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Inequality, Crime, and the Long Run Legacy of Slavery*

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Abstract

This paper investigates the relationship between economic inequality and crime in Colombian municipalities. Following recent scholarly research that suggests that the legacy of slavery is largely manifest in persistent levels of economic inequality, we instrument economic inequality with a census-based measure of the proportion of slaves in each municipality before the abolition of slavery in the 19 century. We also explore the robustness of our estimates to relaxing the exclusion restriction, as the slavery instrument is only plausibly exogenous. We document a strong association between inequality and both violent and property crime rates at the municipal level. Our estimates are robust to including traditional determinants of crime (like population density, the proportion of young males, the average education level, the quality of law enforcement institutions, and the overall economic activity), as well as current ethnic differences and geographic characteristics that may be correlated both with the slave economy and with crime.

Keywords: Slavery, Inequality, Crime, Colombia
JEL: D63, J15, K42, N36.

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1 Introduction

Since the seminal contribution of Becker (1968), the relationship between inequality and crime has attracted the attention of social scientists, especially economists and criminologists. Becker argued that agents would engage in crime or illegal behavior as long the expected benefits offset the expected costs. Indeed, for a given probability of apprehension and expected punishment, higher levels of inequality would increase the expected benefit of committing a crime for the relatively disadvantaged. A reasoning of this fashion seems to be in the mind of many, as inequality is often considered in the public debate as a fundamental determinant of crime.

The idea that inequality causes crime finds support in several theoretical accounts besides Becker's (see for example Ehrlich, 1973; Chiu and Madden, 1998; Imrohoroglu et al., 2000). But a positive relationship between inequality and crime is not the only existing theoretical prediction: As long as inequality increases *the threat of* crime, it may be negatively related with actual crime rates. This may occur if private protection strategies are implemented to offset crime by the wealthy (e.g. alarm systems, private security, etc.). Galiani et al. (2016) and Allen (1996)–among others- suggest this mechanism, and Chintrakarn and Herzer (2012) find a robust crime-reducing effect of inequality in a panel of US states.

The empirical evidence is also inconclusive. While some have found support for the idea of a positive relationship between inequality and crime (e.g. Ehrlich, 1973; Kelly, 2000; Machin and Meghir, 2000; Gould et al., 2002; Fajnzylber et al., 2002; Demombynes and Özler, 2005), others have failed to find any significant relationship (Allen, 1996; Bourguignon et al., 2003; Neumayer, 2005).

One limitation of most of the existing empirical literature is the lack of an empirical strategy to overcome the usual identification challenges.[1] In addition, the existing contributions are by and large based on cross-country evidence or other large levels of aggregation, thus the issue of data and institutional comparability is also likely to play an important role in the study of the relationship between inequality and crime. For instance, the lack of a large panel of homogeneous data on inequality may constitute a source of attenuation bias that is likely to explain, at least partially, why several studies have failed to find a significant relationship. The use of data at a smaller level of geographical aggregation is highly desirable as it allows a more adequate measurement both of inequality and crime.

In this paper we investigate the effect of land inequality on crime focusing on subnational variation across Colombian municipalities. We focus on land inequality for two main reasons. On the one hand there exists no data on income inequality at the

[1] See Bourguignon (1999), Eide (1999) and Freeman (1999) for thorough reviews on the relationship between inequality and crime.

municipal level, the most disaggregated administrative unit in Colombia.[2] On the other, the relationship between land inequality and crime has been traditionally overlooked by the empirical literature, possibly with the exception of scholarly research that relates land inequality to invasions of private land in Brazil (e.g. Hidalgo et al., 2010; Albertus et al., 2016).

Besides the fact that the sub-national approach helps us mitigate some of the concerns regarding the institutional heterogeneity and data comparability present in cross-country set ups, we argue that Colombia is a good laboratory to study this relationship for several reasons. First, it is one of the most unequal and most criminogenic countries in the world. According to a recent Oxfam study Latin America is the world's region with the most unequal distribution of land and Colombia is the region's most unequal country, with two thirds of productive land concentrated in the hand of 0.4% of landholdings (Guereña (2016)).[3] Likewise, according to the 2016 UNODC Homicide Statistics[4], Colombia ranks 208 out of 218 countries in terms of the homicide rate.[5] Second, high quality data on various types of crime are available in Colombia for academic research. The Criminal Research Division (DIJIN) of the Colombian National Police maintains monthly-level municipal-specific datasets on the incidence of various types of crimes. In particular, Colombian crime statistics allow us to overcome under-reporting issues that typically affect crime statistics. Third, Colombia's history of slavery, combined with the availability of pre-abolition population censuses allows us to construct a municipal-level instrument of current inequality, thereby addressing–at least partially- identification concerns.

Indeed, recent research has established that the legacy of slavery is manifested in persistent levels of inequality, particularly in landholdings. Engerman and Sokoloff (1997) and Sokoloff and Engerman (2000) argue that ecological and climate characteristics present at the earlier colonial period determined the economic activity adopted by the colonizers. There, where the soil and the geography were ideal for establishing large-scale, labor-intensive plantations, the use of slave force became more prevalent. In turn, the establishment of this institution determined large initial levels of land concentration,

[2]Household surveys are only representative at the department level since 2012 (before then, since 2007, they were representative of just the country's 23 main cities). In addition, the populations census does not retrieve income information for the entire population. The income census question belongs to an "augmented census" questionnaire that has neither a sampling design nor enough power to make any inference at the municipality level. The augmented questionnaire is used to make more aggregate (department or region-level) comparisons. The methodology of the last (2005) census can be obtained (in Spanish) from: https://www.dane.gov.co/files/investigaciones/fichas/Censo_2005.pdf (last accessed December 10, 2017).

[3]Also, Colombia is one of the most unequal countries in terms of the income distribution. According to the 2016 World Development Indicators, Colombia ranks 146 among 155 countries in terms of income inequality.

[4]Available at: http://www.unodc.org/unodc/en/data-and-analysis/statistics.html, last accessed 12/22/2016.

[5]The 10 countries that have higher homicide rates than Colombia are, from the most violent to the least violent: Honduras, Venezuela, Virgin Islands, Belize, Jamaica, El Salvador, Lesotho, Guatemala, Saint Kitts and Nevis, and South Africa.

thus affecting land as well as income inequality. Finally, initial inequality shaped the choice of certain type of institutions (what Acemoglu et al. (2012) would call *extractive* institutions) that generated further inequalities and thus made it persist over time. One implication of this argument, which has found support in the work of Lagerlöf (2005); Easterly (2007); Nunn (2008); Soares et al. (2012), both cross-country and within the US, is that the use of slaves in colonial times has explanatory power over current inequality. This is also validated by our data.

Recent economic literature has widely investigated the long-term effect of slavery on various economic outcomes. Empirical studies provide evidence on the long-term legacy of slavery income inequality (Bertocchi and Dimico, 2014), economic development (Acemoglu et al., 2002; Nunn, 2008; Maloney and Valencia Caicedo, 2016), racial educational inequality (Bertocchi and Dimico, 2012), and political attitudes (Acharya et al., 2016). More closely related to our work, Gouda and Rigterink (2016) find that the US counties that historically had a higher fraction of slaves are significantly more violent today. Colombia is not an exception: Acemoglu et al. (2012) show that places with higher slaves concentration in the colonial times due to the establishment of gold mines plundered by the conquistadors, are more unequal and less developed today.

Building on this political economy literature, we exploit the heterogeneous slave legacy across Colombian municipalities to construct a plausible source of exogenous variation of current levels of inequality. As explained, we focus on land inequality. In particular, using a historical population census, we compute the proportion of slaves to the total municipal population in 1851, right before the abolition of slavery that took place with the 1853 Constitution. We find that inequality is associated with higher property crime rates (car theft) as wee as with higher violent crime rates (murder). Our estimates are robust to including traditional correlates of crime like population density, the proportion of young males, the average education level, the quality of law enforcement and the overall economic activity. This helps mitigating potential threats to the exclusion restriction that stem from the fact that past slavery may have had an independent effect on other social outcomes different from inequality (as shown by Acemoglu et al. (2012). Importantly, we also show that our results are not driven by fixed geographic characteristics that may be correlated both with the slave economy in the nineteenth century and with current crime, or by current ethnic differences across municipalities.

Our results are also robust to relaxing the exclusion restriction, acknowledging that the slavery instrument may only be plausibly exogenous. More specifically, following Conley et al. (2012) and Berkowitz et al. (2012), we conduct some sensitivity analysis to test the extent to which our estimates survive after allowing for plausible amounts of imperfect exogeneity of the slavery instrument.

Our results for property crime are consistent with the framework of Becker (1968), as criminals attempt to obtain material benefits from their actions. However, it is less

clear why should there be an association between inequality and violent crime. While it may be the case that a fraction of violent crimes start as non-violent attempts to illegally obtain someone else's property, this fraction seems rather marginal. Instead, the results on violent crime are consistent with recent epidemiological research. In particular, Wilkinson and Pickett (2009) provide evidence that inequality has a pernicious effect on society by eroding trust and social capital, and by creating a range of pathologies ranging from anxiety and drug abuse to mental and physical illness. This is the mechanism that according to the authors links inequality with social ailments like the formation of gangs and the resort to violent crime.

The remainder of the paper is organized as follows. Section 2 describes the data and their sources. Section 3 presents our identification strategy. Section 4 describes the main results and robustness checks, and finally section 5 concludes.

2 Data

2.1 Main variables

We estimate the relationship between land inequality and crime using the proportion of slaves in the nineteenth century as instrument of current land inequality. Thus, the main variables in our analysis are the historic proportion of slaves, and the contemporaneous inequality and violent crime rate, all at the municipal level.

The proportion of slaves comes from the 1851 Census of Colombia (then called the *New Granada*), which took place just two years before the abolition of slavery with the 1853 Constitution. Despite all the potential challenges of carrying out a comprehensive population census in a relative backward country like the New Granada some 150 years ago, the 1851 census is believed to have been the most reliable demographic account of the century. Indeed, while historians like Gomez (1969) mention as one of the hurdles of the 1851 census the fact that some people tried to hide from the census officials fearing that it was a way to extend that tax base, they also conclude that, compared to other censuses carried out in the nineteenth century in Colombia, the 1851 census was the one with less problems (Gomez, 1969).

The census includes most municipalities (then called "parochial districts") existing at the time in Colombia. Each municipality mayor, together with the governor of the municipality's state (then called "canton") were in charge of delimiting the borders and choosing two local "commissioners" to administer the census within that area. The commissioners had to record the information of each household, by hand writing in strict order the names and ages head of the household, his wife, the offspring, dependents and servants and finally the slaves (both single and married).[6] For each municipality we

[6]Presidential Decree of July 18 of 1842. Accessed from:

record the number of counted slaves as well as the total municipal population, allowing us to construct slave shares at the most disaggregated administrative level. Critically, before the abolition the settlement of slaves was determined by exogenous factors, like the presence of mineral deposits (Acemoglu et al., 2012).

The administrative division of the New Granada territory differs from the contemporaneous administrative division of Colombia. Today there are over 1,100 municipalities, which is about double the number of parochial districts in the 1850s. Current municipalities were either founded from settlements on frontier lands that did not belong to any administrative unit, or split from pre-existing municipalities. Using data on the date of foundation of each modern municipality, as well as its origin (wether a vacant land or one or more pre-existing municipalities) we aggregate the current administrative division to that existing in 1851, when the census was administered. We end up with 541 parochial districts, which constitute our estimation sample.

We use the Gini coefficient of the current distribution of the value of landholdings as our main measure of land inequality. These data, that were previously used by Offstein (2005) and Fergusson and Vargas (2011), come from the 2002 cadastral update of IGAC, the Colombian government institution in charge of maintaining cadastral records at the municipal level. IGAC, however, does not keep the records of the whole state of Antioquia, which maintains its own (confidential) cadaster. Thus the municipalities from Antioquia are not included in our main sample.[7] Using the individual label data on land tenancy and value we computed current municipal-level Gini coefficients of the value of land for the municipalities existing in the geo-administrative division of the New Granada in 1851. For robustness purposes we also compute other inequality measures, namely the Theil index and the Atkinson index.

The data on crime comes from the Colombian National Police. We take the average of the monthly incidence of various types of crime in each municipality for the period 2005-2010. However, for reasons of data quality we focus on two specific crimes: the murder rate and the car theft rate. The first is a proxy of violent crime and the second a proxy of property crime. We focus on these measures because other categories of crime (e.g. mugging and larceny) have severe problems of underreporting.[8] This is the case both in Colombia and internationally: people do not report minor crimes because the opportunity cost of doing so is high given the low probability of detection and the small loses involved. They also are unlikely to report crimes that make them feel ashamed, like rape. In turn, while in cases of murder there is a body that makes the crime difficult to

http://www.banrepcultural.org/blaavirtual/economia/estadcol/estadcol38.htm

[7]However, because Antioquia does have public data on crime as well as data on the proportion of slaves in the XIX century, we can estimate the reduced-form specifications including this state. In this case the results are unchanged in terms of magnitude and significance compared to the reduced form estimated over the baseline sample.

[8]In addition to murder and vehicle theft, we construct a crime index of both property and violent crimes using principal components analysis.

hide, in cases of vehicle theft people do not have incentives not to report it, even in cases in which the vehicle is uninsured, because the loss is very valuable and so the expected gain of denouncing is relative high even if the probability of detection is low. In the specific case of Colombia, General Naranjo, the chief of the National Police from 2007 to 2012, confirms that, for this country "the public figures of murder and vehicle theft are by far the closest to the real phenomena, much more so than those of mugging and larceny".[9]

Table 1 shows descriptive statistics for these variables. Panel A focuses on the three outcomes described, which are normalized by the municipal population. Panels B and C describe respectively our independent variable of interest and the instrument. The mean value of the land Gini coefficient in Colombia is rather high: 0.68, with the less unequal municipality having a Gini of 0.21 and the most unequal having one of 0.91. Alternative inequality measures (the Theil index and the Atkinson index) show a similar picture. Indeed, as mentioned in the introduction, Colombia is one of the most unequal countries in the world. In turn, the proportion of slaves in 1851 parochial districts is not too high: on average municipalities had 3% slaves with some having no slaves and one having as much as 11% slaves.

2.2 Controls

Panel D of Table 1 describes the controls included in our estimations. We focus on variables that have been identified in the literature as robust determinants of the incidence of crime. These include demographic variables like population density (crime is more likely to occur in more densely populated, urban areas), and the proportion of young males in the age bracket 15-29 (young males in that age range are the subset of the population identified as more prone to commit crimes). We also include the average years of education, a measure of the efficiency of the judicial system at the local level and, in the absence of municipal-level GDP data for Colombia, per capita tax revenues as a measure of economic activity. We also look at the robustness of our results to controlling for the current proportion of blacks and geographical variables that are correlated with the slave economy. We describe these controls in detail below.

The demographic variables and the average level of education are census-based variables that we computed from the 2005 Census. To compute the density we use data from DANE (the Colombian statistics office) on the area of each municipality. The mean density in our sample is 0.14 people per squared Km. The average proportion of young males aged 15 to 29 is 25% of the municipal population. However the variation of this variable is somewhat large, from 17% to 52%. The average education almost 5 years of schooling

[9]General Oscar Naranjo in his address on street crime, Center for Latin American Studies, The School of Foreign Services, Georgetown University, 2006. Available at: http://pdba.georgetown.edu/Security/citizensecurity/Colombia/evaluaciones/delitocajellero.ppt.

with municipalities with as low as 3 average years of schooling. The proportion of blacks is based on self-reported ethnicity in the 2005 Census. We call "blacks" the proportion of people that identify themselves as either "Afro-colombian" or "Palenqueros".[10]

As for our proxy of judicial efficiency, we use the index computed by Fergusson et al. (2013). The index uses all homicide cases that entered the criminal justice system from 2008 to 2010, from the National Office of the Attorney.[11] The index is computed as follows:

$$\begin{aligned} \textit{Efficiency Index}_m &= \frac{\textit{Cases Closed}_m}{\textit{Total Cases}_m} \times \frac{\textit{Total Cases Resolved}_m}{\textit{Cases Closed}_m} \\ &= \frac{\textit{Total Cases Resolved}_m}{\textit{Total Cases}_m}. \end{aligned}$$

Hence, our measure can be thought of as the efficiency of judges, adjusted for quality. Indeed, the first ratio in the first line of the expression measures the share of cases entering the judicial system that are resolved (efficiency). However, cases are often closed without resolution, meaning that either no one is found guilty, or terms expire and the judge is forced to close the case with no definite action. Thus, we adjust by the second ratio (quality): the share of closed cases that were actually resolved. Low values of the first ratio indicate congestion of cases and slow decision-making, and low values of the second translate to high levels of impunity.

The data on tax revenues comes from the fiscal database of the National Planning Department, and the geographic variables (the average municipal elevation and the average soil quality) come from the database of the CEDE, Universidad de los Andes.

3 Empirical strategy

Our baseline evidence comes from estimating through ordinary least squares (OLS) a regression model of the following form:

$$crime_m = \alpha + \beta Inequality_m + \delta' X_m + \epsilon_m \tag{1}$$

The outcome $violence_m$ measures the incidence of murder at municipality m. $Inequality_m$ is our measure for land inequality, namely the municipal-level Gini coefficient of the

[10] Palenqueros is the term that identifies the inhabitants of Palenque, a municipality in the state of Bolivar where fugitive slaves would flee to before the emancipation.

[11] Colombia started implementing a new criminal justice system in 2005, before which municipal judges were not forced to report systematically on the investigations carried out by them. Hence data on criminal judicial outcomes is sparse and unreliable for the years when the old system was in place. Because the adoption of the new system was staged in several years across different geographic regions, there is consistent data for all the municipalities starting from 2008.

distribution of the value of landholdings. $Slavery_m$ is the proportion of slaves to the total municipal population according to the 1851 Census, carried out just two years before slavery was abolished in Colombia, with the 1853 Constitution. X_m is a vector of municipal specific controls that are likely to affect the local dynamics of crime. These are described in section 2.

Estimating the effect of inequality on crime using a simple linear regression is likely to produce biased estimates for several reasons, including reverse causality, omitted variable bias and measurement error. The incidence of crime (especially property crime) may be redistributive to the extent that perpetrators are economically disadvantaged with respect to victims. If that was the case then, assuming that the true value of β_1 in the model below is positive, the potential for reverse causality would be less worrisome for our purposes as the estimated coefficient would go against us finding any relationship between the two variables. Omitted variable bias is a concern to the extent that inequality and criminal behavior are jointly determined by unobserved factors. One such factor could be an ill functioning broad institutional apparatus that, on the one hand, promotes the accumulation of wealth in the hands of a small elite and, on the other, lacks the law enforcement capacity to prevent and punish crime. This seems to be the case in many developing countries that are both highly unequal and prone to crime and violence, as recently noted by Acemoglu et al. (2012). Finally the scope for measurement error is not negligible in our context, as our proxy of inequality is based on the cadaster-recorded value of land property, which may suffer from severe under-reporting.

For these reasons, in order to study the effect of inequality on crime we estimate the following regression model by 2SLS:

$$crime_m = \alpha + \beta_1 \widehat{Inequality}_m + \delta' X_m + \epsilon_m \tag{2}$$

where, $\widehat{Inequality}_m$ are the predicted values of the inequality that are computed from the estimation:

$$Inequality_m = \gamma + \phi_1 Slavery_m + \lambda' X_m + \varepsilon_m \tag{3}$$

We also report the results from the reduced-form equation:

$$crime_m = a + b_1 Slavery_m + \rho' X_m + e_m \tag{4}$$

which, in addition to testing the direct effect of past slavery on current crime, allows us to include the state of Antioquia, for which there is no publicly available micro-level cadastral data to compute our proxy of inequality.

We are interested in the estimate of β_1. A positive estimate suggests that higher level of inequality produce higher crime rates. The exclusion restriction implies that the settlement of slaves before the abolition of slavery does not affect current crime through

a channel different than inequality. This may seem implausible at first glance: the salve economy in the 19th century could affect current crime through several channels other than inequality. For instance, slavery could have help creating "extractive institutions" (Acemoglu et al., 2012) that imply weak law enforcement. However, recall that our set of controls includes municipal level characteristics that net out the effect of several potential channels violation of the exclusion restriction. These are average education levels, the quality of local institutions, a proxy of municipalities' economic performance, the current proportion of black population and geographic characteristics that may be correlated with the slave economy, among other things.

In any case, to address any remaining concern about the validity of the instrument conditional on the aforementioned controls, we investigate the robustness of our baseline estimates in circumstances in which the instrumental variable does not perfectly meets the exclusion restriction. In particular, Conley et al. (2012) propose a way to construct conservative confidence intervals of the structural coefficient of interest (in our case β_1) in the face of an instrument that is only plausibly exogenous. To this end, consider the following simultaneous equation model:

$$crime_m = \beta EI_m + bSlavery_m + \delta' X_m + \epsilon_m \tag{5}$$

$$EI_m = \phi Slavery_m + u_m \tag{6}$$

Following Conley et al. (2012), interval estimates of β, our coefficient of interest, are obtained by taking the *union* of all confidence interval estimates across all plausible values of b, the direct effect of the instrument on the outcome (which for a perfectly met exclusion restriction should be equal to zero).[12]

4 Results

Table 2 reports the results from estimating a naïve linear regression of the murder rate on our measure of land inequality. The tables presented hereafter have all the same structure except for Tables 7 to 9 in the appendix. They include 6 columns. The first column includes no controls. The subsequent columns include, additively, a standard set of controls in the economics of crime literature: Column 2 includes population density and column 3 includes the proportion of males in the age range 15-29, that captures the supply of (the most common) crime perpetrators. Column 4 adds as control the average years of education in each municipality. The idea is that education increases the

[12] As an alternative approach, we follow Berkowitz et al. (2012) who propose a Fractionally resampled Anderson-Rubin test (FAR) to assess the significance of endogenous regressors in an instrumental variables estimation. The FAR test allows us to conduct reliable inference in presence of a plausible violation of the exclusion restriction.

opportunity cost of engaging in criminal behavior, as it increases one's chances in the legal labor market. Column 5 controls for the efficiency of the criminal justice system at the local level, and column 6 includes the per capita tax revenues as a proxy for local economic activity, in the absence of municipal-level GDP data.[13][14]

Table 2 includes three panels, respectively showing the results for the murder rate, the rate of car theft and the crime index. The estimated coefficient of the effect of inequality on the per capita murder rate is very stable across specifications. Using the most conservative specification in column 6 it implies that a one standard increase in the land Gini (equivalent to 0.09, see Table 1) is associated with an increase in the murder rate of 0.068 (0.09×0.755) assassinations per capita, equivalent to a fourth of a standard deviation. This effect seems somewhat small. However recall that the naïve OLS estimates are likely to be downward biased, both because of the potential redistributive impact of crime as well as for the attenuation driven by the likely measurement error.[15]

Regarding the effect of inequality on the rate of car theft the magnitude of the estimated coefficient is not so stable. It drops as controls are added progressively, in particular when the average municipal education is accounted for. The estimated coefficient of column 6 is the smallest of all, and implies that a one standard deviation increase in inequality is associated with an increase in the rate of car theft of 0.03 (0.09×0.277) thefts per capita, equivalent to a sixth of a standard deviation.

The estimated coefficient of interest in the regression involving the crime index is much more stable. A one standard deviation increase in our measure of inequality is associated with an increase in the crime index of 0.07 (0.09×0.730), equivalent to a fourth of a standard deviation.

Table 3 reports the IV coefficients, estimated by 2SLS. In addition to the three panels of Table 2, it includes a fourth panel (D), which reports the first stage estimates (which is the same for the three outcomes). The effect of past slavery on current inequality is, as expected, positive and significant across specifications. A one standard deviation increase in the proportion of slaves as measured by the 1851 Census (which is equivalent to a 1% increase), is associated with a fourth of a standard deviation increase in current inequality. In addition the F-statistic of the Kleibergen-Paap Wald rk test of weak instruments is very large throughout (= 46.1 in the most demanding specification).

The estimated IV coefficients are larger than the OLS ones reported in Table 2. This

[13] Adding the judicial efficiency index reduces our sample from 541 municipalities to 538.

[14] Results hold using Conley-corrected standard errors (Conley (1999)) using different cutoffs for spatial correlation (15, 30 and 50 km).

[15] Using a public opinion survey that records both victimization and various measures of income, we can show a robust positive correlation between crime victimization and income/wealth in Colombia. These results are available upon request. On the other hand, we claim that land inequality is measured with error because land registries in Colombia are often outdated. Moreover, Martinez (2017) shows that how outdated local cadasters are is not related to municipal-specific characteristics, so the measurement error is most likely of the classical form.

is consistent with our prior regarding the downward bias of the OLS coefficients, both because of the potential redistributive effect of conflict and because of measurement error. It is also reassuring that the magnitude of the coefficients is very stable across specifications, even for car theft, that presented very unstable OLS estimates (Panel B, Table 2).

Using the most complete specifications (column 6), we find that a one standard deviation increase in inequality causes a 0.32 increase in the per capita murder rate, equivalent to 1.15 standard deviations. In the case of car theft, an equivalent increase in our measure of inequality causes an increase in this outcome of about 2 thirds of a standard deviation. Finally, the IV estimates of the effect of inequality on our crime index are reported on Panel C of Table 3. As in the case of the murder rate, a one standard deviation increase in inequality causes an increase in the index equivalent to 1.15 standard deviations.

As mentioned, the magnitude of the coefficients is larger in the IV specifications relative to OLS. While this is consistent with the direction of the bias we expected, IV coefficients are about four times larger in the most demanding specifications (column 6). A gap this size could also arise if the exclusion restriction was not met perfectly. In Table 4 we allow for such possibility and, following Conley et al. (2012), report the lower and upper 95% confidence intervals of the coefficient of interest (β in equation 4) for *non-zero* values of b (the direct effect of the instrument on the outcome) in different ranges, from $(-0.1, 0.1)$ to $(-1, 1)$. Importantly, regardless of the magnitude of the (non-zero) plausibly endogenous relationship between the instrument and the outcome, the confidence bound of the estimated relationship of interest is quite consistent and does not overlap with zero in any of the cases. This confirms that the impact of inequality on criminal activities is positive and significant, even if one thinks that the instrument is only plausibly exogenous.[16]

Table 5 shows the results from estimating the reduced-form regression. The association between the share of slaves in the nineteenth century and current crime is positive and significant throughout specifications, and the magnitude is fairly stable. In the case of murder, a one standard deviation increase in the share of slaves translates into an increase in the homicide rate of almost a third of a standard deviation. The substantive effect is very similar in the case of the crime index, whereas for vehicle theft a one standard deviation increase in the proportion of slaves in the mid 1800s is associated with an increase in this crime of about a sixth of a standard deviation.

[16]We also conducted, following Berkowitz et al. (2012), a Fractionally resampled Anderson-Rubin test. The null hypothesis of the FAR test is that the impact of inequality on crime is equal to zero. This is rejected for all variables under different scenarios, providing further evidence of the robustness of our empirical findings. These results are available upon request.

4.1 Further robustness

The effect of land inequality on both property and violent crime is positive and very robust to controlling for a set of variables that are likely to affect the incentives for engaging in criminal behavior. These include demographic characteristics, education, economic conditions and institutional quality.

One limitation of our estimates has to do with the fact that they exclude the state of Antioquia, one of the largest of Colombia, and with crime rates that are higher than the national average, largely inherited from the time of the Medellin Cartel and the war against drugs. Unfortunately, Antioquia maintains its own cadaster and its information is not publicly available. This prevents us from being able to interpret our results as national averages.[17] Nevertheless, we do have information for Antioquia of both crime rates and the share of saves in the nineteenth century. Indeed, the former data is provided by the National Police and the latter was obtained from the 1851 population census, and thus none of it can be withheld by the state's governor's office.

Thus, in Table 6 we report again reduced-form estimates of Table 5, this time including Antioquia. Our sample is now 74 municipalities larger.[18] It is reassuring that the estimates are not only still positive and significant across outcomes, but also that their magnitudes are virtually unchanged (though slightly smaller for the case of murder and slightly larger for the case of vehicle theft). We are then confident that the exclusion of Antioquia is very unlikely to be biasing out IV results of Table 3 in any systematic way.

Our argument hinges on the long term legacy of slavery in terms of inequality. It is not a story about the effect on crime of current ethnic differences across municipalities, as proxied by slavery over 150 years ago. This point is important because, as pointed out by Lagerlöf (2005) for the case of the US, slavery in 1850 is highly correlated with the current proportion of black population at the county level. This is also the case of Colombia. Our data suggest that the municipal-level correlation between the proportion of slaves in 1851 and the self-reported blacks in the 2005 census is 0.55.

It is then important to show that our results are robust to controlling for the current proportion of blacks. If this were not the case, then our argument about the legacy of slavery in terms of inequality would be weakened. Table 7 looks at this issue. In addition to the complete set of controls included in the previous results (as of column 6 of the previous tables), columns 1 to 3 of the table include the current proportion of (self-identified) blacks, as registered by the 2005 Colombian population census. Column 1 reports the naïve OLS estimates for comparison; column 2 the reduced form and column 3 the IV results. As with the previous tables, the three outcomes are investigated in three different panels, respectively murder (Panel A), vehicle theft (Panel B), and the crime index (Panel C).

[17] Of course, the IV estimates of Table 3 have to be interpreted as loca average treatment effects.
[18] Recall that the estimation uses the administrative divisions as for the mid nineteenth century.

The effect of inequality on crime is positive and significant across outcomes and econometric specifications. The results are also somewhat larger in magnitude. Focusing on the IV results of column 3, a one standard deviation increase in the land Gini coefficient, increases the murder rate by 1.3 standard deviations. It also increases the rate of vehicles theft by just over one standard deviation, and the crime index by 1.5 standard deviations.

An additional robustness check is motivated by the argument of Engerman and Sokoloff (1997) and Sokoloff and Engerman (2000) that the use of slaves was determined by exogenous geographical characteristics that were adequate for large-scale crops like cotton, sugar or tobacco. This hypothesis finds support in the works of Easterly (2007), who shows that current inequality is correlated with the geographical suitability for sugarcane production cross-country, and Lagerlöf (2005), who shows that historical slavery in the US counties is correlated with geographic conditions including elevation and other variables associated with the soil quality. If the geographic characteristics that favored the acquisition of slaves in the nineteenth century in Colombia can also predict current crime rates at the municipal level to some extent, then failing to control for these would bias our results.

Table 7 includes the average municipal elevation and the average soil quality as controls, in addition to all the other controls (including the current proportion of black population). Columns 4 to 6 report the OLS estimates, the reduced-form, and IV results respectively. The estimated coefficients are again positive and significant across these specifications and for the three outcomes, and their magnitude is virtually unchanged with respect to the effects computed for columns 1 to 3. We conclude that geography does not drive our results.

Acemoglu et al. (2012) investigate the effect of slavery on long-run development in Colombia by comparing municipalities with gold mines during the colonial period with neighboring municipalities without mines. The idea is that gold mines during the 17^{th} and 18^{th} centuries, now depleted, where a major source of demand for slaves. The authors conclude that slavery is associated with worse current development indicators. While this paper is the closest to ours, the empirical strategy differs. We rely on Engerman and Sokoloff (1997) and Sokoloff and Engerman (2000) to argue that slavery was the seed of large initial economic and political inequalities that persisted through the centuries. This motivates our first stage, which is hence not limited to the places that had gold mines, but generally to all the places that had slaves before the abolition of this institution and hence before slaves could freely decide where to settle. As Engerman and Sokoloff noted, beyond mining these were places with large-scale plantations. Hence, to show that our results are not driven by the towns that had gold mines during the colony, in Table 8 we repeat our exercise on a sample that excludes these municipalities (columns 1 to 3) as well as on a sample that excludes both the mining towns and their neighbors (columns 4 to 6). Throughout this table we include the entire set of controls, inclusive those explored

in Table 7 as robustness (i.e. the ethnicity and geography controls).

The baseline results are robust to excluding these subsamples, which implies that our results are not driven by the towns included in the analysis of Acemoglu et al. (2012). The estimated coefficients are positive throughout and the magnitude remarkably similar, with the IV coefficients (columns 3 and 6) only slightly larger than in the previous table. Also, the significance of the coefficients is not reduced by the efficiency lose that comes from reducing the estimation sample.

As an additional robustness check looks at whether the results are driven by using the Gini coefficient as proxy for inequality. There are several alternative measures other than the Gini coefficient. Two of the most popular are the Theil index and the Atkinson index. The Theil index is a special case and the most widely used version of the generalized entropy index. While the Gini coefficient is arguably more intuitive as it is based on the Lorenz Curve, the overall Theil index has the property of being additive across different subgroups, so it can be decomposed in the inequality between groups and the inequality within them. The Atkinson index is useful to determine which tail of the observed distribution contributes more to the overall inequality. It includes an 'inequality aversion' parameter that, when varied, produces different values of the index that put different weights to different parts of the distribution. Here we use the index that sets the aversion parameter to 1, which makes the index more sensitive to changes at the left tail of the distribution. Our results are however robust to indices that use other values of the inequality aversion parameter.

Table 9 looks at the effect of inequality on our three outcomes of crime using as the measure of inequality the Theil index (columns 1 to 3) and the Atkinson index (columns 4 and 5). The entire set of controls, including the proportion of contemporaneous black population and the geographic controls, is included in all the regressions. Using either of the alternative inequality measures does not change our results in substantive terms. The estimated coefficients of the OLS regression, the reduced form and the IV regression are positive and significant for both inequality measures and all crime outcomes.[19]

The magnitude of the estimated coefficients when using the Theil index is between four and five times smaller than the estimates of the equivalent model using the Gini coefficient (Table 7, columns 4 to 6 that use the entire set of controls). This is because while the Theil index is left-bounded at zero, it can be greater than 1. Indeed, as can be seen in Table 1 the mean of the Theil index in our sample is five times larger than that of the Gini coeffIcient, and so is its maximum. In turn, the estimated coefficients using the Atkinson index (a measure that does vary between 0 and 1) are virtually unchanged with respect to the Gini benchmark. Thus, accounting for their measurement details, Table 9 shows that using alternative proxies of inequality leaves our results unchanged in terms

[19]The reduced is not included under the Atkinson index label, as it is the same than the one reported in column 2.

of both significance and magnitude.

Our last robustness check uses as the treatment variable an indicator of municipalities with high inequality. This is done either by separating municipalities according to the median of the distribution of the Gini coefficient (columns 1 to 4 of Table 10), or according to its mean (columns 5 to 8). In each case we report the results of using two alternative IV specifications. First, we instrument the indicator of high inequality with the same an indicator of high proportion of slaves using the same statistic in both cases (that is the median in column 3 and the mean in column 7). Second, we instrument the indicator of high inequality with the entire distribution of the proportion of slaves in the nineteen century (column 4 for the median and 8 for the mean).

The results are generally robust to this alternative measure of inequality, which may arguably be subject to less measurement error. With the exception of the first IV approach (that instruments the indicator of the upper median (mean) of inequality with the indicator of the upper median (mean) of the proportion of slaves), the estimated coefficient is in all cases positive and significant.[20]

5 Conclusion

Inequality is often considered a key factor in explaining criminal behavior. Building from the contribution of Becker (1968) a large theoretical literature suggests that inequality increases the incentives of (property) crime. More recently it has been argued that wealth inequality causes anxiety, mental disorder, lack of trust and discontent for the unfair distribution of assets (relative deprivation), thus also increasing violent crime. The empirical literature is less conclusive, perhaps owing to methodological shortcomings and measurement error. Indeed, inequality is difficult to define and measure in a standardized way cross-nationally, and most of the existing literature suffers from endogeneity and omitted variable bias.

We investigate empirically the relationship between land inequality and crime using sub-national level data for Colombia, a country that is both very unequal and that features very high crime rates. In order to address the usual identification challenges, we instrument inequality at the municipality level with the share of slaves in 1851, just before the abolition of slavery in 1853. Our approach is motivated by the growing political economy literature on the long term legacy of slavery. Engerman and Sokoloff (1997) and Sokoloff and Engerman (2000) argue that pre-existing geo-ecological characteristics of colonies determined the economic activities of the colonizers and the use of slave labor. This resulted in differential levels of initial inequality that persisted overtime, and is correlated with current inequality. This hypothesis has found support in the empirical

[20]The second IV approach is just short of being significant for the case of vehicle theft.

contribution of several authors.

Our findings point to the existence of a positive and significant effect of inequality, as measured by the Gini coefficient of the value of land, on both property and violent crimes. The results are robust to the inclusion of several of the usual determinants of crime (like the proportion of young males, the average education level and the overall economic activity), as well as of other potential channels through which slavery can impact current crime (like the quality of local law enforcement institutions). We also show that our results are not driven by current ethnic differences in the population or by geographic characteristics that may be correlated with the slave economy in the nineteenth century and with current crime. Moreover, our results are robust to the use of different measures of inequality, such as the Gini coefficient, the Theil index and the Atkinson index.

Our results suggest that policy initiative to reduce crime (both property and violent) should deal with structural inequalities. Current policing efforts and hot-spots patrolling are unlikely to reduce crime in the long run if not accompanied by efforts to break persistent cycles of inequality. This can be done through a large number of policy instruments, like increasing the quality of education, to name only one. However, this paper is silent about the expected success of specific inequality-reducing policies and this has to be informed by future research and by studying and adapting successful experiences.

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Table 1: Summary statistics

	Mean	Std. Dev.	Min.	Max.	N
Panel A: *Outcomes*					
Murder per capita	.28	.28	0	2.09	541
Panel B: *Land inequality*					
Gini coefficient	.68	.09	.21	.91	541
Theil index	1.07	.45	.09	4.37	540
Atkinson index	.64	.13	.09	.95	540
Panel C: *Instrument*					
Prop. slaves 1851	.003	.010	0	.11	541
Panel D: *Controls*					
Pop. density	.14	.50	.002	7.39	541
Prop. males age 15-29	.25	.03	.17	.52	541
Years education	4.86	.97	2.59	8.39	541
Judicial efficiency	.60	.63	-2.27	5.56	538
Tax revenue per capita	.07	.09	.002	.84	541
Prop. blacks	.07	.18	0	.97	541
Elevation	1,268	956	2	3,087	530
Soil quality	2.74	1.22	0	6.67	531

Note: Variables measurement and sources described in section 2.

Table 2: Effect of land inequality on crime – Ordinary Least Squares

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Dependent variable: *Murder rate*						
Land inequality	0.772***	0.797***	0.738***	0.815***	0.784***	0.755***
	(0.158)	(0.162)	(0.174)	(0.185)	(0.185)	(0.185)
Panel B. Dependent variable: *Vehicle theft rate*						
Land inequality	0.625***	0.534***	0.511***	0.319***	0.318***	0.277***
	(0.0864)	(0.0807)	(0.0774)	(0.0622)	(0.0626)	(0.0624)
Panel C. Dependent variable: *Crime index (PCA)*						
Land inequality	0.988***	0.941***	0.883***	0.802***	0.779***	0.730***
	(0.142)	(0.143)	(0.151)	(0.152)	(0.152)	(0.152)
Controls:						
Pop. density		✓	✓	✓	✓	✓
Prop. males age 15-29			✓	✓	✓	✓
Education				✓	✓	✓
Judicial efficiency					✓	✓
Economic activity						✓
Observations	541	541	541	541	538	538

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. Sample excludes department of Antioquia, that has its own independent cadaster, which is confidential. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.

Table 3: Effect of land inequality on crime – Instrumental Variables

	(1)	(2)	(3)	(4)	(5)	(6)
			Second Stage			
Panel A. Dependent variable: *Murder rate*						
Land inequality	3.103***	3.147***	3.395***	3.543***	3.472***	3.553***
	(0.525)	(0.532)	(0.651)	(0.632)	(0.636)	(0.673)
Panel B. Dependent variable: *Vehicle theft rate*						
Land inequality	1.193***	1.149***	1.195***	1.143***	1.136***	1.109***
	(0.401)	(0.387)	(0.440)	(0.409)	(0.417)	(0.416)
Panel C. Dependent variable: *Crime index (PCA)*						
Land inequality	3.038***	3.038***	3.246***	3.313***	3.258***	3.297***
	(0.425)	(0.429)	(0.519)	(0.556)	(0.559)	(0.587)
			First Stage			
Panel D. Dependent variable: *inequality*						
Share slaves 19^{th} cent.	2.742***	2.709***	2.391***	2.295***	2.270***	2.179***
	(0.339)	(0.338)	(0.340)	(0.315)	(0.314)	(0.321)
(K-P) F-Stat.	63.29	63.94	49.43	52.91	52.43	46.10
Controls:						
Pop. density		✓	✓	✓	✓	✓
Prop. males age 15-29			✓	✓	✓	✓
Education				✓	✓	✓
Judicial efficiency					✓	✓
Economic activity						✓
Observations	541	541	541	541	538	538

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. Sample excludes department of Antioquia, that has its own independent cadaster, which is confidential. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.

Table 4: Confidence bounds of the effect of inequality on crime relaxing the exogeneity assumption of the instrument

Support interval for possible values of b	*Murder rate*		*Vehicle theft rate*		*Crime index (PCA)*	
	Lower	Upper	Lower	Upper	Lower	Upper
$b \in$ (-0.1,+0.1)	2.038	4.168	.371	2.015	2.168	3.906
$b \in$ (-0.2,+0.2)	2.001	4.203	.334	2.052	2.131	3.943
$b \in$ (-0.3,+0.3)	1.963	4.240	.297	2.088	2.094	3.979
$b \in$ (-0.4,+0.4)	1.926	4.276	.260	2.125	2.056	4.015
$b \in$ (-0.5,+0.5)	1.889	4.312	.223	2.162	2.019	4.051
$b \in$ (-1,+1)	1.701	4.494	.037	2.348	1.830	4.234

Notes: 95% confidence lower and upper bounds are estimated according to the approach proposed by Conley et al. (2012). All estimates include the entire set of control as in column 6 of Tables 2 and 3.

Table 5: Effect of land inequality on crime – Reduced Form

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Dependent variable: *Murder rate*						
Share slaves 19^{th} cent.	8.509***	8.525***	8.117***	8.130***	7.883***	7.743***
	(1.849)	(1.853)	(1.870)	(1.865)	(1.860)	(1.861)
Panel B. Dependent variable: *Vehicle theft rate*						
Share slaves 19^{th} cent.	3.271***	3.112***	2.858**	2.622***	2.579***	2.417***
	(1.179)	(1.107)	(1.114)	(0.885)	(0.890)	(0.829)
Panel C. Dependent variable: *Crime index (PCA)*						
Share slaves 19^{th} cent.	8.329***	8.229***	7.760***	7.603***	7.397***	7.184***
	(1.616)	(1.583)	(1.586)	(1.523)	(1.515)	(1.482)
Controls:						
Pop. density		✓	✓	✓	✓	✓
Prop. males age 15-29			✓	✓	✓	✓
Education				✓	✓	✓
Judicial efficiency					✓	✓
Economic activity						✓
Observations	541	541	541	541	538	538

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. Sample excludes department of Antioquia, that has its own independent cadaster, which is confidential. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.

Table 6: Effect of land inequality on crime – Reduced Form (including Antioquia)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Dependent variable: *Murder rate*						
Share slaves 19^{th} cent.	8.324***	8.318***	7.922***	7.965***	7.680***	7.523***
	(1.800)	(1.800)	(1.816)	(1.808)	(1.801)	(1.798)
Panel B. Dependent variable: *Vehicle theft rate*						
Share slaves 19^{th} cent.	3.511***	3.348***	3.041***	2.844***	2.834***	2.699***
	(1.216)	(1.123)	(1.125)	(0.897)	(0.904)	(0.855)
Panel C. Dependent variable: *Crime index (PCA)*						
Share slaves 19^{th} cent.	8.368***	8.249***	7.752***	7.643***	7.434***	7.228***
	(1.632)	(1.576)	(1.574)	(1.522)	(1.513)	(1.479)
Controls:						
Pop. density		✓	✓	✓	✓	✓
Prop. males age 15-29			✓	✓	✓	✓
Education				✓	✓	✓
Judicial efficiency					✓	✓
Economic activity						✓
Observations	615	615	615	615	612	612

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.

Table 7: Effect of land inequality on crime – Robustness check 1 (including current share of black and geographical controls)

	OLS	Red. form.	IV	OLS	Red. form.	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Dependent variable: *Murder rate*						
Land inequality	0.693***		4.100***	0.633***		4.094***
	(0.178)		(0.990)	(0.182)		(0.989)
Share slaves 19^{th} cent.		8.027***			7.875***	
		(2.412)			(2.309)	
Panel B. Dependent variable: *Vehicle theft rate*						
Land inequality	0.290***		1.866***	0.276***		1.819***
	(0.0628)		(0.605)	(0.0633)		(0.600)
Share slaves 19^{th} cent.		3.653***			3.500***	
		(0.930)			(0.903)	
Panel C. Dependent variable: *Crime index (PCA)*						
Land inequality	0.695***		4.218***	0.643***		4.181***
	(0.149)		(0.903)	(0.151)		(0.894)
Share slaves 19^{th} cent.		8.259***			8.043***	
		(1.931)			(1.821)	
Previous controls:	✓	✓	✓	✓	✓	✓
Additional controls:						
Contemp. prop. of blacks	✓	✓	✓	✓	✓	✓
Geography				✓	✓	✓
Observations	538	538	538	528	528	528

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. Sample excludes department of Antioquia, that has its own independent cadaster, which is confidential. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.

Table 8: Effect of land inequality on crime – Robustness check 2 (excluding municipalities with gold mines in the colonial times and their neighbours)

	OLS	Red. form.	IV	OLS	Red. form.	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Dependent variable: *Murder rate*						
Land inequality	0.598***		4.290***	0.515**		4.199***
	(0.188)		(1.232)	(0.200)		(1.035)
Share slaves 19^{th} cent.		8.061***			10.15**	
		(3.075)			(4.300)	
Panel B. Dependent variable: *Vehicle theft rate*						
Land inequality	0.284***		2.501***	0.284***		1.897***
	(0.0661)		(0.730)	(0.0703)		(0.529)
Share slaves 19^{th} cent.		4.700***			4.584***	
		(1.062)			(1.264)	
Panel C. Dependent variable: *Crime index (PCA)*						
Land inequality	0.624***		4.802***	0.565***		4.311***
	(0.158)		(1.147)	(0.170)		(0.816)
Share slaves 19^{th} cent.		9.023***			10.42***	
		(2.611)			(3.555)	
Previous controls[a]	✓	✓	✓	✓	✓	✓
Additional controls:						
Excl. muns. with gold mines	✓	✓	✓	✓	✓	✓
Excl. gold mines + neighbors				✓	✓	✓
Observations	505	505	505	451	451	451

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. Sample excludes department of Antioquia, that has its own independent cadaster, which is confidential. [a] Including the current share of black population and the geographic characteristics. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.

Table 9: Effect of land inequality on crime – Robustness check 3 (alternative measures of inequality)

	Theil index			Atkinson index	
	OLS	Red. form.	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)
Panel A. Dependent variable: *Murder rate*					
Land inequality	0.136***		0.730***	0.409***	3.263***
	(0.0370)		(0.163)	(0.124)	(0.817)
Share slaves 19^{th} cent.		7.891***			
		(2.313)			
Panel B. Dependent variable: *Vehicle theft rate*					
Land inequality	0.0405**		0.322***	0.221***	1.440***
	(0.0180)		(0.111)	(0.0423)	(0.488)
Share slaves 19^{th} cent.		3.482***			
		(0.902)			
Panel C. Dependent variable: *Crime index (PCA)*					
Land inequality	0.125***		0.744***	0.445***	3.325***
	(0.0350)		(0.154)	(0.102)	(0.746)
Share slaves 19^{th} cent.		8.042***			
		(1.821)			
Previous controls[a]	✓	✓	✓	✓	✓
Observations	527	527	527	527	527

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. Sample excludes department of Antioquia, that has its own independent cadaster, which is confidential. [a] Including the current share of black population and the geographic characteristics. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.

Table 10: Effect of land inequality on crime – Robustness check 4 (indicator of high inequality)

Indicator based on:	Median				Mean			
	OLS	Red. form.	IV 1	IV 2	OLS	Red. form.	IV 1	IV 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Dependent variable: *Murder rate*								
Land inequality	0.0914***		41.63	2.437**	0.0993***		33.56*	1.828***
	(0.0246)		(42.97)	(1.215)	(0.0244)		(17.64)	(0.704)
Share slaves 19^{th} cent.		1.647***				3.027***		
		(0.540)				(0.906)		
Panel B. Dependent variable: *Vehicle theft rate*								
Land inequality	0.0184*		85.37	1.083	0.0202**		67.34*	0.813**
	(0.00958)		(89.17)	(0.669)	(0.00973)		(36.89)	(0.412)
Share slaves 19^{th} cent.		3.378***				6.073***		
		(1.269)				(2.124)		
Panel C. Dependent variable: *Crime index (PCA)*								
Land inequality	0.0777***		89.80	2.489*	0.0845***		71.34*	1.867**
	(0.0205)		(93.41)	(1.272)	(0.0204)		(38.50)	(0.732)
Share slaves 19^{th} cent.		3.553***				6.434***		
		(1.278)				(2.139)		
Previous controls[a]	✓	✓	✓	✓	✓	✓	✓	✓
Observations	600	617	617	528	600	617	617	528

Notes: Ordinary Least Squares regression. Standard errors in parentheses. Regression sample given by municipalities as existing in 1851, before the abolition of slavery. Sample excludes department of Antioquia, that has its own independent cadaster, which is confidential. IV 1 instruments the indicator of high inequality (as given by the median of the Gini distribution in columns 1-4 or by its mean in columns 5-8) with the indicator of high proportion of slaves in 1851 (median in columns 1-4 and mean in columns 5-8). IV 2 instruments the indicator of high inequality with the entire distribution of the proportion of slaves. [a] Including the current share of black population and the geographic characteristics. * is significance at the 10% level, ** is significance at the 5% level, *** is significance at the 1% level.