

The Wild West *is* Wild: The Homicide Resource Curse*

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Abstract

We uncover interpersonal violence as a dimension and a mechanism of the resource curse. We rely on a historical natural experiment in the United States, in which mineral discoveries occurred at various stages of governmental territorial expansion. “Early” mineral discoveries, before full-fledge rule of law is in place in a county, are associated with higher levels of interpersonal violence, historically and today. The persistence of this homicide resource curse is partly explained by the low quality of -subsequent- judicial institutions. The specificity of our results to violent crime also suggests that a private order of property rights did emerge on the frontier, but that it was enforced by high levels of interpersonal violence. The results are robust to state-specific effects, to comparing only neighboring counties, and to comparing only discoveries within short time intervals.

KEYWORDS: Homicide, Institutions, Resource curse, United States

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“It is manifest that during the time men live without a common power to keep them all in awe, they are in a condition which is called war; and such a war, as is of every man, against every man. [...] The nature of war consists not in actual fighting but in the known disposition thereto, during all the time there is no assurance to the contrary” (Hobbes 1651, page 262).

1 Introduction

Why is the homicide rate in the United States more than four times higher than in Western Europe or other neo-Europes, such as Australia?¹ Elias (1994)’s civilizing process roots the decline in homicide in the development of a Weberian state, which enforces agreed settlements and monopolizes violence, making violence both superfluous and ineffective.² In sharp contrast with this view, Anderson and Hill (1979, 2004) argue that self-interest suffices to sustain a peaceful order, even in anarchy. In the “*Not So Wild Wild West*”, they argue that the private enforcement of property rights in the West of the United States in the 19th century provides just the demonstration. A closer look at the evidence in this study reveals that while a private order of property rights order there was, peace there was not.

The circumstances of mineral discoveries in the United States provide the ideal natural experiment to examine the relationship between state development and interpersonal violence. Mineral discoveries generally occurred after the state was established, but they preceded the state in more than a third of cases. Incorporation of large swathes of territory in the West occurred at the same time as an intense mineral rush, but for independent, geopolitical reasons according to Davis (1972). Motivated by the fact that in the United States, contrary to most countries, individuals own mineral rights, private prospectors flocked the country, irrespective of whether the state was already in place or not.³ It is therefore not

¹This comparison is based on UNODC data for homicide rates per 100,000 people in 2010: United States: 4.7, United Kingdom: 1.6, France: 1.1, Germany: 0.8, Australia: 1.

²Pinker (2007) observes that homicide has been falling steadily in Europe since the emergence of modern states in the Middle Ages.

³Lang (1983) (first published in 1882) witnessed how: “*Within the short space of half a year from the discovery of gold in California, extensive prospecting had been done, and the gold-bearing*

farfetched to assume that mineral discovery was independent of the precise timing of state development in the very place of discovery.

We take advantage of the respective timings of state development and mineral discovery in order to test the civilizing process hypothesis. We track more than 4,500 mineral discoveries across counties and time, and we match discoveries with historical county formation from the Atlas of Historical County Boundaries. Our measure of state development consists of the territorial status of the place of discovery: colony or state, in which case we consider that discovery postdates the establishment of the state; territory or unorganized land, in which case we consider that the discovery predates the state. We regress measures of crime today on the presence of minerals and on our measure of whether formal state institutions were in place at the time of the discovery. Our analysis is at the county level and controls for state fixed effects throughout. We also study the historical relationship between violence and mineral discovery.

Our results give unambiguous support to the civilizing process. Counties that experienced mineral discoveries *before* the state was established exhibit higher levels of homicide and assaults, to this day. Mineral discoveries are associated with about 200 additional assaults and murders per 100,000 people in 2000 in these early mining counties – a 40% increase at the mean. By contrast, no effect is observed if discoveries occurred *after* the state was established.

Our first difference approach rules out that our results are due to differences between mining and non mining areas. However, early and late mining counties may differ along characteristics that also affect crime, thereby jeopardizing our identification strategy. A particular concern is that late mining counties simply have older institutions and older institutions are associated with less crime. To address this concern, we control for the initial date of county creation as well as historical population density, which was the main driver of county incorporation. We control for numerous other historical and contemporary county characteristics that may affect crime, such as income, education, ethnic fragmentation, population density, and the presence of women. Early and late mining counties do not differ from one another along any of these characteristics. In addition, the inclusion of state fixed effects remove the influence of any unobserved heterogeneity across *territory had been examined for hundreds of miles along the Sierras*" (Lang 1983, page 294).

states related to mineral discovery and to state incorporation. In robustness tests, we restrict our attention to discoveries that occur within 5 or 10 year windows of each other and avoid comparing older and more recent discoveries. We also restrict our analysis to counties within arbitrarily defined geographic areas, as well as to neighboring counties only. Moreover, even if the timing of incorporation was endogenous, this should work against our main result, as the state should be more likely to develop in resource-rich areas. Another potential concern is that territorial status may reflect not only political but also economic and social development of a county. The robustness to the inclusion of a battery of historical economic and social development indicators described above alleviates this concern.

One last concern is that miners were negatively selected. To threaten our identification, miners should have been able to self select on the basis of the precise timing of the first discovery relative to state incorporation, within a given state. This seems farfetched in the context of the mineral rush that was taking place. Moreover, according to Clay and Jones (2008), miners were positively selected; they more educated and more likely to be white collar workers compared with the rest of the population.

We next turn to the mechanisms that underlie the persistence of violence, more than a hundred years after the state was established in most places. Violence and intimidation that are effective in early mining counties enable the violent party to accumulate rents. Rents then provide the incentives and the financial means to corrupt and shape the nascent political institutions .⁴ We find direct evidence that the persistence of our homicide resource curse is partly explained by a political resource curse, namely by enduring lower quality of judicial institutions. Relying on Epstein et al. (2001)'s state panel of judicial quality indicators since the mid 19th century, we find that in states that were fully incorporated only after some minerals had been discovered, discoveries are associated, yearly, with a to reduction in between 2% and 5% decrease in various indicators of the independence of state judges.

To the best of our knowledge, our findings document for the first time the

⁴Engerman and Sokoloff (1997, 2002), Acemoglu and Robinson (2006), Rajan and Zingales (2006), among others, discuss the implications of economic inequality for the design of political institutions

existence of a homicide resource curse, which, like the other resource curses, is conditional on the quality of initial institutions. To our motivating question, we offer an answer that consists of a combination of the tardiness of the civilizing process in the United States compared to Europe, and of the shock due to natural resource discovery, which, as we show, further delayed the civilizing process.⁵ However, only violent crime as opposed to property crime is affected, historically and today. A private order of property rights did emerge even in the absence of the state, as documented in Anderson and Hill (1979, 2004) but also in Clay and Wright (2005). However, in the absence of third party enforcement, the security of property rights was enforced by high levels of interpersonal violence.

The first contribution of the paper is to the literature on the resource curse and on how initial endowments shape institutions in the long run (Engerman and Sokoloff 1997, 2002 and Rajan and Zingales 2006). How natural resources affect development outcomes depends on the quality of institutions (Mehlum et al., 2006), and resources have further deleterious effects on institutional quality (Brollo et al. 2013).^{6,7} A sizeable literature also finds a positive relationship between natural resources, in particular oil, and civil conflict (see Ross 2006 for a partial review). We focus on privately rather than publicly owned resources and interpersonal rather than political violence. The most closely related paper is Buonanno et al. (2012), which shows that a resource windfall in the context of weak formal property right gave rise to the Sicilian mafia. Our work differs from theirs in two ways. First, we abstract from the organizational form that may have substituted for formal, state-based property rights enforcement. Second, and more importantly, we also study the counterfactual situation in which the resource windfall occurs in the

⁵Australia, another mineral rich neo-Europe, experienced a less violent fate, not only because mineral exploitation occurred later, when state institutions were more developed, but also because mineral rights in Australia are property of the Crown, making state presence a prerequisite to mineral exploitation.

⁶Torvik (2009) provides a review of this literature.

⁷In the context of the United States, while Wright (1990) argues that natural resources contributed to the growth in industrial exports in the United States, recent literature finds empirical evidence for the presence of a resource curse (Goldberg et al. 2008). Clay (2010) points out that the differences in the time periods considered by the two studies (1879–1929 for the first one and 1929–2002 for the second) may explain these divergent findings. Our investigation covers the whole time period, since we shed light on crime both at the time of mineral discoveries and today, and we consider a state panel of institutional quality from the mid 19th century to the present.

presence of strong formal institutions.

Our contribution to the literature on interpersonal violence is two-fold. We consider a rather encompassing definition of formal enforcement – whether there is state at all –, and confirm prior evidence that enforcement deters crime and particularly violent crime (Levitt 1997, Kessler and Levitt 1999, and Draca et al. 2011). Our interpretation is that the security of property rights is ensured even in the absence of the state, but by high levels of interpersonal violence. The second contribution is to highlight the importance of reputation as a driver of violence. We review the theoretical background on this in Section 2. A related paper is Grosjean (2013), which finds that the culture of violence among 18th century Scots-Irish immigrants only persisted in areas of the United States where the formal rule of law was weak. The underlying assumption is that this group was prone to violence because it came from lawless areas and relied on easily stolen resources (Nisbett and Cohen 1996). This paper precisely demonstrates how the combination of weak formal institutions and easily appropriable resources spurs violence in the first place.

We also contribute to the economic history literature on violence during the Gold Rush. In contrast with the popular myth of a lawless and murderous Wild West, the conventional view in economics is that property rights were secure and violence rather limited in mining districts (Umbeck 1975, 1981, Zerbe and Anderson 2001, and Clay and Wright 2005, 2011). While our empirical result support the first part of this claim, they do not support the second.

The remaining of the paper is organized as follows. The conceptual background on rule of law and violence is discussed in Section 2. Section 3 introduces mineral discoveries data and provides some historical information. Sections 4 and 5 provide historical and contemporary evidence. Section 6 discusses channels of persistence and institutional quality. Section 7 concludes.

2 Conceptual background

Until recently, economists have essentially focused on expropriation as a motive for violence. As Skaperdas (1992) and Gonzalez (2010) for example, several models describe the incentives to engage in predatory behavior when the rule of law is

absent or weak, as it was in some areas in the West of the US during the Gold rush (Umbeck 1975). The threat of violence by individuals creates a “*semblance of property rights*” by the words of Skaperdas (1992). It is a substitute for formal law enforcement, albeit an inefficient one, as it involves wasteful individual investments in force. At equilibrium, property rights are sustained by respective investments in power.⁸ A commonality of these complete information models is that, in the absence of bargaining inefficiency, at equilibrium, force is not used.⁹ Better third party enforcement will not affect (observed) violence but will remove incentives for individual predation. This will increase efficiency and affect the division of the surplus, with the powerful party losing much from the withdrawal of the threat of violence (Skaperdas 1992).

Other papers have recently introduced other motives for violence. Chassang and i Miquel (2010) show that the presence of strategic uncertainty introduces a new motive for violence: preemption. Players, while second-guessing each other’s moves, may decide to attack in order to avoid suffering a debilitating surprise attack from an opponent who is expected to be aggressive. Silverman (2004) formalizes a reputation-based theory of crime in a dynamic game of incomplete information. When the population contains a fraction of violence-committed types, normal types may engage in violence in order to build up their reputation and deter attacks. This “culture of violence” equilibrium prevails if the cost of participating in crime is low enough, for example, if the state is absent. In this model, perfect enforcement unravels the culture of violence.¹⁰ In Ghosh et al. (2013), repeated acts of violence build a reputation for being committed to violence, which leads the other party to concede rights over a resource. The primary goal is to explain terrorist activity, but one could easily apply the intuition to a dispute over mineral claims. Signalling one’s strength and determination with a violent attack will convince other agents to concede their claims and enable the violent agent to grab a larger share of the surplus.

⁸Investments in force are either symmetric as in Umbeck (1975) and Gonzalez (2010) or not, with one party specializing in predation as in Skaperdas (1992)

⁹Actual violence only occurs in the case of limited commitment, as in Gonzalez (2010) or incomplete information, as in Donohue and Levitt (1998) or Aney (2012).

¹⁰However, intermediate policy crackdown can actually increase violence if they strengthen the signal of a violent encounter.

This overview of the literature suggests a few testable predictions. No violence will occur in presence of a Weberian state, which enforces agreed settlements and monopolizes violence. In its absence, but with perfect bargaining, a “semblance of property rights” will prevail and violence will not be observed in the process of expropriation. The only type of violence that can be observed in equilibrium aims at intimidation.

Although very different states of the world will prevail in absence or presence of the state, it is important to note that this by no means requires the composition of the underlying population to be different, or in applied econometricians terms - selection. In expropriation models more people will commit crime if the costs of crime are lower, irrespective of their types. In reputation-based models of violence, normal types may engage in violence when enforcement is absent, irrespective of the actual proportion of committed types in the population.

Our empirical analysis is primarily focused on present-day outcomes, when the state has been established everywhere. What could underlie persistent differences?

The first channel of transmission consists of the quality of institutions. A common prediction of all crime models is that the use of force enables the violent party to secure a larger share of the surplus. According to Engerman and Sokoloff (1997, 2002) or Rajan and Zingales (2006), this party will then be able to influence the design of formal institutions to preserve her rents, with negative long-run consequences on the quality of institutions. The persistence of formal institutions – documented by Acemoglu et al. (2001) and Dell (2010) among others –, implies that high levels of interpersonal violence will also persist over time.

A second channel of transmission consists of culture. In models of social interactions *à la* Glaeser et al. (1996), violence feeds on itself, so that initial violence can persist over time. Another possibility is that differences in the quality of institutions give rise to different cultural norms, which can persist over time, regardless of changes in the quality of institutions. Tabellini (2008) and Guiso et al. (2008) describe how parental transmission of preferences depends on the spatial pattern of external enforcement and becomes biased towards toward excessively conservative priors. If formal enforcement is weak, parents transmit low values of trust and high values of aggressiveness in order to protect their children from situations in which they would get taken advantage of if they cooperate. This will result in

low levels of social trust, which become self-fulfilling, despite potential changes in formal institutions. The same argument can easily be extended to aggressiveness. If enforcement is weak at one period of time, the returns to interpersonal violence are high and parents will want their children to internalize the benefits of using violence. They will transmit norms that legitimize the use of force, which also become self-fulfilling. Elias (1994) already had the intuition that state development affects social norms, as agents internalize the social control of violence. Grosjean (2013) shows empirically that violent cultural norms only persisted where formal institutions were weak.

An implication of these models is that institutional and cultural persistence are complements and not substitutes. It is neither our goal, nor within our reach, to identify them as separate channels. Persistent weakness of formal institutions will only make aggressiveness more valuable.

3 Historical background and data on mineral discoveries and rule of law

As noted by Wright (1990), the most distinctive feature of the American mining economy was the intensity in exploration and exploitation. This was due to a particularly rewarding incentive system, since mineral rights were included in the bundle of land rights (David and Wright 1995). Knowledge about American economic geography was gained in the 18th and 19th century both from public and private surveying efforts and from unorganized private ventures (Davis 1972). Even though states and the federal governments invested in geological surveys as early as the 1820s – see Clay (2010) for a full list of state geological surveys' dates –, exploration was to a large extent a private enterprise, in what has been described as an open and saturated market by Clay and Wright (2011). Clay and Jones (2008) find that miners in California in 1850 earned less on average in relative terms than day laborers in other parts of the United States, confirming that open entry gave way to a dissipation of rents. Taken together, such a private and massive search in a market with open entry - the mineral rush– guarantees that specific mineral discoveries were largely independent of territorial status at time of

discovery, at least when considering variation within a given state and controlling for a large number of observable characteristics.

The Mineral Resources Data System (MRDS) describes mineral resources throughout the world. It contains more than 25,000 observations for the United States. Of those, information about discovery year is available for more than 4,500 observations. Minerals were discovered in more than 11% of counties and are well spread out throughout the US. As shown by Figure 1, although a handful of discoveries are recorded before the 18th century, the majority of mineral discoveries occurred between 1825 and the second World War. For each of the 4,500 observations in MRDS, the dataset contains information on localization, year of discovery, type of mineral, and, in some but not all cases, various geologic characteristics. It turns out that most observations for which the discovery year is not available are deposits where no production has ever occurred because the discovery was not worth it.^{11,12}

The independence of territorial status relative to the time of mineral discovery depends not only on the specificity of mineral exploration but also of the territorial expansion. Davis (1972) argues that territorial expansion of the United States was largely driven by a combination of internal and external geo-political forces, which were orthogonal to mineral discoveries. In his view, the main barrier to territorial expansion consisted in other nations' claims to the territory. California and the Southwest were gained after the 1846 – 1848 war with Mexico, which originated in a territorial dispute over the Texas boundary. Within newly integrated areas, the state was developing and incorporating territory step by step, while prospectors were flocking the country, in a manner that, we have already discussed, did by no

¹¹Notice that the MRDS does not convey information on the quantities extracted, but this would be a more endogenous measure, namely influenced by factors such as security of property rights. Oil, gas, and coal are not minerals and are not included in the MRDS.

¹²An alternative source of information on mining activity is provided by occupational information in the Historical Census, which gives the proportion of people employed in mining activity and industry (Ruggles et al. 2010). This is however a less satisfactory proxy for mineral discoveries than physical discoveries for two main reasons. First, people may declare mining as their activity but may be either unemployed or migrant workers, so that self-declared miners may not adequately reflect the extent of mining in a given area. Second, the number of miners in a given region may be endogenous to other regional characteristics, in particular the quality of institutions. Last but not least, Census data, by definition, does not allow to date mining activity that occurred in the absence of an organized Census.

means depend on whether or not formal state structures were in place. Within a state, the main driver of incorporation was probably population density, which we will control for in all empirical specifications.

The distributions of mineral discoveries and of county creation over time are displayed in Figure 1. Our basic identification strategy requires that the two distributions overlap, with some discovery before county incorporation, and some after. This is the case. County creation date may be a problematic measure because of the need to distinguish whether counties were created *ex-nihilo* or carved out of an existing politically organized entity. We therefore consider a finer measure of the territorial status of an area at the time of mineral discovery. We achieve this in two steps. First, we map each mineral discovery on yearly maps of the United States constructed from the Atlas of Historical County Boundaries. Each discovery ends up inside an area that is either a fully unorganized area, or enclosed in some administrative boundaries. The latter includes colonies, states, or organized territories. Organized territory refers to the territorial status between the transfer of sovereignty to the Union and the actual establishment of formal institutions. Even though territories are technically under the jurisdiction of the United States, in practice, law enforcement was minimal to inexistent. To take one example, the transfer of sovereignty from Mexico to the US left California in a vacuum of political order, as the new state institutions were very slow to establish because of the lack of enforcement capacity (Umbeck 1975). David and Wright (1995) write: “*the great California Gold boom occurred under a virtually complete absence of government authority*”. State institutions, such as county jails, sheriffs, constables, and courts only came with the incorporation of local areas into counties and state. We consider that discoveries occurring in territories or in unorganized land – as opposed to states or colonies –, pre-dated the rule of law. We refer to these as *early* discoveries. Second, we project back each discovery on a stabilized map of American administrative boundaries. This enables us to observe whether each county or state ever had mineral discoveries within its boundaries and whether any of those occurred before organization of the land.

We retain two dummy variables to capture an area’s mining history and state development. The first takes value one if any discovery ever occurred inside a county’ boundaries. Minerals were discovered in 355 counties in 29 states, 11% of

all US counties. The second takes value one if any discovery occurred inside what is today a county but was unorganized land or a territory at the time of discovery. This is the case in 126 counties in 15 states, about 4% of all US counties and 35% of mining counties. The map of all US counties and mineral discoveries is presented in Figure 2, alongside with the categories they fall into.

4 Historical evidence

Our work is motivated by explaining contemporary violence, but it is necessary to first document the historical association between mineral discoveries and crime. We document historical crime patterns in this section before turning to the persistent effect on contemporary crime in the next.

4.1 Data and descriptive statistics

Historical crime data is from the Historical Violence Database from the Criminal Justice Research Center at Ohio State University. The coverage of this data is rather limited geographically, with only a few mining areas, and not consistent across time in different places. However, the data contains a wealth of details on homicide, such as the occupation of the offender and the victim, the place where the homicide took place, and the underlying motivations.

McKanna (2002) gathered data on the population of homicides, the occupation of offenders and victims, and the circumstances of homicide in seven California counties between 1849 and 1899 based on coroner's reports and newspaper accounts.¹³ We match these data to the 1% US Censuses from 1850 to 1940 in order to obtain homicide rates per 100,000 inhabitants. The average homicide rate between 1850 and 1899 was higher in the two mining counties of Calaveras and Tuolumne than in the other, non mining counties (42.13 per 100,000 against 32.68, t-stat of 2.33). The correlation between homicide rates and the proportion of people employed in the mining sector between 1850 and 1880 is 0.82. Miners were also over represented as victims and perpetrators of homicide. In Calaveras

¹³Counties for which McKanna (2002) provides information are: Calaveras, Sacramento, San Diego, San Joaquin, San Luis Obispo, Santa Barbara, and Tuolumne.

and Tuolumne, they represented nearly 73% of perpetrators of homicide, against 50% of the population (t-stat of 4.13).

Another striking feature is that, contrary to the popular view of a expropriation as the main goal of homicide, the majority of homicide did not occur in the context of expropriation, nor in the mines, but rather in the context of quarrels. 78% of homicides in mining areas occurred in the context of a quarrel, against 68% in non mining areas (t-stat of 1.83), and only 10% in the context of a robbery, a proportion no different than in non mining areas (t-stat of 0.04). Only 12% of homicides were taking place in the gold fields, against 35% in the saloon or in the street.¹⁴

4.2 Regression results

We have already described some evidence on the relationship between mining and homicide, particularly so in “early” mining areas. We now turn to more systematic evidence on the short-term historical relationship between mineral discoveries and violence at the county level. We match the crime yearly data in the seven Californian counties with information about yearly mining discoveries extracted from the Mineral Resources Data System. Because we have a yearly panel of homicides and mineral discoveries for these counties, it is possible to control for common shocks as well as county-invariant characteristics. As such, we estimate the relationship between yearly homicides and the stock of mines, including time and county fixed effects:

¹⁴McKanna (1997) also gathered data in 3 counties of Arizona, Colorado, and Nebraska between 1880 and 1910. In the “early” mining county of Gila (Arizona), the average homicide rate was 70 per 100,000, with miners, again, over represented as victims and offenders (31% against 18% of the population). The homicide rate in Gila was 40% higher than in Las Animas (Colorado), also a mining county but a “late” one (50). In Douglas (Nebraska), where no discovery occurred, the homicide rate was “only” 13.92. As in California, quarrels were twice as frequently the cause of homicide in the early mining county of Gila (at nearly 70%), compared to other areas; whereas robberies were in fact less frequent (3.2% of homicides against 5.6% in Douglas). In Illinois, where all mineral discoveries occurred after state incorporation, homicide rates between 1850 and 1890 were not only much lower overall but also displayed a reversed pattern as the one described so far. Homicide rates were higher in non-mining areas (16.65) than in mining counties (7.82) (Roth 2009) and miners were under-represented as homicide offender.

$$\begin{aligned} \text{Homicides}_{it} = & \beta_0 + \beta_1 \text{Stock of mines}_{it} + \beta_2 \text{Early mining}_i \\ & + \beta_3 \text{Stock of mines}_{it} \times \text{Early mining}_i + \delta_i + \delta_t + \epsilon_i, \end{aligned} \quad (1)$$

where Homicides_{it} denotes the number of homicides in county i in year t , $\text{Stock of mines}_{it}$ is the cumulated sum of mineral discoveries from 1849 to t and Early mining_i denote mining history of the county.¹⁵

Regression results are displayed in Table 1. In the first column, the coefficient associated with the stock of mines is positive and statistically significant. Although common time-varying shocks are already taken into account, it is likely that counties experienced different population development over the period, especially in counties that experienced mineral resources discoveries. To tackle this issue, we introduce yearly population as a control variable in the second column. As expected, the estimated coefficient of this variable is positive and statistically significant. However, its introduction does not arm the magnitude and the significance of the stock of mineral discoveries. The coefficient is roughly equal to one fourth, meaning that the discovery of four more mines in a county are associated with one more homicide during subsequent years. In column 3, we interact the $\text{Stock of mines}_{it}$ with the mining history of the county (Early mining_i). The effect of the stock of mines on homicides is higher in county where mineral resources was discovered before the organization of the land.

Two other sources of data are available. Vital statistics provide information on deaths due to violent accidents at the state level since 1900. This data is of limited use to us for two reasons. First, it is only available at the state level. Second, violent accidents may include both homicide and other forms of violent deaths, in particular job related accidents. Yet, descriptive statistics back our emerging story of a positive relationship between mineral discoveries and crime, which is particularly strong if discoveries occurred before strong formal institutions were in place. The rate of violent death, defined as the proportion of violent deaths over total mortality, is highest in 1923 Wyoming (20.32%), a state which experienced several “early” discoveries, and lowest in 1918 New Hampshire (3.27%), a state

¹⁵There is an average 3.5 homicides by year in county (s.d. = 3.7), 1.5 discoveries by county over the period (s.d. = 2.8) with a maximum of 11 mineral discoveries.

which never experienced any discovery.¹⁶ Previous literature on historical crime has used Censuses of Prisons as a data source Eriksson (2013). This data is of less use to us, not only because the reasons for imprisonment are often unspecified but also because its availability and quality are endogenous to the quality of state institutions.

Evidence presented so far is consistent with the predictions derived in 2. In places where mineral discoveries have occurred before the advent of the rule of law, mining is concomitant with more virulent outbursts of violence. Such violence does not occur in the context of direct expropriation and aims rather at intimidation. It is perpetrated in plain sight, for every one on the street or saloon to notice one's violent proclivity and strength. Have these patterns persisted?

5 Contemporary evidence

In this section, we investigate the persistent effects of mineral discoveries on violence.

5.1 Data

Contemporary data is from the Uniform Crime Reporting (UCR) Program Data by the United States Department of Justice and Federal Bureau of Investigation. UCR data provide information on 43 types of offenses and the monthly count of arrests by age, sex, and race for each offense in more than 17,000 reporting agencies. Because the number of reporting agencies has been increasing over the

¹⁶In additional regressions included in the Appendix, we only consider mining states but we differentiate between states in which discoveries occurred after the formal rule of law was in place and states in which some discoveries occurred before incorporation of at least some territory into the Union. The latter group consists in Arizona, California, Colorado, Idaho, Louisiana, Montana, New Jersey, New Mexico, Oklahoma, Utah, Washington, and Wyoming. Narrowing our attention to mining states limits the heterogeneity between states in terms of presence of mines and of the likelihood of violent deaths occurring during the normal operation of mines. We regress the rate of violent death as a proportion of total mortality at the state level, between 1900 and 1936 on mineral discoveries, territorial status at time of discovery and an interaction between the two, controlling for a vector of state level time varying controls, which could be correlated with mining discoveries and with homicide, such as the share of males in the population, as well as for state and year fixed effects. The results show that mineral discoveries are associated with more violent deaths, but only in “early mining” states.

years, we use most recent, more reliable data. Our independent variable consists of the average crime rate per 100,000 people in 2000, which we compute by merging UCR data with the 2000 US Census. To proxy for violence aimed at intimidation, we use the rate of murder and aggravated assaults.

On average across US counties, there were 617 murders and aggravated assaults per 100,000 people in 2000. The rate of murders and assaults is much higher in counties with mineral resources, at 881 per per 100,000 people against 511 in mineral poor counties. Within mining counties, the rate of murders and assaults is more than twice as high in early mining counties, with 1,416 murders and aggravated assaults per 100,000 in 2000 compared with 603 in counties which experienced mineral resources discoveries only after the organization of the land. We turn to regression analysis to test the robustness of this discrepancy.

5.2 Empirical strategy

We estimate the following specification:

$$\text{Violence}_i = \beta_0 + \beta_1 \text{Mining}_i + \beta_2 \text{Early Mining}_i + \beta_3 X_i + \delta_{s(i)} + \epsilon_i, \quad (2)$$

where Violence_i captures crime in county i today. One of the main insights of the theoretical background discussed in Section 2 is that a distinction should be made between violence for the purpose of intimidation and violence for the purpose of expropriation or the defense of property rights. We first consider as dependent variable only violent crimes, i.e. murders and assaults, and then look at property crime, i.e. robbery, burglary, and larceny.

The variable Mining_i indicates the presence of any mine at any point in time on the physical area of county i . Early Mining_i is a dummy variable equal to 1 if minerals had been discovered in county i before the area where discovery occurred was administratively organized, that is to say before incorporation of the state in which county i is situated, or before incorporation of county i to another state. X_i is a vector of historical and contemporary controls. $\delta_{s(i)}$ a vector of state dummies.

Identification of expression (2) requires that discoveries are independent both of contemporary violence and of the interactive effect of discoveries and territorial status at the time of discovery. The presence of minerals is exogenous and

the specificity of mineral exploration implies quasi-exogeneity of the territorial status at the precise time of a particular discovery. However, the independence of contemporary violence, mineral discoveries and their precise timing would be jeopardized if some variable not included in expression (2) influenced discoveries, their timing, and historical violence, and if violence persisted over time. To alleviate this concern, we include in X_i a wide range of historical and contemporary characteristics. In particular, to avoid confounding the effect of mineral discovery relative to state development from that of the the age of institutions, we control for the initial date at which the county was organized. We also control for population density, which was the main driver of county incorporation. A potential criticism to our approach is that territorial status may capture more than political development. To address this concern, we use a large number of historical covariates that aim to capture economic and social dimensions of development. In addition to the share of women in the population in 1880, we add manufactured, agricultural and other farming products outputs, and population density measured in 1880, as well as manufacturing wage, white and black literacy rates, and county's population in 1900. The choice of these dates is driven by a trade-off between measuring variables as close as possible to the date of mineral discoveries and the loss of observations inherent to going back further in time. All in all, we end up with a sample of 2,015 counties. Contemporary controls include the shares of blacks and women in the population, ethnic fractionalization, Gini coefficient, population density, urbanization rate, aggregate income, and per capita income. Except if otherwise specified, all regressions are estimated on this sample and with White heteroskedastic standard errors adjusted for clustering at the state level. Descriptive statistics of variables are presented in table 8 in the appendix.

A particular concern is that mining on unincorporated lands may have attracted particularly violent individuals, who then transmitted their violent traits to their offspring, explaining a higher prevalence of violence in these counties today. While we cannot completely rule out this possibility, a number of factors tamper this concern. First, there is no evidence of adverse selection of miners in the West compared to the rest of the population, quite to the contrary. Clay and Jones (2008) use data collected from the 1850 and 1852 Census of Population for California together with the 1% sample of the 1850 Census to compare the charac-

teristics of those who went to California to the rest of the population. Contrary to popular view, they conclude that positive selection occurred, with those migrating to California being more educated and more likely to be from a middle class background. Second, state fixed effects are included in the analysis. To jeopardize our identification, miners should have systematically migrated to different areas within a given state in anticipation of the precise date of incorporation of these counties and as a function of expected violence.

5.3 Results

We first test whether interpersonal violence today is higher in mining areas. To this end, the first two columns of Table 2 present the estimated coefficients of equation (2) from which we remove the *early mining* variable. The theoretical prediction is that the discovery of mineral resources fosters violence, but only in the absence of effective third party enforcement of restrictions of the use of force. A test of this prediction is implemented in columns 3 to 4 by adding the *early mining* dummy to the specification. Regression results fully corroborate this prediction. The effect of *mining* completely vanishes as we introduce the *early mining* variable. In contrast, the coefficient associated with *early mining* is positive and statistically significant at the one percent confidence level. In other words, mining discoveries are positively and robustly associated with higher interpersonal violence, but only in counties in which some minerals were discovered before the rule of law was in place. The effect is robust to controlling for the wide range of historical controls discussed above.

Another theoretical prediction is that the effect of resource abundance conditional on the absence of rule of law is different for different types of violence. More specifically, we predict that it affects violence for intimidation (as illustrated by the previous estimation results using violent crime) but not violence aimed at expropriation. We test this prediction in the first column of Table 3, which displays the estimated coefficients of a specification identical to the one in the fourth column of Table 2, but with property crime (robbery, burglary, and larceny) as the dependent variable. There is no evidence of any relationship between *early mining* history and today's rate of property crime. As illustrated by results presented in

subsequent columns of Table 3, we do not find any evidence of any effect of mining history on other crimes such as sex offense, drunk driving, forgery, or vagrancy. This further advocates in favor of a specific relationship between mining history and the use of interpersonal violence.

5.4 Robustness checks

Our identification strategy relies on a comparison across space within the same state. This may raise three particular concerns. First, a county may have been impacted by early mining history of its neighbors. Second, counties located near state boundaries may share characteristics not captured by the state fixed effects. Finally, mineral resources endowment is not evenly distributed across space. In Table 4, we pursue a number of strategies to tackle these concerns. We first use the estimation method developed by Hsiang (2010) to take into account spatial correlation. In column 1, standard errors are adjusted for spatial correlation adjustment with a 300 kilometers radius. Standard errors appear to be very similar to those previously estimated. In column 2, we restrict the sample to counties that are either mining counties or that are immediate neighbors of mining counties. While the point estimate of the variable of interest is lower, it still has the same order of magnitude. In columns 2 to 5, we address the issue that the borders of states may not reflect the geological characteristics that are relevant for mineral discoveries. We cut the United States using arbitrary 2-, 5- and 7-degree grids. We use this groups to replace state fixed effects and we adjust standard errors at this level. Estimated coefficients of *early mining* are lower the wider the squares of the grid, but the effect on this variable on today's violence persists.

Another possible concern regarding our identification strategy is that we compare mineral discoveries that occurred before organization of the land to mineral discoveries that occurred anytime between organization of the land and today. As many elements of the context in which counties evolve changed over time, one may be argue that we do not capture an effect link to the organization of the land at the moment of discoveries, but rather simply an effect due to ancient mining activity. We show here that there is some credence to our interpretation and less to the alternative one. To this end, we zoom in on each county's history and

observed how many discoveries occurred in a small time window around organization of the land. More precisely, we constructed a dummy variable equal to one if mineral resources were discovered up to 5 years before organization of the land, and a dummy variable if mineral resources were discovered up to 5 years after. We then use these variables to replace the *early mining* dummy in (2). Estimated coefficients are presented in column 6 of Table 4. While discoveries up to 5 years before organization of the land have a positive effect that lies just above the 10% statistical significance threshold, discoveries up to 5 years after organization of the land have a clearly non-significant effect. We undertake the same exercise in column 7 using a 10-year window and reach a similar conclusion.

All in all, results presented here support the existence of a robust positive correlation between the discoveries in the absence of the rule of law and interpersonal violence today.

6 Persistence and the political resource curse

In this section, we explore the mechanisms of persistence, which explain why discoveries more than a hundred years ago are still associated with homicide today. In our suggested mechanism, the use of force enables violent agents to accumulate economic resources, with implications for the design and quality of subsequent institutions. In other words, we suggest the homicide resource curse as a mechanism for a political resource curse. We first describe the data and document the existence of a political resource curse in early mining areas.

6.1 Data and empirical methodology

The legal prerogatives of counties and municipalities vary greatly across states. Even though they often involve some dimension of law enforcement, the judicial and legislative powers lie at the state level, with the exception of federal issues. Moreover, data on local law enforcement, particularly historical data, is very limited, and only consist of the number of police, or police budgets, which are difficult to interpret because endogenous to crime.

Because of the conceptual and data availability limitations, we turn to a well

accepted measure of the quality of judicial institutions at the state level. As noted by Epstein et al. (2001), the motivation of state legislatures shaped judicial independence in the US. We rely on Epstein et al. (2001)'s measures of judicial quality in a state panel available yearly from 1866 - or the date of statehood- to 2000. Appointment and retention methods, as well as length of terms of state Supreme Court Judges, are taken as measures of independence of the judiciary. The first variable consists in the nomination procedures for state judges. It is equal to 0 if judges are appointed, to 1 if they are elected through partisan elections, and to 2 if they are elected through non-partisan elections. Direct appointment of state judges by the legislature is considered to be the most restrictive of judicial independence, and non-partisan elections to lead to highest independence of judges. The second measure considers nomination and retention procedures. The third variable consists in the term length of state judges, which varies from 1 to 25 years throughout the period. The fourth and last variable is a dummy indicating the presence of intermediary appellate courts. Longer terms, as well as the presence of intermediary appellate courts are indicative of higher judicial independence.

Our aim is to study how mineral discoveries affect institutional quality. We regress yearly judicial quality indicator indices on the number of mineral discoveries that occurred during the preceding period. The analysis control for state fixed effects, which remove the influence of potential heterogeneity across states in the development of institutions, as well as for year fixed effects, which capture general trends in the development of institutions. We estimate the following equation:

$$IQ_{st} = \beta_0 + \beta_1 \text{Mining}_{st} + \delta_s + \delta_t + \epsilon_{st}, \quad (3)$$

where IQ_{st} denotes our different measures of the quality of judicial institutions in state s at time t . Each is scaled such that a higher value indicates higher judicial independence. Mining_{st} denotes the total number of mineral discoveries that occurred in state s at time t . δ_s and δ_t are state and year fixed effect, and ϵ_{st} is the error term.

In the second step of the analysis, we distinguish between states in which some mineral discoveries had occurred before incorporation into the Union and states that were well established before any mineral was discovered. This distinction

is introduced in order to test our model, which predicts that the acquisition of economic power is only possible in areas in which violence is not illegal, so that the deterioration in institutional quality should be observed there only. We estimate the following specification:

$$IQ_{st} = \beta_0 + \beta_1 \text{Mining}_{st} + \beta_2 \text{Mining}_{st} \times \text{Early Mining}_s + \delta_s + \delta_t + \epsilon_{st}, \quad (4)$$

where Early Mining_s is a dummy variable taking value one if a mineral discovery occurred in any county of state s before the state was incorporated into the Union, or before the county was incorporated into the state.¹⁷ All other variables are identical to those defined in expression (3). Because state fixed effects are included in the specification, the interactive term is correctly estimated.

6.2 Results

Figure 3 illustrates the main argument. It displays the evolution of (i) the nomination procedure for state judges; (ii) the independence of both selection and retention of state judges; (iii) the length of terms of state judges; and (iv) the presence of an intermediary appellate court, for states without mineral discoveries, for states with mineral discoveries after the organization of the land and for “early mining” states.

In the 19th century and up until the Second World War, there is a large difference in nomination procedures for state judges between early mining states and others. In early mining states, judges are predominantly appointed, whereas the prevalence of elections is much larger in late mining or non mining states. This gap closes fast around the time of the second World War, when the importance of mineral exploitation sharply declined in the American economy (David and Wright 1995). In other words, judicial independence is far lower in states in which early mineral discoveries enabled the accumulation of substantial economic power, but it improves as the power associated with these resources declines. The independence of both selection and retention of state judges exhibits the same pattern,

¹⁷States in which some early discovery occurred are: Arizona, California, Colorado, Idaho, Louisiana, Montana, New Jersey, New Mexico, Oklahoma, South Dakota, Texas, Utah, Washington, Wyoming.

but the difference persists for longer. The length of judges' tenure is much shorter in mining states, which is indicative of less independent judges, but there is no statistically significant difference between early and late mining states.

Estimation results of expressions (3) and (4) presented in Table 5 confirm these broad patterns. For each dependent variable, the first column considers the relationship between judicial institutional quality and mineral discoveries. Mineral discoveries are negatively associated with judicial independence, illustrating the presence of a political resource curse. The effect is statistically significant for nomination and retention procedures. However, as indicated in the second column for each variable, the effect is entirely driven by early mining states. Selection and retention procedures, terms of judges, and presence of intermediary appellate courts in a given year and in a given state are not affected by mineral discoveries that occurred in states which were incorporated to the Union well before minerals were first discovered. However, all measures of judicial independence are negatively affected by mineral discoveries in states in which at least some of the discoveries occurred before full state incorporation to the Union.

The magnitude of the effect is substantial. In a state where some discoveries occurred before incorporation, mineral discoveries are associated with a 2.5% reduction in the measure of independence of selection procedure for state judges, a 5% reduction in their terms length, a 1.7% reduction in the likelihood that an intermediary appellate court is present.

These results mirror those obtained for violence. We put forward the homicide resource curse as a mechanism for the political resource curse. Violence enables some individuals can acquire substantial economic power. When the state arrives, these individuals have the incentives and the financial resources to corrupt formal institutions in the aim of preserving their rents. The effect persists over time, and is aggravated by the discovery of additional resources.

6.3 Robustness checks

The results are robust to using logit, or ordered logit specifications in the relevant cases. The results are also robust to clustering standard errors both at the year and state level and to correcting for serial and the spatial correlation (Hsiang,

2010).

We include lags of discoveries in order to investigate dynamic effects. Results are displayed in Appendix Table 6. The effect is quite persistent over time, except for the length of terms of state judges, for which the effect is no longer significant after two periods. This may be due to the fact that term length may be more easily adjustable than nomination and retention procedures.

A potential concern here is that these results are not due to the causal effect of mineral discoveries but to unobservable state level characteristics that are correlated with poor institutional quality. Since we control in all regressions for state and year fixed effects, such state characteristics should be varying over time in order to jeopardize causal identification. This substantially restricts the set of possible contestants. One possibility is that mineral discoveries generated short term immigration of a poorly educated and disenfranchised population, explaining the observed deterioration in institutional quality. Two elements argue against this possibility. First, as we have noted before, Clay and Jones (2008) find that migrants were positively selected to mining areas, in terms of education and income. Second, we perform a falsification test and find that measures of competitiveness of national politics (Besley et al., 2010) are affected by mineral discoveries, but without distinction in early or late mining states (see Table 7 in Appendix). Moreover, the effect on the competitiveness in general elections is positive, which suggests that if anything, the relationship between mining and institutional quality is upwardly biased.

As argued in 2, both initial violence and the quality of subsequent institutions can affect social norms. We tried to test this hypothesis with data on attitudes towards the use of interpersonal violence from the General Social Survey. However, data is only available in 300 out of nearly 3,000 US counties. Furthermore, this sub-sample of counties are geographically clustered within each state. As a consequence, there is virtually no variation in mineral resources endowment between counties of the same state surveyed in the General Social Survey. Although we are unable to document the cultural legacy, the review of the literature in 2 suggests that it would go in the same direction as the institutional legacy: one should expect more violent norms where institutions are of lower quality.

7 Conclusion

This work documents the negative short and long run consequences of mineral discoveries in the context of weak polities. It uncovers the existence of a homicide resource curse, which is conditional on the quality of formal institutions. In areas of the US in which mineral discoveries occurred before the formal rule of law was established, violence spiked up and higher levels of interpersonal violence have persisted until today.

By focusing on the relative timing of mineral discoveries and advent of the rule of law, our work also illustrates the existence of a political resource curse in the US and suggests a particular mechanism. The legitimacy and prevalence of violence at the timing of discovery are crucial in determining whether a political resource curse will occur. In areas in which mineral discoveries occurred before the formal rule of law, the possibility for some individuals to exert interpersonal violence led to the accumulation of substantial economic power, which could then be used to corrupt formal institutions. Such a mechanism could not unfold in areas where formal institutions outlawed and prevented the use of interpersonal violence. In turn, the persistence of institutions has paved the way to the persistence of the homicide resource curse.

We also provide a new interpretation for the economic role of interpersonal violence. Violence that aims at intimidating potential partners plays a crucial role in determining surplus allocation. Because this type of violence is efficient, it is observable by the econometrician, in contrast with violence aimed at expropriation. An implication is that as the rule of law progresses, only an effect on violence for intimidation rather than violence for expropriation will be observed. We thereby reconcile the robust yet puzzling result of the crime literature that violent crime is much more responsive to policing than property crime. Another implication is that the penalization of interpersonal violence and its impartial enforcement are necessary for the development of open and fair market economies and inclusive polities. Impartiality—punishing all perpetrators regardless of their economic or political power—is particularly important since it is the accumulation of economic power through violent means that is precisely at the heart of the resource curse mechanism described in this paper.

Our findings on interpersonal violence mirror three robust findings of the literature on political violence. First, violence is the hallmark of weak polities. Second, the presence of natural resources is an important driver of violence in the context of weak institutions, where it can lead to the further debilitation of institutions. Third, because institutions are persistent and because violence often begets more violence, countries can be trapped in an unfortunate equilibrium of poor quality institutions and high violence.

One criticism to our approach is that our proxy for state development may also capture other dimensions of political, economic, and social development. We address this issue by controlling for a large number of historical proxies for economic and social development, but some dimension may be still remain unobserved. However, even if territorial status does encompass more than the rule of law, the policy recommendation remains identical. Early mining, before strong and impartial polities are developed, has deleterious and lasting effects on interpersonal violence and on institutional quality.

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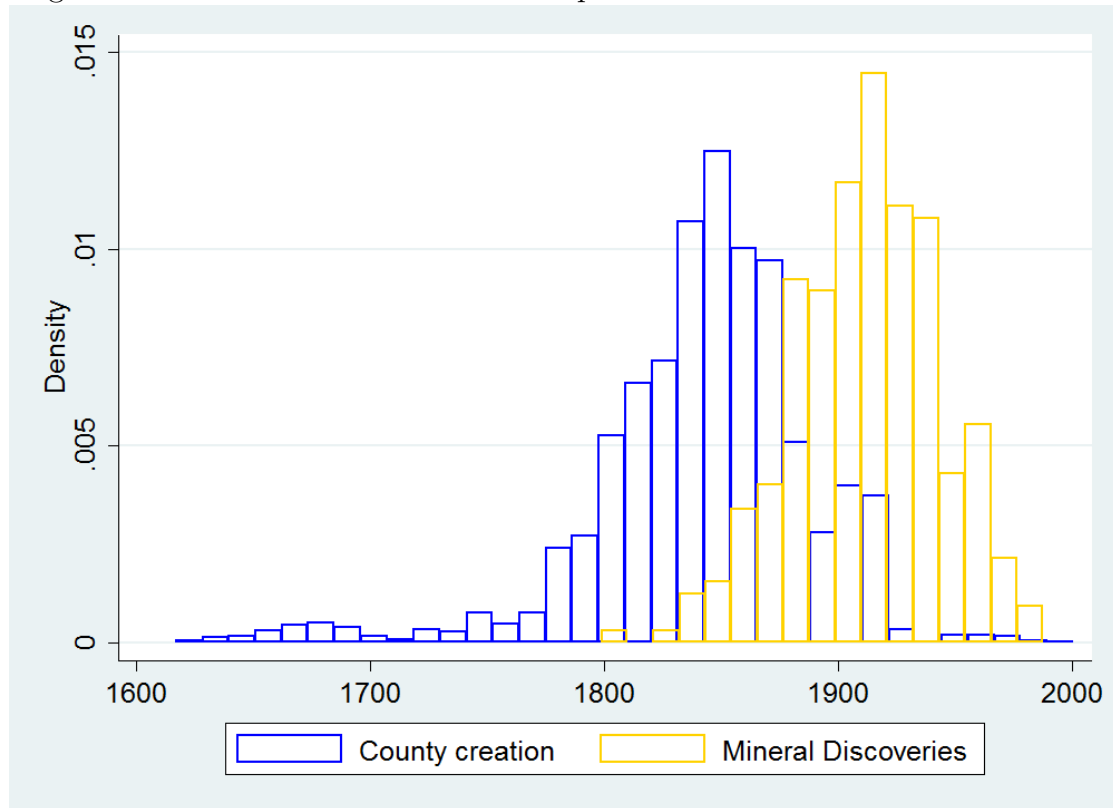
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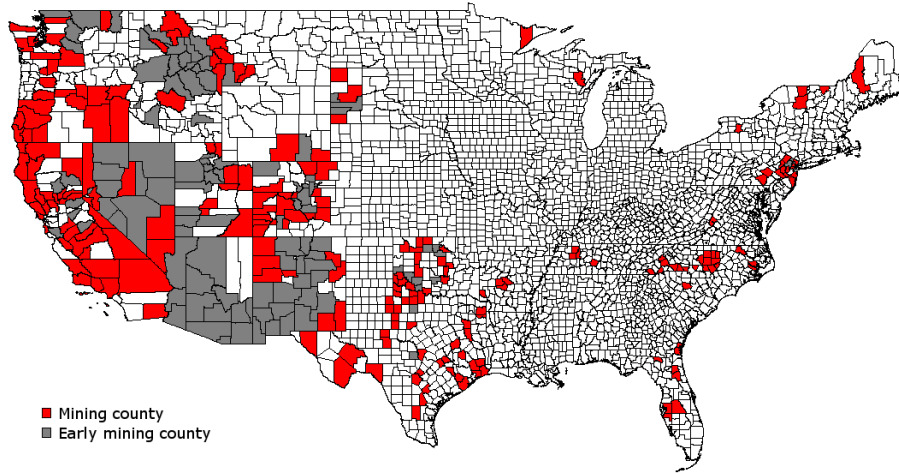
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Figure 1: Distributions of counties' incorporation dates and mineral discoveries.



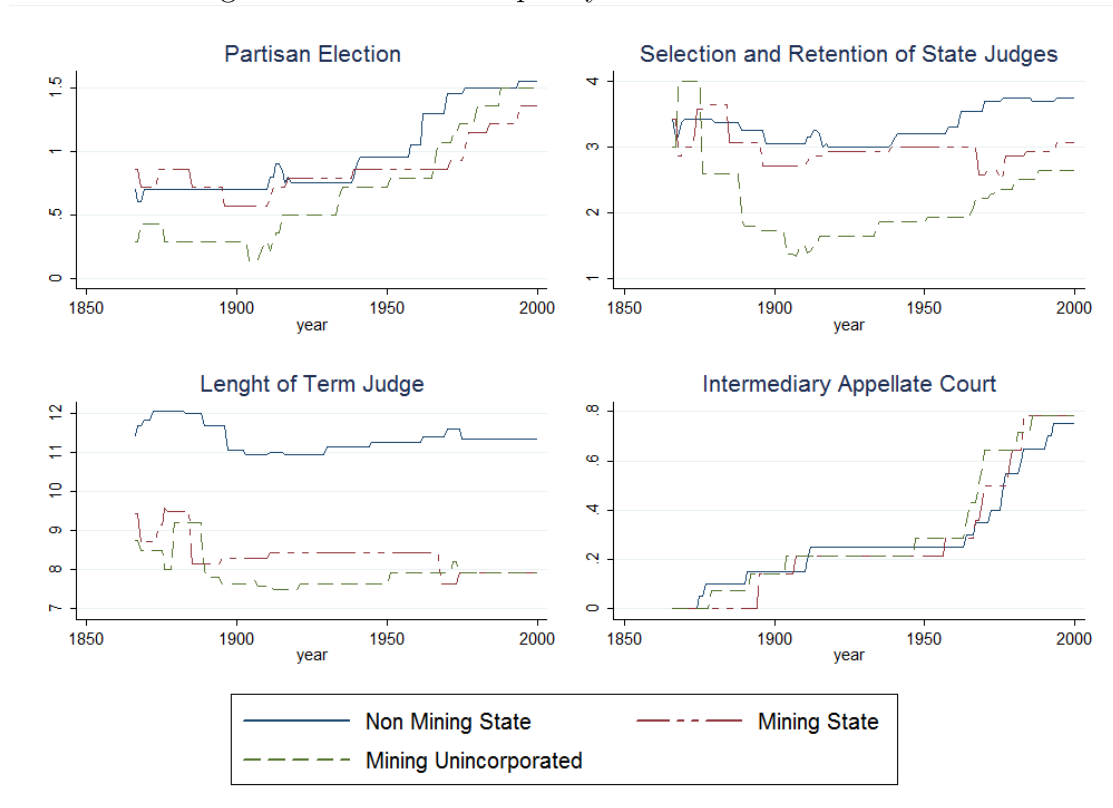
Histograms of the distributions of dates of county first creation (in blue) and dates of mineral discoveries (in yellow). Sources: National Association of Counties, and Mineral Resources Data System.

Figure 2: Map of US counties, distinguishing between mining and early mining counties.



Sources: Atlas of Historical County Boundaries and Mineral Resources Data System.

Figure 3: Institutional quality and mineral discoveries.



Sources: Epstein et al. (2001) and Mineral Resources Data System.

Table 1: Historical relationship between mining and homicides in a handful of counties.

Dependent variable: $Homicides_{it}$	(1)	(2)	(3)
Stock of mines $_{it}$	0.187** (0.090)	0.237*** (0.087)	0.260*** (0.088)
Population (thousands) $_{it}$		0.278*** (0.043)	0.351*** (0.050)
Stock of Mines $_{it}$ * Early mining $_i$			3.700*** (0.922)
Observations	357	329	329
Adjusted R-squared	0.155	0.349	0.389

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. White heteroskedastic standard errors in parentheses. OLS regressions. Each column presents the estimates from a separate regression. The dependent variable $Homicides_{it}$ is the number of homicides in county i at time t . *Stock of mines* is the cumulated sum of mineral discoveries over the 1849–1895 period. *Early mining $_i$* is a dummy variable equal to one if the county i experienced mineral resources discoveries before organization of the land. All regressions include state fixed effects, year fixed effects and a constant term.

Table 2: Relationship between mining history and today's violent crimes.

Dependent variable: rate of violent crimes per 100,000 inhabitants in 2000				
	(1)	(2)	(3)	(4)
Mining county	38.76 (23.80)	37.39* (21.51)	5.80 (21.13)	4.33 (18.91)
Early mining			202.67*** (58.43)	208.80*** (60.37)
State FE	Yes	Yes	Yes	Yes
Contemporary controls	Yes	Yes	Yes	Yes
Historical controls		Yes		Yes
Adjusted R-squared	0.39	0.40	0.40	0.41

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. White heteroskedastic standard errors adjusted for clustering at the state level in parentheses. OLS regressions. Each column presents the estimates from a separate regression. 2,015 observations in each regression. *Violent crimes* include murders and aggravated assaults. *Mining county* is a dummy variable equal to 1 if the county had any mining activity. *Early mining* is a dummy variable equal to one if the county experienced mineral resources discoveries before organization of the land. All regressions include state fixed effects and a constant term. All regressions include the date of creation of the county and the following *Contemporary controls* measured in 2000: (log of) county's aggregate income, (log of) income per capita, shares of blacks and women in the population, fractionalization, Gini coefficient, population density, and urbanization rate. *Historical controls* include the following covariates: manufacturing wage, white and black literacy rates, and county's population in 1900, manufactured, agricultural and other farming products outputs, population density, and share of women in 1880.

Table 3: Relationship between mining history and today's property crimes and other crimes.

Dependent variables: rate of different crimes per 100,000 inhabitants in 2000

	Property crimes (1)	Sex offense (2)	Drunk driving (3)	Forgery (4)	Vagrancy (5)
Mining county	-25.07 (20.52)	-0.90 (3.00)	9.85 (13.75)	-0.02 (3.70)	0.00 (1.01)
Early mining	45.41 (48.63)	12.31 (8.00)	21.04 (27.83)	2.46 (5.88)	-0.64 (2.53)
Adjusted R-squared	0.34	0.26	0.61	0.24	0.11

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. White heteroskedastic standard errors adjusted for clustering at the state level in parentheses. OLS regressions. Each column presents the estimates from a separate regression. 2,015 observations in each regression. *Property crimes* include robbery, burglary, and larceny. *Mining county* is a dummy variable equal to 1 if the county had any mining activity. *Early mining* is a dummy variable equal to one if the county experienced mineral resources discoveries before organization of the land. All regressions include state fixed effects and a constant term. All regressions include all contemporary and historical covariates used in table 2.

Table 4: Relationship between mining history and today's violent crimes: robustness checks.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable: rate of violent crimes per 100,000 inhabitants in 2000							
Mining county	4.33 (18.27)	39.80* (21.01)	45.49 (35.21)	36.37 (28.47)	42.19 (35.08)	29.11 (19.98)	28.03 (19.93)
Early mining	208.80*** (51.16)	165.23** (63.76)	203.82*** (51.10)	165.77*** (61.45)	110.43** (48.57)		
Discoveries 5 years after organization						31.87 (69.75)	
Discoveries 5 years before organization						112.57 (69.61)	
Discoveries 10 years after organization							38.83 (74.97)
Discoveries 10 years before organization							110.65 (67.93)
Correction for spatial correlation	Yes	Yes	Yes	Yes	Yes		
Only neighboring counties							
Arbitrary groups							
Adjusted R-squared	0.83	0.42	0.36	0.30	0.27	0.40	0.40
Number of groups			202	47	28		

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. White heteroskedastic standard errors adjusted for clustering at the state level in parentheses, except in column 1 where standard errors are computed using Hsiao (2010) with a 300 km spatial correlation. OLS regressions. Each column presents the estimates from a separate regression. 2,015 observations in each regression, except in column 2 where only 494 observations are used. *Violent crimes* include murders and aggravated assaults. *Mining county* is a dummy variable equal to 1 if the county had any mining activity. *Early mining* is a dummy variable equal to one if the county experienced mineral resources discoveries before organization of the land. All regressions include a constant term and state fixed effects, except in columns 3, 4, and 5 where states are replaced by 202, 47, and 28 arbitrary groups designed using 2-, 5-, and 7-degree grids. In these columns, standard errors are adjusted for clustering at the arbitrary group level. All regressions include all contemporary and historical covariates used in table 2. variables labeled *Discoveries x years before (after) organization* are dummy variables equal to 1 if the county experienced mineral resources discoveries x years before (after) organization of the land.

Table 5: Relationship between mining and the quality of judicial institutions.

Dependent variables in columns' head				
	Selection Procedure _{it}		Retention _{it}	
	(1)	(2)	(3)	(4)
Mining _{it}	-1.75*	-0.06	-2.82*	-0.52
	(0.89)	(0.30)	(1.61)	(0.58)
Early mining _i × Mining _{it}		-2.57***		-4.23**
		(0.96)		(1.75)
Observations	6,480	6,480	6,170	6,170
R-squared	0.66	0.66	0.85	0.85
	Length of Terms _{it}		Appellate Court _{it}	
	(5)	(6)	(7)	(8)
Mining _{it}	-3.00	-0.11	-0.45	0.68**
	(2.34)	(1.25)	(0.59)	(0.31)
Early mining _i × Mining _{it}		-5.34**		-1.72**
		(2.58)		(0.70)
Observations	6,170	6,170	6,480	6,480
R-squared	0.90	0.90	0.67	0.67

*** p<0.01, ** p<0.05, * p<0.1. White heteroskedastic standard errors in parentheses. OLS regressions. Each column presents the estimates from a separate regression. *Selection Procedure_{it}* is the selection procedure for state judges; *Retention* is an indicator of the independence of both selection and retention of state judges; *Length of Terms_{it}* is the length of terms of state judges; and *Appellate Court_{it}* is the presence of an intermediary appellate court. For each dependent variable, a higher value indicates higher judicial independence. *Mining_{it}* is a dummy variable equal to 1 if the county *i* had any mining discovery at time *t*. *Early mining_i* is a dummy variable equal to one if the county *i* experienced mineral resources discoveries before organization of the land. All regressions include state fixed effects, year fixed effects and a constant term.

Appendix

Table 6: Relationship between mining and the quality of judicial institutions, including lagged discoveries.

Dependent variables in columns' head				
	Selection Procedure _{it}	Retention _{it}	Length of Terms _{it}	Appellate Court _{it}
Mining _{it}	-0.31 (0.23)	-0.53 (0.36)	0.22 (0.56)	0.43*** (0.15)
L1.Mining _{it}	-0.04 (0.17)	-0.25 (0.30)	-0.04 (0.62)	0.34* (0.17)
L2.Mining _{it}	0.11 (0.13)	-0.17 (0.27)	-0.38 (0.72)	0.24 (0.14)
L3.Mining _{it}	0.20 (0.13)	-0.07 (0.29)	-0.40 (0.74)	0.23 (0.16)
L4.Mining _{it}	0.41* (0.21)	0.22 (0.28)	-0.48 (0.66)	0.09 (0.14)
Early mining _i × Mining _{it}	-1.50** (0.62)	-2.30* (1.16)	-3.56** (1.73)	-1.09*** (0.37)
Early mining _i × L1.Mining _{it}	-1.41*** (0.51)	-1.98** (0.94)	-2.78* (1.44)	-0.92*** (0.34)
Early mining _i × L2.Mining _{it}	-1.34*** (0.47)	-1.66** (0.80)	-1.85 (1.20)	-0.82** (0.31)
Early mining _i × L3.Mining _{it}	-1.60*** (0.54)	-2.51** (0.96)	-2.02* (1.20)	-0.90** (0.34)
Early mining _i × L4.Mining _{it}	-1.75*** (0.63)	-2.93*** (1.05)	-1.75 (1.44)	-0.78** (0.37)
Observations	6,476	6,166	6,166	6,476
R-squared	0.67	0.85	0.90	0.67

*** p<0.01, ** p<0.05, * p<0.1. White heteroskedastic standard errors in parentheses. OLS regressions. Each column presents the estimates from a separate regression. *Selection Procedure_{it}* is the selection procedure for state judges; *Retention* is an indicator of the independence of both selection and retention of state judges; *Length of Terms_{it}* is the length of terms of state judges; and *Appellate Court_{it}* is the presence of an intermediary appellate court. For each dependent variable, a higher value indicates higher judicial independence. *Mining_{it}* is a dummy variable equal to 1 if the county *i* had any mining discovery at time *t*. *Early mining_i* is a dummy variable equal to one if the county *i* experienced mineral resources discoveries before organization of the land. All regressions include state fixed effects, year fixed effects and a constant term.

Table 7: Relationship between mining history and political competition.

Dependent Variable: Political Competition in General Elections		
	(1)	(2)
Mining _{it}	0.33*** (0.10)	0.44*** (0.10)
Early Mining _i × Mining _{it}		-0.19 (0.11)
Observations	772	772
R-squared	0.55	0.55

*** p<0.01, ** p<0.05, * p<0.1. White heteroskedastic standard errors in parentheses. OLS regressions. Each column presents the estimates from a separate regression. *Selection Procedure_{it}* is the selection procedure for state judges; *Retention* is an indicator of the independence of both selection and retention of state judges; *Length of Terms_{it}* is the length of terms of state judges; and *Appellate Court_{it}* is the presence of an intermediary appellate court. For each dependent variable, a higher value indicates higher judicial independence. *Mining_{it}* is a dummy variable equal to 1 if the county *i* had any mining discovery at time *t*. *Early mining_i* is a dummy variable equal to one if the county *i* experienced mineral resources discoveries before organization of the land. All regressions include state fixed effects, year fixed effects and a constant term.

Table 8: Summary statistics for the relationship between mining history and today's violent crimes.

	Full sample		Mining counties		Early mining counties	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
In 2000:						
Violent crimes per 100,000 inhabitants	520.82	329.05	623.34	323.42	655.79	341.88
Aggregate income (log of)	20.01	1.47	20.57	1.77	20.12	1.88
Per capita income (log of)	9.49	0.24	9.55	0.29	9.53	0.30
Share of blacks	0.10	0.15	0.05	0.09	0.01	0.01
Share of women	0.51	0.02	0.50	0.02	0.5	0.02
Fractionalization	0.25	0.18	0.33	0.18	0.29	0.16
Gini coefficient	0.43	0.04	0.43	0.03	0.43	0.03
Population density	232.3	1293.58	305.15	1120.09	124.88	291.42
Urbanization rate	0.43	0.30	0.56	0.30	0.54	0.32
Date of creation	1793.3	67.4	1817.37	63.78	1853.22	22.76
In 1900:						
Manufacturing wage	1012548	6560182	784613	2954666	252269	556000
White literacy rate	5368	12147	4427	7492	2567	2576
White literacy rate	412	816	175	412	7	15
Population	8538	24212	7061	12761	4192	4272
In 1880:						
Farming output	954936	1248379	444911	837506	192954	429809
Other farming products output	882071	917558	636151	1037276	292766	507688
Manufactured output	2330518	16154217	1540540	7536783	309740	600072
Population density	65.71	834.2	47.03	298.12	8	17.17
Share of women	0.47	0.06	0.41	0.10	0.36	0.11
Observations	2015		209		58	

See the text and notes of table 2.