The impact of colonial legacies on inequality of opportunity in education

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May, 2019

Abstract

I study the impact of the colonial legacies of the *mita* on inequality opportunity in educational achievement. To do this I use data from Peru's "Evaluación Censal de Estudiantes" (2007-2012), which evaluates the math and communication skills for all children in the second grade of primary in Peru. I define inequality of opportunity in education as the difference in the ability of displaying the expected cognitive skills for age. My results show evidence of an effect of mita on academic performance in communication, and no effect in math. I investigate differences in school characteristics between mita and non-mita districts as potential mechanisms, and find a negative effect on the likelihood of having access to sanitation. I observe that the lack of sanitation is related to lower public spending in health and sanitation in mita areas vis-á-vis non-mita ones. These findings are tied to the known effects of mita on stunting, and in turn to a negative effect on educational attainment.

Keywords: mita, colonial legacies, inequality of opportunity, educational achievement.

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1 Introduction

Do colonial legacies affect the level of inequality of opportunity in educational achievement? Education is one of the mechanisms that maps the effect of institutions onto income inequality in adulthood (Balcázar, 2016; Ansell, 2010). However little is known about the effect of colonial legacies on educational achievement as opposed to the effect of colonial legacies on educational on educational attainment.[1] This is an important omission inasmuch as educational attainment is an imperfect proxy for the provision of public education, since it fails to capture the quality of the education being provided (Gift and Wibbels, 2014). Furthermore, evidence shows that it is educational achievement what usually explains differences in development outcomes, not attainemt (Hanushek and Woessmann, 2012a). I address this gap by investigating the causal effect of the *mita*—a mandatory public service in the society of the Inca Empire later abused by spaniards for resource extraction during the colinal period—on children educational achievement in Peru.

By measuring children's educational achievement directly, I can determine whether the mita had long-term legacies on the future opportunities of those exposed to it by assessing its impact on cognitive-skill formation. The analysis of such outcomes is preponderant since enrollment in primary education in Peru is almost universal (Contreras et al., 2018), and as a result there is little variation in young children's educational attainment to carry out a meaningful analysis.

To measure an educational opportunity I use children's ability of displaying the expected cognitive skills for age as the outcome of interest, and measure inequality of opportunity as the differences in outcomes that can be attributed to circumstances out of the control of individuals—such as being exposed to colonial legacies.[2] Thus inequality of educational opportunity in the context of this paper is not defined as differences in test scores between mita and non-mita areas. This stands to reason because we do not know to what extent differences in efforts to study owe solely to differences in circumstances, and whether the latter call for compensation from society and to what extent (Brunori et al., 2012). Instead I leverage on the concept of *educational adequacy* (Clune, 1994), which calls for guaranteeing a minimum level of education for all individuals.

On top of this, using a proxies of educational achievement as an outcome also allows me to contribute to the study of the long-run effect of Peru's mining *mita* on educational outcomes. For instance, Dell (2010) seminal work explores the causal effect of the mita on literacy and years of education attained, among other development outcomes, but this analysis has two relevant short-

[1] Some examples include Garnier and Schafer (2006); Huillery (2009); Gallego (2010); Dell (2010); Dupraz (2017).

[2] Inequality of opportunity refers to the differences in outcomes that can be attributed to circumstances out of the control of individuals (Roemer, 1998; Roemer and Trannoy, 2015). The mita is a good example of a circumstance since in theory children cannot choose where they grow up and attend to school.

comings: First, literacy and years of schooling may be subject to selective sorting around the mita boundary. This could occur if the mita treatment provokes substantial out-migration of relatively skilled individuals, and in-migration of relatively less skilled ones. This concern stands to reason since residents in mita districts engage in subsistence farming at higher rates than those outside it, thus mita districts may attract unskilled labor and provide more skilled labor to other areas. Carpio and Guerrero (2016) finds evidence that the mita indeed generated considerable sorting around its boundary in the form of out-migration from the mita region, affecting human capital in adults. I argue herein that compelling evidence of the impact of mita on educational outcomes can be obtained from analyzing the educational outcomes of young children, who are more likely to be exposed to the legacies of the mita during key years of formation (Heckman, 2007).[3] Second, literacy and years of education are imperfect proxies for the provision of public education; in Latin America it is educational achievement what usually explains differences in development outcomes (Hanushek and Woessmann, 2012b). Therefore it stands to reason to address this limitation by exploring both differences in test scores and, from the public policy point of view, inequality of opportunity in expected cognitive skills for age.

I address these concerns by analyzing differences in test scores around the mita boundary using a standardized test for second graders (2007-2012): the "Evaluación Censal de Estudiantes" (or ECE), which evaluates math and communication skills for all children circa 7 years of age in Peru. To do this I use an Regression Discontinuity Design (RDD) similar to Dell (2010), and exploit the mita quasi-exogenous geographic assignment. The outcomes of interest are both math and communication test scores and whether children display the expected cognitive skills for age, defined by using Peru's Ministry of Education minimal achievement cut-offs.[4] Nonetheless I focus on the latter outcome in my analyses on the basis of the reasons mentioned earlier, despite achieving a minimum standard can be contingent on the variation above it (Koski and Reich, 2006).

I analyze the potential mechanisms that may give rise to inequality of educational opportunity owing to the mita by exploring the differences in public school characteristics between mita and non-mita areas. For this endeavor I use data from Peru's school census: "Censo Escolar" (or CE), which collects data on schools' teaching body, student composition, access to public services, among other school characteristics. This data allows me to carry out a hard test for the public policy mechanism insfoar as 81% of primary schools in the districts around the mita boundary are public, allowing me to control to an extent for the presence of goods and services that act as substitutes to

[3]In Dell (2010) there is actually weak evidence for a persistent effect of mita through access to schooling.

[4]These cut-offs are defined by experts in education and capture the level of educational attainment that is expected from a children in second grade of primary, in order for him (or her) to advance in their education and develop effectively as a member of society.

the provision of public goods, such as private education.[5] In this sense, this paper leverages on the extant evidence that school resources, such as teachers and proper school infrastructure, are key for children cognitive development during school (Glewwe and Kremer, 2006; Das et al., 2011; Glewwe and Muralidharan, 2016).

I also explore the effect of mita on public spending in education by using data on government expenditures in education and culture at the district level.[6] On top of this, I explore the effect of mita on public spending in health and sanitation. This stands to reason since the extant literature documents a mapping from child health to children educational outcomes (Glewwe and Miguel, 2007).

The results I obtain from the main analysis show no evidence of a statistically significant differences in the educational outcomes as measured by test scores in math, but I do find suggestive evidence of differences in test scores in communication of about 0.15 standard deviations. Consistent with these findings, my results are suggestive of some degree of inequality of opportunity in communication—as measured by the differences between mita and no-mita areas in the likelihood of showing the level of educational attainment that is expected from a children in second grade of primary. My findings indicate that if children receive their education during key years of formation in a mita district, they are 2.5% to three 3% less likely to show the level of learning expected for their grade, indicating that they are not prepared to advance further with their education. However, this evidence is not robust to all specifications. I also evaluate whether the mita is relevant to understand the potential impacts of the level of private education supply on public school students' educational achievement, but find no evidence that this is the case. Therefore it is hard to make a convincing case for the mita as a direct source of inequality of educational opportunity.

When exploring the potential channels associated to the provision of public goods, I find that the mita is robustly, and positively associated with an increase in the percentage of teachers with long-term contracts and a fall in the likelihood of sanitation services at school. Nevertheless, I find no suggestive evidence about the effect of the share of teachers with long-term contracts on children's educational achievement. Hence I conclude that the share of teachers with long-term contracts have no discernible impact on educational achievement in the context of this paper. Looking at public spending, I find no robust evidence of a mita effect on public spending in education and culture. Interestingly, I find that the mita reduce public spending in health and education between

[5] The existence of private school education may increase the level of competition between schools, leading to higher educational achievement, or it may depress investment in public education in those areas where demand for public education falls as a result of having cheap—privately provided— substitutes (Muralidharan and Sundararaman, 2015). Thus it is convenient for the purpose herein to have relatively little to worry about the mediating effects of private education provision.

[6] Peruvian's Ministry of Finance reports public spending in education and culture as a single (bundled) sub-item, belonging to social public spending item, in their expenditure reports.

0.4 and 0.6 percentage points. I argue that this finding explains why I observe a lower access to sanitation for schools in mita districts, and how these results support Dell (2010) findings about the negative effect of mita on child stunting. Moreover, I also argue that a lower likelihood of having access to sanitation affects children educational outcomes through their effect on their health (e.g., through stunting). This is consistent with the literature on stunting and children outcomes (e.g, Chang et al. 2002; McGovern et al. 2017). Thus the effect of mita legacies on inequality of opportunity in education is subtle, and acts through its effect on children's health.

This paper makes a number of contributions. First, it contributes to the vast literature on the persistent effects of colonial legacies on development (e.g., Acemoglu et al. 2001; Nunn 2009; Nunn and Qian 2010), by investigating the potential long-rung impacts of colonial legacies on inequality of educational opportunity.[7] Second, by exploring the mechanisms that may bring about differences in children's educational outcomes, it also contributes to the literature on the impacts of public good provision on student learning (Glewwe and Muralidharan, 2016). Particularly, it explores potential (persistent) causes for observed differences in the allocation of public goods between areas with different histories. Importantly, it also explores the mediating effects of public policies that may ameliorate the long-run effects of the mita, insofar as public policy is the quintessential tool to address disparities owing to early institutions. Finally, it provides some nuances to Dell (2010) findings insofar we are able to test the effect of the mita institution on educational outcomes that are key for development (Hanushek, 2010; Gallego, 2010; Hanushek and Woessmann, 2012a).

2 Equality of educational opportunity

Since this paper looks to identify and understand the source of inequality of opportunity in education owing to the institution of the mita, it is useful to define what we mean by (in)equality of educational opportunity. This stands to reason since the production function that maps educational resources into scores also contains effort as an argument. Inequality of opportunity, as defined by Roemer (1998), refers to the differences in outcomes that can be attributed to circumstances out of the control of individuals.[8] The problem is that we do not know to what extent differences in efforts owe to differences in circumstances, and whether the former call for compensation from

[7] Albeit a number of authors study the effect of colonial legacies on educational outcomes (e.g., Garnier and Schafer 2006; Huillery 2009; Gallego 2010), to the best of my knowledge none of them explore the effect on test scores at the sub-national using comparable units (Dupraz, 2017). Furthermore, none focus on analyzing the implications of colonial legacies on inequality of educational opportunity.

[8] See also Roemer and Trannoy (2015) for a review of the literature.

society (Brunori et al., 2012).[9] To understand what constitutes educational opportunity is relevant to interpret differences in educational outcomes as something economically and socially relevant; something that has important implications for public policy.

One may argue that state interventions should not guarantee equality of educational achievements but rather correct externalities and guarantee a minimum level of education (Milton, 1962). One example of this is universal coverage in primary education. But although such concept may be appealing, it does not have policy superiority. What is adequate can be a purely political and economic issue that depends on the demands of the economy and the political views on appropriate levels of government spending (Hanushek, 2002). From the egalitarian perspective, instead, education systems should neutralize the effects of circumstances on the education attainments and achievements and let unaltered the effects of choices (Roemer and Trannoy, 2015). In this manner, differences in educational achievement—such as test scores—become important. But since we cannot separate circumstances from efforts, it is unclear when society should intervene to correct these differences instead of rewarding them (Brighouse and Swift, 2009).

I resort herein to the idea of educational adequacy to address this conundrum (Clune, 1994). This idea defends the thesis that governments should provide the minimum level of public resources to guarantee a minimum level of educational achievement for every student. This is often referred to as a high minimum outcome (Satz, 2008). No egalitarian would disagree with the idea of providing students with the basic cognitive skills that are expected for their age.[10] Hence public school systems should provide the resources that students need to achieve high minimums; there is no need to decide which normative ideal is to be preferred. Universal high minimums can be considered a first step towards equality of educational opportunity.

As I mention in the previous section, I define high minimum in this case using Peruvian's Ministry of education minimal cut-offs. These cut-offs are defined by experts in education and capture the level of educational attainment that is expected from a children in second grade of primary, in order for her to advance satisfactorily to the next grade and continue her education.[11]

This does not mean, however, that we should not pay attention to the variation above the high minimum threshold: Adequacy does not preclude inequalities in educational outcomes to arise from differences in socially-inherited factors. Where some perceive superior socioeconomic advantages, for example, those with only the minimally education will have limited opportunities

[9] See Ferreira and Gignoux (2013) and Jacobs (2016) for a related discussion.

[10] There are many children deprived from the conditions necessary to garner the skills that will allow them to participate actively in society (`http://gpseducation.oecd.org/CountryProfile?primaryCountry=PER&treshold=10&topic=PI`), and both the equality and adequacy paradigm state that this is wrong.

[11] The reader can refer to `http://umc.minedu.gob.pe/evaluaciones-censales/` for further information.

later in life. Thus, governments should still strive to provide the conditions to equalize educational opportunities in the long-run, even after lifting all children above the high minimum. Having this in mind, I also explore the effect of the mita on differences in test scores.

3 The mita

Beginning in 1573, the indigenous villages located within a continues region to the Potosí silver mines, were required to provide one-seventh of their adult male population as rotating laborers to Potosí or Huancavelica—which provided the mercury to refine silver ore. The word mita was used to describe this system of labor obligations of native populations with the Spanish colonizers.

Local elites were the ones responsible for collecting conscripts, delivering them to the mines, and ensuring that they reported for mine duties. Whenever they were unavailable to do so, they had to cover the expenses of hiring wage laborers. Likewise, avoiding this responsibility had enormous costs for those that attempted to flee, if caught. These rules were strictly enforced all the way into 1812, when the silver deposits depleted and the mita was abolished. Therefore it comes as no surprise that the mita was a relatively stable institution of colonial rule for almost 240 years (Bakewell, 1984; Cole, 1985).

The mita had detrimental impacts for the development of districts in its catchment area: Historically, the system allowed colonizers to exploit labor at wages below the subsistence level, to extract resources from those communities that could afford opting out from providing labor, to extract the surplus from local economic activity and for aspiring landowners to expropriate lands from local peasants after the mita was abolished, thanks to the lack of secure property rights over land such as land titles. Overtime the poor economic institutions that emerged as a result, devolved in clashes between local peasants and Peruvian elites looking to secure the rights over ownership of the land.[12] Following the rationale behind dependency theory (Banerjee et al., 2005; Banerjee and Iyer, 2005), poor economic institutions devolved in weaker collective action to demand provision of public goods at the local level, locking local labor markets in subsistence agriculture, leading to lower agricultural and economic development, and—as a result—poor development outcomes as discussed in detail by Dell (2010).

In contrast, in non-mita areas, large landowners enjoyed a relatively stable control over land. Albeit this set-up concentrated economic power in the hands of local elites, it secluded peasants and local markets from the extractive institutions of colonial society brought forth by the mita.

[12] Indeed, "numerous peasant rebellions engulfed mita districts during the 1910s and 1920s, and indiscriminate banditry and livestock rustling remained prevalent in some mita districts for decades." (Dell, 2010).

In these areas, the *Hacienda* elite lobbied successfully for the provision of public goods such as roads, not to mention that it was possible to organize labor provided by local citizens and hacienda peons to create economies of scale (Yeager, 1995; Dell, 2010; Hurley, 2011), resulting (as it would be expected) in better development outcomes in these areas vis-á-vis mita areas (Dell, 2010).

When it comes to educational policy, there is little that we know about the differences between mita and neighboring non-mita areas. The historical evidence indicates that the local elites reserved all formal education, controlled by the priest caste, to themselves. It was virtually impossible for a commoner to receive formal education. Any training that the commoner would receive was dictated by the needs of the Spanish crown to produce physically able and morally liable workers, respectful of the social hierarchy, and with the skills necessary for subsistence (Paulston, 2014). Wherever the local elite was strong, they sought to procure educational services for their own children and resist taxation that could underwrite or subsidize educational services for other members of the population (Engerman and Sokoloff, 2002). It was only until the second wave of democratization that the masses demands for education translated into a more compressed distribution in educational attainment (Balcázar, 2016). Nevertheless, Peru's education system has a strong urban bias associated to the need of supplying the industrial and services' sector with well-trained workers, indicating that in other localities, the presence of weak (rural) communities exacerbates the collective action problem associated with the funding and establishment of public schools in the areas where they inhabit (Paulston, 2014). Therefore it stands to reason to believe that local elites can lobby successfully for the provision of public education where they are strong, and that this demand translates into policy (Engerman and Sokoloff, 2005).

The latter phenomenon could explain why there is suggestive evidence that inhabitants in mita districts have fewer years of education in comparison to their peers outside the mita area (Dell, 2010), but it is unclear whether the mita affected the provision of public education, and whether these dynamics persist. The problem is that it is difficult to evaluate the underlying channel behind her findings in order to rule out-migration dynamics (Carpio and Guerrero, 2016).[13] This creates problems to analyze the effect of mita on educational outcomes for adults, because there could be sorting in Peru's local labor markets, wherein mita areas attract or retain unskilled labor and out-mita areas attract more skilled workers. Thus the effects of mita on educational achievement could be the result of confounding labor market conditions.

Given the dearth in historical evidence and empirical evidence tying the institution of the mita to educational outcomes, the best we can do is to conjecture that differences in local political power translate into difference in the provision of public goods such as education (Paulston, 2014). In

[13] It is also difficult to extrapolate from existing studies historical studies to identify the mechanisms behind persistent differences in educational outcomes owing to colonial institutions (Nunn, 2009).

what follows, however, I evaluate whether the mita had long-lasting effects in children's test scores and the characteristics of the (public) public schools where they study. This provides a hard test to the effects of the mita on education since young children are more likely to be exposed to its legacies during key years of formation (Heckman, 2007). Likewise, I evaluate the impact of mita on public spending in education, and the potentially mediating impact of private education and public policy.

4 Data

The data on student's test scores comes from the ECE 2007-2012, a national standardized test applied yearly since 2007 to all second graders in Peru in public and private schools.[14] The ECE is administered by the Ministry of Education, and collects information about the students' performance in math and reading plus a small set of students' and schools' characteristics—the characteristics include gender, mother tongue and whether the school is single-teacher or multi-teacher. Students' scores are my main outcome variable. However, to analyze the effect of mita on inequality of educational opportunity, I adopt a dichotomous variable that takes the value of one if the student's academic achievement was "satisfactory" (i.e., above 584 in communication and above 639 in math) by the Peruvian Ministry of Education standards; it measures whether the student achieved the level of learning expected for his grade and is prepared to advance to the next grade. This variable captures a high minimum outcome, as defined in Section 2.

Data on the characteristics of schools come from the CE, which collects information for all schools on infrastructure, personnel and other administrative data. I use this data to construct a number of variables that proxy school characteristics that are associated to public policies in education at the local level (Glewwe and Muralidharan, 2016), such as the pupil-to-teacher ratio, the share of the teacher body with long-term contracts, and other other variables related to the school's infrastructure: access to electricity, water and sanitation.[15] I use data from 2007 to 2012 to be consistent with the data available from the ECE. I use these variables to explore the possible

[14] The *Oficina de Medición de calidad de los Aprendizajes* makes publicly available a sub-sample (*Muestra de Control*) with post-stratification weights to replicate the results at the national level, urban/rural split, and other macro-areas. This limits my analysis since I need data representative at the district level. This file also lacks the key identifier (*código modular*) to match the school with other datasets, such as the school census, further hamstringing the analysis. Thus it is necessary to use the ECE micro data files.

[15] The criteria to choose the variables I use obeys the following rationale: i) variables with less than 5% of missing observations, ii) variables with high public policy relevance that embody the provision of public goods by the government and local authorities, iii) indicators that are not exhausted (e.g., this would occur if all schools have access to sanitation for example). This data is publicly available online at http://escale.minedu.gob.pe/censo-escolar-eol/.

mechanisms associated with public good provision (Glewwe and Kremer, 2006; Das et al., 2011; Glewwe and Muralidharan, 2016).

The ECE and CE are merged using a unique identifier that allows to connect the two data sets, the *código modular*. This identifier can also be used to match schools to their respective geographical location using the Peruvian's Ministry of Education *Padron de Escuelas Públicas*. The problem is that the Padron is incomplete, and misses (non-randomly) more than one third of all schools in the catchment area. Hence the Mita area and all geographical covariates, such as elevation and slope, are computed following Dell (2010). In this sense, the geographical unit of analysis is the district. Like Dell, I exclude metropolitan Cusco—which compromises seven non-mita and two mita districts—because its relative prosperity relates to its pre-mita heritage as the Inca capital. Figure 1 shows the distribution of schools and students by district in the catchment area.

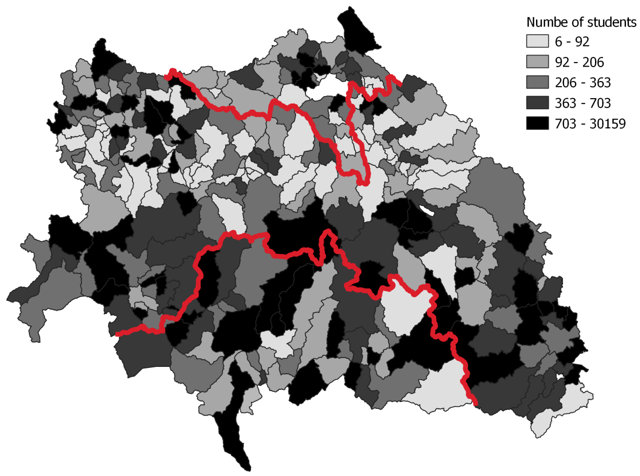
Finally, I also obtain data on public expenditure in education and culture, and health and sanitation, at the district level, from Peru's Ministry of Finance. Public spending in education and culture is provided as single (bundled) sub-item, belonging to social public spending item, in the Ministry's expenditure reports; the same is true for health and sanitation. I transform this data to constant USD of 2010 for my analyses.[16] I include public spending in my analyses since the extant literature documents a map from child health to children educational outcomes (Glewwe and Miguel, 2007).

For the purposes of this paper, I constrain myself only to public schools. This decision stands to reason insofar I am interested in evaluating the effect of mita on education as a public good. This decision comprises 19% of all schools in my sample. It is important to note that within the mita area, I drop 14% of all schools, whereas in the non-mita area this share is 30%. This striking difference is probably associated to differences in the demand and supply of private goods, owing to the fact that non-mita areas enjoy more developed local markets, and higher levels of income and consumption (Dell, 2010). This can be problematic if higher provision of private education increases the level of competition between public and private schools, or if private education depresses investment in public education in those areas where demand for public education falls as a result of having these substitutes. However, in the context herein the provision of private education responds to the effects of mita because it depends on the conditions of local markets, hence to control for example for the density of private schools or private-school peer-effects to account for these issue would necessarily introduce post-treatment bias. One may argue that an attractive option to address this issue is to model self-selection of children into private schools; unfortunately

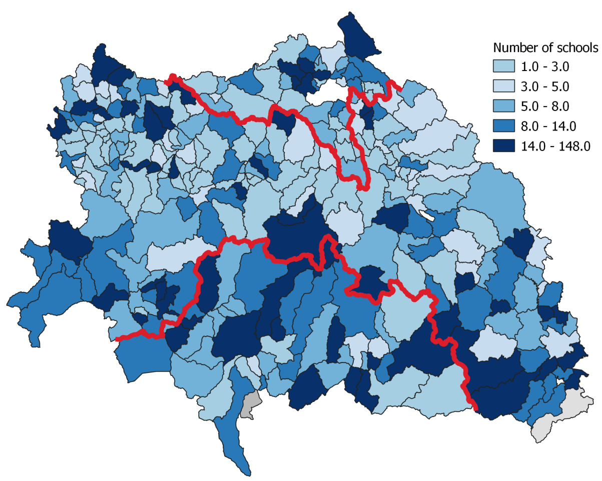
[16]This data can be obtained from `http://apps5.mineco.gob.pe/transparencia/mensual/`. However, for the purposes of this paper, I rely on a petition made to the Ministry of Finance for another paper: Aguero et al. (2017).

Figure 1: Geographic distribution of schools and students

(a) Students



(b) Schools



Note: The red thick lines represent the Mita boundary. All district between the two red lines are those exposed to the legacies of the mita.

there is not enough information on children characteristics to do this. Furthermore, I find that the differences in the level of provision of private education do not fall if I constrain my analysis closer to the boundary precisely because the mita generates sorting in the provision of private education. Thus I treat private education as an outcome of the mita and analyze instead whether it moderates the effect of private school on public school students' educational achievement.[17]

Table 1 presents the summary statistics for my main outcomes using different distance bands from the mita area: 100km, 75km and 25km. Overall, mita districts fare worse on average than non-mita districts in both math and communication. Likewise non-mita districts exhibit better school outcomes and higher public spending in health and sanitation. In summary, non-mita areas seem to have an advantage over mita areas across the board but for one outcome: public expenditure in education and culture.

Albeit we should not conclude anything from the correlations gleaned from the summary statistics, we indeed observe that there are reasons to think that the mita is a source of inequality of opportunity as conjectured. I will explore these differences deeper using a spatial regression discontinuity design (RDD), which I describe in the next section.

[17]It is possible to identify econometrically the interaction effect of the mita treatment and private education supply. The only requirement to do this is that the mita treatment is as good as random (Spenkuch, 2012; Kaplan et al., 2018).

Table 1: Summary statistics

	Sample Falls Within								
	<100 km of Mita Boundary			<75 km of Mita Boundary			<50 km of Mita Boundary		
	Inside	**Outside**	**s.e.**	**Inside**	**Outside**	**s.e.**	**Inside**	**Outside**	**s.e.**
A. Educational achievement									
Satisfactory performance in math	0.086	0.119	(.001)***	0.068	0.118	(.001)***	0.068	0.117	(.002)***
Satisfactory performance reading	0.128	0.199	(.002)***	0.097	0.198	(.002)***	0.095	0.195	(.002)***
Math test scores	499.980	514.441	(.479)***	487.640	514.044	(.515)***	486.430	513.207	(.539)***
Communication test scores	491.291	512.577	(.399)***	477.789	512.148	(.431)***	476.461	511.233	(.451)***
B. School characteristics									
Pupils per teacher	0.033	0.024	(.003)***	0.034	0.022	(.003)***	0.034	0.022	(.003)***
Teachers with long-term contract	0.368	0.334	(.007)***	0.395	0.339	(.007)***	0.415	0.343	(.008)***
Access to electricity	0.726	0.792	(.003)***	0.712	0.790	(.004)***	0.717	0.794	(.004)***
Access to water	0.659	0.725	(.004)***	0.666	0.722	(.004)***	0.677	0.728	(.004)***
Access to sanitation	0.741	0.824	(.003)***	0.733	0.825	(.003)***	0.732	0.829	(.004)***
C. District outcomes (mill. constant USD of 2010)									
Spending in education and culture	0.237	0.225	(.023)	0.239	0.243	(.026)	0.275	0.280	(.032)
Spending in health and sanitation	0.254	0.356	(.032)***	0.262	0.382	(.035)***	0.291	0.444	(.042)***

Note: Robust standard errors corrected for clustering at the district level are in parentheses. In the first three columns, the sample includes only observations located less than 100 km from the mita boundary, and this threshold is reduced to 75, and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

5 Estimation strategy

I use a spatial regression discontinuity approach. This decision obeys the following rationale: Mita treatment is a deterministic and discontinuous function of longitude and latitude, creating a multidimensional discontinuity in the longitude-latitude space. The identifying assumptions are the following: First, all relevant factors besides treatment must vary smoothly at the mita boundary. Dell (2010) tests this assumption using elevation, terrain ruggedness, soil fertility, rainfall, ethnicity, preexisting settlement patterns, local 1572 tribute (tax) rates, and allocation of 1572 tribute revenues. Overall, there are modest differences between mita and non-mita areas when the sample is limited to fall within 100 km or 75 km from the mita boundary.[18] Nevertheless, all differences disappear as the sample is limited to fall closer to the mita boundary. Therefore we can assume that the first assumption is met. Second, non-linearities in the counterfactual conditional mean function must not be mistaken for a discontinuity, or vice versa. Like Dell, I address this concern by examining robustness to different orders of RD polynomials, and by reporting two baseline specifications that project geographic location into a single dimension: The first one controls for a cubic polynomial in Euclidean distance to Potosi, a dimension which historical evidence identifies as particularly important thanks to its role as an important determinant of trade and local economic growth. The second one examines a specification that controls for a cubic polynomial in distance to the mita boundary—although there is neither historical nor qualitative evidence suggests that distance to the mita boundary is economically important. The final assumption is absence of selective sorting across the treatment threshold. This is not problematic for the analysis herein since I focus on children circa 7 years of age, who are unlikely to have any choice of where they grow up.[19] The biggest problem that I face is that mita creates sorting in the provision of private education, which may in turn affect public education. To address this concern, I explore the provision of private education as an interesting channel of the effect of the mita on education in general, to the extent that the data permit.

My main specification is as follows:

$$y_{isdb} = \alpha + \gamma mita_d + X_{id}'\beta + f(\text{geographic location}_d) + \theta_b + \gamma_t + \varepsilon_{isdb} \quad (1)$$

where y_{isdb} is the outcome of interest for individual i, in school s, in district d, along segment

[18] I replicate her analysis obtaining the same results. I do not discuss this analysis herein because the relevant discussion is properly carried out by Dell herself.

[19] The assumption here is that children are less likely to migrate when they are very young, and are in school age. This is usually the case across most countries, as the cost of migration increases for households with young children in school age (Rogers, 2015).

b of the mita boundary; $mita_d$ is a dummy equal to one if district where the school is located contributed to the mita, zero otherwise; X_{id} is a vector of covariates that includes the mean area weighted elevation and slope for district d, and demographic variables such as the mother language and sex of children; $f(\text{geographic location}_d)$ is the RD polynomial, which controls for smooth functions of geographic location. θ_b is a set of boundary segment fixed effects that denote which of four equal length segments of the boundary is the closest to the observation's district capital. γ_t is year t's fixed effect; ε_{isdb} is the idiosyncratic error term.

6 Results

Table 2 presents the main results. Columns 1-3 shows my estimates of the long-run mita effects on children's educational attainment in math, and columns 4-6 do so for communication. In Panel A I show the effects on mita on the high minimum outcome defined in Section 2. Overall, I observe that the mita had no statistically significant impacts on children's performance in math, but there is suggestive evidence that it reduces children's likelihood of showing satisfactory performance in communication between 2.5 and 3.2 percent. Looking at Panel B, I find that the mita reduced children's test scores by about 0.15 standard deviations in communication. Notice that the point estimates remain fairly stable as the sample is restricted to fall within narrower bands of the mita boundary. Moreover, the coefficients seem to be statistically equal across specifications. These results stand to reason since we observe that small changes in average score between mita and non-mita areas, can pull an important number of children outside of the high minimum outcome threshold (Figure A1). Indeed, consistent with the results of Panel A, since around a 12 point improvement in communication test scores is enough to improve the academic performance of 3.3% of children in mita areas on the basis of the criteria herein.

In order to test the robustness of the previous results, I examine 14 different specifications of the RD polynomial. The results are available in the Table A1 Appendix. All in all, I find suggestive evidence of a statistically significant effect of the mita on inequality of educational opportunity in communication. The robustness tests on test scores (see Table A2) provide consistent results with this finding and with those in Table 2, panel B.

Table 2: Effect of mita on student's academic achievement

	Dependent variable					
	Children shows satisfactory performance in math			Children shows satisfactory performance in communication		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-0.0231	-0.0183	-0.0209	-0.0436	-0.0454	-0.0458
	(0.0189)	(0.0208)	(0.0221)	(0.0322)	(0.0351)	(0.0377)
R-squared	0.0199	0.0161	0.0164	0.0508	0.0430	0.0415
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-0.0130	-0.0148	-0.0113	-0.0278*	-0.0325**	-0.0268
	(0.0100)	(0.0093)	(0.0103)	(0.0162)	(0.0155)	(0.0176)
R-squared	0.0678	0.0549	0.0529	0.1409	0.1175	0.1135
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-0.0116	-0.0136	-0.0109	-0.0275*	-0.0291**	-0.0253*
	(0.0089)	(0.0084)	(0.0089)	(0.0144)	(0.0139)	(0.0151)
R-squared	0.0662	0.0558	0.0536	0.1377	0.1190	0.1150

(*Continues on next page.*)

	Dependent variable					
	Test scores in math			Test scores in communication		
	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)	<100 km of Bound. (4)	<75 km of Bound. (5)	<50 km of Bound. (6)
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-8.6612	-6.6094	-7.3142	-13.5143	-13.2673	-13.7539
	(11.8020)	(12.8060)	(13.7239)	(11.4169)	(12.4061)	(13.2864)
R-squared	0.0678	0.0549	0.0529	0.1409	0.1175	0.1135
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-7.4788	-7.3619	-5.7501	-13.0949**	-13.0539**	-11.7332*
	(5.6806)	(5.4710)	(6.0204)	(5.4852)	(5.4156)	(6.0662)
R-squared	0.0678	0.0549	0.0529	0.1409	0.1175	0.1135
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-6.7451	-7.5083	-6.1062	-11.9732**	-11.9001**	-10.8009**
	(5.5014)	(5.2284)	(5.5516)	(5.1586)	(5.0445)	(5.4497)
R-squared	0.0662	0.0558	0.0536	0.1377	0.1190	0.1150
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	286	237	183	286	237	183
Observations	171264	127749	112872	170724	127338	112605

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

7 Mechanisms: school characteristics and public spending

In the previous section I found a weak but suggestive negative effect of the mita on students performance in communication. In this section I explore the potential mechanisms behind these results. This is important insofar I am concerned with the impact of mita on education as a public good. I focus on exploring differences between mita and non-mita areas in a number of school characteristics: the number of pupils per teacher, the proportion of teachers with long-term contract, the proportion of teachers with tertiary education, and the likelihood of having access to electricity, water and sanitation. Likewise I analyze the impacts of mita on two sources of public spending than can be mapped to children educational outcomes: public spending in education and culture and public spending in health and sanitation.[20]

The results of my analysis are contained in Table 3. All in all, I find that the mita increases the percentage of school teachers with long-term contracts in mita areas between 6% and 16%. I also find that mita reduces the likelihood of accessing to sanitation by about 6%. Moreover, I observe suggestive evidence that the mita is tied to a decrease in public spending in health and sanitation. This latter results is quite interesting since it is consistent with Dell (2010) finding that the legacy of the mita has a substantive impact on child stunting, furthermore this result is also consistent with the finding that the mita reduces the likelihood for schools of having access to sanitation. Thus it is possible to conjecture an impact of mita on children educational outcomes through their effect on their health (see for example Chang et al. 2002; Glewwe and Miguel 2007; McGovern et al. 2017).

It is harder to think about the effect of the share of teachers with long-term contracts on education. On the one hand, long-term contracts may increase the incentives to shirk and attract those teachers that care more about job stability than imparting knowledge adequately; a negative self-selection problem (Balcázar, 2016). On the other hand, the Peruvian government has taken measures in the past years to create incentives to attract teachers to disadvantaged areas (Morduchowicz, 2011; Huicho et al., 2012). The problem is that these incentives do not necessarily solve the self-selection problem if teacher (or teaching) quality does not improve. Therefore it is difficult to create a solid theory- or evidence-based conjecture for this outcome.

To further explore which one of these outcomes may have relevant implications for my analysis, I proceed with a similar analysis to that done in Section 7.1. Tables A6 and A7 show the results. Once more, I focus on the possibility of interpreting the causal effect of the interaction term. First of all, Table A6 does not provide any suggestive evidence about the effect of the share of teachers with long-term contracts on children's educational achievement: the interaction effect is very small and statistically zero, and the component term does not provide hints about a statistically significant

[20] See Section 4 for a brief discussion about these variables.

correlation between this outcome and children's learning. On the other hand, Table A7 indicates that albeit the correlation between investments in public health and sanitation and educational achievement is positive, the mita attenuates this effect in the case of math. Thus the result indicates that the legacies of the mita indeed seem to indeed be detrimental for children's school outcomes since it attenuates the potentially positive effect of public spending.

In summary, I argue herein that one subtle mechanism through which the mita may affect children educational achievement is health. Indeed, the mita reduces public investments in health and sanitation, which in turn may si likely to lead to higher rates of child stunting (Bowser et al., 2016); stunting in turn is associated with poorer academic performance (Chang et al. 2002; McGovern et al. 2017). This chain is consistent with the extant literature on the effects of health on educational outcomes (Glewwe and Miguel, 2007).

Table 3: Effect of mita on school characteristics

	Dependent variable					
	Pupils per teacher			Teachers with long-term contract		
	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)	<100 km of Bound. (4)	<75 km of Bound. (5)	<50 km of Bound. (6)
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-0.0030	-0.0024	-0.0028	0.1328***	0.1504***	0.1662***
	(0.0057)	(0.0063)	(0.0060)	(0.0455)	(0.0510)	(0.0539)
R-squared	0.2330	0.2289	0.2387	0.1208	0.1315	0.1208
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	0.0037	0.0052	0.0046	0.0664**	0.0578*	0.0632*
	(0.0035)	(0.0035)	(0.0040)	(0.0292)	(0.0297)	(0.0323)
R-squared	0.0474	0.0455	0.0489	0.0511	0.0564	0.0518
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	0.0024	0.0031	0.0027	0.0840***	0.0764**	0.0838**
	(0.0034)	(0.0035)	(0.0037)	(0.0305)	(0.0318)	(0.0338)
R-squared	0.0410	0.0481	0.0492	0.0482	0.0537	0.0512
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	289	239	185	289	239	185
Observations	15260	12319	10537	11739	9634	8158

(*Continues on next page.*)

	Dependent variable					
	Access to electricity			Access to water		
	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)	<100 km of Bound. (4)	<75 km of Bound. (5)	<50 km of Bound. (6)
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-0.0223	-0.0185	-0.0408	-0.0302	-0.0632	-0.0778*
	(0.0492)	(0.0525)	(0.0532)	(0.0437)	(0.0465)	(0.0457)
R-squared	0.0474	0.0455	0.0489	0.0511	0.0564	0.0518
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-0.0328	-0.0138	-0.0158	-0.0089	0.0140	0.0114
	(0.0336)	(0.0353)	(0.0370)	(0.0302)	(0.0312)	(0.0322)
R-squared	0.0474	0.0455	0.0489	0.0511	0.0564	0.0518
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-0.0396	-0.0288	-0.0319	0.0039	0.0184	0.0157
	(0.0333)	(0.0353)	(0.0371)	(0.0289)	(0.0304)	(0.0318)
R-squared	0.0410	0.0481	0.0492	0.0482	0.0537	0.0512
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	289	239	185	289	239	185
Observations	68124	55161	46872	68124	55161	46872

(*Continues on next page.*)

	Dependent variable					
	Access to saniation			Log public spending in education and culture		
	<100 km of Bound. **(1)**	**<75 km of Bound.** **(2)**	**<50 km of Bound.** **(3)**	**<100 km of Bound.** **(4)**	**<75 km of Bound.** **(5)**	**<50 km of Bound.** **(6)**
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-0.0376	-0.0578	-0.0699*	0.0602*	0.0606	0.0611
	(0.0379)	(0.0401)	(0.0419)	(0.0308)	(0.0381)	(0.0403)
R-squared	0.2022	0.2039	0.1945	0.2568	0.2039	0.1945
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-0.0574**	-0.0506**	-0.0577**	0.0218	0.0172	-0.0027
	(0.0226)	(0.0237)	(0.0255)	(0.0265)	(0.0278)	(0.0269)
R-squared	0.0474	0.0455	0.0489	0.2568	0.0455	0.0489
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-0.0533**	-0.0486**	-0.0604**	0.0236	0.0197	-0.0005
	(0.0218)	(0.0227)	(0.0241)	(0.0222)	(0.0248)	(0.0273)
R-squared	0.0410	0.0481	0.0492	0.1948	0.1921	0.2055
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	289	239	185	289	239	185
Observations	68118	55155	46862	1720	1421	1099

(*Continues on next page.*)

	Dependent variable		
	Log public spending in health and sanitation		
	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)
	Panel A. Cubic Polynomial in Latitude and Longitude		
Mita	0.0068	-0.0139	-0.0123
	(0.0339)	(0.0377)	(0.0388)
R-squared	0.2145	0.2526	0.2591
	Panel B. Cubic Polynomial in Distance to Potosi		
Mita	-0.0466*	-0.0480	-0.0683**
	(0.0274)	(0.0292)	(0.0289)
R-squared	0.2145	0.0564	0.0518
	Panel C. Cubic Polynomial in Distance to Mita Boundary		
Mita	-0.0343	-0.0374	-0.0588**
	(0.0242)	(0.0263)	(0.0287)
R-squared	0.1582	0.1811	0.2122
Geo. Controls	yes	yes	yes
Boundary F.E.s	yes	yes	yes
Clusters	289	239	185
Observations	1720	1421	1099

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

7.1 The role of private education

An important concern in the context of this paper is the potential role of private education provision in public school students' scores. I have expressed that the supply of private education may affect the effects of the mita because the existence of private education may increase the level of competition between schools, or it may generate student sorting. Of course we cannot control directly for the level of provision of private education because there is also sorting in the supply of this service as a result of the mita: Indeed, Table A3 indicates that there is between 8% and 10% higher chances of observing a private school in non-mita areas vis-á-vis mita ones; moreover non-mita children are 4% more likely to be enrolled in private schools in comparison children in mita areas.

But should we be concerned about the role of private education? One way to address this question is to explore the mediating effect of the mita along the distribution of private education supply. To do this we first need to make sure that there are no differences in the quality of private education between mita and non-mita areas. Overall, I find no robust evidence of statistical significant differences in educational achievement (and the size of the differences) for private school students between mita and non-mita districts (Table A4). Thus I proceed under the somewhat strong assumption of homogeneous private school quality across the boundary.

Since private schools score on average 66 and 72 points higher in communication than public schools in non-mita and mita areas respectively (these numbers are 41 and 46 for math), I expect that those children that can afford private education are usually those that have resources to further their education vis-á-vis their peers. This increases the local competition to attract good students, generating a positive effect. But since public good provision is generally poorer in mita areas, public schools may not compete effectively with private schools. To test this hypothesis, I estimate Equation (1) interacting the mita treatment with the percentage of private schools at the district level, and focus only on the interaction effect. To interpret this effect we require that the mita treatment is as good as random (Spenkuch, 2012; Kaplan et al., 2018), which is a problem that is taken care of by the RDD design. Further, while I recognize that this moderator is post-treatment, the conditional difference-in-differences in means provides at worst exploratory evidence of this mechanism.

The results of this analysis are shown in Table A5. Overall, we observe a positive and statistically significant effect of private schools on public school children academic performance across the board. It would be, however, a mistake to interpret this coefficient beyond a mere correlation since the provision of private education is endogenous to the conditions of the local markets, among other things; this coefficient is probably biased upwards holding constant concerns about post-treatment bias. Let us focus on then the interaction effect. I find some suggestive evidence that even when local market conditions—embodied by higher private education supply—are beneficial for public education, as the coefficient for the share of private schools would indicate, the mita moderates this positive effect. Nevertheless, we must keep in mind that results herein are not robust and that the size of the interaction coefficient fluctuates substantially across specifications.

Thus there is little evidence to believe that the supply of private school education has a relevant effect on my previous findings.

8 Conclusions

In this paper I compare differences in edducational achievement between mita and non-mita areas. Unlike the extant literature, I explore the level of inequality of opportunity in educational achievement caused by the institution of the mita, as measured by differences in the likelihood, for second graders, of achieving the expected academic performance in math and communication for their age. This allows me to explore the effect of mita on individuals that are more likely to have been exposed to its legacy during key years of formation. I find suggestive evidence of the impact of the mita on the educational achievement (in communication). I find no evidence for the case of math.

I also explore the potential public policy mechanisms that may bring about any difference in educational achievement. I observe a negative effect on the likelihood of having access to sanitation that is related to lower public spending in health and sanitation in mita areas vis-á-vis non-mita ones. I argue that these findings can be tied to the known effects of mita on stunting (Dell, 2010), and in turn to a negative effect on educational outcomes. These findings reveal the possible existence of a nuanced effect of mita legacies on inequality of opportunity in education, acting through its effect on children's health.

References

Acemoglu, D., S. Johnson, and J. A. Robinson (2001). The colonial origins of comparative development: An empirical investigation. *American economic review 91*(5), 1369–1401.

Acemoglu, D. and J. Robinson (2013). *Why nations fail: the origins of power, prosperity, and poverty,*. Crown Books.

Aguero, J., C. Balcázar Salazar, S. Maldonado, and H. Ñopo (2017). The value of redistribution: natural resources and the formation of human capital under weak institutions. Technical report, NYU.

Almond, D., J. Currie, and V. Duque (2018). Childhood circumstances and adult outcomes: Act ii. *Journal of Economic Literature 56*(4), 1360–1446.

Ansell, B. W. (2010). *From the ballot to the blackboard: The redistributive political economy of education*. Cambridge University Press.

Bakewell, P. J. (1984). *Miners of the red mountain: Indian labor in Potosí, 1545-1650*. University of New Mexico Press.

Balcázar, C. F. (2016). Long-run effects of democracy on income inequality in latin america. *The Journal of Economic Inequality 14*(3), 289–307.

Banerjee, A. and L. Iyer (2005). History, institutions, and economic performance: The legacy of colonial land tenure systems in india. *American economic review 95*(4), 1190–1213.

Banerjee, A., L. Iyer, and R. Somanathan (2005). History, social divisions, and public goods in rural india. *Journal of the European Economic Association 3*(2-3), 639–647.

Bowser, D., W. Zeng, I. Akobirshoev, T. C Morrill, and A. Nandakumar (2016, 05). The impact of health care spending and income inequality on stunting prevalence. *International Journal of Healthcare 2*.

Brighouse, H. and A. Swift (2009). Educational equality versus educational adequacy: A critique of anderson and satz. *Journal of applied philosophy 26*(2), 117–128.

Brunori, P., V. Peragine, and L. Serlenga (2012). Fairness in education: The italian university before and after the reform. *Economics of Education Review 31*(5), 764–777.

Carpio, M. and M. Guerrero (2016). Migration as a channel of persistence of the effects of peru's mining mita: what surnames may reveal. Mimeo.

Chang, S., S. Walker, S. Grantham-McGregor, and C. Powell (2002). Early childhood stunting and later behaviour and school achievement. *Journal of Child Psychology and Psychiatry 43*(6), 775–783.

Clune, W. H. (1994). The shift from equity to adequacy in school finance. *Educational Policy 8*(4), 376–394.

Cole, J. A. (1985). *The Potosí mita, 1573-1700: compulsory Indian labor in the Andes*. Stanford Univ Pr.

Contreras, S., M. Chavez, and M. Paredes (2018). Peru: Indicadores de educacion por departamento. Technical report, INEI.

Currie, J. and D. Almond (2011). Human capital development before age five. In *Handbook of labor economics*, Volume 4, pp. 1315–1486. Elsevier.

Das, J., S. Dercon, J. Habyarimana, P. Krishnan, K. Muralidharan, and V. Sundararaman (2011). *School inputs, household substitution, and test scores*. The World Bank.

Dell, M. (2010). The persistent effects of peru's mining mita. *Econometrica 78*(6), 1863–1903.

Dupraz, Y. (2017). French and british colonial legacies in education: Evidence from the partition of cameroon. Technical report, Competitive Advantage in the Global Economy (CAGE).

Engerman, S. L. and K. L. Sokoloff (2002). Factor endowments, inequality, and paths of development among new world economics. Technical report, National Bureau of Economic Research.

Engerman, S. L. and K. L. Sokoloff (2005). The evolution of suffrage institutions in the new world. *The Journal of Economic History 65*(4), 891–921.

Ferreira, F. and J. Gignoux (2013). The measurement of educational inequality: Achievement and opportunity. *The World Bank Economic Review 28*(2), 210–246.

Gallego, F. A. (2010). Historical origins of schooling: The role of democracy and political decentralization. *The Review of Economics and Statistics 92*(2), 228–243.

Garnier, M. and M. Schafer (2006). Educational model and expansion of enrollments in sub-saharan africa. *Sociology of Education 79*(2), 153–176.

Gift, T. and E. Wibbels (2014). Reading, writing, and the regrettable status of education research in comparative politics. *Annual Review of Political Science 17*, 291–312.

Glewwe, P. and M. Kremer (2006). Schools, teachers, and education outcomes in developing countries. *Handbook of the Economics of Education 2*, 945–1017.

Glewwe, P. and E. A. Miguel (2007). The impact of child health and nutrition on education in less developed countries. *Handbook of development economics 4*, 3561–3606.

Glewwe, P. and K. Muralidharan (2016). Improving education outcomes in developing countries: Evidence, knowledge gaps, and policy implications. In *Handbook of the Economics of Education*, Volume 5, pp. 653–743. Elsevier.

Hanushek, E. (2002). Publicly provided education. *Handbook of public economics 4*, 2045–2141.

Hanushek, E. A. (2010). Education and economic growth. *Economics of education*, 60–67.

Hanushek, E. A. and L. Woessmann (2012a). Do better schools lead to more growth? cognitive skills, economic outcomes, and causation. *Journal of economic growth 17*(4), 267–321.

Hanushek, E. A. and L. Woessmann (2012b). Schooling, educational achievement, and the latin american growth puzzle. *Journal of Development Economics 99*(2), 497–512.

Heckman, J. J. (2007). The economics, technology, and neuroscience of human capability formation. *Proceedings of the national Academy of Sciences 104*(33), 13250–13255.

Huicho, L., F. D. Canseco, C. Lema, J. J. Miranda, and A. G. Lescano (2012). Incentivos para atraer y retener personal de salud de zonas rurales del perú: un estudio cualitativo. *Cadernos de saude publica 28*, 729–739.

Huillery, E. (2009). History matters: The long-term impact of colonial public investments in french west africa. *American economic journal: applied economics 1*(2), 176–215.

Hurley, D. (2011). Spanish Colonial Economies: An Overview of the Economy of the Viceroyalty of Peru, 1542-1600. Technical report, Cornell University.

Jacobs, L. A. (2016). Dealing fairly with winners and losers in school: Reframing how to think about equality of educational opportunity 50 years after the coleman report. *Theory and Research in Education 14*(3), 313–332.

Kaplan, C., J. L. Spenkuch, and H. Yuan (2018). Natural disasters, moral hazard, and special interests in congress. CESifo Working Paper.

Koski, W. S. and R. Reich (2006). When adequate isn't: The retreat from equity in educational law and policy and why it matters. *EmORy lJ 56*, 545.

McGovern, M. E., A. Krishna, V. M. Aguayo, and S. Subramanian (2017). A review of the evidence linking child stunting to economic outcomes. *International journal of epidemiology 46*(4), 1171–1191.

Milton, F. (1962). Capitalism and freedom. *University of Chicago*.

Morduchowicz, A. (2011). Diseno y experiencias de incentivos salariales docentes. *Documento de trabajo*.

Muralidharan, K. and V. Sundararaman (2015). The aggregate effect of school choice: Evidence from a two-stage experiment in india. *The Quarterly Journal of Economics 130*(3), 1011–1066.

Nunn, N. (2009). The importance of history for economic development. *Annu. Rev. Econ. 1*(1), 65–92.

Nunn, N. and N. Qian (2010, may). The Columbian Exchange: A History of Disease, Food, and Ideas. *Journal of Economic Perspectives 24*(2), 163–188.

Paulston, R. G. (2014). *Society, Schools and Progress in Peru: The Commonwealth and International Library: Education and Educational Research*. Elsevier.

Roemer, J. (1998). *Equality of opportunity*. Harvard University Press.

Roemer, J. E. and A. Trannoy (2015). Equality of opportunity. In *Handbook of income distribution*, Volume 2, pp. 217–300. Elsevier.

Rogers, A. (2015). *Applied multiregional demography: Migration and population redistribution*. Springer.

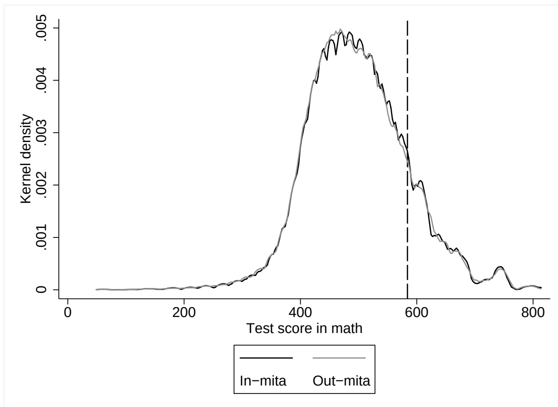
Satz, D. (2008). Equality, adequacy, and educational policy. *Education Finance and Policy 3*(4), 424–443.

Spenkuch, J. L. (2012). Moral hazard and selection among the poor: Evidence from a randomized experiment. *Journal of Health Economics 31*(1), 72–85.

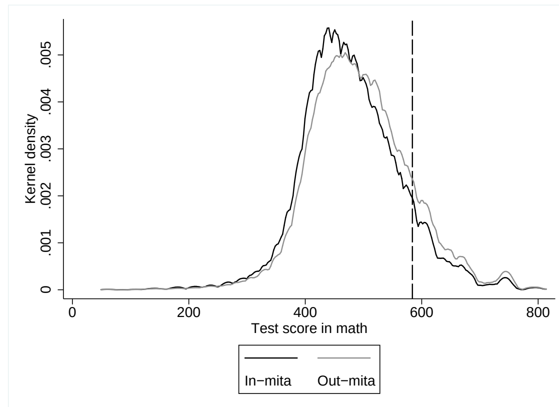
Yeager, T. J. (1995). Encomienda or slavery? the spanish crown's choice of labor organization in sixteenth-century spanish america. *The Journal of Economic History 55*(4), 842–859.

Figure A. 1: Students' test scores distributions

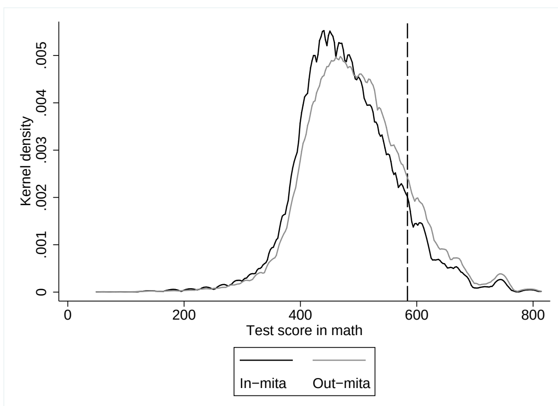
(a) <100 km of boundary



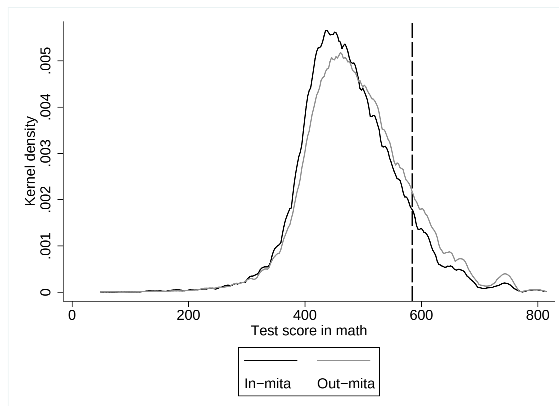
(b) <75 km of boundary



(c) <50 km of boundary



(d) <25 km of boundary



Note: The vertical dotted lines represent Peruvian's Ministry of Education thresholds to define adequate academic performance.

Table A. 1: Specification tests, high minimum outcomes

	Dependent variable					
	Children shows satisfactory performance in math			Children shows satisfactory performance in communication		
	<100 km of Bound.	<75 km of Bound.	<50 km of Bound.	<100 km of Bound.	<75 km of Bound.	<50 km of Bound.
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Alternative Functional Forms for RD Polynomial: Baseline I						
Linear polynomial in latitude and longitude						
Mita	-0.0147	-0.0167*	-0.0140	-0.0337**	-0.0350**	-0.0306
	(0.0090)	(0.0094)	(0.0113)	(0.0147)	(0.0159)	(0.0194)
Quadratic polynomial in latitude and longitude						
Mita	-0.0069	-0.0145	-0.0207	-0.0199	-0.0399	-0.0483
	(0.0206)	(0.0204)	(0.0218)	(0.0342)	(0.0339)	(0.0365)
Quartic polynomial in distance to mita boundary						
Mita	-0.0228	-0.0100	-0.0051	-0.0474	-0.0255	-0.0182
	(0.0246)	(0.0230)	(0.0224)	(0.0403)	(0.0377)	(0.0363)
Panel B. Alternative Functional Forms for RD Polynomial: Baseline II						
Linear polynomial in distance to Potosi						
Mita	-0.0091	-0.0143	-0.0109	-0.0217	-0.0282*	-0.0220
	(0.0096)	(0.0089)	(0.0094)	(0.0158)	(0.0152)	(0.0162)
Quadratic polynomial in distance to Potosi						
Mita	-0.0177*	-0.0137	-0.0107	-0.0352**	-0.0286*	-0.0229
	(0.0091)	(0.0091)	(0.0097)	(0.0149)	(0.0150)	(0.0164)
Quartic polynomial in distance to Potosi						
Mita	-0.0151	-0.0143	-0.0098	-0.0311**	-0.0316**	-0.0239
	(0.0093)	(0.0091)	(0.0095)	(0.0153)	(0.0150)	(0.0160)
Interacted linear polynomial in distance to Potosi						
Mita	-0.0088***	-0.0141***	-0.0104***	-0.0207***	-0.0277***	-0.0209***
	(0.0001)	(0.0001)	(0.0001)	(0.0003)	(0.0003)	(0.0002)
Interacted quadratic polynomial in distance to Potosi						
Mita	-0.0060***	-0.0005***	0.0006***	-0.0108***	-0.0022***	-0.0016***
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)

(*Continues on next page.*)

	Dependent variable					
	Children shows satisfactory performance in math			**Children shows satisfactory performance in communication**		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Panel C. Alternative Functional Forms for RD Polynomial: Baseline III						
Linear polynomial in distance to mita boundary						
Mita	-0.0119	-0.0132	-0.0101	-0.0273*	-0.0279*	-0.0215
	(0.0092)	(0.0086)	(0.0092)	(0.0152)	(0.0144)	(0.0156)
Quadratic polynomial in distance to mita boundary						
Mita	-0.0115	-0.0134	-0.0114	-0.0268*	-0.0288**	-0.0245
	(0.0088)	(0.0087)	(0.0089)	(0.0145)	(0.0145)	(0.0151)
Quartic polynomial in distance to mita boundary						
Mita	-0.0114	-0.0140	-0.0112	-0.0271*	-0.0302**	-0.0255*
	(0.0090)	(0.0085)	(0.0089)	(0.0146)	(0.0141)	(0.0152)
Interacted linear polynomial in distance to mita boundary						
Mita	-0.0086	-0.0003	-0.0074	-0.0190	-0.0101	-0.0240
	(0.0224)	(0.0223)	(0.0253)	(0.0384)	(0.0389)	(0.0448)
Interacted quadratic polynomial in distance to mita boundary						
Mita	-0.0007	-0.0012	-0.0002	-0.0068	-0.0077	-0.0082
	(0.0119)	(0.0133)	(0.0158)	(0.0190)	(0.0219)	(0.0268)
Panel D. Ordinary Least Squares						
Mita	-0.0098	-0.0138	-0.0103	-0.0242	-0.0280*	-0.0218
	(0.0095)	(0.0090)	(0.0095)	(0.0160)	(0.0155)	(0.0165)
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	286	237	183	286	237	183
Observations	171264	127749	112872	170724	127338	112605

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Table A. 2: Specification tests, test scores

	Dependent variable					
	Children shows satisfactory performance in math			Children shows satisfactory performance in communication		
	<100 km of Bound.	<75 km of Bound.	<50 km of Bound.	<100 km of Bound.	<75 km of Bound.	<50 km of Bound.
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Alternative Functional Forms for RD Polynomial: Baseline I						
Linear polynomial in latitude and longitude						
Mita	-6.8928	-7.5064	-5.8020	-12.3093**	-12.1384**	-10.2303
	(5.4869)	(5.7336)	(6.8695)	(5.1508)	(5.5171)	(6.6677)
Quadratic polynomial in latitude and longitude						
Mita	-1.5806	-4.9660	-7.8026	-7.1494	-11.1880	-14.6964
	(12.0072)	(12.4969)	(13.3877)	(11.3841)	(12.0317)	(12.8999)
Quartic polynomial in distance to mita boundary						
Mita	-6.7420	-0.6599	1.4837	-12.1428	-6.5579	-4.0655
	(15.4462)	(14.5834)	(14.1272)	(14.6677)	(13.7351)	(13.4083)
Panel B. Alternative Functional Forms for RD Polynomial: Baseline II						
Linear polynomial in distance to Potosi						
Mita	-5.3929	-7.4877	-5.8966	-10.3375*	-11.6663**	-9.8649*
	(5.6896)	(5.5761)	(5.9231)	(5.3414)	(5.3590)	(5.7419)
Quadratic polynomial in distance to Potosi						
Mita	-9.5024*	-7.5287	-5.9058	-14.5940***	-12.3458**	-11.0537*
	(5.6668)	(5.5661)	(5.9378)	(5.4029)	(5.3984)	(5.8188)
Quartic polynomial in distance to Potosi						
Mita	-8.1732	-7.1029	-4.9924	-13.6081**	-12.7385**	-10.8575*
	(5.4130)	(5.4275)	(5.7528)	(5.2958)	(5.3269)	(5.7212)
Interacted linear polynomial in distance to Potosi						
Mita	-5.5944	-7.6464	-5.3646	-10.4655	-11.7869	-9.3425
	(37.2425)	(33.8560)	(30.6882)	(32.7785)	(31.0523)	(29.7647)
Interacted quadratic polynomial in distance to Potosi						
Mita	-2.9593	-0.3959	0.6443	-7.6074	-4.9900	-4.5172
	(26.9186)	(26.0739)	(28.6995)	(26.0467)	(26.4637)	(29.0947)

(*Continues on next page.*)

	Dependent variable					
	Children shows satisfactory performance in math			**Children shows satisfactory performance in communication**		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Panel C. Alternative Functional Forms for RD Polynomial: Baseline III						
Linear polynomial in distance to mita boundary						
Mita	-6.7996	-7.3110	-5.7107	-11.9482**	-11.6508**	-9.7807*
	(5.6023)	(5.3201)	(5.6696)	(5.3041)	(5.1361)	(5.5370)
Quadratic polynomial in distance to mita boundary						
Mita	-6.6654	-7.4109	-6.4279	-11.8219**	-11.7961**	-10.6213*
	(5.4918)	(5.3846)	(5.5836)	(5.1701)	(5.1776)	(5.4327)
Quartic polynomial in distance to mita boundary						
Mita	-6.6784	-7.6721	-6.2506	-11.8930**	-12.1746**	-10.8367**
	(5.5365)	(5.3376)	(5.5194)	(5.1934)	(5.0912)	(5.4532)
Interacted linear polynomial in distance to mita boundary						
Mita	-3.5312	-0.0549	-1.5965	-8.5170	-5.1795	-7.8895
	(13.2684)	(13.6407)	(15.5199)	(12.6854)	(13.2213)	(15.1631)
Interacted quadratic polynomial in distance to mita boundary						
Mita	-1.6842	-1.5189	0.5037	-6.4841	-5.9198	-5.0804
	(7.4311)	(8.2967)	(9.7650)	(6.9817)	(7.9348)	(9.4562)
Panel D. Ordinary Least Squares						
Mita	-5.6270	-7.2072	-5.5294	-10.8617**	-11.5047**	-9.6069*
	(5.6972)	(5.5627)	(5.8587)	(5.4196)	(5.3663)	(5.7026)
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	286	237	183	286	237	183
Observations	171264	127749	112872	170724	127338	112605

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Table A. 3: Effect of mita on student's academic achievement

	Dependent variable					
	Likelihood of being enrolled in a private school			**Likelihood of having a private school in the district**		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-0.0411**	-0.0416*	-0.0420*	-0.1068**	-0.0918	-0.0987
	(0.0192)	(0.0215)	(0.0217)	(0.0518)	(0.0572)	(0.0627)
R-squared	0.0987	0.0359	0.0384	0.1658	0.0420	0.0439
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-0.0350**	-0.0337**	-0.0407***	-0.0833**	-0.0788**	-0.0858**
	(0.0158)	(0.0154)	(0.0154)	(0.0350)	(0.0351)	(0.0346)
R-squared	0.0987	0.0359	0.0384	0.1658	0.0420	0.0439
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-0.0370**	-0.0333**	-0.0399**	-0.0912**	-0.0868**	-0.1006***
	(0.0155)	(0.0158)	(0.0159)	(0.0379)	(0.0371)	(0.0384)
R-squared	0.0932	0.0354	0.0384	0.1347	0.0410	0.0485
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	286	237	183	289	239	185
Observations	185539	133731	119472	13413	10460	8916

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language (Columns 1 to 3). In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Table A. 4: Effect of mita on student's academic achievement, private schools

	Dependent variable					
	Children shows satisfactory performance in math			**Children shows satisfactory performance in communication**		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Panel A. Cubic Polynomial in Latitude and Longitude					
Mita	-0.0705	-0.0037	-0.0249	-0.0836	-0.0054	0.0344
	(0.0518)	(0.0569)	(0.0586)	(0.0868)	(0.1083)	(0.1001)
R-squared	0.0350	0.0419	0.0553	0.0718	0.0760	0.0960
	Panel B. Cubic Polynomial in Distance to Potosi					
Mita	-0.0238	-0.0989***	-0.1329***	0.0152	-0.1175**	-0.1344**
	(0.0378)	(0.0328)	(0.0332)	(0.0598)	(0.0509)	(0.0610)
R-squared	0.0554	0.0783	0.1056	0.1067	0.1370	0.1716
	Panel C. Cubic Polynomial in Distance to Mita Boundary					
Mita	-0.0104	-0.0229	-0.0046	0.0337	0.0104	0.0515
	(0.0351)	(0.0358)	(0.0372)	(0.0485)	(0.0550)	(0.0517)
R-squared	0.0545	0.0611	0.0778	0.1006	0.1104	0.1514
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	73	59.0000	45.0000	73.0000	59.0000	45.0000
Observations	22179	8026	6797	22120	7984	6763

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	Dependent variable					
	Test scores in math			Test scores in communication		
	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)	<100 km of Bound. (4)	<75 km of Bound. (5)	<50 km of Bound. (6)
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-29.5588	-3.2852	-5.2722	-24.6134	-11.1950	-4.9856
	(22.9389)	(27.6104)	(30.1534)	(20.9904)	(25.2340)	(25.2635)
R-squared	0.0554	0.0783	0.1056	0.1067	0.1370	0.1716
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-14.8361	-44.5278***	-50.9054***	-8.6953	-41.1544***	-37.9110**
	(16.0386)	(15.3218)	(17.5938)	(13.6591)	(12.1673)	(14.1825)
R-squared	0.0554	0.0783	0.1056	0.1067	0.1370	0.1716
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-5.3657	-9.1329	1.3358	-2.3118	-6.6678	4.6411
	(13.7705)	(14.8697)	(14.3412)	(11.4406)	(12.5169)	(10.9336)
R-squared	0.0545	0.0611	0.0778	0.1006	0.1104	0.1514
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	73	59	45	73	59	45
Observations	22179	8026	6797	22120	7984	6763

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Table A. 5: Effect of mita on student's academic achievement, private education as moderator

	Dependent variable					
	Children shows satisfactory performance in math			Children shows satisfactory performance in communication		
	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)	<100 km of Bound. (4)	<75 km of Bound. (5)	<50 km of Bound. (6)
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	0.0014	0.0021	0.0017	-0.0000	-0.0070	-0.0039
	(0.0101)	(0.0103)	(0.0107)	(0.0143)	(0.0146)	(0.0152)
Share of private schools	0.0025***	0.0025***	0.0027***	0.0045***	0.0046***	0.0050***
	(0.0006)	(0.0006)	(0.0006)	(0.0011)	(0.0009)	(0.0010)
MitaXShare of private schools	-0.0017**	-0.0002	-0.0006	-0.0029**	-0.0009	-0.0014
	(0.0007)	(0.0007)	(0.0008)	(0.0012)	(0.0011)	(0.0012)
R-squared	0.0263	0.0249	0.0256	0.0649	0.0620	0.0633
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	0.0062	0.0008	0.0073	0.0068	-0.0025	0.0085
	(0.0090)	(0.0073)	(0.0073)	(0.0127)	(0.0098)	(0.0099)
Share of private schools	0.0021***	0.0024***	0.0026***	0.0039***	0.0044***	0.0049***
	(0.0006)	(0.0006)	(0.0006)	(0.0011)	(0.0010)	(0.0011)
MitaXShare of private schools	-0.0019**	-0.0002	-0.0004	-0.0033**	-0.0009	-0.0011
	(0.0008)	(0.0007)	(0.0008)	(0.0013)	(0.0012)	(0.0013)
R-squared	0.0223	0.0235	0.0250	0.0564	0.0590	0.0617
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	0.0082	0.0010	0.0079	0.0075	-0.0006	0.0110
	171181	127675	112872	170643	127266	112605
Share of private schools	0.0022***	0.0023***	0.0026***	0.0039***	0.0042***	0.0048***
	(0.0006)	(0.0005)	(0.0006)	(0.0009)	(0.0009)	(0.0010)
MitaXShare of private schools	-0.0019**	-0.0001	-0.0002	-0.0031**	-0.0007	-0.0011
	(0.0008)	(0.0006)	(0.0007)	(0.0012)	(0.0011)	(0.0012)
R-squared	0.0082	0.0010	0.0079	0.0075	-0.0006	0.0110

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	Dependent variable					
	Test scores in math			**Test scores in communication**		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	7.9439	7.8414	8.3933	2.2002	0.5394	1.3928
	(6.1087)	(6.3102)	(6.3548)	(5.5374)	(5.7911)	(5.8764)
Share of private schools	0.0025***	0.0025***	0.0027***	0.0045***	0.0046***	0.0050***
	(0.0006)	(0.0006)	(0.0006)	(0.0011)	(0.0009)	(0.0010)
MitaXShare of private schools	-1.1715***	-0.5285	-0.7727**	-0.9632***	-0.4144	-0.6746*
	(0.3859)	(0.3636)	(0.3849)	(0.3489)	(0.3409)	(0.3519)
R-squared	0.0856	0.0780	0.0783	0.1676	0.1508	0.1499
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	5.7775	3.8402	7.3996	-0.6368	-2.5395	0.9002
	(4.9999)	(4.5479)	(4.6505)	(4.5424)	(4.1158)	(4.2339)
Share of private schools	0.0021***	0.0024***	0.0026***	0.0039***	0.0044***	0.0049***
	(0.0006)	(0.0006)	(0.0006)	(0.0011)	(0.0010)	(0.0011)
MitaXShare of private schools	-1.2451***	-0.4155	-0.5776	-1.0623***	-0.3059	-0.4831
	(0.3902)	(0.3390)	(0.3611)	(0.3557)	(0.3396)	(0.3418)
R-squared	0.0774	0.0751	0.0764	0.1551	0.1458	0.1466
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	6.8219	3.4258	7.4457*	0.6456	-1.6299	2.3685
	171181	127675	112872	170643	127266	112605
Share of private schools	0.0022***	0.0023***	0.0026***	0.0039***	0.0042***	0.0048***
	(0.0006)	(0.0005)	(0.0006)	(0.0009)	(0.0009)	(0.0010)
MitaXShare of private schools	-1.2551***	-0.3726	-0.4825	-1.0271***	-0.2830	-0.4876
	(0.3786)	(0.3179)	(0.3318)	(0.3472)	(0.3220)	(0.3394)
R-squared	6.8219	3.4258	7.4457*	0.6456	-1.6299	2.3685
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	286	237	183	286	237	183
Observations	171181	127675	112872	170643	127266	112605

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Table A. 6: Effect of mita on student's academic achievement, teachers with long-term contract (LTC) as a moderator

	Dependent variable					
	Children shows satisfactory performance in math			**Children shows satisfactory performance in communication**		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-0.0188	-0.0122	-0.0140	-0.0384	-0.0368	-0.0354
	(0.0189)	(0.0203)	(0.0224)	(0.0310)	(0.0331)	(0.0372)
Share of teachers with LTC	0.0001	0.0000	0.0001	-0.0000	-0.0001	-0.0000
	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
MitaXShare of teachers with LTC	-0.0002	-0.0001	-0.0002	-0.0001	-0.0000	-0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
R-squared	0.0230	0.0195	0.0196	0.0595	0.0536	0.0519
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-0.0086	-0.0099	-0.0065	-0.0228	-0.0265*	-0.0205
	(0.0107)	(0.0099)	(0.0110)	(0.0170)	(0.0160)	(0.0183)
Share of teachers with LTC	0.0000	0.0000	0.0001	-0.0001	-0.0001	-0.0001
	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
MitaXShare of teachers with LTC	-0.0002	-0.0002	-0.0002	-0.0000	-0.0000	-0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
R-squared	0.0205	0.0188	0.0192	0.0544	0.0519	0.0503
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-0.0064	-0.0101	-0.0073	-0.0222	-0.0264*	-0.0211
	170131	126949	112336	169588	126535	112065
Share of teachers with LTC	0.0001	0.0000	0.0000	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
MitaXShare of teachers with LTC	-0.0002	-0.0001	-0.0002	-0.0001	0.0000	-0.0001
	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
R-squared	-0.0064	-0.0101	-0.0073	-0.0222	-0.0264*	-0.0211

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	Dependent variable					
	Test scores in math			Test scores in communication		
	<100 km of Bound.	**<75 km of Bound.**	**<50 km of Bound.**	**<100 km of Bound.**	**<75 km of Bound.**	**<50 km of Bound.**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-6.8952	-3.7701	-4.1854	-11.6159	-9.6590	-9.5814
	(11.6402)	(12.4209)	(13.7601)	(10.5681)	(11.3536)	(12.6912)
Share of teachers with LTC	0.0001	0.0000	0.0001	-0.0000	-0.0001	-0.0000
	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
MitaXShare of teachers with LTC	0.0066	0.0197	0.0146	0.0560	0.0461	0.0234
	(0.0995)	(0.1030)	(0.1149)	(0.0895)	(0.0905)	(0.1026)
R-squared	0.0776	0.0676	0.0659	0.1675	0.1512	0.1480
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	-5.2732	-4.9106	-3.4100	-10.9001*	-10.2395*	-8.8599
	(6.2008)	(5.9062)	(6.5077)	(5.5694)	(5.4157)	(6.0739)
Share of teachers with LTC	0.0000	0.0000	0.0001	-0.0001	-0.0001	-0.0001
	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
MitaXShare of teachers with LTC	-0.0097	-0.0115	-0.0144	0.0546	0.0273	0.0127
	(0.0995)	(0.0992)	(0.1049)	(0.0875)	(0.0871)	(0.0919)
R-squared	0.0737	0.0664	0.0648	0.1624	0.1491	0.1461
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	-4.5162	-6.2229	-4.9516	-10.0873*	-10.4759**	-8.9947
	170131	126949	112336	169588	126535	112065
Share of teachers with LTC	0.0001	0.0000	0.0000	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
MitaXShare of teachers with LTC	-0.0324	0.0086	0.0070	0.0342	0.0415	0.0087
	(0.1015)	(0.0963)	(0.1001)	(0.0884)	(0.0837)	(0.0906)
R-squared	-4.5162	-6.2229	-4.9516	-10.0873*	-10.4759**	-8.9947
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	286	237	183	286	237	183
Observations	171181	127675	112872	170643	127266	112605

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Table A. 7: Effect of mita on student's academic achievement, log of public spending in health and sanitation as a moderator

	Dependent variable					
	Children shows satisfactory performance in math			Children shows satisfactory performance in communication		
	<100 km of Bound. (1)	**<75 km of Bound.** (2)	**<50 km of Bound.** (3)	**<100 km of Bound.** (4)	**<75 km of Bound.** (5)	**<50 km of Bound.** (6)
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	-0.0008	0.0007	-0.0021	-0.0217	-0.0252	-0.0235
	(0.0128)	(0.0140)	(0.0151)	(0.0214)	(0.0232)	(0.0248)
Log of Pub. Exp. Health	0.0903***	0.0891***	0.0894***	0.1220***	0.1306***	0.1361***
	(0.0232)	(0.0231)	(0.0236)	(0.0381)	(0.0381)	(0.0397)
MitaXLog of Pub. Exp. Health	-0.0684***	-0.0593**	-0.0586**	-0.0600	-0.0533	-0.0588
	(0.0245)	(0.0238)	(0.0243)	(0.0386)	(0.0377)	(0.0395)
R-squared	0.0253	0.0211	0.0216	0.0613	0.0534	0.0532
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	0.0052	0.0029	0.0089	-0.0136	-0.0157	-0.0027
	(0.0091)	(0.0080)	(0.0081)	(0.0136)	(0.0118)	(0.0122)
Log of Pub. Exp. Health	0.0587**	0.0708***	0.0772***	0.0671*	0.0982***	0.1164***
	(0.0230)	(0.0213)	(0.0216)	(0.0375)	(0.0348)	(0.0357)
MitaXLog of Pub. Exp. Health	-0.0483*	-0.0438*	-0.0467**	-0.0263	-0.0279	-0.0399
	(0.0249)	(0.0227)	(0.0224)	(0.0387)	(0.0359)	(0.0361)
R-squared	0.0212	0.0193	0.0203	0.0530	0.0495	0.0500
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	0.0091	0.0041	0.0103	-0.0104	-0.0138	-0.0011
	170195	126758	111958	169668	126361	111702
Log of Pub. Exp. Health	0.0664***	0.0722***	0.0806***	0.0820**	0.0992***	0.1174***
	(0.0208)	(0.0194)	(0.0195)	(0.0342)	(0.0323)	(0.0325)
MitaXLog of Pub. Exp. Health	-0.0535**	-0.0429*	-0.0477**	-0.0333	-0.0263	-0.0433
	(0.0249)	(0.0223)	(0.0227)	(0.0389)	(0.0358)	(0.0363)
R-squared	0.0091	0.0041	0.0103	-0.0104	-0.0138	-0.0011

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	Dependent variable					
	Test scores in math			Test scores in communication		
	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)	<100 km of Bound. (4)	<75 km of Bound. (5)	<50 km of Bound. (6)
Panel A. Cubic Polynomial in Latitude and Longitude						
Mita	2.9029	3.5668	3.0235	-5.8823	-6.7388	-6.5664
	(8.3665)	(9.1680)	(9.7591)	(8.5762)	(9.3667)	(9.9246)
Log of Pub. Exp. Health	0.0903***	0.0891***	0.0894***	0.1220***	0.1306***	0.1361***
	(0.0232)	(0.0231)	(0.0236)	(0.0381)	(0.0381)	(0.0397)
MitaXLog of Pub. Exp. Health	-34.9522***	-30.6225**	-30.9830**	-20.1528*	-15.8722	-17.5109
	(12.7340)	(12.3969)	(12.8385)	(10.5225)	(10.3152)	(10.8229)
R-squared	0.0795	0.0664	0.0653	0.1568	0.1334	0.1304
Panel B. Cubic Polynomial in Distance to Potosi						
Mita	3.3172	2.5850	5.8444	-6.3601	-7.1977	-3.7188
	(4.9488)	(4.5386)	(4.8386)	(4.9393)	(4.6022)	(5.0879)
Log of Pub. Exp. Health	0.0587**	0.0708***	0.0772***	0.0671*	0.0982***	0.1164***
	(0.0230)	(0.0213)	(0.0216)	(0.0375)	(0.0348)	(0.0357)
MitaXLog of Pub. Exp. Health	-26.7160**	-23.1912**	-25.0837**	-12.3998	-8.3804	-11.5843
	(12.5111)	(11.3592)	(11.4181)	(10.3264)	(9.3620)	(9.5950)
R-squared	0.0725	0.0635	0.0629	0.1468	0.1288	0.1265
Panel C. Cubic Polynomial in Distance to Mita Boundary						
Mita	4.9628	2.5793	5.7041	-4.8155	-6.5044	-3.0441
	170195	126758	111958	169668	126361	111702
Log of Pub. Exp. Health	0.0664***	0.0722***	0.0806***	0.0820**	0.0992***	0.1174***
	(0.0208)	(0.0194)	(0.0195)	(0.0342)	(0.0323)	(0.0325)
MitaXLog of Pub. Exp. Health	-28.8934**	-23.4384**	-25.2266**	-13.7699	-8.3471	-12.2413
	(12.7612)	(11.3401)	(11.5803)	(10.6150)	(9.1955)	(9.5125)
R-squared	4.9628	2.5793	5.7041	-4.8155	-6.5044	-3.0441
Geo. Controls	yes	yes	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes	yes	yes
Clusters	286	237	183	286	237	183
Observations	171181	127675	112872	170643	127266	112605

Source: Author's calculations.

Note: Robust standard errors, adjusted for clustering by district, are in parentheses. Mita is an indicator equal to 1 if the school is a district that contributed to the mita and equal to 0 otherwise. Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosi, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the mita boundary. All regressions include controls for elevation and slope, as well as boundary segment fixed effects (F.E.s) and children sex and language. In columns 1 and 4, the sample includes observations whose district capitals are located within 100 km of the mita boundary, and this threshold is reduced to 75 and 50 km in the succeeding columns. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.