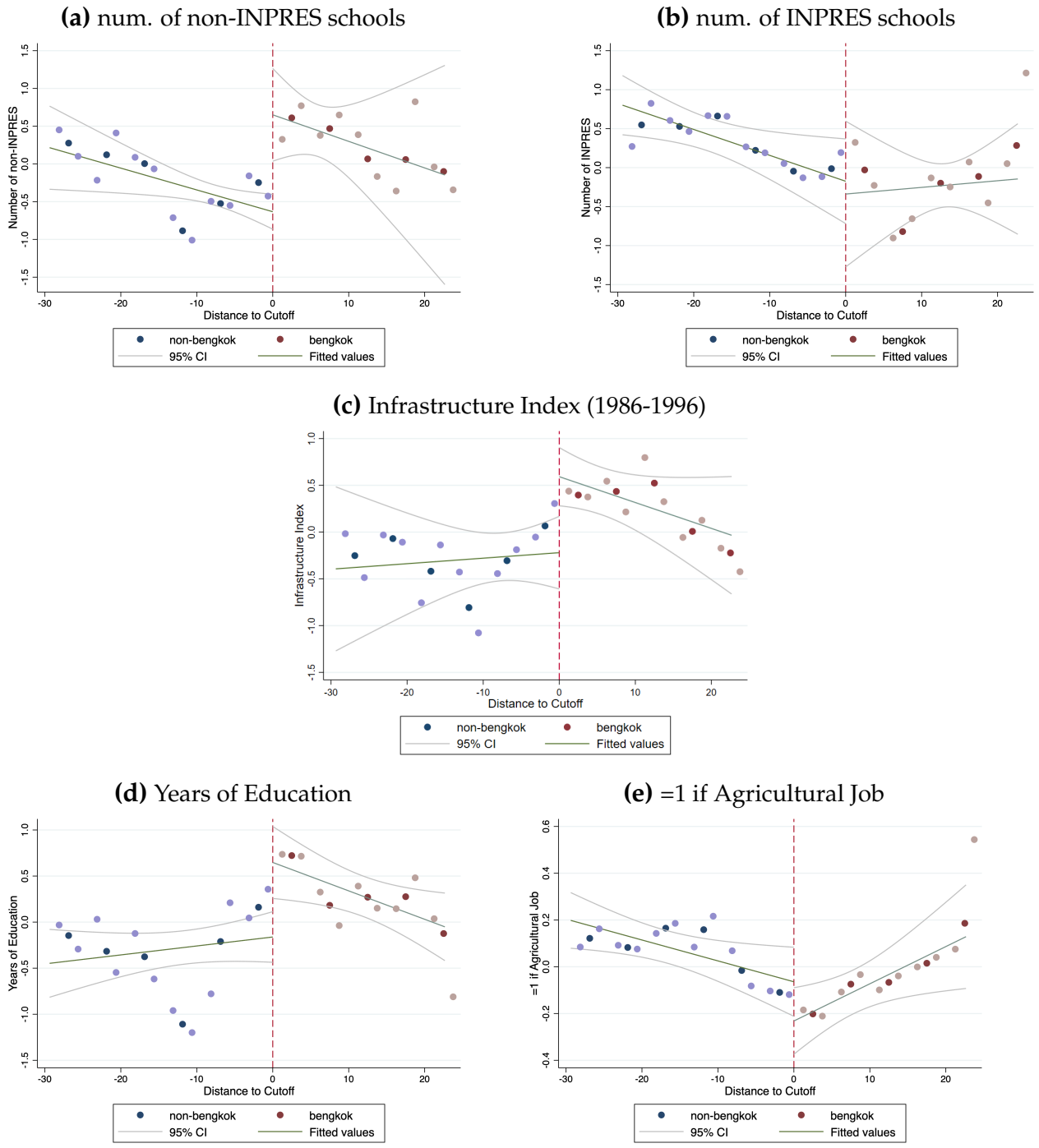
Notes: This map zooms in on the regions bordering my green study border in Figure 1a. All villages to the north of the study border lie in the historical region of Galuh. All villages to the west and south of the study border lie in the historical regions of, respectively, Limbangan and Sukapura. This map plots the total size of *tanah bengkok* land awarded to both chiefs and non-chiefs, at the village-level, across my study borders. Given the mountainous geography of this region, I restrict my study sample to villages across two segments of this border where there are no discontinuities in elevation. Hence, in grey, are villages not included in my study. In white, are mountains where no village settlement exists. Urbanized towns and cities are omitted given that settlements in these areas are organized under a different system of village administration.

Figure 3: RD Plots: *Bengkok* Villages and Village Funds



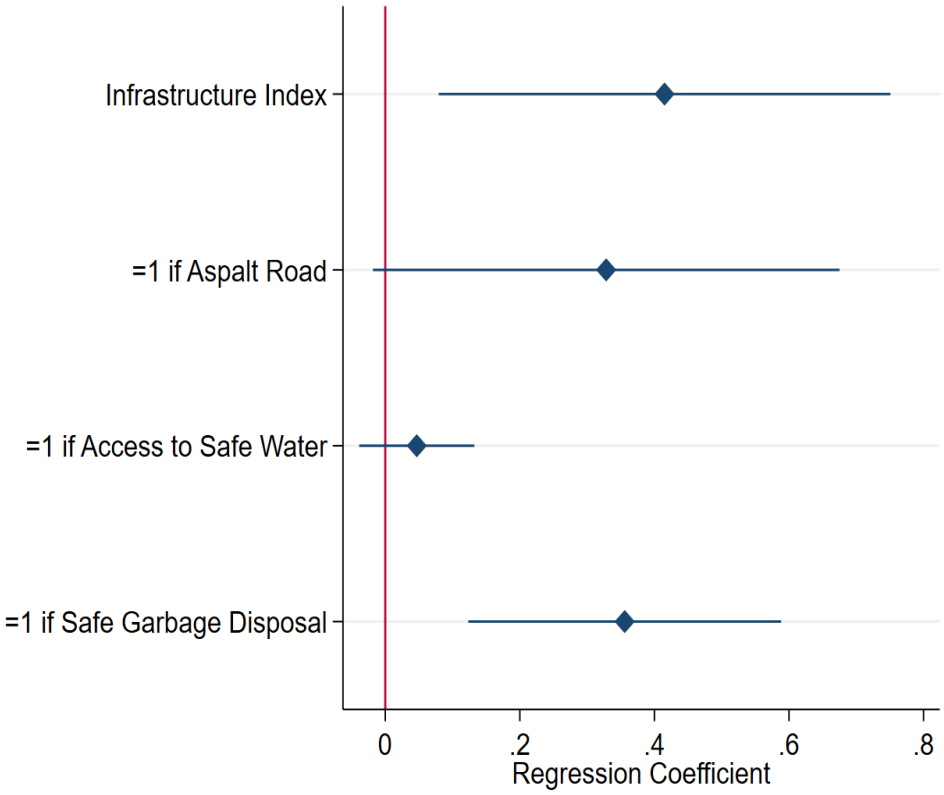
Notes: Darker (lighter)-shaded dots give the average value of the specified outcome variable for villages falling within 2.5km (1km) distance bins. Distance to cutoff refers to the distance between a village centroid and the closest point on the Cirebon–Priangan border, in kilometers. The dotted vertical line represents the Cirebon–Priangan border. Negative (positive) values of distance give the distance of villages South (North) of the Cirebon–Priangan border with villages to the North having had persistently larger plots of *bengkok* land. Solid line trends are predicted values from a regression of the specified variable on a linear polynomial in distance to the border that allows for a local linear trend estimated separately on each side of the discontinuity, uses a triangular kernel and a bandwidth of 30km. Each regression is jointly estimated following equations (1) and (2). All regressions control for whether a village had ever split, and include a nearest-border segment fixed effect. In addition, both Panel (b) and (d) controls for whether a chief's electoral term coincided with the end of Suharto rule. Panel (d) additionally controls for whether the development project was a road project, the most common type of project in our survey data. Standard errors clustered at the sub-district (*kecamatan*) level and figures show 95% confidence intervals. The order of these plots correspond to the order of outcomes in Table 3.

Figure 4: RD Plots: *Bengkok* Villages and Contemporary Development



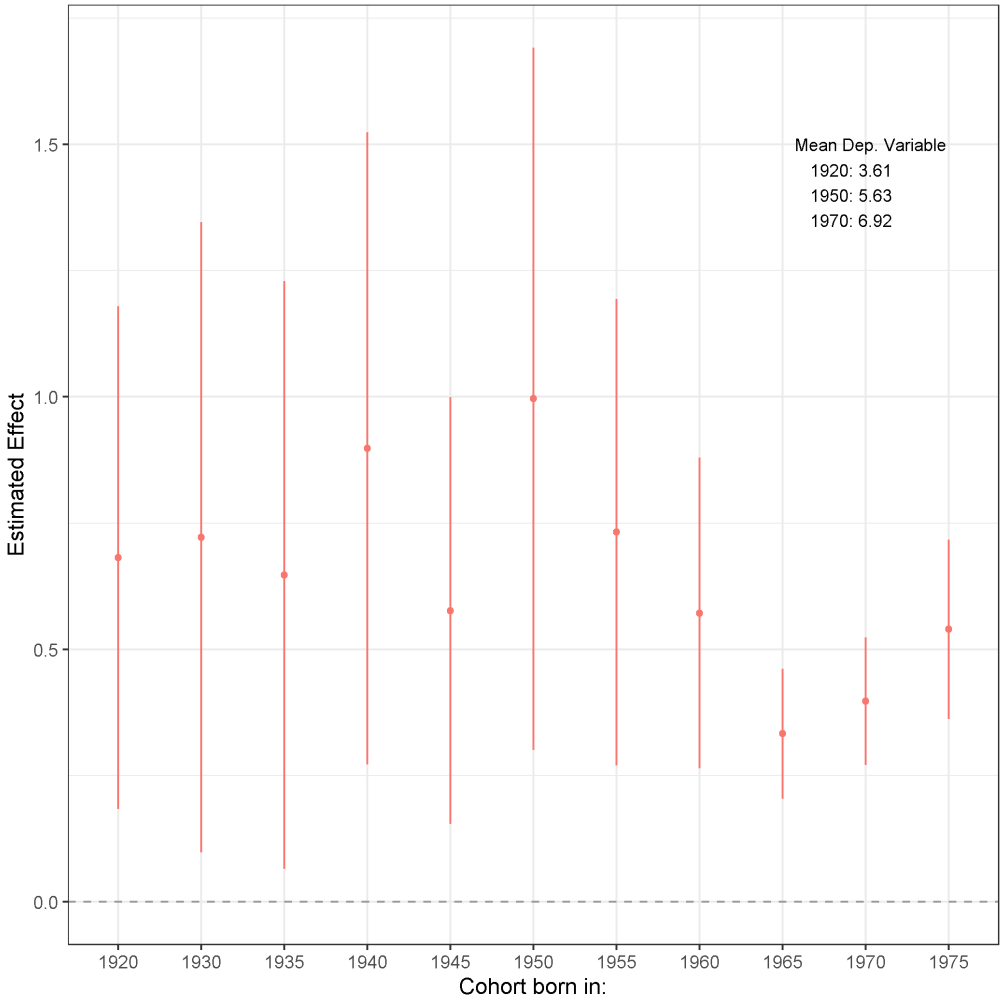
Notes: Darker (lighter)-shaded dots give the average value of the specified outcome variable for villages falling within 2.5km (1km) distance bins. Distance to cutoff refers to the distance between a village centroid and the closest point on the Cirebon–Priangan border, in kilometers. The dotted vertical line represents the Cirebon–Priangan border. Negative (positive) values of distance give the distance of villages South (North) of the Cirebon–Priangan border with villages to the North having had persistently larger plots of *bengkok* land. Solid line trends are predicted values from a regression of the specified variable on a linear polynomial in distance to the border that allows for a local linear trend estimated separately on each side of the discontinuity, uses a triangular kernel and a bandwidth of 30km. Each regression is jointly estimated following equations (1) and (2). All regressions control for whether a village had ever split and include a nearest-border segment fixed effect. In addition, the regression in Panel (c) control for survey year, and regressions in Panel (d) and (e) control for cohort-year and gender. Standard errors clustered at the sub-district (*kecamatan*) level and figures show 95% confidence intervals. The order of these plots correspond to the order of outcomes in Table 4.

Figure 5: *Bengkok* Villages and Infrastructure Public Goods Provision (1986-1996)



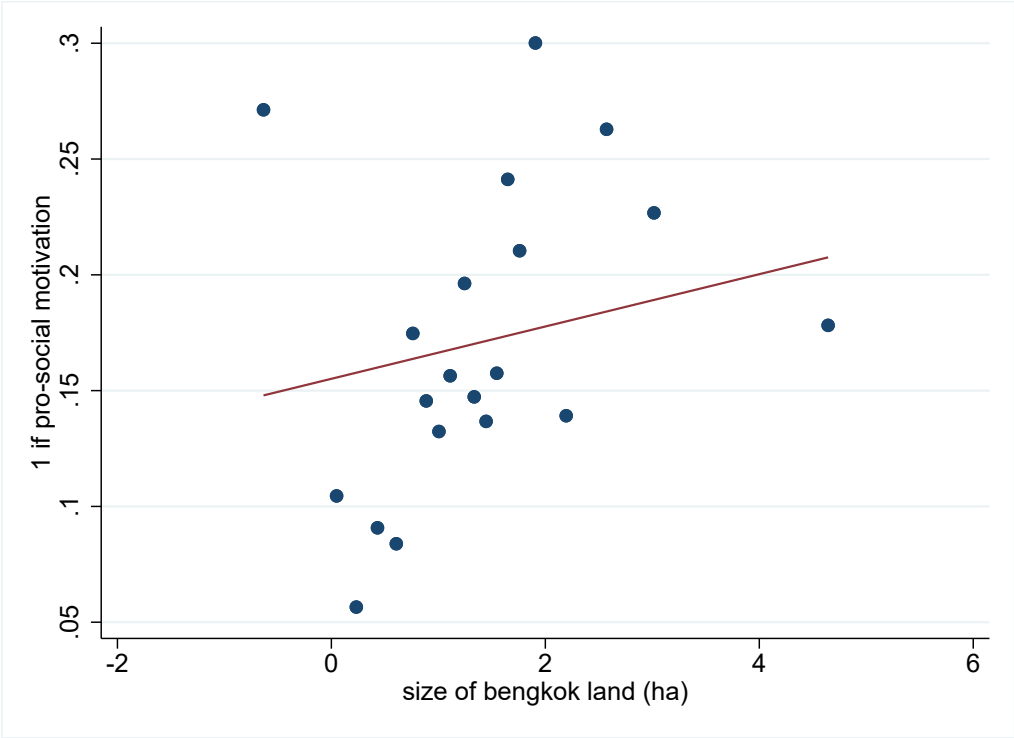
Notes: Infrastructure Index is constructed following Kling et al. (2007). Each public good outcome is standardized. Point estimates and 90% confidence interval shown in the figure are from a regression of the specified variable on a linear polynomial in distance to the border that allows for a local linear trend estimated separately on each side of the discontinuity, uses a triangular kernel, and the Calonico et al. (2014) optimal bandwidth. Each regression is jointly estimated following equations (1) and (2). Regressions control for whether a village had ever split, survey year, and include a nearest-border segment fixed effect. Standard errors are clustered at the subdistrict level.

Figure 6: Cohort-Level Differences in Years of Education of Villagers Across the *Bengkok* Boundary



Source: Census 2000 data. Each dot and solid line plots the point estimate and 90% confidence interval on Bengkok$_{fuzzy,v}$ from jointly estimating equations (1) and (2) at the individual-level and pooled at 5 year cohort-levels. First cohort pooled at 10-year level (1920-1930) due to the smaller cohort size. Each regression allows for a local linear trend estimated separately on each side of the discontinuity, uses a triangular kernel and the Calonico et al. (2014) optimal bandwidth. Each regression is jointly estimated following equations (1) and (2). All regressions control for whether a village had ever split, cohort-year, gender, and include a nearest-border segment fixed effect. Standard errors are clustered at the subdistrict level.

Figure 7: Correlation Plot: Pro-Social Motivation and Size of *bengkok* Land



Notes: On the y-axis: "=1 if pro-social motivation" is an indicator variable that takes the value of 1 if, in response to our question: "Why did you choose to run for office?", a past or current living chief answered that it was to give back to and/or serve the village(rs). Figure is a binscatter of "=1 if pro-social motivation" on the size of *bengkok* land that a village chief would stand to cultivate. Binscatter includes a border-segment fixed effect, a linear polynomial in latitude and longitude, and baseline controls of whether a village had ever split. The inability to interview dead or extremely old chiefs leads to a smaller sample size and hence, we include all chiefs that ever ran for office between 1979-2014 and include indicator variables for whether a chief's electoral term coincided with the end of Suharto rule, began between 2000 to 2009, or began after 2010.

Table 1: Balance on Geographic and Pre-Treatment Characteristics

	Within 30 km			Within 10 km			RD Estimates	
	North (1)	South (2)	Std. err. (3)	North (4)	South (5)	Std. err. (6)	RD coefficient (7)	Std. err. (8)
Geographic Characteristics:								
Elevation	497.36	432.04	(47.24)	452.88	442.36	(55.55)	10.14	(33.21)
Slope	25.36	28.48	(6.79)	19.99	18.74	(6.66)	0.34	(8.51)
Ruggedness	0.15	0.21	(0.04)	0.14	0.13	(0.03)	0.10	(0.06)*
Wet Rice Potential Yield (kg)	2161.30	2145.92	(5.84)*	2159.09	2151.89	(5.92)	-5.02	(2.01)**
Coffee Potential Yield (kg)	623.54	624.40	(3.32)	619.29	620.31	(3.91)	-3.06	(2.39)
> 0 *rivers*	0.45	0.60	(0.08)	0.51	0.60	(0.13)	0.07	(0.15)
Obs.	86	101		45	52		62	
Population Characteristics:								
Ethnic Sunda Share (%)	0.97	0.95	(0.01)**	0.97	0.95	(0.01)*	0.01	(0.02)
Obs.	54	65		36	52		59	
Population Density (1819)	0.22	0.27	(0.14)	0.24	0.31	(0.22)	-0.04	(0.28)
Obs.	14	10		11	6		24	

Note: For 1819 population density, unit of observation is at the sub-district level measured in terms of persons per hectare and RD estimates refer to entire 30 km bandwidth, given the small sample size in 1819. Source: 1819 Dutch archival records. Details of other variable sources are described in Appendix Table B.1. The unit of observation is at the village polygon level. Columns (1), (2), (4), and (5) present the mean of the variable. Columns (3) and (6) present clustered standard errors for difference in means clustered at the subdistrict level. North and South indicate whether a village is located north of my study boundary, i.e. a *bengkok* village, or south of my study boundary, i.e. a *non-bengkok* village. Columns (7) and (8) present the estimated RD coefficient and standard error using the corresponding variable as its outcome using a local linear specification estimated separately on each side of the study boundary and a triangular kernel. The RD MSE optimal bandwidth is determined using the procedure by Calonico et al. (2014). Column (7) uses the average of all optimal bandwidths (5.56 km). Controls include a border-segment fixed effect and whether a village had ever split.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2: First Stage Results: Jumps in Size of Chief *Bengkok* Across Historical Border

	Bengkok Size (ha) (1)	*Bengkok* Size (ha) (2)
T	2.408**	1.932***
	(1.025)	(0.577)
Distance	−0.111	0.026
	(0.125)	(0.017)
T * Distance	0.149	−0.088**
	(0.181)	(0.038)
Observations	67	186
Bandwidth	5.99	30.00
Mean Dep. Va	2.16	1.59

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification estimated separately on each side of the study boundary and use a triangular kernel. In Column (1), the narrow bandwidth of 5.99 is calculated by taking the average of all optimal Calonico et al. (2014) bandwidths across my main outcomes. Unit of observation is at the village level. Outcome in column (1) - (2) is the average size of *bengkok* land awarded to the elected chief as reported in our survey data. T is an indicator for whether a village is on the northern side of the historical Cirebon-Priangan border; "Distance" is distance to the closest border point in kilometers. Regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: *Bengkok* Villages and Village Funds

	(1)	(2)	(3)	(4)
Panel A: Informal Taxation	Villager Contributions, IHS 1993		% Informal Taxes Collected	
bengkok	0.387**	0.406**	28.001***	12.907***
	(0.156)	(0.198)	(10.728)	(4.816)
weak-instrument-robust p-value	[0.010]	[0.035]	[0.000]	[0.000]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	45	184	33	143
Clusters	10	22	8	20
Bandwidth	4.72	30.00	3.59	30.00
Mean Dep. Var.	10.92	11.17	58.79	67.13
Std. Dev. Var.	0.939	0.858	18.029	19.111
Mean Dep. Var. (RP)	40509	50694		
First Stage Effective F-stat	7.33	11.01	6.22	9.39
Underidentification Test, p-value	0.054	0.017	0.069	0.015

	(1)	(2)	(3)	(4)
Panel B: District-Level Funds	District Funds, IHS 1996		Govt and Own Village Funds	
bengkok	2.031**	1.990*	0.124	0.142**
	(0.977)	(1.057)	(0.077)	(0.067)
weak-instrument-robust p-value	[0.002]	[0.008]	[0.066]	[0.003]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	69	184	196	625
Clusters	11	22	11	22
Bandwidth	6.43	30.00	6.73	30.00
Mean Dep. Var.	4.77	5.26	0.21	0.26
Std. Dev. Var.	3.395	2.808	0.408	0.437
Mean Dep. Var. (RP)	2800	1363		
First Stage Effective F-stat	7.24	11.01	5.38	7.37
Underidentification Test, p-value	0.027	0.017	0.038	0.051

	(1)	(2)	(3)	(4)
Panel C: Central and Province	Central Government, IHS 1996		Province Government, IHS 1996	
bengkok	−0.018	0.007	0.033	0.159
	(0.015)	(0.049)	(0.297)	(0.510)
weak-instrument-robust p-value	[0.248]	[0.894]	[0.919]	[0.759]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	69	184	86	184
Clusters	11	22	11	22
Bandwidth	6.70	30.00	8.69	30.00
Mean Dep. Var.	9.45	9.48	1.06	1.04
Std. Dev. Var.	0.200	0.336	3.157	2.946
Mean Dep. Var. (RP)	6518	7179	2856	1570
First Stage Effective F-stat	7.24	11.01	7.16	11.01
Underidentification Test, p-value	0.027	0.017	0.016	0.017

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification estimated separately on each side of the study boundary and use a triangular kernel. Each regression is jointly estimated following equations (1) and (2). Optimal bandwidths are chosen following Calonico et al. (2014) and are reported in kilometers. Unit of observation is at the village level except for *% Informal Taxes Collected* which is at the village-chief level, and *Govt and Own Village Funds* which is at the village-chief, development-project level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression of *% Informal Taxes Collected* control for whether a chief's electoral term coincided with the end of Suharto rule and regression of *Govt and Own Village Funds* controls for both the former and whether a development project is a road project, the most common project in our survey data. *Villager Contributions* measures the amount of funds collected from villagers. *% Informal Taxes Collected* measures the percentage of informal taxes, collected successfully by village chiefs, as a percentage of their annual target. *District Funds* measures the amount of funds from district-level government sources. *Govt and Own Village Funds* equals one if a development project was constructed using both government and villager contributions, and zero otherwise. *Central Government* and *Province Government Funds* measures the amount of funds from Central and Provincial government sources, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: *Bengkok* Villages and Contemporary Development

	(1)	(2)	(3)	(4)
Panel A: Schools (1983)	num. of non-INPRES		num. of INPRES	
bengkok	0.323**	0.600***	0.272	0.061
	(0.136)	(0.176)	(0.190)	(0.192)
weak-instrument-robust p-value	[0.010]	[0.000]	[0.109]	[0.756]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	76	181	85	181
Clusters	11	22	11	22
Bandwidth	7.66	30.00	8.65	30.00
Mean Dep. Var.	2.55	2.47	1.16	1.38
Std. Dev. Var.	1.290	1.143	0.843	0.951
First Stage Effective F-stat	6.86	10.83	6.77	10.83
Underidentification Test, p-value	0.019	0.018	0.017	0.018

	(1)	(2)
Panel B: Infrastructure (1980-1996)	Infrastructure Index	
bengkok	0.356**	0.294**
	(0.165)	(0.122)
weak-instrument-robust p-value	[0.002]	[0.014]
Bandwidth choice	Optimal	Wide
Observations	106	358
Clusters	11	22
Bandwidth	5.32	30.00
Mean Dep. Var.	-0.04	-0.01
Std. Dev. Var.	0.884	0.969
First Stage Effective F-stat	8.56	11.91
Underidentification Test, p-value	0.059	0.018

	(1)	(2)	(3)	(4)
Panel C: Education & Prosperity	Years of Education		=1 if Agricultural Job	
bengkok	0.421***	0.302**	−0.080***	−0.052
	(0.078)	(0.125)	(0.029)	(0.035)
weak-instrument-robust p-value	[0.001]	[0.048]	[0.010]	[0.130]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	60822	246734	40165	181635
Clusters	10	22	10	22
Bandwidth	4.81	30.00	4.86	30.00
Mean Dep. Var.	7.17	6.77	0.23	0.40
Std. Dev. Var.	3.165	2.860	0.423	0.489
First Stage Effective F-stat	12.19	11.37	14.94	14.34
Underidentification Test, p-value	0.062	0.017	0.060	0.010

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification estimated separately on each side of the study boundary and use a triangular kernel. Each regression is jointly estimated following equations (1) and (2). Optimal bandwidths are chosen following Calonico et al. (2014) and are reported in kilometers. Unit of observation in Panels A and B is at the village level. Unit of observation in Panel C is at the individual, villager-level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression in Panel B controls for survey year. Regressions in Panel C control for cohort-year and gender. *num. of non-INPRES* measures the number of bottom-up village schools. *num. of INPRES* measures the number of top-down, Central government-constructed schools. *Infrastructure Index* is comprised of three variables indicating the presence of safe water sources, aspalt road, and safe garbage disposal between 1986-1996. I construct this index following (Kling et al., 2007) by standardising each variable, averaging across all three standardised variables, and standardising the average. *Years of Education* measures the number of years of education for all individuals aged 21-40 years old. *=1 if Agricultural Job* is an indicator variable that takes the value of 1 if an individual has an agricultural job and 0 otherwise, for all individuals aged 21-40 years old.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: *Bengkok* Villages, Political Selection and Re-election Incentives

	(1)	(2)	(3)	(4)
Panel A: Chiefs	Years of Education		=1 if Civil Servant	
bengkok	0.504	0.698**	0.278***	0.121**
	(0.355)	(0.349)	(0.036)	(0.054)
weak-instrument-robust p-value	[0.163]	[0.020]	[0.000]	[0.000]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	78	247	60	247
Clusters	11	22	9	22
Bandwidth	5.46	30.00	4.31	30.00
Mean Dep. Var.	9.56	9.53	0.13	0.13
Std. Dev. Var.	3.022	2.914	0.343	0.336
First Stage Effective F-stat	12.31	7.86	19.48	8.33
Underidentification Test, p-value	0.039	0.030	0.050	0.027

	(1)	(2)
Panel B: Re-Election Incentives	=1 if incumbent ran	
bengkok	−0.025	−0.091*
	(0.066)	(0.048)
weak-instrument-robust p-value	[0.722]	[0.058]
Bandwidth choice	Optimal	Wide
Observations	101	290
Clusters	11	22
Bandwidth	5.92	30.00
Mean Dep. Var.	0.22	0.28
Std. Dev. Var.	0.415	0.448
First Stage Effective F-stat	9.13	9.26
Underidentification Test, p-value	0.029	0.018

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification estimated separately on each side of the study boundary and use a triangular kernel. Each regression is jointly estimated following equations (1) and (2). Optimal bandwidths are chosen following Calonico et al. (2014) and are reported in kilometers. Unit of observation is at the village chief level. All regressions control for an indicator that equals 1 if a village had ever split, whether a chief's electoral term coincided with the end of Suharto rule, and a border segment fixed effect. *Years of Education* measures the number of years of education of a village chief. *=1 if Civil Servant* takes the value of 1 if a chief worked in the civil service before becoming a chief, and 0 otherwise. *=1 if incumbent ran* takes the value of 1 if a chief re-ran for elections in the subsequent term.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: *Bengkok* Villages and Political Competition

	(1)	(2)	(3)	(4)
Panel A: Political Competition I	Num. of Candidates		=1 if sole candidate	
bengkok	0.016	−0.030	−0.064*	−0.048
	(0.136)	(0.065)	(0.036)	(0.055)
weak-instrument-robust p-value	[0.92]	[0.65]	[0.07]	[0.36]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	78	247	91	247
Clusters	11	22	11	22
Bandwidth	5.31	30.00	6.15	30.00
Mean Dep. Var.	2.14	2.20	0.18	0.17
Std. Dev. Var.	0.908	0.839	0.383	0.373
First Stage Effective F-stat	12.71	8.27	8.69	8.27
Underidentification Test, p-value	0.042	0.027	0.026	0.027

	(1)	(2)	(3)	(4)
Panel B: Political Competition II	Difference in Vote Shares		Trad. Belief in Chief Ancestry	
bengkok	−0.582	1.026	0.012	−0.169*
	(0.999)	(1.868)	(0.066)	(0.099)
weak-instrument-robust p-value	[0.602]	[0.587]	[0.866]	[0.010]
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	40	155	71	181
Clusters	9	20	11	21
Bandwidth	4.56	30.00	5.83	30.00
Mean Dep. Var.	22.13	26.60	0.21	0.18
Std. Dev. Var.	15.902	16.492	0.411	0.387
First Stage Effective F-stat	5.17	13.15	6.63	6.06
Underidentification Test, p-value	0.046	0.020	0.029	0.042

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification estimated separately on each side of the study boundary and use a triangular kernel. Each regression is jointly estimated following equations (1) and (2). Optimal bandwidths are chosen following Calonico et al. (2014) and are reported in kilometers. Unit of observation for regression of *Trad. Belief in Chief Ancestry* is at the village-level. Unit of observation for all other regressions is at the village-chief election level. All regressions control for an indicator that equals 1 if a village had ever split, whether a chief's electoral term coincided with the end of Suharto rule, and a border segment fixed effect. *Num. of Candidates* measures the number of candidates that ran for election. *=1 if sole candidate* takes the value of 1 if an election was uncontested. *Difference in Vote Shares* measures the vote margin between the winning chief and the runner-up. *Trad. Belief in Chief Ancestry* takes value of 1 if villagers typically believe that a chief should belong to a traditional ruling family.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: *Bengkok* Villages and Proportion of Chiefs Whose Income Source Includes Rice Land After Assuming Office

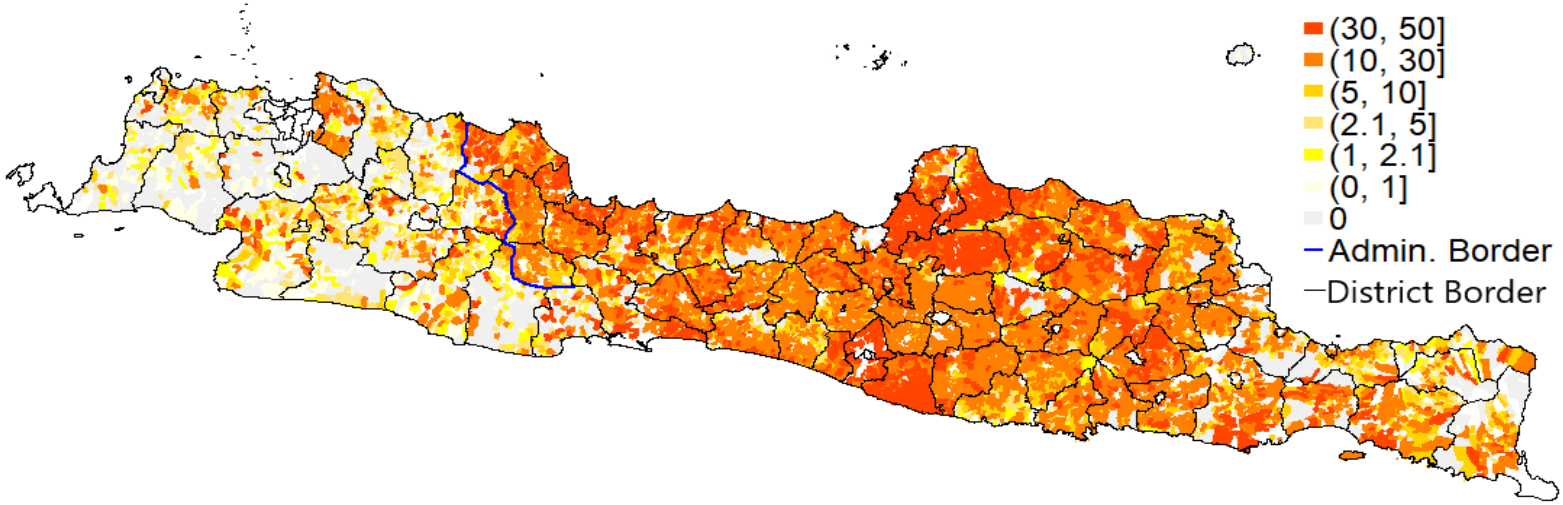
	=1 if rice-land income (1)	=1 if rice-land income (2)
bengkok	0.057**	0.069**
	(0.023)	(0.027)
weak-instrument-robust p-value	[0.012]	[0.000]
Bandwidth choice	Optimal	Wide
Observations	117	238
Clusters	11	22
Bandwidth	8.10	30.00
Mean Dep. Var.	0.95	0.96
Std. Dev. Var.	0.222	0.191
First Stage Effective F-stat	7.90	7.94
Underidentification Test, p-value	0.022	0.028

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification estimated separately on each side of the study boundary and use a triangular kernel. Each regression is jointly estimated following equations (1) and (2). Optimal bandwidths are chosen following Calonico et al. (2014) and are reported in kilometers. Unit of observation is at the chief level. All regressions control for an indicator that equals 1 if a village had ever split, whether a chief's electoral term coincided with the end of Suharto rule, and a border segment fixed effect. *=1 if rice-land income* takes the value of 1 if a chief derived income from rice-land after entering office.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

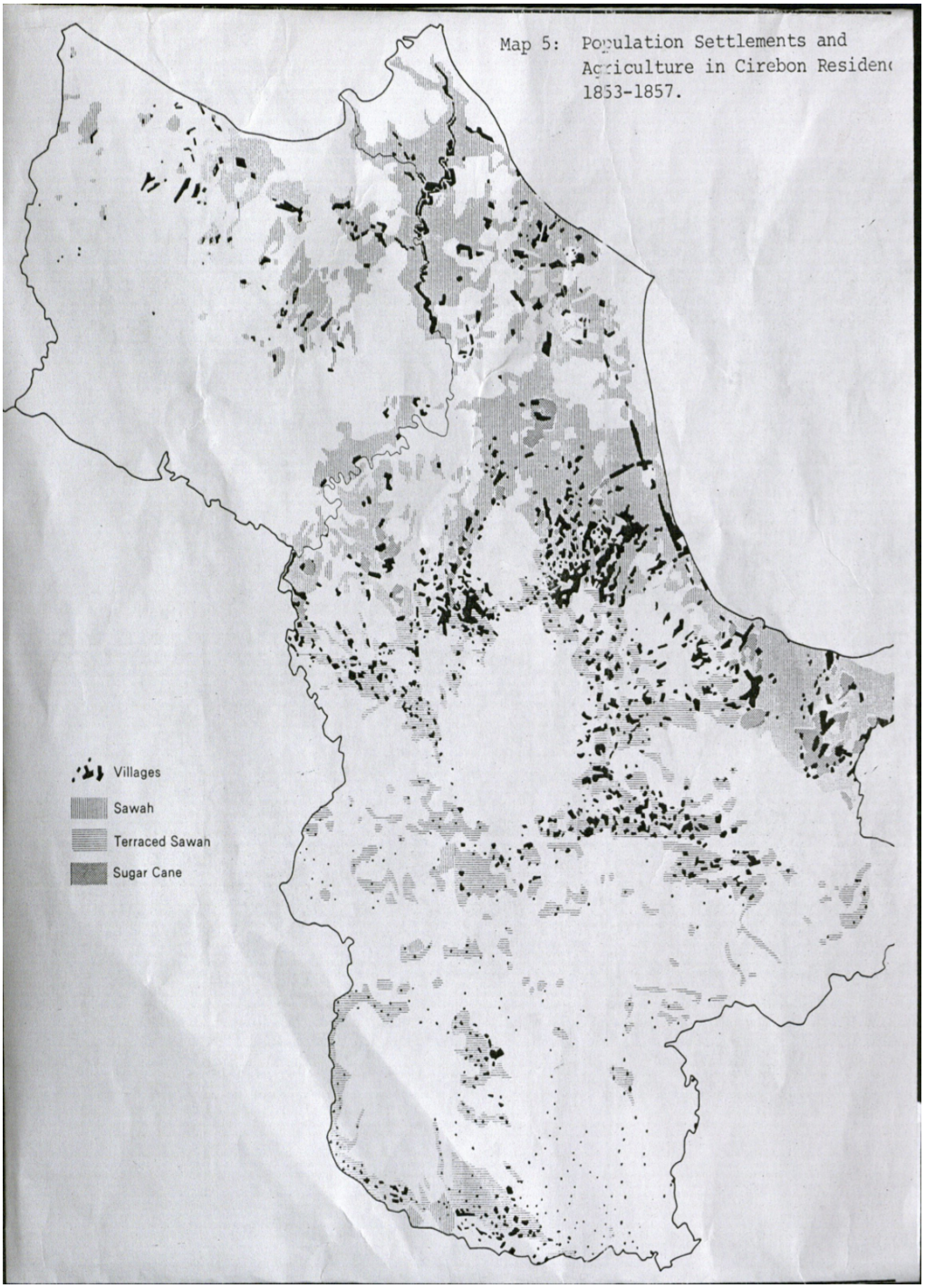
Appendix Tables and Figures

Figure A.1: Bengkok Land in each village, 2000 (ha)



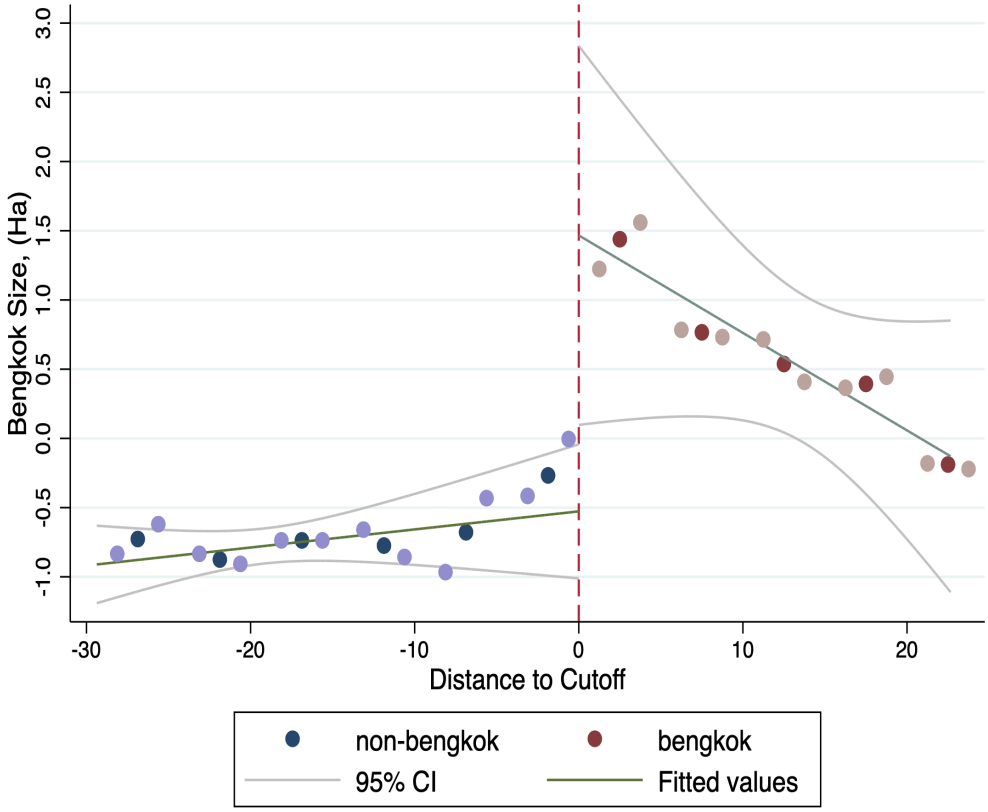
Notes: This map plots the size of *tanah bengkok* land, at the village-level, across the entire island of Java, the most populous island in Indonesia. The full Cirebon–Priangan Residency border is highlighted in dark blue. Residencies are deprecated Dutch administrative units and hence, these borders no longer demarcate separate Dutch Residencies. Parts of this deprecated border, however, continues to overlap with modern-day district borders. I address this issue in Section 4.3. In addition, for identification in a fuzzy regression discontinuity setting, I compare areas to the North (Cirebon) and South (Priangan) of the southernmost third of the Cirebon–Priangan border, a frontier region where historical evidence suggests that areas to the North and South were largely similar on pre-treatment characteristics. I provide quantitative evidence in support of this in Section 3.3. I zoom in on my study border and sample villages, progressively from more distant time periods to the present, in Figures 1b, 1a, and 2.

Figure A.2: Map of Agricultural Cultivation in Cirebon Residency, 1853



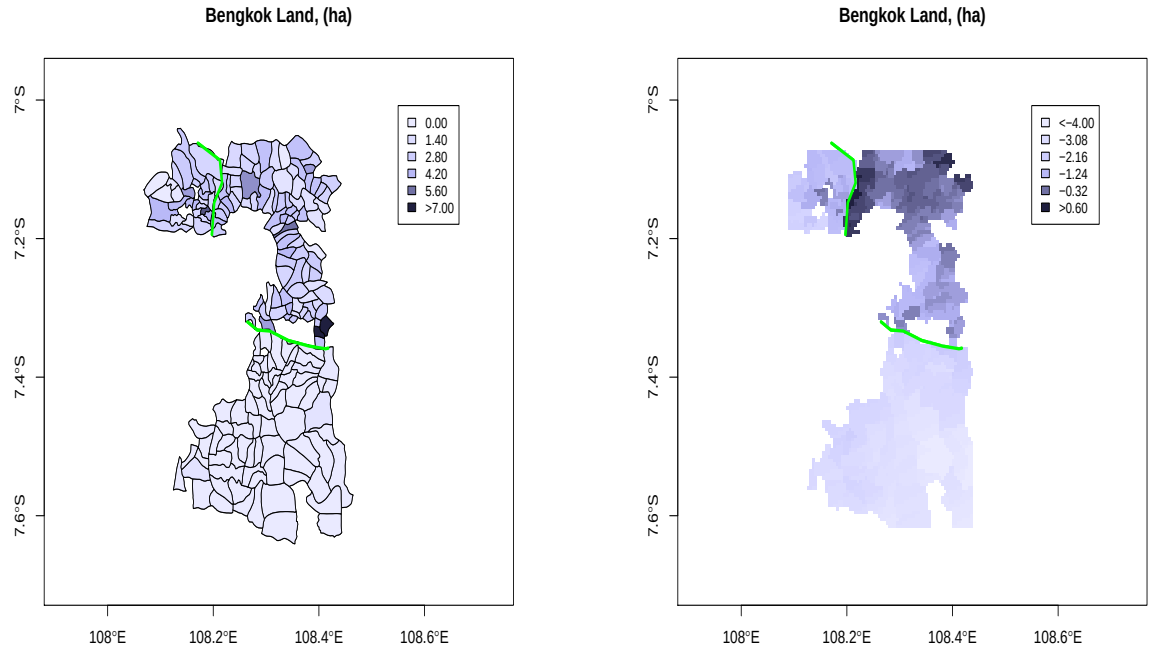
This map shows, shaded in dark grey, that there was no sugar cultivation along my study border in the south of Cirebon. The only pockets of sugar cane cultivation lay along the middle portion of the Cirebon–Priangan border and in Central Cirebon, away from my study border. Source: Fernando (1982).

Figure A.3: First-stage 2D RD Graph: Size of *Bengkok* Land Awarded to Chiefs, conditional on distance to the border (Bandwidth 30km)



Notes: The figure presents RD plots for the size of *tanah bengkok* land (in hectares) awarded to chiefs (i.e. first-stage results). Darker (lighter)-shaded dots give the average value of the specified outcome variable for villages falling within 2.5km (1km) distance bins. Distance to cutoff refers to the distance between a village centroid and the closest point on the Cirebon–Priangan border in kilometers. The dotted vertical line represents the Cirebon—Priangan border. Negative (positive) values of distance give the distance of villages South (North) of the Cirebon–Priangan border with villages to the North having had persistently larger plots of *bengkok* land. Solid line trends are predicted values from a regression of the specified variable on a linear polynomial in distance to the border that allows for a local linear trend estimated separately on each side of the discontinuity, uses a triangular kernel and a bandwidth of 30km. Regressions control for whether a village had ever split and include a nearest-border segment fixed effect. Standard errors are clustered at the subdistrict level and the figures show 95% confidence intervals.

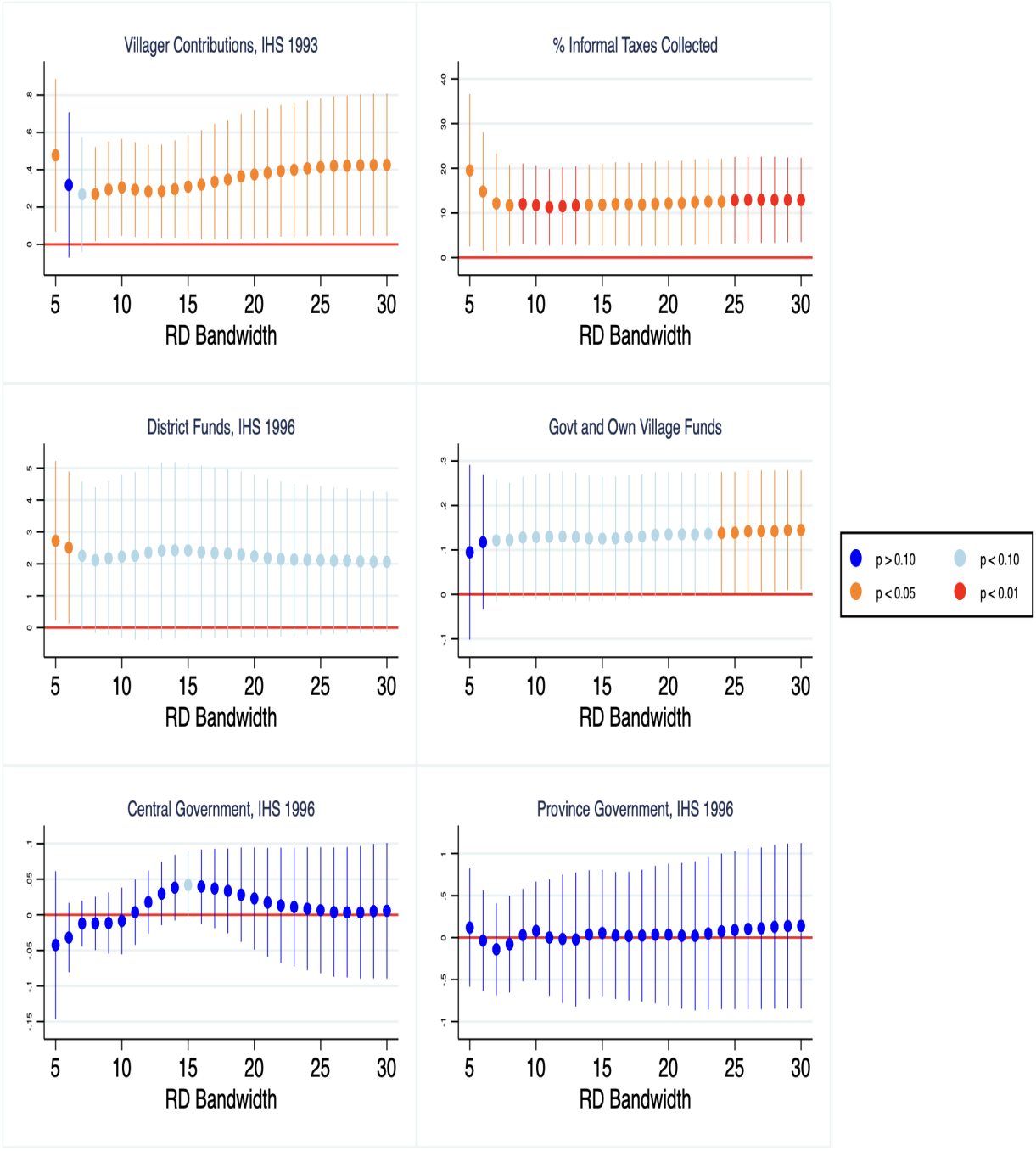
Figure A.4: First-stage Spatial RD Graph: Actual vs Predicted Y Values of Size of *Bengkok* Land Awarded to Chiefs



(a) Actual **(b)** Predicted

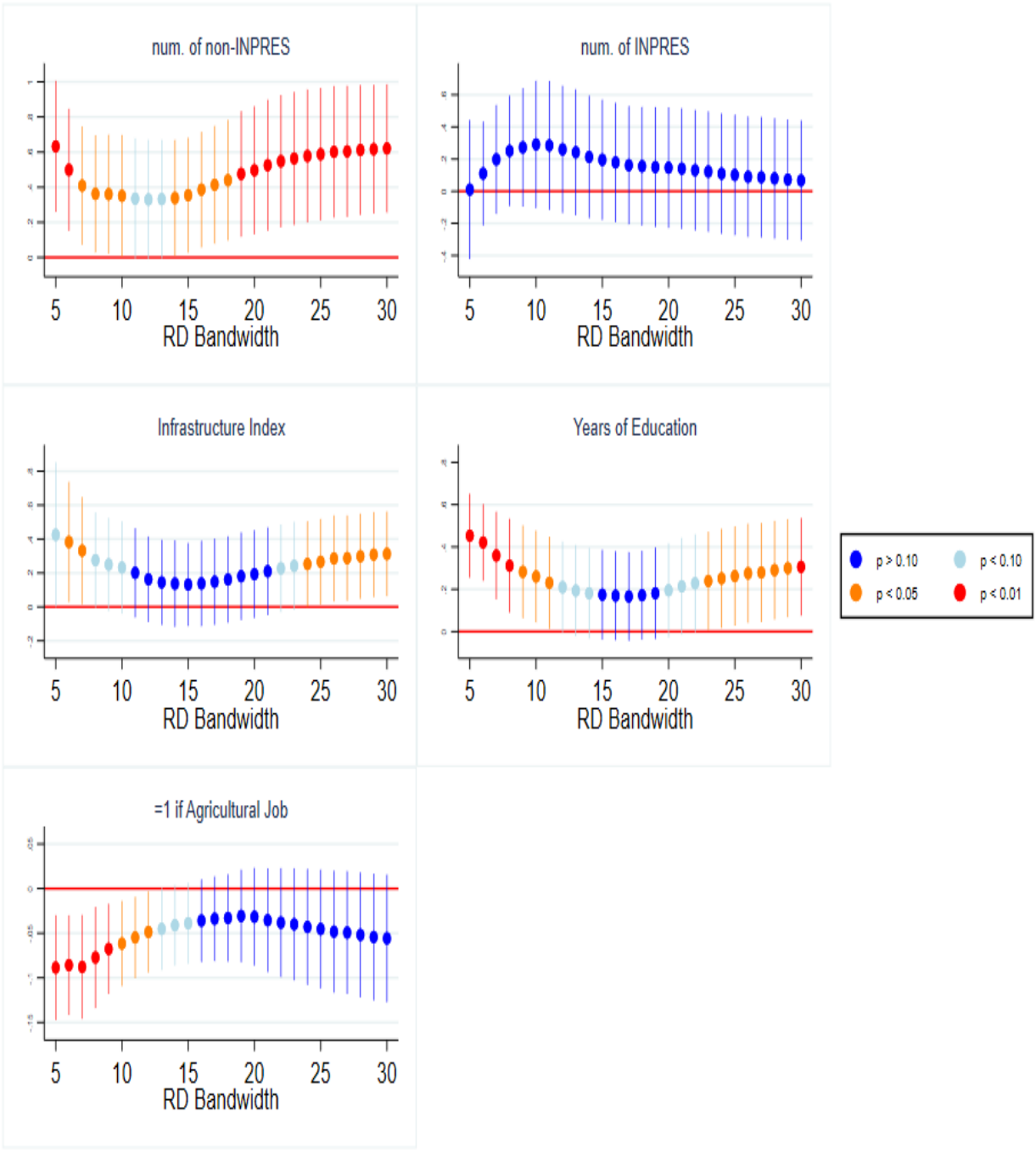
Notes: Longitude is on the x-axis, latitude is on the y-axis, and the data value is shown using an evenly-spaced monochromatic color scale. Figure A shows actual data values plotted at the village-level. Figure B shows predicted values, for a finely spaced grid of longitude-latitude coordinates, from a regression of the size of *bengkok* land awarded to chiefs, on latitude, longitude, an indicator for being on the Cirebon side of the border, whether a village had ever split and a nearest-border segment fixed effect.

Figure A.5: *Bengkok* Villages and Village Funds: Robustness to RD Bandwidth



Notes: Standard errors clustered at the sub-district level. All regressions include a local linear specification estimated separately on each side of the Cirebon–Priangan boundary. All regressions control for whether a village had ever split, and include a nearest-border segment fixed effect. In addition, both Panel (b) and (d) controls for whether a chief's electoral term coincided with the end of Suharto rule. Panel (d) additionally controls for whether the development project was a road project, the most common type of project in our survey data. Regressions use a triangular kernel following Cattaneo et al. (2019). Figure shows point estimates and 95% confidence intervals.

Figure A.6: *Bengkok* Villages and Contemporary Development: Robustness to RD Bandwidth

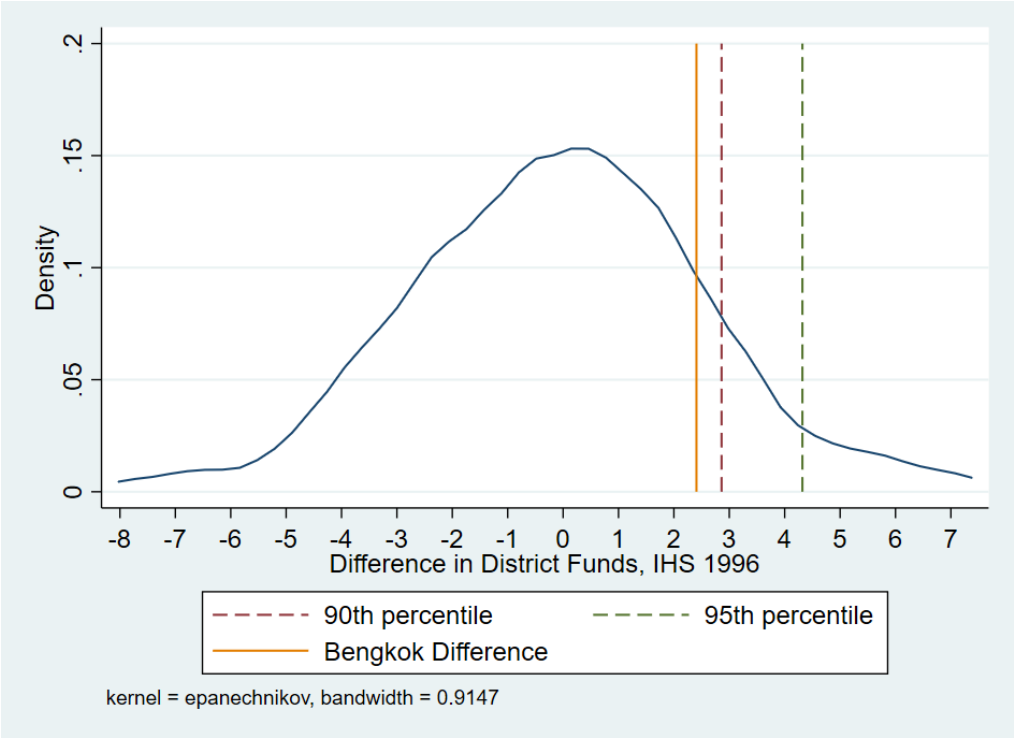


Notes: Standard errors clustered at the sub-district level. All regressions include a local linear specification estimated separately on each side of the Cirebon–Priangan boundary. All regressions control for whether a village had ever split and nearest border segment fixed effects. In addition, individual-level regressions of *years of education* and *agricultural job*, control for gender and age-cohort. Regression of *infrastructure index* controls for survey year. All regressions use a triangular kernel following Cattaneo et al. (2019). Figure shows point estimates and 95% confidence intervals.

Figure A.7: 1853 Dutch Maps

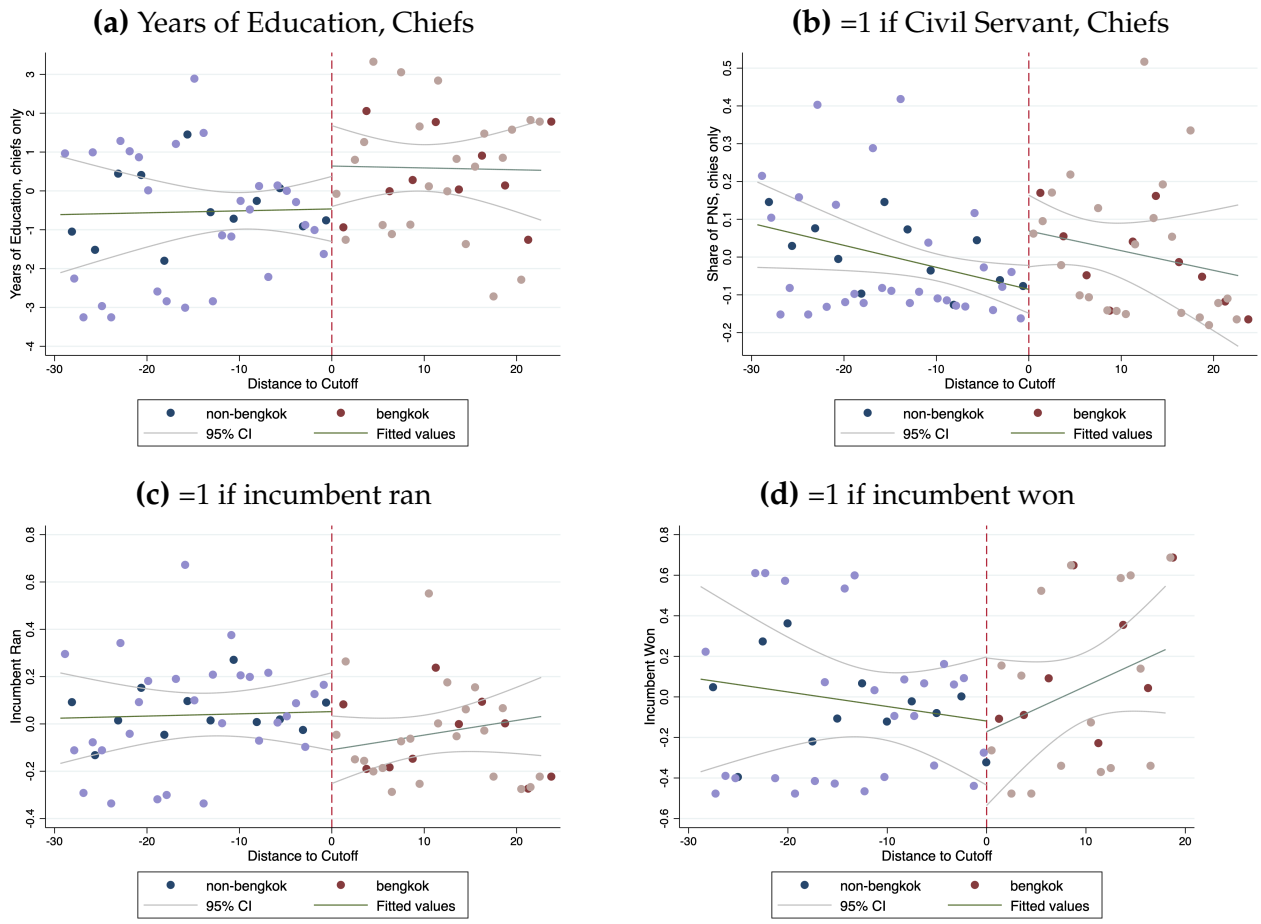
These maps were created by Dutch cartographers simultaneously with a village-level land use survey at a scale of 1:2 500 (1cm to 25m). Reproduction was allowed only after those in charge of statistical survey declared that land use was displayed correctly.

Figure A.8: Differences in District Funds, IHS 1996: Neighboring District-Pairs on Java



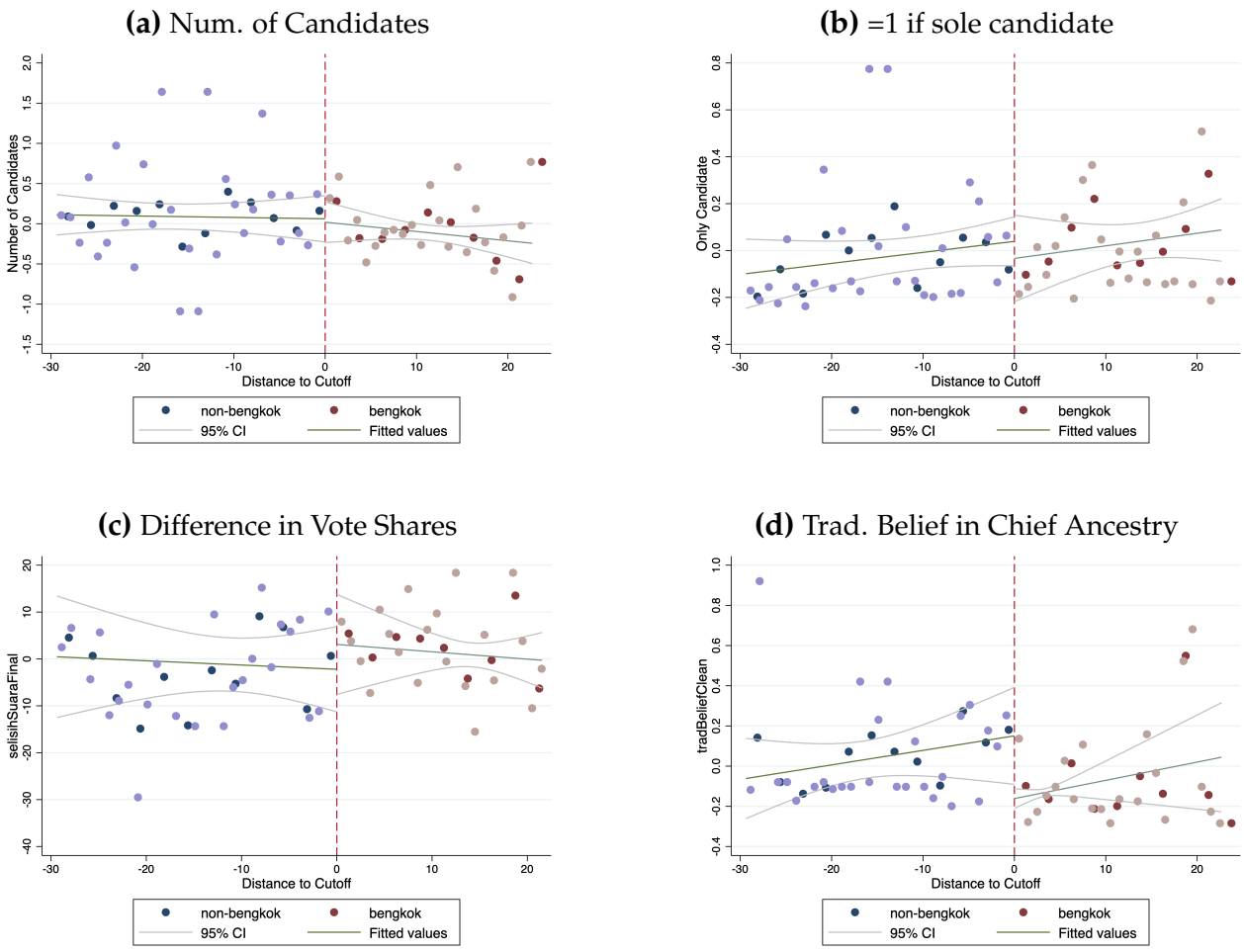
Notes: Histogram of differences in amount of funds received from their respective district governments, for villages in adjacent districts on Java. Dashed lines give the 90th and 95th percentile of the distribution. The solid line gives the estimated difference between *bengkok* and non-*bengkok* villages across my study boundary. Sample excludes all villages within urban areas (whose chiefs do not receive any *bengkok*); adjacent district-pairs where there are insufficient villages on both sides of the border for estimation (district-pair border is too short); adjacent district-pairs that are unbalanced on elevation; and adjacent district-pairs that are outliers in terms of cross-district border differences in *bengkok*.

Figure A.9: RD Plots: *Bengkok* Villages, Political Selection and Re-election Incentives



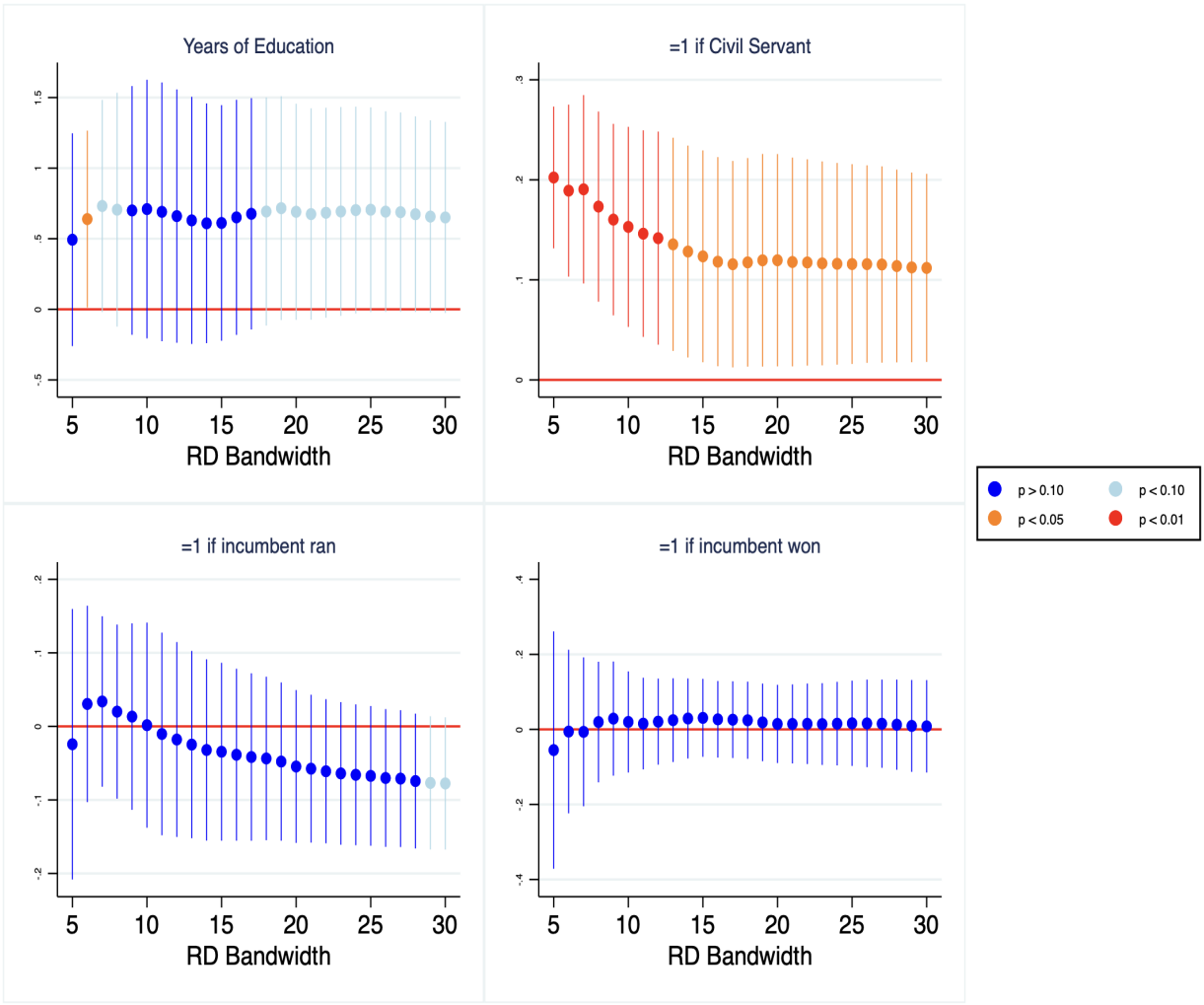
Notes: Darker (lighter)-shaded dots give the average value of the specified outcome variable for villages falling within 2.5km (1km) distance bins. Distance to cutoff refers to the distance between a village centroid and the closest point on the Cirebon–Priangan border, in kilometers. The dotted vertical line represents the Cirebon–Priangan border. Negative (positive) values of distance give the distance of villages South (North) of the Cirebon–Priangan border with villages to the North having had persistently larger plots of *bengkok* land. Solid line trends are predicted values from a regression of the specified variable on a linear polynomial in distance to the border that allows for a local linear trend estimated separately on each side of the discontinuity, uses a triangular kernel and a bandwidth of 30km. Each regression is jointly estimated following equations (1) and (2). All regressions control for whether a village had ever split, whether a chief's electoral term coincided with the end of Suharto rule, and include a nearest-border segment fixed effect. Standard errors clustered at the sub-district (*kecamatan*) level and figures show 95% confidence intervals. The order of these plots correspond to the order of outcomes in Table 5.

Figure A.10: RD Plots for Political Competition Outcomes



Notes: Darker (lighter)-shaded dots give the average value of the specified outcome variable for villages falling within 2.5km (1km) distance bins. Distance to cutoff refers to the distance between a village centroid and the closest point on the Cirebon–Priangan border, in kilometers. The dotted vertical line represents the Cirebon–Priangan border. Negative (positive) values of distance give the distance of villages South (North) of the Cirebon–Priangan border with villages to the North having had persistently larger plots of *bengkok* land. Solid line trends are predicted values from a regression of the specified variable on a linear polynomial in distance to the border that allows for a local linear trend estimated separately on each side of the discontinuity, uses a triangular kernel and a bandwidth of 30km. Each regression is jointly estimated following equations (1) and (2). All regressions control for whether a village had ever split, whether a chief's electoral term coincided with the end of Suharto rule, and include a nearest-border segment fixed effect. Standard errors clustered at the sub-district (*kecamatan*) level and figures show 95% confidence intervals. The order of these plots correspond to the order of outcomes in Table 6.

Figure A.11: *Bengkok* Villages, Political Selection and Re-election Incentives: Robustness to RD Bandwidth



Notes: Standard errors clustered at the sub-district level. All regressions include a local linear specification estimated separately on each side of the Cirebon–Priangan boundary. All regressions control for whether a village had ever split, nearest border segment fixed effects, and an indicator variable for whether a chief's term of office coincided with the end of Suharto's rule. All regressions use a triangular kernel following Cattaneo et al. (2019). Figure shows point estimates and 95% confidence intervals.

Figure A.12: Data Appendix

Table	Panel	Column	Variable	Question/Section	Note
3		1	Bengkok Size (ha)	C9	How large is *bengkok* land alloted to the village chief in this village?
		2	Bengkok Size (ha)	C9	How large is *bengkok* land alloted to the village chief in this village?
4	A	1	Villagers Contributions, IHS 1993	PODES	Amount of community contributions
		2	Villagers Contributions, IHS 1993	PODES	Amount of community contributions
		3	% Informal Taxes collected	E13	What % of the total informal taxes were obtained from the expected target
		4	% Informal Taxes collected	E13	What % of the total informal taxes were obtained from the expected target
	B	1	District Funds, IHS 1996	PODES	Amount of funds
		2	District Funds, IHS 1996	PODES	Amount of funds
		3	Govt and Own Village Funds	D3.1	`=1 if project constructed from community contributions and government funds
		4	Govt and Own Village Funds	D3.1	`=1 if project constructed from community contributions and government funds
	C	1	Central Government, IHS 1996	PODES	Amount of funds
		2	Central Government, IHS 1996	PODES	Amount of funds
		3	Province Government, IHS 1996	PODES	Amount of funds
		4	Province Government, IHS 1996	PODES	Amount of funds
5	A	1	Num of non-INPRES	PODES	
		2	Num of non-INPRES	PODES	
		3	Num of INPRES	PODES	
		4	Num of INPRES	PODES	
	B	1	Infrastructure Index	PODES	
		2	Infrastructure Index	PODES	
	C	1	Years of Education	2000 Census	
		2	Years of Education	2000 Census	
		3	`=1 if Agricultural Job	2000 Census	
		4	`=1 if Agricultural Job	2000 Census	
6	A	1	Years of Education	D7	
		2	Years of Education	D7	
		3	`=1 if Civil Servant	D7	Chief Occupation (qualitative)
		4	`=1 if Civil Servant	D7	Chief Occupation (qualitative)
	B	1	`=1 if incumbent ran	D7	`=1 if a chief ran in the next immediate election
		2	`=1 if incumbent ran	D7	`=1 if a chief ran in the next immediate election
7	A	1	Num. of candidates	D7	Number of candidates that ran for elections
		2	Num. of candidates	D7	Number of candidates that ran for elections
		3	`=1 if sole candidate	D7	`=1 if there were no other chief candidates during that election
		4	`=1 if sole candidate	D7	`=1 if there were no other chief candidates during that election
	B	1	Difference in Vote Shares	D7	Vote margin between winner and runner-up
		2	Difference in Vote Shares	D7	Vote margin between winner and runner-up
		3	Trad. Belief in Chief Ancestry	D7	`=1 if respondent said yes to belief that chief has to hail from ruling family
		4	Trad. Belief in Chief Ancestry	D7	`=1 if respondent said yes to belief that chief has to hail from ruling family
8	A	1	`=1 if cultivated farmland	E17	`=1 if the chief derived income from rice-land after assuming office
		2	`=1 if cultivated farmland	E17	`=1 if the chief derived income from rice-land after assuming office
A.1.			Bengkok System	C14	How did you (the village chief) cultivate the *bengkok* land?
A.2.			Reason for Contract Choice	C17	Why did you (the village head) decide on this system

Table A.1: Choice of Contract over *Bengkok* Land

Which contract did you use?	Percent	Frequency
Sharecropping	12.9	11
Rented out	85.9	73
Self-cultivated	1.17	1
Total	100	85

Table A.2: *Bengkok* Chiefs and Reason for Contract Choice over *Bengkok* Land

Why did you use this contract?	Percent	Frequency
Insufficient time/resources	7.32	6
Village tradition (to improve villager welfare)	64.6	53
Village policy or regulation	25.6	21
Others	2.44	2
Total	100	82

Notes: Number of responses are different from Table A.1 because of 3 missing responses.

Table A.3: Uses of Informal Taxes (Villager Contributions)

	(1)	(2)	(3)
	No Bengkok	Bengkok	All
For village development projects	0.26	0.39	.64
For paying salary of village officials	0.20	0	0.20
For operational use	0.38	0.23	0.60

Notes: Source: Primary survey data. Percentages do not add up to 100% as respondents could report more than one purpose for villager contributions. "For operational use" refers to administrative expenses such as stationary, paper, gas, food, and accommodation costs incurred during official travel.

Table A.4: *Bengkok* Villages and Village Funds:
Robustness to Controlling for Ruggedness and Potential Wet Rice Yield

	(1)	(2)	(3)	(4)
Panel A: Informal Taxation	Villager Contributions, IHS 1993		% Informal Taxes Collected	
bengkok	0.455*	0.371*	22.294**	12.955***
	(0.237)	(0.192)	(9.510)	(4.535)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	44	184	38	143
Clusters	10	22	10	20
Bandwidth	4.62	30.00	4.43	30.00
Mean Dep. Var.	10.89	11.17	61.05	67.13
Std. Dev. Var.	0.931	0.858	17.902	19.111
F stat	5	13	5	13
Mean Dep. Var. (RP)	39271	50694		

	(1)	(2)	(3)	(4)
Panel B: District-Level Funds	District Funds, IHS 1996		Govt and Own Village Funds	
bengkok	1.897*	2.113*	0.131	0.146**
	(1.070)	(1.134)	(0.147)	(0.064)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	70	184	161	616
Clusters	11	22	11	22
Bandwidth	6.87	30.00	5.40	30.00
Mean Dep. Var.	4.80	5.26	0.25	0.25
Std. Dev. Var.	3.381	2.808	0.437	0.435
F stat	6	13	4	8
Mean Dep. Var. (RP)	2768	1363		

	(1)	(2)	(3)	(4)
Panel C: Central and Province	Central Government, IHS 1996		Province Government, IHS 1996	
bengkok	−0.045	0.001	0.101	0.242
	(0.034)	(0.050)	(0.351)	(0.565)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	55	184	94	184
Clusters	11	22	12	22
Bandwidth	5.29	30.00	9.92	30.00
Mean Dep. Var.	9.45	9.48	1.06	1.04
Std. Dev. Var.	0.223	0.336	3.123	2.946
F stat	4	13	8	13
Mean Dep. Var. (RP)	6609	7179	2634	1570

Note: Standard errors clustered at the subdistrict level. Each regression is jointly estimated following equations (1) and (2). Unit of observation is at the village level except for *% Informal Taxes Collected* which is at the village-chief level, and *Govt and Own Village Funds* which is at the village-chief, development-project level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression of *% Informal Taxes Collected* control for whether a chief's electoral term coincided with the end of Suharto rule and regression of *Govt and Own Village Funds* controls for both the former and whether a development project is a road project, the most common project in our survey data. *Villager Contributions* measures the amount of funds collected from villagers. *% Informal Taxes Collected* measures the percentage of informal taxes, collected successfully by village chiefs, as a percentage of their annual target. *District Funds* measures the amount of funds from district-level government sources. *Govt and Own Village Funds* equals one if a development project was constructed using both government and villager contributions, and zero otherwise. *Central Government* and *Province Government Funds* measures the amount of funds from Central and Provincial government sources, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: *Bengkok* Villages and Contemporary Development:
Robustness to Controlling for Ruggedness and Potential Wet Rice Yield

	(1)	(2)	(3)	(4)
Panel A: Schools (1983)	num. of non-INPRES		num. of INPRES	
bengkok	0.488**	0.670***	0.247	0.121
	(0.202)	(0.202)	(0.198)	(0.196)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	68	181	70	181
Clusters	11	22	11	22
Bandwidth	6.76	30.00	7.05	30.00
Mean Dep. Var.	2.53	2.47	1.17	1.38
Std. Dev. Var.	1.275	1.143	0.816	0.951
F stat	5	12	6	12

	(1)	(2)
Panel B: Infrastructure (1980-1996)	Infrastructure Index	
bengkok	0.424*	0.306**
	(0.227)	(0.135)
Bandwidth choice	Optimal	Wide
Observations	106	358
Clusters	11	22
Bandwidth	5.32	30.00
Mean Dep. Var.	-0.04	-0.01
Std. Dev. Var.	0.884	0.969
F stat	5	13

	(1)	(2)	(3)	(4)
Panel C: Education & Prosperity	Years of Education		=1 if Agricultural Job	
bengkok	0.587**	0.290**	−0.087***	−0.055
	(0.228)	(0.128)	(0.031)	(0.037)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	64312	246734	44144	181635
Clusters	10	22	11	22
Bandwidth	4.98	30.00	5.11	30.00
Mean Dep. Var.	7.16	6.77	0.23	0.40
Std. Dev. Var.	3.179	2.860	0.419	0.489
F stat	7	13	6	17

Note: Standard errors clustered at the subdistrict level. Each regression is jointly estimated following equations (1) and (2). Unit of observation in Panels A and B is at the village level. Unit of observation in Panel C is at the individual, villager-level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression in Panel B controls for survey year. Regressions in Panel C control for cohort-year and gender. *num. of non-INPRES* measures the number of bottom-up village schools. *num. of INPRES* measures the number of top-down, Central government-constructed schools. *Infrastructure Index* is comprised of three variables indicating the presence of safe water sources, aspalt road, and safe garbage disposal between 1986-1996. I construct this index following (Kling et al., 2007) by standardising each variable, averaging across all three standardised variables, and standardising the average. *Years of Education* measures the number of years of education for all individuals aged 21-40 years old. *=1 if Agricultural Job* is an indicator variable that takes the value of 1 if an individual has an agricultural job and 0 otherwise, for all individuals aged 21-40 years old.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: *Bengkok* Villages and Village Funds:
Alternative RD Specification: Linear Polynomial in Latitude and Longitude

	(1)	(2)	(3)	(4)
Panel A: Informal Taxation	Villager Contributions, IHS 1993		% Informal Taxes Collected	
bengkok	0.217***	0.514**	4.500***	14.388***
	(0.080)	(0.226)	(1.374)	(4.775)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	46	186	34	144
Clusters	10	23	8	21
Bandwidth	4.52	30.00	3.59	30.00
Mean Dep. Var.	10.94	11.17	59.26	67.22
Std. Dev. Var.	0.939	0.861	17.970	19.074
Mean Dep. Var. (RP)	41142	50569		

	(1)	(2)	(3)	(4)
Panel B: District-Level Funds	District Funds, IHS 1996		Govt and Own Village Funds	
bengkok	1.811*	1.948*	0.143**	0.206***
	(0.938)	(1.101)	(0.060)	(0.071)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	71	186	199	623
Clusters	11	23	11	23
Bandwidth	6.49	30.00	6.67	30.00
Mean Dep. Var.	4.82	5.24	0.22	0.26
Std. Dev. Var.	3.363	2.821	0.416	0.436
Mean Dep. Var. (RP)	2734	1350		

	(1)	(2)	(3)	(4)
Panel C: Central and Province	Central Government, IHS 1996		Province Government, IHS 1996	
bengkok	−0.012	0.023	−0.129	0.100
	(0.025)	(0.059)	(0.586)	(0.600)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	71	186	82	186
Clusters	11	23	11	23
Bandwidth	6.55	30.00	7.93	30.00
Mean Dep. Var.	9.44	9.49	1.01	1.03
Std. Dev. Var.	0.198	0.349	3.119	2.932
Mean Dep. Var. (RP)	6503	7274	2964	1553

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification in latitude and longitude and use a triangular kernel. Each regression is jointly estimated following equations (1) and (2). I use the same optimal bandwidths as in Table 3. Unit of observation is at the village level except for *% Informal Taxes Collected* which is at the village-chief level, and *Govt and Own Village Funds* which is at the village-chief, development-project level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression of *% Informal Taxes Collected* control for whether a chief's electoral term coincided with the end of Suharto rule and regression of *Govt and Own Village Funds* controls for both the former and whether a development project is a road project, the most common project in our survey data. *Villager Contributions* measures the amount of funds collected from villagers. *% Informal Taxes Collected* measures the percentage of informal taxes, collected successfully by village chiefs, as a percentage of their annual target. *District Funds* measures the amount of funds from district-level government sources. *Govt and Own Village Funds* equals one if a development project was constructed using both government and villager contributions, and zero otherwise. *Central Government* and *Province Government Funds* measures the amount of funds from Central and Provincial government sources, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: *Bengkok* Villages and Contemporary Development:
Alternative RD Specification: Linear Polynomial in Latitude and Longitude

	(1)	(2)	(3)	(4)
Panel A: Schools (1983)	num. of non-INPRES		num. of INPRES	
bengkok	0.357***	0.617***	0.217*	0.015
	(0.116)	(0.205)	(0.123)	(0.163)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	76	183	87	183
Clusters	11	23	11	23
Bandwidth	7.51	30.00	8.59	30.00
Mean Dep. Var.	2.58	2.46	1.16	1.39
Std. Dev. Var.	1.278	1.142	0.834	0.953

	(1)	(2)
Panel B: Infrastructure (1980-1996)	Infrastructure Index	
bengkok	0.541***	0.433***
	(0.164)	(0.150)
Bandwidth choice	Optimal	Wide
Observations	110	362
Clusters	11	23
Bandwidth	5.32	30.00
Mean Dep. Var.	-0.04	-0.02
Std. Dev. Var.	0.881	0.972

	(1)	(2)	(3)	(4)
Panel C: Education & Prosperity	Years of Education		=1 if Agricultural Job	
bengkok	0.189***	0.357***	−0.110***	−0.076*
	(0.049)	(0.124)	(0.020)	(0.044)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	63977	250112	42178	184238
Clusters	10	23	10	23
Bandwidth	4.83	30.00	4.84	30.00
Mean Dep. Var.	7.16	6.77	0.23	0.40
Std. Dev. Var.	3.132	2.851	0.423	0.490

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear specification polynomial in latitude and longitude and use a triangular kernel. Each regression is jointly estimated following equations (1) and (2). I use the same optimal bandwidths as in Table 4. Unit of observation in Panels A and B is at the village level. Unit of observation in Panel C is at the individual, villager-level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression in Panel B controls for survey year. Regressions in Panel C control for cohort-year and gender. *num. of non-INPRES* measures the number of bottom-up village schools. *num. of INPRES* measures the number of top-down, Central government-constructed schools. *Infrastructure Index* is comprised of three variables indicating the presence of safe water sources, aspalt road, and safe garbage disposal between 1986-1996. I construct this index following (Kling et al., 2007) by standardising each variable, averaging across all three standardised variables, and standardising the average. *Years of Education* measures the number of years of education for all individuals aged 21-40 years old. *=1 if Agricultural Job* is an indicator variable that takes the value of 1 if an individual has an agricultural job and 0 otherwise, for all individuals aged 21-40 years old.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: *Bengkok* Villages, Political Selection and Re-election Incentives: Alternative RD Specification: Linear Polynomial in Latitude and Longitude

	(1)	(2)	(3)	(4)
Panel A: Chiefs	Years of Education		=1 if Civil Servant	
bengkok	0.210	0.768*	0.100**	0.077**
	(0.267)	(0.396)	(0.045)	(0.033)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	76	247	64	247
Clusters	11	23	10	23
Bandwidth	5.26	30.00	4.52	30.00
Mean Dep. Var.	9.54	9.50	0.16	0.13
Std. Dev. Var.	3.048	2.919	0.366	0.336

	(1)	(2)	(3)	(4)
Panel B: Re-Election Incentives	=1 if incumbent ran		=1 if incumbent won	
bengkok	−0.018	−0.016	0.078	0.067
	(0.027)	(0.062)	(0.099)	(0.062)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	95	290	13	80
Clusters	11	23	8	19
Bandwidth	5.67	30.00	3.63	30.00
Mean Dep. Var.	0.21	0.28	0.23	0.39
Std. Dev. Var.	0.410	0.448	0.439	0.490

Note: Standard errors clustered at the subdistrict level. All regressions include a local linear polynomial in latitude and longitude. Each regression is jointly estimated following equations (1) and (2). I use the same optimal bandwidths as in Table 5. Unit of observation is at the village chief level. All regressions control for an indicator that equals 1 if a village had ever split, whether a chief's electoral term coincided with the end of Suharto rule, and a border segment fixed effect. *Years of Education* measures the number of years of education of a village chief. *=1 if Civil Servant* takes the value of 1 if a chief worked in the civil service before becoming a chief, and 0 otherwise. *=1 if incumbent ran* takes the value of 1 if a chief re-ran for elections in the subsequent term.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: *Bengkok* Villages and Colonial Policy

	(1)	(2)	(3)	(4)
Panel A: 1853 Land Use	% Land Settled		% Land Grew Coffee	
bengkok	2.056	0.940	−4.490*	1.917*
	(1.834)	(1.382)	(2.404)	(1.053)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	42	185	33	185
Clusters	9	22	9	22
Bandwidth	4.15	30.00	3.46	30.00
Mean Dep. Var.	14.25	5.95	4.96	2.11
Std. Dev. Var.	12.650	8.563	9.188	5.236

	(1)	(2)	(3)	(4)
Panel B: Road Density	1853		1945	
bengkok	0.887	0.617	1.575	−0.042
	(1.562)	(0.494)	(1.528)	(0.571)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	65	185	42	185
Clusters	11	22	9	22
Bandwidth	5.90	30.00	4.24	30.00
Mean Dep. Var.	2.81	1.58	6.90	3.45
Std. Dev. Var.	3.827	3.022	4.903	4.224

	(1)	(2)
Panel C: Railroad Density	1945	
bengkok	−0.031	−0.243
	(0.364)	(0.328)
Bandwidth choice	Optimal	Wide
Observations	88	185
Clusters	11	22
Bandwidth	8.79	30.00
Mean Dep. Var.	0.66	0.34
Std. Dev. Var.	1.952	1.391

Note: Unit of observation is at the village-level. Standard errors clustered at the subdistrict level. Following my main regression specifications, I control for an indicator for whether a village had ever experienced a split and border fixed effects. All measures calculated from 1853 and 1945 Dutch maps overlaid over 2000 village border polygons. The unit of measure for road and rail density is meters per hectare. Standard errors clustered at the sub-district level. *% Land Settled* divides the area covered by housing settlements, over the total area within a village polygon and is a proxy for village development in 1853. *% Land Grew Coffee* divides the area covered by coffee fields, over the total area within a village polygon.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.10: *Bengkok* Villages and Village Funds:
Robustness to Controlling for Historical Coffee Cultivation (1853)

	(1)	(2)	(3)	(4)
Panel A: Informal Taxation	Villager Contributions, IHS 1993		% Informal Taxes Collected	
bengkok	0.242	0.421**	28.419*	12.575**
	(0.196)	(0.198)	(14.736)	(5.496)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	56	184	41	143
Clusters	11	22	10	20
Bandwidth	5.52	30.00	4.73	30.00
Mean Dep. Var.	10.92	11.17	62.44	67.13
Std. Dev. Var.	1.014	0.858	17.928	19.111
F stat	4	9	3	8
Mean Dep. Var. (RP)	45153	50694		

	(1)	(2)	(3)	(4)
Panel B: District-Level Funds	District Funds, IHS 1996		Govt and Own Village Funds	
bengkok	2.239*	2.065*	0.148	0.168**
	(1.305)	(1.187)	(0.093)	(0.078)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	69	184	200	616
Clusters	11	22	11	22
Bandwidth	6.42	30.00	6.92	30.00
Mean Dep. Var.	4.77	5.26	0.21	0.25
Std. Dev. Var.	3.395	2.808	0.412	0.435
F stat	5	9	5	6
Mean Dep. Var. (RP)	2800	1363		

	(1)	(2)	(3)	(4)
Panel C: Central and Province	Central Government, IHS 1996		Province Government, IHS 1996	
bengkok	−0.015	0.007	−0.023	0.204
	(0.016)	(0.044)	(0.285)	(0.539)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	68	184	69	184
Clusters	11	22	11	22
Bandwidth	6.34	30.00	6.45	30.00
Mean Dep. Var.	9.45	9.48	1.08	1.04
Std. Dev. Var.	0.202	0.336	3.251	2.946
F stat	7	9	7	9
Mean Dep. Var. (RP)	6526	7179	3487	1570

Note: Standard errors clustered at the subdistrict level. Each regression is jointly estimated following equations (1) and (2). Unit of observation is at the village level except for *% Informal Taxes Collected* which is at the village-chief level, and *Govt and Own Village Funds* which is at the village-chief, development-project level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression of *% Informal Taxes Collected* control for whether a chief's electoral term coincided with the end of Suharto rule and regression of *Govt and Own Village Funds* controls for both the former and whether a development project is a road project, the most common project in our survey data. *Villager Contributions* measures the amount of funds collected from villagers. *% Informal Taxes Collected* measures the percentage of informal taxes, collected successfully by village chiefs, as a percentage of their annual target. *District Funds* measures the amount of funds from district-level government sources. *Govt and Own Village Funds* equals one if a development project was constructed using both government and villager contributions, and zero otherwise. *Central Government* and *Province Government Funds* measures the amount of funds from Central and Provincial government sources, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.11: *Bengkok* Villages and Contemporary Development: Robustness to Controlling for Historical Coffee Cultivation (1853)

	(1)	(2)	(3)	(4)
Panel A: Schools (1983)	num. of non-INPRES		num. of INPRES	
bengkok	0.392**	0.637***	0.274	0.076
	(0.183)	(0.206)	(0.187)	(0.194)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	79	182	86	182
Clusters	11	22	11	22
Bandwidth	7.71	30.00	8.61	30.00
Mean Dep. Var.	2.56	2.47	1.16	1.38
Std. Dev. Var.	1.268	1.140	0.838	0.949
F stat	6	9	5	9

	(1)	(2)
Panel B: Infrastructure (1980-1996)	Infrastructure Index	
bengkok	0.231*	0.214**
	(0.134)	(0.095)
Bandwidth choice	Optimal	Wide
Observations	234	650
Clusters	11	22
Bandwidth	6.12	30.00
Mean Dep. Var.	0.00	-0.01
Std. Dev. Var.	0.616	0.615

	(1)	(2)	(3)	(4)
Panel C: Education & Prosperity	Years of Education		=1 if Agricultural Job	
bengkok	0.448***	0.283**	−0.093***	−0.060
	(0.089)	(0.123)	(0.036)	(0.039)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	66040	248462	35946	182682
Clusters	10	22	9	22
Bandwidth	4.99	30.00	4.36	30.00
Mean Dep. Var.	7.15	6.77	0.24	0.39
Std. Dev. Var.	3.160	2.857	0.429	0.489

Note: Standard errors clustered at the subdistrict level. Each regression is jointly estimated following equations (1) and (2). Unit of observation in Panels A and B is at the village level. Unit of observation in Panel C is at the individual, villager-level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression in Panel B controls for survey year. Regressions in Panel C control for cohort-year and gender. *num. of non-INPRES* measures the number of bottom-up village schools. *num. of INPRES* measures the number of top-down, Central government-constructed schools. *Infrastructure Index* is comprised of three variables indicating the presence of safe water sources, aspalt road, and safe garbage disposal between 1986-1996. I construct this index following (Kling et al., 2007) by standardising each variable, averaging across all three standardised variables, and standardising the average. *Years of Education* measures the number of years of education for all individuals aged 21-40 years old. *=1 if Agricultural Job* is an indicator variable that takes the value of 1 if an individual has an agricultural job and 0 otherwise, for all individuals aged 21-40 years old.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.12: *Bengkok* Villages and Village Funds:
Robustness to Controlling for Colonial Roads and Railways (1945)

	(1)	(2)	(3)	(4)
Panel A: Informal Taxation	Villager Contributions, IHS 1993		% Informal Taxes Collected	
bengkok	0.288	0.410**	22.765**	12.749***
	(0.213)	(0.200)	(9.367)	(4.699)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	52	184	41	143
Clusters	11	22	10	20
Bandwidth	5.19	30.00	4.69	30.00
Mean Dep. Var.	10.82	11.17	62.44	67.13
Std. Dev. Var.	0.950	0.858	17.928	19.111
F stat	6	11	5	11
Mean Dep. Var. (RP)	37451	50694		

	(1)	(2)	(3)	(4)
Panel B: District-Level Funds	District Funds, IHS 1996		Govt and Own Village Funds	
bengkok	2.388**	2.016*	0.148**	0.151***
	(1.148)	(1.093)	(0.070)	(0.057)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	69	184	206	616
Clusters	11	22	11	22
Bandwidth	6.48	30.00	7.24	30.00
Mean Dep. Var.	4.77	5.26	0.21	0.25
Std. Dev. Var.	3.395	2.808	0.411	0.435
F stat	7	11	10	10
Mean Dep. Var. (RP)	2800	1363		

	(1)	(2)	(3)	(4)
Panel C: Central and Province	Central Government, IHS 1996		Province Government, IHS 1996	
bengkok	−0.016	0.007	0.005	0.131
	(0.014)	(0.051)	(0.317)	(0.496)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	69	184	66	184
Clusters	11	22	11	22
Bandwidth	6.81	30.00	6.11	30.00
Mean Dep. Var.	9.45	9.48	1.13	1.04
Std. Dev. Var.	0.200	0.336	3.317	2.946
F stat	9	10	10	10
Mean Dep. Var. (RP)	6518	7179	3645	1570

Note: Standard errors clustered at the subdistrict level. Each regression is jointly estimated following equations (1) and (2). Unit of observation is at the village level except for *% Informal Taxes Collected* which is at the village-chief level, and *Govt and Own Village Funds* which is at the village-chief, development-project level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression of *% Informal Taxes Collected* control for whether a chief's electoral term coincided with the end of Suharto rule and regression of *Govt and Own Village Funds* controls for both the former and whether a development project is a road project, the most common project in our survey data. *Villager Contributions* measures the amount of funds collected from villagers. *% Informal Taxes Collected* measures the percentage of informal taxes, collected successfully by village chiefs, as a percentage of their annual target. *District Funds* measures the amount of funds from district-level government sources. *Govt and Own Village Funds* equals one if a development project was constructed using both government and villager contributions, and zero otherwise. *Central Government* and *Province Government Funds* measures the amount of funds from Central and Provincial government sources, respectively.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.13: *Bengkok* Villages and Contemporary Development: Robustness to Controlling for Colonial Roads and Railways (1945)

	(1)	(2)	(3)	(4)
Panel A: Schools (1983)	num. of non-INPRES		num. of INPRES	
bengkok	0.405**	0.628***	0.209	0.062
	(0.175)	(0.201)	(0.159)	(0.183)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	73	182	72	182
Clusters	11	22	11	22
Bandwidth	7.39	30.00	7.24	30.00
Mean Dep. Var.	2.56	2.47	1.17	1.38
Std. Dev. Var.	1.269	1.140	0.805	0.949
F stat	7	9	7	9

	(1)	(2)
Panel B: Infrastructure (1980-1996)	Infrastructure Index	
bengkok	0.244*	0.231**
	(0.130)	(0.095)
Bandwidth choice	Optimal	Wide
Observations	234	650
Clusters	11	22
Bandwidth	6.12	30.00
Mean Dep. Var.	0.00	-0.01
Std. Dev. Var.	0.616	0.615
F stat	8	10

	(1)	(2)	(3)	(4)
Panel C: Education & Prosperity	Years of Education		=1 if Agricultural Job	
bengkok	0.487***	0.304**	−0.068**	−0.060*
	(0.111)	(0.124)	(0.033)	(0.036)
Bandwidth choice	Optimal	Wide	Optimal	Wide
Observations	58491	248462	44058	182682
Clusters	10	22	10	22
Bandwidth	4.53	30.00	5.09	30.00
Mean Dep. Var.	7.15	6.77	0.23	0.39
Std. Dev. Var.	3.153	2.857	0.420	0.489
F stat	22	9	19	11

Note: Standard errors clustered at the subdistrict level. Each regression is jointly estimated following equations (1) and (2). Unit of observation in Panels A and B is at the village level. Unit of observation in Panel C is at the individual, villager-level. All regressions control for an indicator that equals 1 if a village had ever split and a border segment fixed effect. In addition, regression in Panel B controls for survey year. Regressions in Panel C control for cohort-year and gender. *num. of non-INPRES* measures the number of bottom-up village schools. *num. of INPRES* measures the number of top-down, Central government-constructed schools. *Infrastructure Index* is comprised of three variables indicating the presence of safe water sources, aspalt road, and safe garbage disposal between 1986-1996. I construct this index following (Kling et al., 2007) by standardising each variable, averaging across all three standardised variables, and standardising the average. *Years of Education* measures the number of years of education for all individuals aged 21-40 years old. *=1 if Agricultural Job* is an indicator variable that takes the value of 1 if an individual has an agricultural job and 0 otherwise, for all individuals aged 21-40 years old.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B Further Supplementary Materials

B.1 Description of Falsification Test Across Adjacent District Border-Pairs in Figure A.8

I proceed in three steps. First, I use data from the 1996 village census and restrict my sample to all rural villages on Java (urban villages do not receive *bengkok*), and exclude any rural villages (adjacent border-pairs) in (bordering) the greater Jakarta area or Yogyakarta, an independent Sultanate/Kingdom whose villages are ruled under a different governance structure. I then overlay all remaining district borders on Java onto village polygons and exclude any district borders that overlap with provincial borders.

Second, each district could potentially be adjacent to more than one district. Hence, for each district, I randomly draw a single adjacent district-border pair.

Third, for each adjacent district-border pair, I randomly assign one of the two districts into treatment and calculate the average differences, at the village-level, in 1996 district funds between treated and non-treated districts, using the same specification as equations (1) and (2) and the optimal Calonico et al. (2014) bandwidth.

Last, to avoid variations in district-funding due to differences in topography that are uncharacteristic of my study area, I exclude adjacent district-border pairs that are unbalanced on elevation. I also exclude those that are unbalanced on village-level *bengkok*, given that these large differences in *bengkok* could have occurred for other plausibly non-exogenous reasons that I cannot account for. District-border pairs that are too short in length and hence, have insufficient villages for estimation purposes are also excluded from my analysis.

Table B.1: Data Sources

Data	*Source*	*Content*	*Time Span*	*Variable*
1. Village Chiefs and Elections	Author's original survey	Universe of local village chiefs	1979 -1996	Size of *bengkok*, percentage of informal taxes collected, indicator for development projects using government and own village funds, years of education, ex-civil servant job indicator, re-ran in an election indicator, number of candidates, difference in vote shares, traditional belief in chief ancestry, indicator for farmland cultivation
2. Village Development	*Potensi Desa* (Village Potential)	Universe of local villages	1983-1996	Number of (non-)INPRES schools, infrastructure index, village funds
	Population Census	Universe of Individuals	2000	Ethnic Sunda share, villagers years of education, indicator for whether a villager had an agricultural job
3. Population Density	National Archives of Indonesia (ARSIP, Jakarta)	Historical population density data	1819	1819 Population density
4. Geospatial	SRTM	Village level geospatial measures	2000	Elevation, slope, ruggedness, rivers
	FAO-GAEZ	Village level geospatial measures	2000	Wet rice potential yield and coffee potential yield
5. Colonial Policy	Historical Dutch Maps	Universe of villages	1853, 1945	Percent of village land settled, percent of land with coffee cultivation, road density, railroad density