

Indirect Rule and Public Goods Provision: Evidence from Colonial India

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Abstract

This paper examines the persistent effect of historical institutional differences in colonial India on the contemporary provision of public goods. In particular, it explores the long-term effects in directly and indirectly ruled areas. It looks at a single region of India, which has areas that historically experienced both direct and indirect institutions. The theoretical mechanism focuses on the differences in the local leaders' incentives and emphasizes that the colonizer's formal accountability is more efficient than informal accountability in the absence of effective control mechanisms. Unlike local princes, colonizers in directly ruled territories had stronger incentives to provide goods, because of more restriction by the necessity to extract resources. A spatial regression discontinuity design is used to compare territories with direct and indirect rule. The empirical results show that indirect rule has long-term negative effects on the provision of various public goods.

Key Words: indirect rule, colonial legacies, accountability, local incentives, public goods.

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1 Introduction

It is well established that differences in institutional design can impact socio-economic outcomes ([North and Weingast, 1989](#); [Acemoglu and Robinson, 2006](#)). One of such institutions that the developed world colonizers introduced in their colonial territories was indirect rule. While direct rule meant that the colonizers built a centralized organization of power at the subordinated territories, indirect rule, on the contrary, allowed the colonizers to delegate certain policy-making duties to local leaders.

The existing literature provides conflicting findings about both direct and indirect rule ([Mamdani, 1996](#); [Fisher, 1998](#); [Lange, 2004](#); [Iyer, 2010](#); [Baldwin, 2016](#); [Naseemullah and Staniland, 2016](#); [Mukherjee, 2017](#)). Some scholars claim that direct rule allows a better use of colonizer's institutional capacity in terms of a proper provision of developmental goods ([Lange, 2009](#)); however it is not inclusive to the local habitat. Indirect rule, on the other hand, is more integrated in the local environment ([Lange, 2009](#)). It can prevent rulers' despotic intentions and the exclusion of natives from civil freedoms ([Fisher, 1998](#)). This inclusiveness of natives could lead to better self-governance and prosperity, and, as a result, territories with indirect rule should have better socio-economic outcomes ([Iyer, 2010](#)). Additionally, such engagement and local connections of the native rulers may decrease colonial resistance and reduce dissatisfaction and potential violence from natives towards colonizers ([Ferwerda and Miller, 2014](#)). At the same time, the effects of indirect rule vary across territories. Some studies show negative effects of indirect rule on development ([Lange, 2004](#)) because of the low capacity of the institutional system to provide public goods. Eventually, such inefficiency leads to despotic and autocratic regimes, like decentralized despotism ([Mamdani, 1996](#)).

This paper posits that the effects of indirect rule should be negative on the provision of public goods. The theoretical mechanism is based on the principal-agent model with the central government which was trying to constrain local agents in their ability to invest resources in the private consumption in order to avoid abusive rent-seeking and local instability. But the center's ability to constrain varied depending on whether there was either direct or indirect organization of power.

As a result, the agency problem was different in these two institutional systems. Princes in the indirectly ruled areas had more autonomy from the center and more legitimized authoritarian power over the local population. Being residents helped them to establish a proto-autocratic administration without formalized institutions of control and accountability ([Benichou, 2000](#)). In turn, the local population was suppressed by the authority of the native princes, decreasing the risks of potential revolt and, consequently, weakening the incentives of the princes. Hence, that allowed them not to invest as many resources in the public goods provision.

Direct rule territories had a more institutionalized system of accountability to the center, because of their institutional direct subordination to the central government. Here, expectations of local dissatisfaction with the foreign presence led to anticipated risks of the local violence. As a result, more severe control mechanisms from the center and the fear of losing potentially extracted resources on the ground created stronger incentives for local British representatives to provide public goods. Therefore, the informal accountability that may have existed in the indirectly ruled territories was less efficient than the formal accountability in the British provinces.

To improve understanding of indirect rule and examine whether there is evidence consistent with theoretical expectations, this paper compares the long-term effects of direct and indirect rule in India. While existing literature did not focus on a particular region, instead estimating the average effect across the whole heterogeneous country ([Iyer, 2010](#)), this study looks at the state of Karnataka. Karnataka is a single territory which includes areas with former direct and indirect rule. Importantly, it was formed based on the ethnic-linguistic similarities of the territories that made it up, which makes it easier to eliminate alternative explanations of the variation in the outcomes across the state.

Following the growing literature that exploits colonial-era borders ([Dell, 2010; Bubb, 2013; Michalopoulos and Papaioannou, 2016; Lechler and McNamee, 2018; Ali et al., 2018](#)), methodologically, this paper uses a spatial regression discontinuity design to estimate the effects of indirect rule. The former borders between direct and indirect rule territories serve as two-dimensional running variable and provide the cut-off between treatment (indirect rule) and control (direct rule)

groups.

Results mostly support the expectations of long-term negative effects of indirect rule on public goods availability at the local level. Specifically, indirectly ruled territories are worse at providing paved roads and health facilities. These results are consistent with the claim that native princes did not have enough incentives to provide public goods, possibly as a result of gaining a certain amount of autonomy which helped them build a stable autocratic regime. Being the heirs of the monarchic families that were present in these territories before colonization may have facilitated their legitimized authority, dampening the fear to lose their power.

The analysis and results of this study also have broader implications. They bridge the extensive literature on political and administrative decentralization ([Prud'Homme, 1995](#); [Grindle, 2007](#); [Treisman, 2007](#); [Brancati, 2008](#); [Chhibber and Kollman, 2009](#)) with that on the long-term consequences of colonial presence in developing countries ([Sokoloff and Engerman, 2000](#); [Acemoglu, Johnson and Robinson, 2001](#); [Nunn, 2008](#); [Dell, 2010](#); [Gerring et al., 2011](#); [Lee and Schultz, 2012](#)).

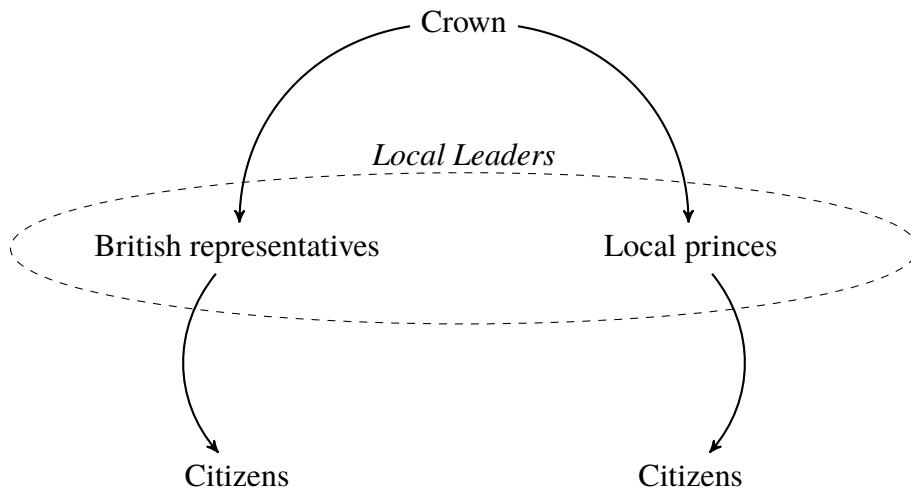
The rest of the paper consists of six parts. The second section includes the description of the theory and mechanism. Section three provides historical background. Section four describes data, methods and the main assumptions of the empirical analysis. Section five presents baseline models, robustness checks, and discusses the results. Section six concludes.

2 Theory

Consider three players: center (i.e., central government or colonial government), local authorities, and the local population (Figure 1). Assume that the center, represented by the colonial government, never interacts with the local population in the colonized territory. Direct and indirect rule presence defines the mechanism through which the colonial government exercises its authority over the local population. In case of direct rule, the territory is governed by the British representatives that are sent overseas and are highly subordinated to the central government. Indirectly ruled territories are governed by local princes who have autonomy through delegation of policy-making. British

representatives and local princes both serve as *local leaders*. The theoretical mechanism in the interactions between local leaders and the center can be explained with the principal-agent model with the colonial government as the principal. Here local leaders - the agents - are making decisions at the local territories on behalf of the center. The classical problem occurs when the local leaders have a trade-off between being accountable to the central government or acting in their own private interests.¹

Figure 1: Linkages between the players



2.1 Incentives of the Local Leaders

The central government wanted to avoid protests and to maximize the amount of the extracted resources. Thus it intended to constrain local leaders so that to avoid bad rent-seeking and expropriation which could have led to the massive dissatisfaction from the local population. At the same time colonial government had different abilities to control the two types of the local leaders, because of the institutional differences. As a result, the choice that the local leaders made in the trade-off between upward accountability and their private interests was strongly defined by their institutional status.

¹A similar principal-agent problem existed not only in India. For instance, Spanish *encomienda* system had an analogous problem of abused rent-seeking from the side of the local agents, who were given a monopoly on the labor of particular groups of indigenous people. See ([Keith, 1971](#)).

The trade-off between upward accountability and local leaders' private interests was reflected in the process of the allocated resources. Accountable local leaders were investing in the infrastructure and goods that could have simultaneously improved the resource extraction and kept the local population satisfied. Local leaders that were investing in their private interests did not care much about providing public goods, but rather increasing their own wealth. As the central government had different abilities to constrain different types of leaders, they had incentives to abuse this principal-agent relationship and not to invest in public goods. Thus, depending on the institutional structure - direct or indirect rule, the theoretical mechanism distinguishes two types of local leaders: ones with strong and ones with weak incentives to provide public goods rather than invest in private consumption. British representatives in the directly ruled territories were subject to more control from the colonial government than the local princes. The delegated authority that was given to native princes was hard to remove without additional costs for the center, whereas the British leaders and their bureaucrats could have been easily punished. Since their salary and promotion was in the central government's jurisdiction, the punishment could have been reflected in their incomes or in the trajectories of their career paths.² Even despite the fact that prior to 1857, East India Company did not have much of a formal accountability system and could have proceeded with its own interests ([Erikson, 2016](#)), there is evidence of political control from the British side.³ This

²For instance, there is an example of Richard Wellesley, who served as Governor-General in 1798-1805. It is established that his military activity and his independent economic decisions made him removed from this position. "During the greater part of this time Wellesley's relations with the court of directors [until 1858 the headquarter of the East India Company located in London, which was proceeded by India Office - the British government department established in London in 1858] were far from satisfactory. They resented his somewhat autocratic proclivities, and they especially disapproved of his mode of exercising his patronage." ([Lee, 1899](#), 216) "Both the court of directors and the board of control under Castlereagh had all along questioned the policy of the Mahratta war, and accordingly, when the intelligence of the disaster reached England, it was at once determined to recall Wellesley and to reverse his policy. Lord Cornwallis was sent out to relieve him, and reached Calcutta on 29 July 1805. Wellesley was not taken by surprise. Indeed from the time of Monson's disaster he had felt that the opponents of his policy in England would bring about his removal from his post." ([Lee, 1899](#), 217).

³For instance, the case of Governor-General Warren Hastings ([Marshall, N.d.](#)).

explains variation in the relationship between the central government and the two types of local leaders.

The center was interested in maintaining political stability over the whole territory, which was mainly expressed in the successful resource extraction and in the decreased amount of protest activity at the local level. Since local princes gained a decent amount of autonomy in internal policy-making, they played a role of proto-autocrats⁴⁵⁶ which let them to avoid both upward and downward accountability ([Mamdani, 1996](#)). The apathy of suppressed people and their involuntary belief in the native rulers decreased the risks of protests ([Ramaswamy and Patagundi, 2007](#)), and eventually provided both local princes and the central government with more stability. Taken together, all of these factors resulted in *weak incentives* of the princes to provide any types of public goods ([Mukherjee, 2018](#)).

While being natives allowed princes to keep lower levels of violence with almost no cost, the British bureaucrats had to secure the colonizer's positions through the provision of basic public goods. British representatives not only lacked such autonomy, but they also were complete foreigners for the local population. That made establishing and legitimizing their authority challenging. The colonizer was a common enemy, which potentially produced higher mobilization of the local population against British representatives. The fear of violence and the risks of losing the territories, and associated resource extraction, led British representatives to have *strong incentives* to provide public goods at their local territories.

Hence, the institutional differences led to the variation of the incentives to provide public goods between the two types of local leaders. Native princes in the indirectly ruled areas managed to

⁴“The rulers of these states enjoyed full autocratic powers over their subjects. The British protected the autocracies of the princes from both internal and external dangers and threats. It was under the umbrella of British protection that these autocratic princes walked with all their grandeur and dignity” ([Krishan, N.d.](#))

⁵“The truth is that neither the princes nor the Paramount Power or for that matter any apologist of the princely order could ever claim any progressive or modern trend in the states... There are states patriarchal or quasi-feudal which still linger in a medieval atmosphere, and states which are purely under autocratic administration” ([Handa, 1968](#), 9)

⁶Literature notices that there could have been some local princes who may have been benevolent, like in Baroda and Travancore cases, but generally the majority of princes resembled autocratic rulers ([Foa, 2016; Lee, 2017; Mukherjee, 2018](#))

build stable autocratic power which helped them keep local population loyal and increase stability without providing much public services. British representatives in the directly ruled territories had more control mechanisms from the central government and had to maintain extraction process with lower costs. So they used public goods provision to legitimize their authority at the local level and, as a result, to prove their accountability to the central government.

2.2 Formal and Informal Accountability

Historical sources provide empirical evidence for two types of leaders. British provinces, like Bombay, had an efficient and disciplined administration.⁷ The Mysore administration was also well organized, but not as rigorous as in the British provinces, leaders in Hyderabad did not have neither discipline nor rigor (Ramaswamy and Patagundi, 2007, 213).⁸ So, the agency problem differed between directly and indirectly ruled places. Such differences can be driven by different types of accountability mechanisms that have been present in directly and indirectly ruled territories.

The colonial organization of power in the directly ruled areas was structured such that upward accountability was more important than downward accountability (Ribot, 1999). Hence, it was more demanding for the local leaders to be accountable to the center rather than to the local population. Their attempts to violate the orders of the center may have led to the loss of their positions, benefits and privileges.

Local princes had much less established institutional system and much less strict obligations to the center, because of their gained autonomy in policy-making. Additionally, they were natives, and the local population could have used local networks as instruments of informal accountability (Tsai, 2007; Singh, 2015; Xu and Yao, 2015) . However, these networks did not prevent local princes

⁷“Bombay had a more rigorous administration with more punctual, efficient, and disciplined civil servants, corruption was not so visible here, punishments for defaults were certain and severe. The loyalty of the civil servants was not under the question. Administering of these territories was most of the time smooth, with rare examples of violence attempts during the struggles for independence” (Ramaswamy and Patagundi, 2007, 210).

⁸In the periphery of the Nizam state, people did not respect or feared the government, and poverty and constant underdevelopment made it minimally governed area.”

from becoming highly autonomous proto-autocrats who used the co-ethnicity and co-residency to create trust in favor of their power. The lack of any formal mechanisms of accountability in these areas (like elections or external control from the center) enhanced the uncontrolled rule of the native princes. As a result, informal accountability mechanisms could not counterbalance formal accountability, which resulted in the long-lasting differences in the public goods outcomes in these territories.

2.3 Persistence

Even if there were differences historically between direct and indirect rule, whether they persist is another matter. Moreover, there can exist both physical and cultural persistence. Public goods that were provided in the colonial times can be used and expanded in certain capacity today, which forms physical persistence. Additionally, historical experience may also provide a greater propensity to maintain and improve these goods; i.e., there may be cultural persistence.

Cultural persistence mechanism suggests that differences between the leaders in directly and indirectly ruled areas created differences in the local populations' mobilization activity and their propensity to carry out collective actions.⁹ Poor incentives of the local leaders and population apathy in the princely states built the lack of interest in collective action, which led to the lack of mobilization. Directly ruled areas, on the contrary, pushed the local population to unite in the face of a common enemy and its distrust of foreign rulers and to mobilize against the colonizer's authority. Historians show that people in the Bombay region had myriad grievances driven by the presence of colonizers and their extraction interests ([Ramaswamy and Patagundi, 2007](#)). However, this paper rules out this potential mechanism by providing survey evidence from 2005 and 2011-2012 (Appendix B) which shows that the levels of confidence in politicians today is similar in both formerly directly and indirectly ruled territories. This supports the presence of a physical persistence mechanism, which presumes that different levels of public goods provision happened

⁹[Lawrence \(2013\)](#) cites [Hechter \(2000\)](#) and says that "direct rule prompts nationalist mobilization, but indirect rule thwarts nationalism because it reduces the demand for sovereignty and raises the costs of collective action".

in the colonial period, and later, after Independence, it was easier for the local governments to maintain existing goods than to create new ones.

Hence, institutional differences between directly and indirectly rule territories created differences in the starting points of development after independence and the reorganization of states. Although in the next forty years the Indian Government tried to implement special economic programs to balance the development of Karnataka, these programs did not reach the expected results; and even by the mid-1990s the imbalance between districts of Karnataka still existed ([Ramaswamy and Patagundi, 2007](#), 375). Due to historical differences, the southern part of Karnataka had better institutions and better infrastructure, which required less planned maintenance and less investment in the provision of new infrastructure (like building new roads). As a result, new governmental programs that aimed to improve the economic status of certain districts continued to contribute to the skewed development between different parts of the state ([Karnataka Human Development Report, 2005](#); [Banerjee and Iyer, 2005](#)).

3 Historical Background

3.1 India

India presents a unique setting for the comparison of direct and indirect rule effects. Colonial India was divided into separate territories - provinces - the combination of which formed British India. Provinces were ruled by British representatives - Governor-Generals, *directly* appointed by the Crown. The rest of the territory consisted of *indirectly ruled* princely states. Princely states were subordinated to the British, but ruled by the local princes, who were delegated to govern these territories. Figure A.4 shows the geographical division between princely states and British provinces in the middle of the 19th century.

As mentioned, indirectly ruled territories possessed a lot of policy-making autonomy. There were separate departments of education, finance, and industry at the local level. The financial structure, however, was irregular, and much of the total revenue was claimed by the ruler to spend

on his private interests ([Handa, 1968](#), 61). States tried to claim that they established the system of administration which was analogous to the institutional design of the British provinces, but it still was akin to one-person rule, which resembled “an autocracy without the advantage of any incentive to improvement” ([Handa, 1968](#), 64). Princes acted like proto-autocrats, who overused the authority that was delegated to them from the center.¹⁰ They made most of the important appointments (high court judges, civil servants, ministers, advisers, and members of public service commissions). There was no liberty of press or freedom of expression, no liberty of person, no security of property, and no rule or law governing the levels of taxation ([Handa, 1968](#), 65, 68). Princely states were undemocratically governed, and despite the existence of the electoral institutions, there was no actual representation. That does not deny the fact that administration in the British provinces also resembled autocratic authority. But here the necessity for extraction and maintaining stability overweighted the private interests of local leaders and led to the positive externalities for the local population.

Without formalized institutions of control, there was low local accountability in the princely states. Princes were subordinated to the center¹¹, but autonomous enough to make decisions about public goods provision.¹² British representatives, on the contrary, were extremely accountable to higher level British officials. Although, there were still no local elections, and no democratic

¹⁰“Most of the princely states had autocratic rule where powers was concentrated in the hands of rulers or their favorites appointed in the patrimonial administration. The burden of land revenue was generally much higher in the princely states compared to British administration and this was linked to their administrative machinery. The rulers generally enjoyed supreme control over the state revenues for their own personal use, often leading to ostentatious living.” ([Krishan, N.d.](#))

¹¹The British Crown reserved the right to intervene in internal matters “in cases of grave misrule, or to prevent disputed successions or rebellion, or the dismemberment of a State by division of legacy” ([House of Commons, 1913](#)).

¹² The recognition of princely states was an important action from the British side. It is important that “although many [of them] were coerced into subordination, princes usually sought political and material benefits from their agreements with the British” ([Ramusack, 2004](#), 48). Princes “could not enter political relations with foreign countries or other Princely States without explicit permission from the Government of India (GOI). In exchange these states were allowed to manage their internal affairs including tax collection and the provision of public services”.

accountability mechanisms, the risks of revolts, the potential loss of territories for extraction, and the formal upward mechanisms of control made the British leaders more accountable to the local population.

3.2 Karnataka

As noted, this paper looks at the state of Karnataka, which includes regions that were both under direct and indirect rule. After independence in 1947, the Indian government retained the British subdivision of the country. It was restructured after the States Reorganization Act in 1956. According to this act, India was divided into states that included homogeneous linguistic groups, regardless of the colonial past. So, in spite of considerable social heterogeneity across India, working with one state helps to eliminate ethno-linguistic cleavages as the alternative explanation of the differences between directly and indirectly ruled territories. Also, literature claims that indirect rule is a non-binary concept and indirectly ruled territories could have varied across India (Mahoney, 2010; Gerring et al., 2011). In such a situation, it is more important to narrow down the analysis to one particular region. However, this paper emphasizes that the core proto-autocratic aspects of indirect rule that shaped the impact on the public goods provision could have existed in all princely states. It is an important note for the external validity argument.

Karnataka was initially called Mysore State and was shaped from the districts of the former princely states (indirect rule) - Mysore and Hyderabad, and the former British provinces (direct rule) - Bombay and Madras. Mysore was renamed Karnataka in 1973.

It is generally established that in India even the neighboring city blocks can be different in language, religion and economic prosperity (Lee, 2019), which proves that heterogeneity can exist even inside one state. Previous studies have shown that the effects of decentralized administration vary across districts in Karnataka (Crook and Manor, 1998).¹³ This paper aims to explain the

¹³ For example, in terms of helping minorities' representation in Dharwar (former Bombay) district, bureaucrats tended to steal the funds or keep them unspent, rather than furnish goods to the scheduled castes. In the Mysore district (former Mysore state), programs for Scheduled Castes worked mostly because of the corruption control and inaction

origins of such differences with the colonial legacies.

Most princely states date back to Indian kingdoms and dynasties, so this study looks at the borders between direct and indirect rule as exogenous to the British capabilities and the willingness to annex. It cannot claim that the borders between princely states were random, because they were a result of wars and treaties during the annexation process.¹⁴ But it can be considered as-if random, because of the uncertainty in the conflict process ([Sun and Tyson, 2018](#)). Therefore, it is reasonable to say that the borders were not explained by the socio-economic conditions of these territories¹⁵, as generally British tried to annex as much territory as possible.

The paper works only with Karnataka, so it concentrates only on two princely states - Hyderabad and Mysore (Figure [A.4](#)). These princely states were two of the biggest in the colonial India but had a different historical and economic backgrounds. In the end of the 19-th century Mysore was annexed by the British, but in 1881 it was returned to the native princes. Hyderabad, on the other hand, was never annexed, although it was much poorer and less developed than Mysore. It was located in the middle of the continent without access to the sea ([Sherman, 2007](#)), which allowed the creation of a more closed political environment.¹⁶ Some of the princely states, like Mysore, were well-developed and very tempting for the colonizers, but they ultimately stayed under the indirect rule. This evidence helps eliminate the potential mechanism that the British invaded only

among bureaucrats ([Crook and Manor, 1998](#)).

¹⁴“Their territories in many cases dovetailed into those of the adjoining provinces, and their boundaries were so irregular that there were many princely enclaves in British Indian territory and vice versa” ([Handa, 1968](#), 13).

¹⁵In the case of Mysore, it was also known that the annexation was driven by the necessity of the British to protect themselves against the alliance between Mysore’s leader - Tipu Sultan - and Napoleon during the Napoleonic Wars ([Mukherjee, 2017](#)). So the decision to annex was exogenous to the socio-economic status of Mysore.

¹⁶After the 1822 treaty Hyderabad boundaries were well defined and assumed autonomous policy-making aside from the East India Company. Unlike Mysore, Hyderabad was free from paying any debts to the British, and the British guaranteed non-intervention. Although British power was considered dominant and the most efficient, Hyderabad administration practiced a lot of sovereign rights such as the collection of revenue and legal jurisdiction over its territories. ([Ramusack, 2004](#), 63). “Nizams of Hyderabad have been independent in the internal affairs of the state, just as much as the British Government in British India. They acted with complete freedom and independence in all inter-Governmental questions that naturally arise from time to time between neighbors”([Handa, 1968](#), 39).

poor territories, the ones that could not have fought back and had worse conditions for building infrastructure and providing public goods.

Economic differences between Mysore and Hyderabad existed during the colonial times¹⁷, which can be explained by the differences in the individual personalities of the princes that stayed in power. After Independence, the differences in the public goods provision were not eliminated.¹⁸ However, despite such economic and developmental variation between these two princely states, the study still observes worse outcomes in both princely states rather than in the neighboring directly ruled area. That allows the paper to eliminate economic prosperity as a main factor for the ability to provide public goods, emphasizing the importance of the institutional structure in these territories.

4 Data and Methods

4.1 Data

I use village-level data for 2011 (the last Indian census) that is available from the Village Directory of the electronic census library of India.¹⁹ The pool of observations includes villages located in the districts alongside the former Mysore-Bombay and Hyderabad-Bombay borders (Figure 2)²⁰.

The main independent (*treatment*) variable is whether the village is located in the former princely

¹⁷“Towards the end of the 19th century new industries and modern techniques were introduced in Mysore Karnataka. While Hyderabad Karnataka did not have much of industrial development under their strong leaders – Nizams, in Mysore there was a spurt of industrial developments in various centers like Bangalore, Mysore, Davangere, Mandya, Shimoga and others” (Ramaswamy and Patagundi, 2007, 27).

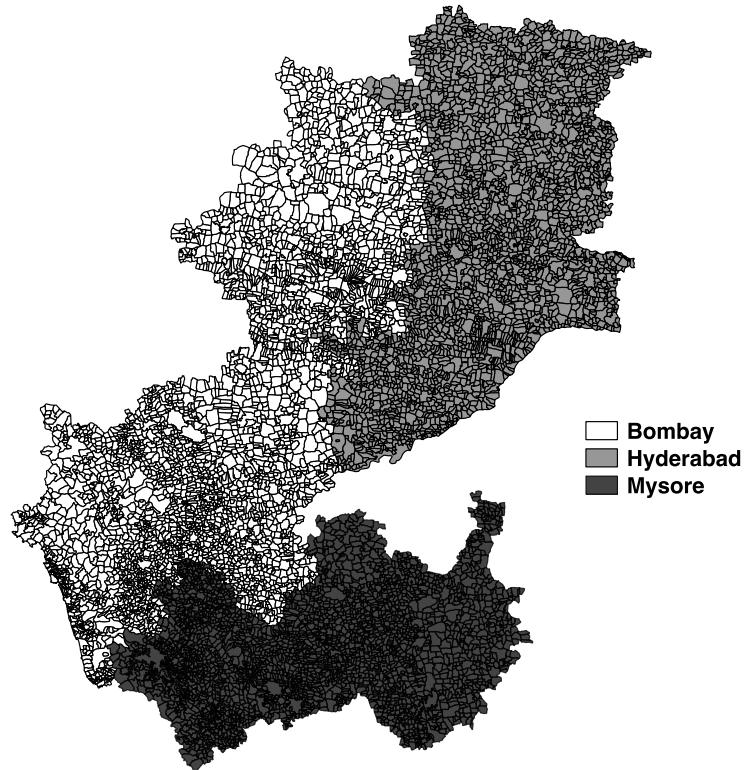
¹⁸In the early 1950s, during the State Reorganization Act discussions, “there was fairly good road development in the old Mysore state while North Karnataka, particularly Hyderabad Karnataka, did not have proper development of roads. Even now many of the villages are not even connected by surfaced roads or do not have bus services. The same is true with regard to post, telegraph and telephone services” (Ramaswamy and Patagundi, 2007, 28).

¹⁹Official Website of the Office of the Registrar General and Census Commissioner of India(URL Source: <http://censusindia.gov.in/>)

²⁰The list of districts is the following: Bagalkot, Bijapur, Chitradurga, Davangere, Dharwad, Gadag, Gulbarga, Haveri, Koppal, Raichur, Shimoga, Uttara Kannada, Yadgir

state or the province territory. Here the empirics works with the princely states, which existed as separate full territories and had well recognized borders with the neighboring provinces (Figures A.5 in the Appendix). Although some of the districts and villages changed their names and borders, the district division alongside the borders were preserved since 1872 ([of the Registrar General et al., 2004](#)). Thus, the treatment variable was assigned to the villages using contemporary district level information in GIS.

Figure 2: Village polygons Mysore-Bombay-Hyderabad



Note: The map is constructed using GIS village polygons of the 2001 Indian Census.

I measure public goods provision - dependent variables - through the availability of paved roads (*pucca roads*) and medical facilities (*health centers*). It is important to notice that the results can drastically vary depending on what distributive goods are used as the outcomes ([Kramon and](#)

Posner, 2013). My choice of specific public goods is explained by the fact that they present excellent examples of the two - infrastructural and social - sets of public goods that are usually provided by local leaders.²¹ First, these public goods respond to the needs of the local population. Roads, for instance, are necessary for food distribution or for the access to schools and hospitals, and they also have an economic value of expanding the market. Medical facilities are important for maintaining social needs of the locals. Second, these are the goods that exhibit physical persistence. For example, it is easier and cheaper to pave a road that existed in the village rather than to build a new road and to build a hospital in the place where previously there have existed medical facilities and medical personnel. It is also important to remember that the Crown was about to invest only in the provision of such public goods that could be useful for her main goal - resource extraction. And since the British provinces were under more accountability about extraction than the local princes, they were more likely providing such goods.²² All the dependent variables are binary, where 1 indicates the availability of the public goods and 0 indicates its absence.

There are a lot of potential factors that may impact the interaction between direct and indirect rule and public goods availability, but controlling for some of them (like contemporary economic indicators) cannot be possible because of post-treatment bias. That is why for control variables I use a set of geographic factors that are not changeable over time and population characteristics such as total population, scheduled castes and scheduled tribes population (Rosenbaum, 1984; Keele and Titiunik, 2015). I use scheduled castes and tribes population given that the caste system existed at these territories many years before the colonizers came to India, and since it was hard to move to new territories (especially for the people from the lower castes), the social hierarchy of the

²¹Tables C.1, C.2 in the Appendix show the summary statistics of dependent variables for the 20 kilometers bandwidth around the Mysore-Bombay and Hyderabad-Bombay borders, correspondingly.

²²"Railways, irrigation and roads were built only where such investment could directly contribute to the expansion of trade, and it was largely taken as given that if people in rural areas wanted to have access to modern medicine and "English" education, they should be prepared to travel to the nearest big town. While this was not necessarily what the people wanted, the colonial state was powerful enough not to need to embrace populism". Education facilities could have been seen by both - princely states and the British provinces - as the places for growing radical ideas (Banerjee, 2002).

population persisted through the colonial times until today.

Another potential alternative explanation can be through economic factors. One such factor is the land revenue system. But the entire geographical region that is analyzed in this study had the same scheme of land revenue system during colonial times ([Banerjee and Iyer, 2005](#)).²³ Another economic mechanism is internal migration. It is possible to imagine that people moved to the places with a better administrative system. But historians establish that migration was uncommon in these territories ([Fisher, 1998](#)). People were not only attached to their families and the communities where they grew up, but it was also quite hard to move without a proper transportation system. Moreover, it is logical to assume that in colonial times people did not have enough sources of information about the other side of the border, which could have prevented them from moving across the border for a better life.

Recall that the Karnataka state was formed on the grounds of ethno-linguistic homogeneity. This mitigates the impact of ethno-linguistic cleavages. In addition, although there is no open data on the ethnic and linguistic groups in the census, historians have pointed out that British India and princely states were well balanced in ethno-linguistic variables.²⁴

4.2 RDD

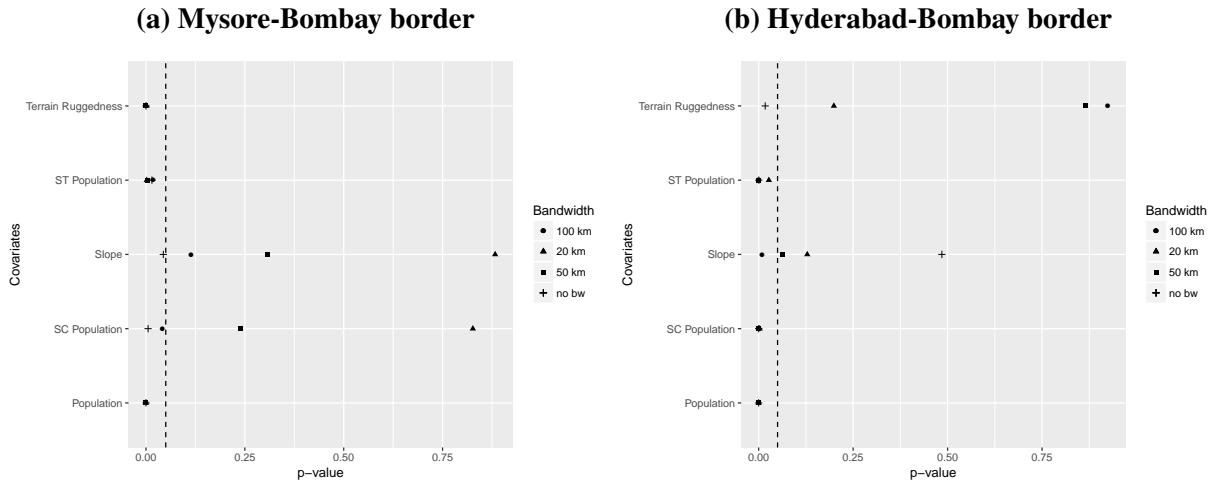
Locating in the former princely state side of the border is a deterministic and discontinuous function of known covariates: longitude and latitude. It is hard to claim that even within one state the borders are random, which is why this paper uses a regression discontinuity design (RDD). RDD does not require randomization, but treatment should be exogenous conditional on the pre-treatment characteristics (conditional independence assumption): $(Y_{1i}, Y_{0i} \perp T_i | X_i, d_i < D)$. All relevant factors, besides the treatment, should be continuous at the boundary ([Angrist and Pischke, 2008](#)).

²³It can be observed in Figure 1 of [Banerjee and Iyer \(2005\)](#) paper.

²⁴“Both of them [British India and Indian states] were utterly artificial. Both belonged to the same ethnic stock, spoke the same language or languages and had common aspirations and ambitions” ([Handa, 1968](#), 2).

While the classic RDD looks at the impact of being on one side of a running variable, in the spatial case the border is a two-dimensional object. Borders between directly and indirectly ruled places form a multidimensional discontinuity in the longitude - latitude space. That explains why geography is one of the most important covariates for the spatial RDD.

Figure 3: Balance Tests of pre-treatment covariates around the borders



Note: Figures present p-values. P-values are calculated for the null hypotheses about the absence of statistical differences between the covariates' means. Different symbols correspond to different bandwidths around the border. The dashed line shows a cutoff of p-value = 0.05.

Figure 3 shows balance tests of the covariates for several bandwidths around the border.²⁵ The imbalance in terrain ruggedness can be explained by the differences in elevation. That is why I use the slope variable which is balanced across the border to achieve geographical continuity. These are the primary variables that can be considered pre-treatment and which are used as the main balancing covariates. Here I also observe inconsistent imbalance in the population characteristics. A possible concern can be about scheduled castes population and scheduled tribes population, which indicate the amount of the poorest population. Scheduled castes population is balanced only for Mysore-Bombay border at twenty kilometers and fifty kilometers bandwidths; the rest of the variables are not balanced. This proves the existence of the population variability across the border. However, I argue that the creation of the borders is exogenous to the socio-economic status of the territories, and is defined by the randomized component in the conflict and in the annexation

²⁵Figures E.1 – E.4 in the Appendix present the plots of some unbalanced variables for both borders.

process. Also, D.1 and D.2 in the Appendix provide evidence that the indirectly ruled territories averagely have less scheduled castes and scheduled tribes population, which argues against the idea that the negative effect on the provision of public goods in the indirectly ruled areas can be explained by the economic poverty of these regions.

The existing literature is skeptical about linear estimation of the spatial regression discontinuity models, because it estimates the average effect alongside the border (Keele and Titiunik, 2015). Therefore, as a baseline estimation technique, I use a non-parametric method, which helps identify the potential heterogeneous effects and takes them into account in the estimation of the average treatment effect.

I also provide OLS models with a baseline twenty kilometers (ten kilometers on each side of the border) bandwidth. The distance from the village to the border is measured as the shortest distance from the center of the village polygon to the border line between two different systems. The regression form is as follows:

$$y_i = \alpha + \gamma * t_i + \beta * X_i + f(g) + \varepsilon_i,$$

where y_i is a dummy variable that indicates the availability of public goods in village i ; t_i is a treatment variable which equals 1 if village is on the former princely state (indirect rule) side of the border and 0 otherwise, X_i is a set of pre-treatment control variables (total population, scheduled castes and scheduled tribes population, terrain ruggedness, and slope). Further, $f(g)$ is a function of the latitude and longitude that serves as an analogue of a running variable in the classic RDD. In the baseline specifications, the paper uses a linear function of latitude and longitude, whereas an additional cubic polynomial specification is shown in the robustness checks section.

5 Results

5.1 Baseline Results

Table 1 demonstrates the results of the non-parametric estimation.²⁶ Here the border is presented as a set of points, and the estimated effect is the mean of the average treatment effects at each of these points. The tables show a consistent negative effect of indirect rule without any heterogeneity between princely states and between different types of public good.

Table 1: Non-Parametric Estimation of the Indirect Rule Effect on Public Goods Outcomes

Mysore-Bombay Border	Outcomes	Coefficient	Lower CI Bound	Upper CI Bound
	Health Centers	-0.046	-0.059	-0.034
	Paved Roads	-0.173	-0.187	-0.158
Hyderabad-Bombay Border	Outcome	Coefficient	Lower CI Bound	Upper CI Bound
	Health Centers	-0.119	-0.129	-0.108
	Paved Roads	-0.019	-0.038	-0.0004

Note: Coefficients show the average effects of indirect rule on the availability of health centers and paved roads across the border points. They were calculated using the bootstrap technique from the coefficients estimated on the set of points alongside the border. CI stands for the 95% confidence intervals for the estimated average effects across the border points, also calculated using a bootstrap technique.

Table 2 presents the results for the OLS models with the linear polynomial of latitude and longitude with twenty kilometers bandwidths around the borders. These results also show a mostly dominant negative effect of indirect rule, which is consistent with the non-parametric estimation results. I do not observe a separation between different types of goods. Roads have a negative significant effect from indirect rule for the Mysore case, and health centers have a significant negative effect from indirect rule for the Hyderabad case; the rest of the coefficients are non-significant for this estimation technique.

²⁶For the estimation of the treatment effects on each point of the border, I used the methodology offered by Keele and Titiunik (2015). Confidence intervals were constructed using bootstrap method (Larget, 2014).

Table 2: OLS Estimation of Indirect Rule Effect on Public Goods Outcomes (20 km bandwidth)

	<i>Dependent variable:</i>			
	Health Centers		Paved Roads	
	(1)	(2)	(3)	(4)
Indirect Rule (Mysore)	-0.016 (0.026)	-0.115*** (0.035)		
Indirect Rule (Hyderabad)			-0.079*** (0.016)	0.008 (0.063)
Constant	-8.060** (3.199)	0.135 (5.072)	6.609 (6.761)	5.368 (6.828)
Controls	✓	✓	✓	✓
Observations	1,158	1,158	940	940

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered on districts are in the parentheses. Models 1 and 2 show the results for the effect of indirect rule on the Mysore-Bombay border, and models 3 and 4 present results for the effect of indirect rule on Hyderabad-Bombay border. All models are controlled on latitude, longitude, slope, terrain ruggedness, total population, scheduled castes and scheduled tribes population.

5.2 Robustness Checks

I use placebo borders between direct and indirect rule territories and additional model specifications for the robustness checks. Table F.1 in the Appendix show the results of the OLS models with linear polynomial for the two placebo Mysore-Bombay borders: ten kilometers closer to the princely state (-10 kilometers) and ten kilometers further from the princely state (+10 kilometers), correspondingly. Health centers and roads do not have significant effects, which means that placebo borders between direct and indirect rule does not have any impact on these outcomes, supporting the main results that the real border matters.

Table F.2 in the Appendix presents the estimation results for OLS models with the linear polynomial of the placebo Hyderabad-Bombay border. As well as in the Mysore case, it is ten kilometers closer to the princely state (-10 kilometers) and ten kilometers further from the princely state (+10 kilometers) correspondingly. The results for -10 kilometers placebo indicate that there is no effect from the placebo border between direct and indirect rule on any of the outcomes, which supports the main results. The results for the +10 kilometers placebo present a significant coefficient for the health facilities. Health facilities here have the same significant negative effect as in the baseline model. It can serve as evidence that placebo border has the same effect as the real border. This weakens the initial results for Hyderabad-Bombay border that the differentiation between direct and indirect rule impacts the provision of the medical facilities. The effect on the availability of roads in the placebo test is not significant across all the models. This result confirms that the placebo border has no significant effect and supports the main result for roads.

Another robustness check tool uses the alternative model specification with the cubic polynomial of latitude and longitude. The model looks as following:

$$y_i = \alpha + \gamma * t_i + \beta * X_i + f(g) + \varepsilon_i,$$

where $f(g)$ indicates the cubic polynomial of the latitude and longitude variables. Cubic polynomial specification is used for the smoothness of the border in a 2-dimensional space. The results of the

estimation for this model specification are presented in Table G.1 in the Appendix. They are mostly consistent with the baseline linear polynomial models and have the same direction of the effects as the non-parametric estimation. I also use alternative bandwidth (fifty kilometers around the border) as additional robustness checks. Tables H.1 and H.2 of the Appendix show the results for both linear and cubic polynomial models with the fifty kilometers bandwidth around the borders. The results are consistent with the baseline OLS with the linear polynomial models.

5.3 Discussion

According to the posited theoretical mechanism, the leaders in the directly ruled territories should have less incentives to spend money on their private interests and should invest in public goods provision. More independent local leaders in the indirectly ruled areas, on the contrary, have weaker incentives to provide public goods, mainly because of the lower risks of violence due to the informal networks and the monarchical legitimization. Despite the existing differences between Mysore and Hyderabad leaders, the paper observes a consistent negative effect of indirect rule on the availability of certain public goods. The main explanation for these results is not based on the claim that the colonizers were more benevolent and less corrupted; instead, it is based on the idea that they had more constraints both from the higher level authorities (the requirement of efficient extraction) and from the local population (the risks of losing authority over these territories). British leaders needed to establish and legitimize their presence at these territories and to decrease the risks of revolts by the local population. Furthermore, investing in road construction could have helped them build trade networks and connect widely-spread parts of the British Raj for more efficient extraction. All these factors created stronger incentives for the local leaders in the directly ruled territories to provide public goods, which can explain better outcomes in cases of direct rule.

This paper looks at examples of both infrastructural and social goods that can be related to the developmental needs of the local population: roads and medicine. I avoid any goods that can be used by the local rulers to shape the minds of the local population (such as education facilities). The results of the empirical analysis show mostly negative effects of indirect rule, with stronger effects

on infrastructural goods. According to the non-parametric estimation, there is no heterogeneity across princely states and across different types of public goods. Both princely states have negative effects of indirect rule on the medical facilities, but for Hyderabad this result does not fully hold the robustness checks. This negative effect can be explained by the British incentives to keep people who work for them healthy. There is historical evidence that the British did not only build hospitals, but also sent medical personnel overseas.²⁷

The effect on roads is also negative, but it is consistently significant only for the Mysore case. I do not consider this effect as heterogeneous between two different princely states. It is possible that roads were not that important for the leaders on both sides of the Hyderabad border, because these territories were badly explored, underdeveloped, and far from most of the trade networks. On the border with Mysore, the effect is stronger potentially because these territories were economically important for the British, and here they invested in the infrastructure much more. Historical evidence can also be provided that roads were important to the British. The British Raj was spread around the territory of India, so it was important to create networks of communication between different parts of the British territories. Roads were necessary for connecting British enclaves and increasing economic efficiency. Such a communication was also helpful for the cooperation between residents that were sent overseas. Roads helped to commercialize agriculture, to transport the raw materials across the empire territories towards the ports, and to serve for defense purposes (Ramusack, 2004, 192). Taken together, this is evidence that the British side of the border was probably better at providing public simply for their own benefits, rather than for the benefits of the local population.

6 Conclusion

The persistent effect of historical institutions has been an object of considerable interest and discussion. When it comes to the impact of direct and indirect rule, there is no scholarly consensus.

²⁷The British fulfilled numerous medical and educational missions to their overseas territories (Kent, 1999).

Here, to bring greater clarity to this discussion, the paper studies the effect of indirect rule on public goods provision in the contemporary Indian state of Karnataka. It finds evidence that the type of rule mattered in understandable ways and that this effect continues to persist to present.

Karnataka was formed from the princely states of Mysore and Hyderabad that were ruled indirectly, and the provinces of Madras and Bombay, which were under direct British control. That makes Karnataka a very strong case to compare persistent effects from both direct and indirect rule. Unlike the previous literature, I eliminate geographical and socio-economic variability by working with the closely located village-level data in Karnataka state.

The theory builds on local leaders' incentives. Directly and indirectly ruled territories had distinguished institutional systems which shaped different incentives for the local leaders. Princes had enough autonomy from the center and played the role of native proto-autocrats. This created an inert population that was not eager to fight with the local elites. Together, these features allowed local princes to neglect informal accountability and have very weak incentives to provide public goods. British representatives were subject to more sophisticated control mechanisms from the central government. Being foreigners, they could have also provoked the local population to mobilize against the foreign enemy. High risks of potential violence and the possible loss of extracted resources made British representatives more accountable and shaped stronger incentives to provide public goods.

Survey data in contemporary India shows that variation in local population's attitudes towards officials is not really observed today, which eliminates the cultural persistence mechanism and points towards physical persistence. It is less costly to maintain the existing goods than to create new ones. As a result the heterogeneity in public goods provision that was formed in the colonial times is preserved till today. Therefore, this paper tests the hypothesis that indirect rule has a persistent long-term negative effect on the public goods outcomes. Using a spatial regression discontinuity design, I show that there is a consistent negative effect of indirect rule on the contemporary availability of paved roads and health centers at the village level. Negative effects of indirect rule are observed in two different princely states (Mysore and Hyderabad), with the stronger effect for Mysore and for

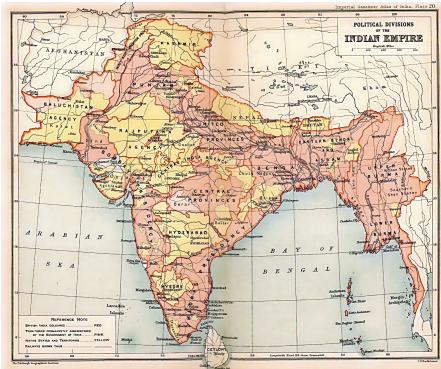
the infrastructural goods. The results hold across different model specifications.

The paper provides new evidence about indirectly ruled territories and suggests that historical differences, and more specifically colonial past, can have an important influence on the contemporary economic outcomes, which cannot be neglected in discussing the topic of political and economic development at the local level.

Appendix

A Graphic Appendix

Figure A.4: Map of Princely States and British Provinces (pre-1947)



Source of the map: British Indian Empire 1909 Imperial Gazetteer of India (URL
Source: <https://goo.gl/8t1iQq>).

Figure A.5: Village polygons: Mysore-Bombay and Hyderabad-Bombay

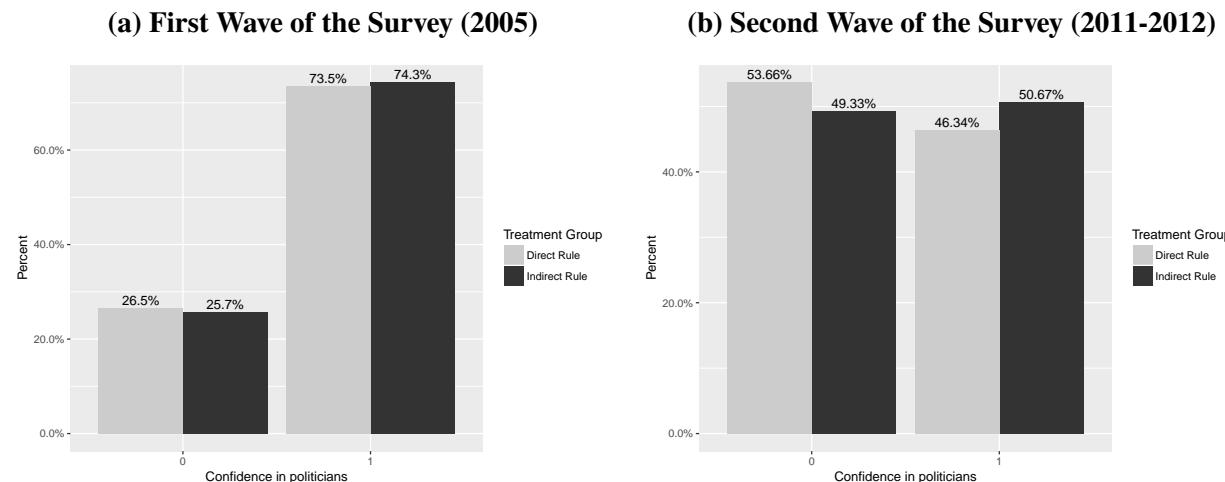


Note: Maps illustrate the village polygons of around Mysore-Bombay and Hyderabad-Bombay borders.

B Alternative Mechanisms

This section provides empirical evidence that helps to eliminate an alternative mechanism of the cultural persistence. The cultural persistence argument presumes that the directly ruled territories had people with less trust to the local leaders, which stimulated the capability of the local population for collective action and for more efficient mobilization. The local population in the indirectly ruled areas, on the contrary, had more trust to the local leaders, which led to the lack of mobilization and the disability of any potential collective actions. These trust attitudes on both sides of the former borders persist today and shape the cultural persistence mechanism. To see whether the

Figure B.1: Indian Human Development Survey Results



Note: The charts are based on the individual survey data and present the survey results only for the districts of Karnataka that were used in the baseline results. For confidence level, the category 1 was constructed with the aggregation of responses - "A great deal" and "Only some" for 2005 wave, and "A great deal of confidence" and "Only some confidence" for 2011-2012 wave. Category 0 means "Hardly any confidence". The first wave of the survey (2005) consisted such options for the respondents as "Don't know", "Valid blank", "Valid skip", and "-". Dropping of the "Don't know" category could have impacted the results of the first wave. The exact question in the survey was the following: "I am going to name some institutions in the country. As far as the people running these institutions are concerned, would you say you have confidence in politicians to fulfill their promises?".

persistence of trust holds through the time, I provide the results for the two waves of the Indian Human Development Survey: wave of 2005²⁸ and wave of 2011-2012.²⁹ Figure B.1 shows graphs of responses about confidence in politicians to fulfill their promises.³⁰ I choose respondents from

²⁸Data is available at the ICPSR website: <https://www.icpsr.umich.edu/icpsrweb/DSDR/studies/22626>.

²⁹Data is available at the ICPSR website: <https://www.icpsr.umich.edu/icpsrweb/DSDR/studies/36151>.

³⁰Here I grouped the three-level scale of the responses to a binary measure.

the districts of Karnataka that are used in the baseline models, identifying the districts of the former princely states as the treatment group and the districts of the British province as the control group. The figures show that, in both time periods, there is no significant differences between confidence in politicians in both former directly and indirectly ruled territories. That helps to eliminate a cultural persistence mechanism and point towards the original physical persistence mechanism.

C Summary Statistics of the Dependent Variables

Table C.1: Summary Statistics for the Dependent Variables. Bandwidth=20km around Mysore-Bombay Border

Statistic	N	Mean	St. Dev.	Min	Max
Health Centers	1,158	0.231	0.422	0	1
Paved Roads	1,158	0.845	0.362	0	1

Table C.2: Summary Statistics for the Dependent Variables. Bandwidth=20km around Hyderabad-Bombay Border

Statistic	N	Mean	St. Dev.	Min	Max
Health Centers	940	0.280	0.449	0	1
Paved Roads	940	0.878	0.328	0	1

D Balance Tests Tables

Table D.1: Balance Tests for Mysore-Bombay border (Bandwidth=20km)

	Mean Tr	Mean Cont	T-Test P.Value
Total Population	844.766	1,445.905	0
Total Scheduled Castes Pop	278.085	282.091	0.827
Total Scheduled Tribes Pop	160.096	206.048	0.002
Slope	88.837	88.740	0.883
Terrain Rugness	2.312	2.755	0.002

Table D.2: Balance Tests for Hyderabad-Bombay border (Bandwidth=20km)

	Mean Tr	Mean Cont	T-Test P.Value
Total Population	1,385.179	1,669.790	0.00002
Total Scheduled Castes Pop	354.623	423.661	0.003
Total Scheduled Tribes Pop	248.146	210.045	0.027
Slope	88.702	87.302	0.129
Terrain Rugness	1.130	1.206	0.199

E Additional Balancing

Figure E.1: Covariates distribution across Mysore-Bombay Border (bw=20 km)

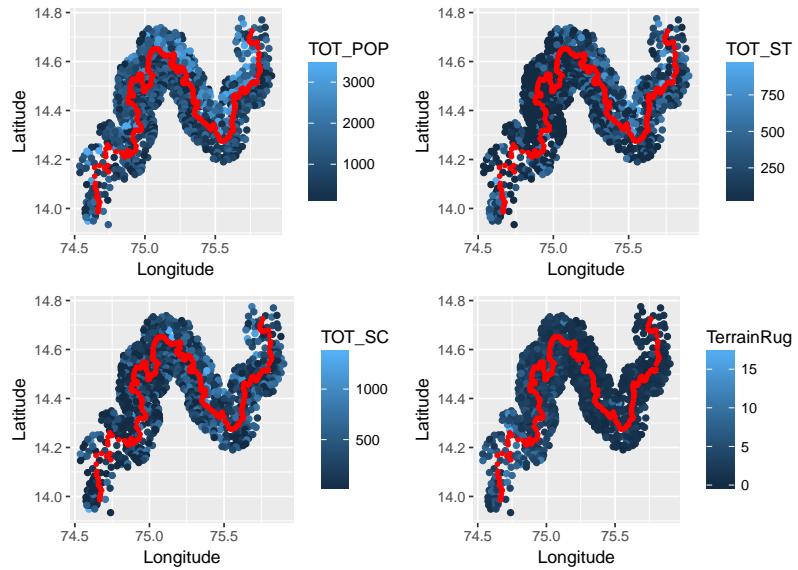


Figure E.2: Covariates distribution across Mysore-Bombay Border (bw=200 km)

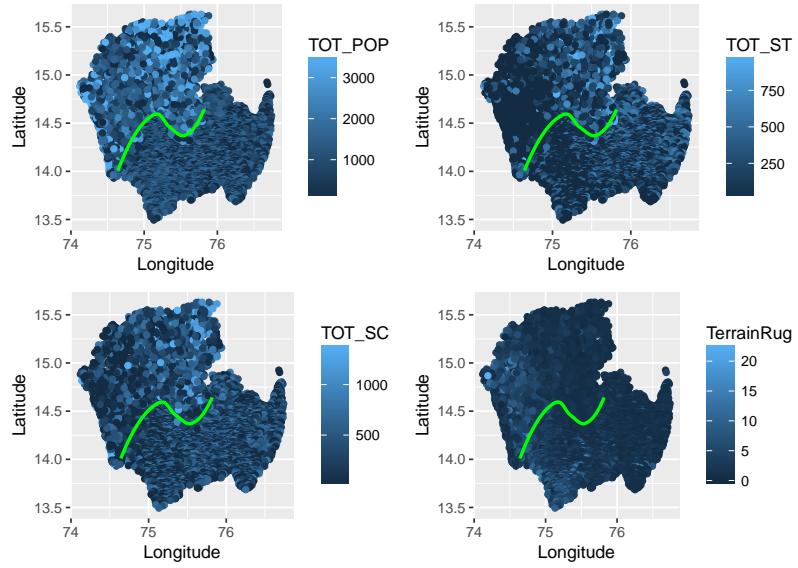


Figure E.3: Covariates distribution across Hyderabad-Bombay Border (bw=20 km)

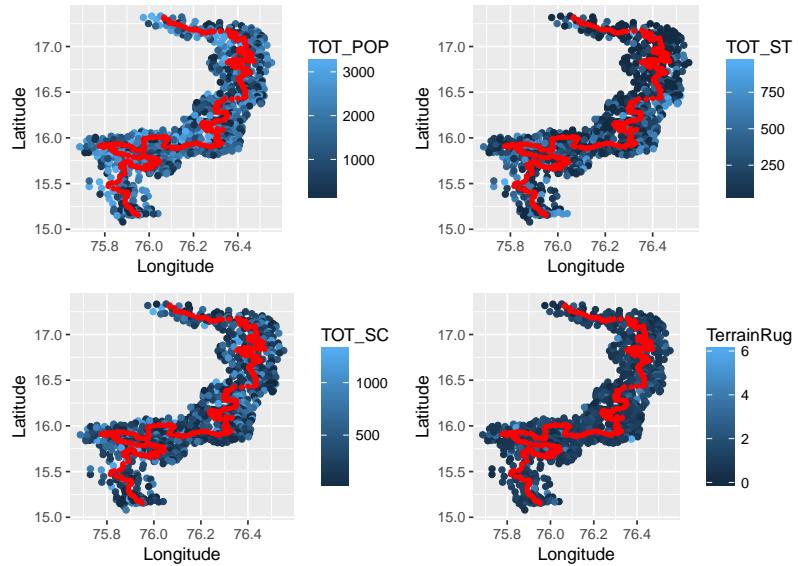
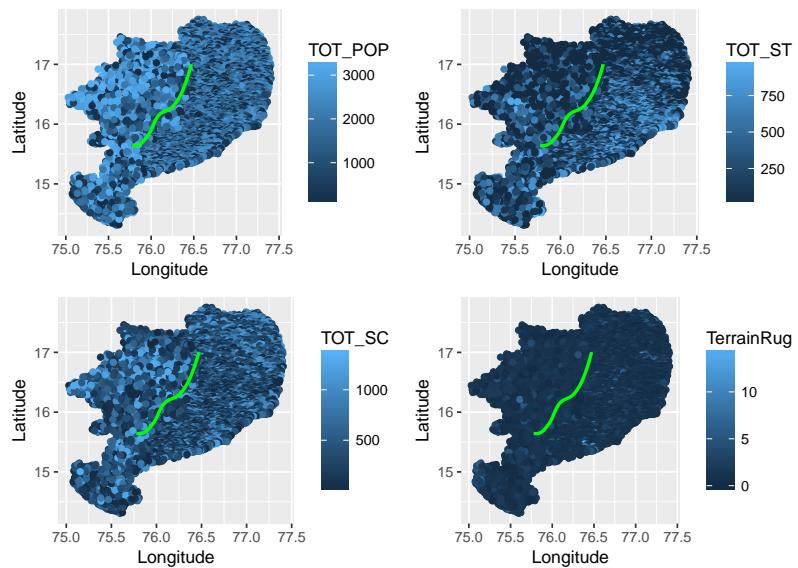


Figure E.4: Covariates distribution across Hyderabad-Bombay Border (bw=200 km)



F Placebo Tests

Table F.1: Placebo Tests for Mysore-Bombay Border

<i>Dependent variable:</i>				
	Health Centers -10 km	Paved Roads	Health Centers +10 km	Paved Roads
	(1)	(2)	(3)	(4)
Placebo Indirect Rule	−0.051 (0.032)	0.001 (0.027)	0.006 (0.007)	0.033 (0.021)
Constant	−8.571*** (0.474)	−8.057*** (2.923)	−9.155 (5.599)	−0.148 (0.970)
Controls	✓	✓	✓	✓
Observations	1,014	1,014	1,110	1,110

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered on districts are in the parentheses. Models 1 and 2 show the results for placebo border that is -10 kilometers (closer to the princely state) from the original Mysore-Bombay, and models 3 and 4 show the results for placebo border that is +10 kilometers (further to the princely state) from the original Mysore-Bombay. All models are controlled on latitude, longitude, slope, terrain ruggedness, total population, scheduled castes and scheduled tribes population.

Table F.2: Placebo Tests for Hyderabad-Bombay Border

<i>Dependent variable:</i>				
	Health Centers -10 km	Paved Roads	Health Centers +10 km	Paved Roads
	(1)	(2)	(3)	(4)
Placebo Indirect Rule	−0.009 (0.041)	−0.013 (0.028)	−0.052*** (0.011)	0.010 (0.020)
Constant	−2.010 (3.585)	8.087*** (1.776)	23.063** (10.229)	1.711 (8.803)
Controls	✓	✓	✓	✓
Observations	740	740	819	819

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered on districts are in the parentheses. Models 1 and 2 show the results for placebo border that is -10 kilometers (closer to the princely state) from the original Hyderabad-Bombay, and models 3 and 4 show the results for placebo border that is +10 kilometers (further to the princely state) from the original Hyderabad-Bombay. All models are controlled on latitude, longitude, slope, terrain ruggedness, total population, scheduled castes and scheduled tribes population.

G Alternative Specifications

Table G.1: OLS Estimation of the Indirect Rule on the Public Goods Outcomes controlled on the Cubic Polynomial (bandwidth=20 kilometers)

	<i>Dependent variable:</i>			
	Health Centers		Paved Roads	
	(1)	(2)	(3)	(4)
Indirect Rule (Mysore)	-0.001 (0.011)	-0.126*** (0.035)		
Indirect Rule (Hyderabad)			-0.093*** (0.021)	-0.009 (0.073)
Constant	-46,305.380 (47,332.330)	-49,469.980 (40,972.960)	-96,428.040 (60,642.290)	-57,746.760 (53,923.800)
Controls	✓	✓	✓	✓
Observations	1,158	1,158	940	940

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered on districts are in the parentheses. Models 1 and 2 show the results for the effect of indirect rule on the Mysore-Bombay border, and models 3 and 4 present results for the effect of indirect rule on Hyderabad-Bombay border. All models are controlled on the cubic polynomial of the latitude and longitude, slope, terrain ruggedness, total population, scheduled castes and scheduled tribes population.

H Alternative Bandwidths

Table H.1: OLS Estimation of Indirect Rule Effect on Public Goods Outcomes (50 km bandwidth)

	<i>Dependent variable:</i>			
	Health Centers	Paved Roads	Health Centers	Paved Roads
	(1)	(2)	(3)	(4)
Indirect Rule (Mysore)	-0.024 (0.028)	-0.119*** (0.036)		
Indirect Rule (Hyderabad)			-0.061*** (0.022)	0.008 (0.061)
Constant	-6.162** (2.876)	-2.865 (2.147)	7.196* (4.344)	7.311 (4.494)
Controls	✓	✓	✓	✓
Observations	2,525	2,525	1,849	1,849

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered on districts are in the parentheses. Models 1 and 2 show the results for the effect of indirect rule on the Mysore-Bombay border, and models 3 and 4 present results for the effect of indirect rule on Hyderabad-Bombay border. All models are controlled on the latitude and longitude, slope, terrain ruggedness, total population, scheduled castes and scheduled tribes population.

Table H.2: OLS Estimation of the Indirect Rule on the Public Goods Outcomes controlled on the Cubic Polynomial (bandwidth=50 kilometers)

	<i>Dependent variable:</i>			
	Health Centers	Paved Roads	Health Centers	Paved Roads
	(1)	(2)	(3)	(4)
Indirect Rule (Mysore)	0.002 (0.007)	-0.119*** (0.013)		
Indirect Rule (Hyderabad)			-0.095*** (0.019)	0.0002 (0.074)
Constant	-2,796.069 (12,968.610)	28,425.830 (24,687.170)	-29,929.680* (18,083.590)	-7,973.379 (43,530.970)
Controls	✓	✓	✓	✓
Observations	2,525	2,525	1,849	1,849

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard errors clustered on districts are in the parentheses. Models 1 and 2 show the results for the effect of indirect rule on the Mysore-Bombay border, and models 3 and 4 present results for the effect of indirect rule on Hyderabad-Bombay border. All models are controlled on the cubic polynomial of the latitude and longitude, slope, terrain ruggedness, total population, scheduled castes and scheduled tribes population.

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