The Spanish Legacy in the US Southwest

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July 10, 2024

Abstract

In this paper, we examine the enduring impact of the Spanish Empire on present-day United States. To achieve this, we digitize a series of maps displaying the locations of Catholic Missions and Presidios in California, Arizona, Texas, and New Mexico, along with the routes used by the earliest European settlers in the region. Using this dataset, we explore the economic and cultural legacy stemming from the Spanish colonial experience in these regions. We combine data from diverse sources and time periods, and across varying levels of disaggregation to assess the effects of exposure to these colonial institutions on local economic activity's extent and composition, as well as on the inhabitants of these areas. We begin by documenting the initial success of the evangelization efforts undertaken by these missionaries, which, nevertheless, have dissipated. Similarly, the agricultural practices initially introduced to these missionary areas during the late 18th and early 19th centuries triggered a process of structural transformation, giving rise to a manufacturing sector in the early 20th century and an overall shift towards urban areas. Finally, in line with this transformative process, we identify a persistent impact of these institutions on schooling levels and educational achievements, which have fostered the rise of a highly educated middle class espousing more liberal perspectives.

JEL Codes: D02, D74, J16, O12.

Keywords: Missions, Persistence, Education, Structural Transformation, Attitudes

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1 Introduction

The lasting impact of colonization has been an object of continued study and recent revaluation in the social sciences. On the one hand, classic papers have argued that the level of economic development that the receiving territories reached was a function of the colonizers identity, the type of institutions they established and, ultimately, of whether they wanted to "permanently settle" these lands (Porta, Lopez-de Silanes, Shleifer, & Vishny, 1998; Sokoloff & Engerman, 2000; Acemoglu, Johnson, & Robinson, 2001). However, more recent developments have challenged these ideas by looking at different contexts, higher degrees of data disaggregation and alternative outcomes (Nunn, 2010; Dell, 2010; Valencia Caicedo, 2019a). In particular, the focus has started turning away from the legal framework imported by colonizers and towards the human capital and cultural norms they brought from their countries of origins, and on how those sets of norms were transplanted to the receiving communities.

In this project, we will contribute to the understanding of the European legacy in America by studying the colonization process of the south-west United States. Originally a part of the Spanish empire, the territories that today make up the states of California, Arizona, New Mexico and Texas were colonized by Catholic missionaries sent from Mexico City in an effort to reassert the Spanish control over the frontier lands (Bolton, 1917). It was not until the mid 19th century, after the US-Mexico war, that the international border between Mexico and the United States was drawn at the Rio Grande —where it remains today. Unlike the amounting empirical work on the westward expansion of the 19th century[1], and despite the extent of the territories cited above, the Spanish legacy in the US has been largely overlooked in the economics literature.

In particular, in this paper we will exploit the location of Missions and Presidios —the two main frontier institutions used by the Spanish empire in North America— as a means to measure the extent of exposure to Catholicism among the inhabitants of these regions. We are interested in testing Bolton's hypothesis, which posits that Missions constituted areas of innovation and adaptation at the Spanish Empire's frontier, an idea more recently examined by García-Jimeno and Robinson (2008). To this end, we leverage off the fact that the paths followed by early explorers during the 17th and 18th centuries were essentially arbitrary due to their lack of knowledge about the region's physical and climatic conditions. We use this quasi-random selection of routes as an instrument to determine the locations of the aforementioned Missions (and Presidios).[2] Our identi-

[1] Bleakley and Lin (2012); Donaldson and Hornbeck (2016); Bazzi, Fiszbein, and Gebresilasse (2020).

[2] We are currently exploring alternative exposure measures, including historical changes to the US-

fication strategy aligns with the urban economics literature (as discussed in Duranton and Turner (2011, 2012)), assuming that, after controlling for various observable factors such as terrain ruggedness and proximity to the nearest coast, the precise course of these routes did not significantly impact both historical and contemporary outcomes. Lastly, in an additional empirical analysis, we exploit the (unrealized) plans to establish a subset of Missions in California. We utilize these locations as control points in the same spirit as Greenstone, Hornbeck, and Moretti (2010), and Dell and Olken (2020).

In order to test these hypotheses empirically, we have assembled a novel and unique dataset with the geo-coded location of each Spanish settlement in the southern states of the United States, along with the routes that these settlers followed to each of their destinies (Figure 1). We are therefore able to measure the distance between each (modern) county to the nearest settlement/route, the Catholic order running the aforementioned settlement as well as its year of foundation. Additionally, we have also geocoded the different frontiers that have existed historically between Mexico and the United States and, therefore, are able to observe those counties which eventually belonged to one or another country.[3] We draw or outcome measures at the county level from historical and contemporaneous US censuses, and individual level attitudes from the *Cooperative Election Study — CCES* (Ansolabehere & Rivers, 2013).

The main result and contribution in this paper is that we are able to document the process of economic transformation that took place in the western territories of the US, tying it's origins back to the original settlements in the region. In particular, we show that areas located in the surroundings of the sites where Missions were first built displayed an initial advantage in terms of agricultural productivity (i.e., in 1860), advantage that dissipated during the first half of he 20th century and disappeared in the later, more recent years. We find that, while the agricultural share in the economy was decreasing, the manufacturing sector in these very same regions was growing, as measured by its share of employment. This, together with an increase in the urbanization rate, allows us to conclude that there was a structural transformation of the economy away from agriculture and towards manufacturing that happened during the first half of the 20th century, and was rooted in the initial investment in agriculture undertaken by the missionaries. Finally, we also show how the transformation was mediated by an increased insertion into the national commercial network, as measured by access to the railroads and highways systems which should have further reinforced the movement away from traditional agriculture and towards more skill-intensive sectors.

Mexico border.

[3]See Figure A3.

We find that areas located near to the location of these Missionary settlements display higher initial levels of religiosity (consistent with the evangelization component of the Mission's system), but that said initial shock dissipated in time. In contrast, we find how the investments made in education translate into a historical higher rate of school enrollment which does persist until contemporary times. More interestingly, these initial investments in education seem to have translated into higher levels of human capital accumulation at the upper end of the distribution, as measured by higher rates of patents and lawyers/doctors per capita in counties located closer to Mission settlements. Finally, we show how the population that currently inhabits the regions historically settled by missionaries self-identify as more democrat and liberal, holding a progressive stance regarding controversial topics in the US political and public sphere such as abortion and immigration laws.

1.1 Literature review

The economics literature on missions is by now rich. (Valencia Caicedo, 2019a) summarizes the literature in Latin America and Asia, while (Meier zu Selhausen, 2019) reviews the impact of missions established in Africa. Missions also figure prominently in broader surveys of the economics of religion, such as (Iyer, 2016; Becker, Rubin, & Woessmann, 2021). One could think about different waves of the missionary literature. The first one looked directly at the impact on religiosity (Nunn, 2010) as well as the political role of these institutions in promoting liberal democracies (Woodberry, 2012). A second wave focused on human capital externalities in Africa, Latin America and Asia (Cagé & Rueda, 2016; Waldinger, 2017; Valencia Caicedo, 2019b). More recent contributions have extended the educational results to different contexts (Ma, 2021) expanded the measure of human capital to include health (Cagé & Rueda, 2019), as well as shown how missions have also shaped attitudes (Ananyev & Poyker, 2021; Hong & Paik, 2021). Still, the literature has largely focused on developing countries with few exceptions.

In this paper we focus on the impact of historical missions in the United States. To the best of our knowledge, only a couple of papers have explored this topic recently, focusing on indigenous outcomes (Feir, Jones, & Scoones, 2020; Alston, Duggan, & Pastrana, 2022). The first one finds an impact for Protestant missions on education, while the other focuses on the socioeconomic impact of Spanish Missions. In this paper we look at economic outcomes and political attitudes for the modern populations in these areas as a whole. To today, there is no formal empirical test of Bolton's hypothesis of missions as

frontier institutions. In fact, we think that the dynamic impacts of missionary exposure are important in the US context. We also consider, in line with the most recent missionary literature, that it is appropriate to incorporate attitudes into the empirical analysis of missions. We contribute econometrically, with two novel identification strategies, that can help us get closer to estimating causal effects.

We also look more broadly at the impact of the Spanish legacy in the United States, where the British were the dominant empire. We believe that this is still an under-explored topic with a few exceptions (Saiz, 2014). In a similar vein, (Laudares & Caicedo, 2016) also consider the impact of the Spanish and Dutch colonization of Brazil, relative to the dominant Portuguese empire. Here we view missions as frontier institutions, following the conceptual characterization provided by (Bolton, 1917). As such, perhaps the closest article conceptually would be (Bazzi et al., 2020) which looks at the Westward expansion of the US, testing the empirical validity of Turner's hypothesis. Here we also focus on historically frontier territories, but scrutinize instead the potential impact of the original settlement institutions in the area: missions and presidios.

The remainder of this paper proceeds as follows: section 2 introduces and describes the historical setting in which Missions emerged during the Spanish rule in America. Section 3 describes the main sources of data, as well as the definition of the most relevant variables used in the analysis. Section 4 lays out the different empirical strategies we use to estimate the effect that Missionary settlements had in north America, while section 5 presents the main results of this project. Finally, section 6 concludes.

2 Background

The colonial experience of the southwestern territories of the United States was, to a large extent, the story of the relationship between the Spanish Catholic missionaries and the Native American tribes (Bolton, 1908). The region, located at the northern frontier of the Viceroyalty of *New Spain*, was both remote and inhospitable for European colonizers, which made it an expensive and therefore unattractive bounty for the Crown (Gerhard, 1982).[4] In the language of Bolton, we can understand North American missions as frontier institutions, and many times the only outposts in these locations.

One particular aspect that rendered the usual colonial institutions employed by the Spanish empire ineffective was the sparse indigenous population of the region (Wyllys, 1935). Unlike the central highlands of Mexico, which were populated by the highly centralized

[4]The first Spanish Mission in the region was established in San Francisco de la Espada (Texas) in 1689, almost 200 years after the arrival of Columbus and more than a century after the defeat of the Aztec empire (Gerhard, 1972).

and stratified Aztec empire by the time the Spanish colonizers arrived, the lands north of the Sonora desert were home to less technologically developed and scattered societies at the dawn of the 19th century. This lack of local "labor supply" meant that the use of the more "traditional" colonial institutions, *Encomienda* and the *Repartimientos*, was ineffective inasmuch as they were based on the exploitation of local labor in exchange for religious and civil education (Carraro, 2000). Hence, these areas remained peripheral for European colonizers.

Despite this situation, the Spanish Crown still had incentives to assert its presence in the northern frontier of the viceroyalty given the territorial challenges it faced from other competing colonial powers, which included the British, French and Russians explorers. Said incentives were only compatible with those of an organization such as the Catholic church, which had an arguably unique objective function that put some weight on the indoctrination of the indigenous population, thereby reducing weight of private earnings. Hence, the task was jointly undertaken by the Crown and the Church. The religious authorities, in turn, entrusted this endeavor to the Jesuit, Dominican and Franciscan orders who were in charge of commanding expeditions into these lands with the goal of establishing a series of self-sustaining settlements all the way from the gulf of Texas up to the Pacific coast in Oregon.[5] In order to overcome the difficulties associated with establishing a permanent settlement in such an inhospitable land, the Missions were supposed to be founded near the coast, at a determined distance one from another and in strategic locations that allowed them to minimize the cost of rounding-up natives (Blackmar, 1891). These initial Missions, were to grow into Pueblos and, eventually, become cities. Presidios, another of the frontier institutions utilized by the Spanish Crown, were fortified garrisons with an expanded military capacity, strategically built near large pueblos (Estrada, Alvarez Lobato, & Miranda, 2005).

The day-to-day dynamics of Missions have been amply documented in several different contexts (Waldinger, 2017; Valencia Caicedo, 2019a). In a nutshell, indigenous people provided the labor needed to run and sustain the settlement, while the priests indoctrinated them into Christianity and European civilian life. A major point to keep in mind when analyzing the history of Catholic Missions, particularly in the northern frontier of *New Spain*, is that most of the accounts available come from the chronicles of missionaries themselves. Thus, the established narrative revolves around the heroic task undertaken by selfless and magnanimous religious clerics whose only goal was to help convert and thereby save the souls of the heathens (Bolton, 1917). It is crucial to highlight that this narrative leaves aside the other face of the coin, which portrays a picture where natives were forcibly reallocated, partitioned and obliged to work for the Europeans. This, in

[5] Among these early religious explorers, was the now infamous Junípero Sierra who is credited with the foundation of the missionary system of Alta California.

turn, had nefarious consequences on the well being of these groups and is arguably one of the main causes behind the population demise of native Americans in the region (Tinker, 1993).

Finally, the missionary system was progressively dismantled as the Spanish Crown left the continent during the early 19th century. Furthermore, this period of time saw the westward expansion of the recently formed United States, fueled by a gold rush and desire to expand the agricultural frontier.[6] This, together with the separation of Texas from the Mexican Republic in 1836 and its posterior attachment to the United States in 1845, as well as the "concession" of California from Mexico to the US as a consequence of the 1846 war between these two nations, meant the final demise of the system as it was initially conceived.[7] Although in many cases the church still hosts regular religious celebrations, the Missionary system as a whole was abandoned before 1840 (Jackson, 2009).

3 Data

In this section we describe the different sources and levels of aggregation of the main variables used in the empirical analysis. We employ information at the county and individual levels. Table A1 lists the definition and sources for the full set of variables.

3.1 Spanish frontier settlements

The main source of data used in our analysis is a novel and unique database with the geocoded location of all Missions and Presidios —the two main frontier institutions established by the Spanish empire in North America— in the states of California, New Mexico, Arizona and Texas. With this end, we relied on previous work by Deasy and Gerhard (1944), Weber (2000), Beattie (1929), and Fontana (2013) and reconstructed the exact coordinates where the original Spanish settlements were located (see Figure A1 for an example of the raw sources utilized). Additionally, we collected information on the Catholic order that founded each outpost, the year it was founded and abandoned (if applicable).[8] Finally, to construct our instrumental variable, we geocoded a series of exploration routes found in the Perry-Castaneda Library Map Collection at the University of Texas at Austin (Perry-Castaneda, 2022) shown in Figure A2.

[6] Take, for instance, the purchase of the territory of Louisiana from the Republic of France in 1803.

[7] Figure 2 in the appendix shows a brief timeline with the main historical events in the United States during this period. Figure A3 shows the territorial evolution of the south west states of the US.

[8] In some cases, a Mission/Presidio was founded by order A and, years later, taken over by order B. We are able to observe and document these changes. The latter were specially common among Missions founded by the Jesuits (Fontana, 2013).

Using these historical data, we are able to construct measures of the exposure of each (modern) county to the cultural norms and values imported by the Spaniard colonizers. In particular, we use the (linear) distance from each county's centroid to the nearest Mission and/or Presidio as our main explanatory variable to capture the colonial legacy of the Spanish empire in North America. Similarly, we measure the distance to the closest intersection with the nearest exploration route and use it as a part of our identification strategy, detailed later. Finally, we exploit the year of foundation and order in charged of each settlement as sources of heterogeneity in our analysis.

3.2 Additional data

We complement our county-level panel with data on several different socioeconomic and demographic indicators drawn from different rounds of the US population census. In particular, we draw data on education, religiosity, agricultural and industrial activities from censuses between 1860 and 2010 (the exact definition of each variable is available in Table A1).

We further utilize individual-level data on political attitudes and on the stance on debated public topics from the 2016 round of the Cooperative (Congressional) Election Study (CCES from Ansolabehere and Rivers (2013)). Finally, we draw information on social capital from and individual connectedness to their community from the "Social Capital Atlas" project run by the Opportunity Insights lab (Chetty et al., 2022).

Observable characteristics of US counties used as control variables in our regressions are drawn from several sources, all detailed in Table A1. These include average altitude, temperature, precipitation, ruggedness and distance to the nearest water body.

4 Empirical Strategy

4.1 OLS and Unbuilt Missions

We begin our empirical analysis by exploring the relationship between the distance to the nearest Mission and both historical and current socioeconomic indicators, such as educational attainment and industrial productivity.[9] In particular, we estimate equations

[9]We focus on the distance to the nearest Mission in this draft for the sake of clarity. We show the main (IV) results using the distance to the nearest Presidio as our measure of interest in appendix section A. These results, as well as those corresponding to the OLS models, are similar in terms of magnitude and significance to the baseline (i.e., "Missions" ones). Full set of results available upon request.

of the form:

$$y_{c,t} = \gamma_s + \beta\left(distance_{c,m}\right) + X_c'\Gamma + \varepsilon c \tag{1}$$

where c indexes counties, m Missions and s states. In Equation (1), $closeness_{c,m}$ is the distance between the geographic centroid of county c and the nearest Mission m; γ_s is a set of state fixed effects, and $y_{c,t}$ is the outcome studied for a county c in period t. We include a comprehensive set of geographical and location controls at the county level, X_c that account for exogenous but potentially confounding factors. These include average altitude, temperature, precipitation, ruggedness and distance to the nearest water body. Finally, the error term εc is robust and clustered at the Mission level.

The parameter of interest in this model is β and represents the conditional correlation between historical exposure to the set of norms and institutions imported by the Spanish colonizers with respect to both historical and current socioeconomic outcomes.

To improve the econometric identification of these OLS models, we further restrict our analysis to counties located in California and exploit the location of "unbuilt" Missions. Following Greenstone et al. (2010) and Dell and Olken (2020), we identify locations where Missions were supposed to be built (i.e., already approved to be) but never got constructed due to historical accidents (e.g., the Mexico-US war). We then compute the distance between the centroid of each county and these unbuilt settlements and estimate Equation (1) as a placebo test. Despite this, there could still be other omitted variables that do not allow us to interpret our estimates causally and so to improve on these potential challenges we turn to our instrumental variables models.

4.2 IV: Exploration Routes

The effects of frontier settlements in sparsely populated areas are potentially correlated with a wide set of county-level characteristics that can simultaneously dictate the location of these settlements and be unobservable. Furthermore, the location of frontier settlements probably responded to a strategic behavior from the colonizers, who looked not only to make a permanent presence in a potentially contested territory but also to subdue its population in the most cost-efficient manner. Thus, Missions and Presidios may have been located in areas of easier access, with a greater abundance of natural resources/agricultural potential and already more densely populated. Therefore, the simple correlation between distance to a Mission/Presidio and socioeconomic outcomes will not capture the desired causal effect of the former on the latter, but rather only capture the effect of these underlying characteristics.

To overcome this difficulty, we follow an instrumental variables (IV) strategy where we borrow insights from the urban economics literature (Duranton & Turner, 2011, 2012; Duranton, Morrow, & Turner, 2014) to instrument for the endogenous location of frontier settlements. More precisely, we instrument the distance to the nearest Mission/Presidio with the distance to the intersection with the nearest route used by the original European settlers in the region. We run second stage equations similar to those in Equation (1), but accounting in the first stage for the non-random decision of Missions/Presidios location. Specifically, we run first stage equations of the form:

$$dist_{c,m} = \gamma_s + \theta route_{c,r} X_c' \Pi + \epsilon c \tag{2}$$

where the index notations and controls are analogous to Equation (1), and $route_{c,r}$ is the (linear) distance between a county's centroid and the nearest intersection with an exploration route followed by the first European colonizers. We take the as the crow flies distance on purpose, as we view it as more exogenous than a cost-path distance. We view this distance as an important factor upon deciding the location of a permanent settlement, yet one that is arguably exogenous given the lack of information that these early explorers had about the layout of the terrain in the region. The underlying assumption is that, conditional on the observable characteristics of an area (cited above), whether a frontier settlement was established in a particular location or not was a function of whether said particular location was actually reached by the colonizers, which in turn was depended on the route they chose to follow upon departing from their origins. Therefore, and given that Europeans had no information on the region at this point in time, the initial choice of route was plausibly random.[10]

5 Results

5.1 OLS results

We begin by estimating how effective missionary settlements were in spreading the Catholic faith and the persistence of this effect in Table 1. Column 1 shows a negative and significative correlation between the number of churches in a county in 1860 and the distance to the nearest mission. Similarly, columns 2-3 show an equally negative and significative correlation between the number of churchgoers and the distance to the

[10]The fact that all the routes span from the colonial towns located south of the current US-Mexico border follows from the intention of the Spanish empire of pushing its border northward and is therefore non-random. Yet, within potential routes north, the choice of the ones actually followed is arguably random.

nearest mission for the years of 1860 and 1936. In contrast, columns 4 and 5 show that the share of Catholics in a county in more recent years (i.e., 1980 and 2000) is not correlated with our measure of colonial exposure to Catholicism. In sum, this table shows that the primary objective of the missionaries (i.e., convert natives to Christianity) was initially achieved, but does not seem to have persisted in time (cf. (Nunn, 2010)). In the remaining tables of this subsection, we inquire into how other dimensions of these counties were affected by the presence of these religious European colonizers.

In Table 2 we explore the relationship between missionary presence, agricultural productivity, and the rise of the manufacturing sector. The historical narrative has stressed how missionaries helped to develop the land, a fact that seems to be confirmed in column 1 of panel A, where we show a significant correlation between the number of agricultural establishments in 1860 and the distance to a missionary settlement.[11] The remaining columns of panel A show how, by the mid 20th century, the areas closer to the location of these institutions appear to have migrated out of agriculture. More exactly, already in 1950 the share of labor devoted to farming is lower in regions closer to where Missions were located. Panel B (of the same table) shows the "other side to the coin". In particular, it shows how the share of the labor force employed in manufacture was initially lagging in places located closer to missionary settlements, and how as agriculture moved out it was replaced by the manufacturing sector (columns 1 and 2). Column 3 shows how in more recent times, there seems to be no correlation between the exposure to these Missions and the share of the labor force employed by the manufacturing sector. We summarize the main message of this table in Figure 3. Building on Eckert, Juneau, and Peters (2023), there was an initial emphasis of agriculture which drew on the expertise of the colonizers. This focus gradually gave way to a burgeoning manufacturing sector, which, in turn, capitalized on the surplus initially generated by the agricultural activities.

Tables 3 and 4 support the previous point by showing the negative correlation between the distance to the nearest Mission and the urbanization rate (3) and the timing of the insertion to the local commercial network (4). Panel A of table 4 shows that counties located near a Mission were initially more likely to be inserted to the trading network via railroads, and once again how this advantage had mostly dissipated by the early 1920's. Panel B paints a similar (albeit more recent) story, using the number of miles of highways constructed in the county at different points in time. In both cases, the takeaway of the exercise seems to be that these counties were initially more central for the economic activity of the region, but that this starting advantage disappeared once economic progress spread through the region. Once again, we take this as evidence of a structural transformation process, that was sparked and fostered by the settlement of

[11] The results are similar in terms of sign and significance when using alternative measures of agricultural development in 1860 such as GDP. Available upon request.

these "frontier" institutions.

One separate, albeit complementary, goal of the Mission system established and run by the Catholic Church in the northern region of *New Spain* was to set up an education system compatible with European standards, and in which the natives could be taught an already "standard" curriculum. Table **??** shows both the results of this initial investment in education, as well as its persistence and evolution in time. In particular, panel A shows how school enrollment and illiteracy rates in 1860 had both a negative and significant correlation with the distance to the nearest Mission. This effect, unlike the productivity of the agricultural sector, persisted in time and still shows up in the latest census round. Panel B shows how this initial investment in basic education translated into a higher level of human capital accumulation at the highest levels, by examining the (significant) relationship between Mission proximity and the relative abundance of engineers, doctors and lawyers. Taken together, these pieces of evidence show that the initial push for agriculture was accompanied with an equally big investment in education, which in time sparked a transition towards a more "human capital intensive" sector such as the manufacturing one (eventually, to the high-skilled services sector).

Finally, panel C in table **??** wraps up the argument of urbanization and structural transformation by showing how individuals that live in these (more urban) areas also hold more liberal and progressive views about some key-controversial issues in the US public discussion. Using data from the CCES, we show that places with a "more intense exposure" to Missions are inhabited by individuals who self-identify more as Democrats (column 1) and have higher levels of support for abortion and lighter immigration policies.

To wrap up this initial overview of the results, we estimate (1) using standard economic variables as outcomes in Table 7. In particular, we use the share of population living under the poverty line (column 1); per-capita income (column 2); a Gini index for income inequality (column 3); and the median household income (column 4). Across columns, the main message of this table is that there were no persistent effects of these early settlements on the usual "economic prosperity" measures, but rather that their effect was concentrated in the agricultural and education sectors. These, in turn, gave way to a transformation of the economic structure in the region, fostering and enabling a move away from agricultural towards more high-skilled occupations.

5.2 Placebo Missions

As discussed above, the location of the Missions was potentially correlated to a series of unobservable characteristics that could also be driving the correlations documented in the previous subsection. For instance, missionaries could have settled in places where the

relative abundance of wildlife was such that they found it easier to hunt and provide for a large group, while at the same time signaling a higher suitability for agriculture. In order to deal with this possibility, we follow a similar strategy to that of Greenstone et al. (2010) and Dell and Olken (2020), and exploit the historical experiment of "unbuilt missions" in California.[12]

Figure 4 summarizes the results for a selected group of outcomes. The full set of outcomes and results is shown in section 6. Overall, the results in panel (a) of the figure show that there is no correlation between the "location" of these unbuilt Missions and the historical measures of education, religiosity, manufacture and urbanization. These results are intuitive and seem to confirm the fact that initial choice of the location of these Missions was not correlated with underlying unobservable characteristics of the area such as availability of natural resources or overall quality of the terrain.

Shifting our focus to panel (b), two notable findings emerge that deserve some discussion. Firstly, there is a consistent and significant increase in religiosity nearer to these "unbuilt" Missions. Additionally, though somewhat imprecisely measured, there appears to be an increased level of manufacturing output in areas closer to these sites. Although these outcomes might pose an initial puzzle, they align with an interpretation suggesting that the areas surrounding these unrealized Missions are currently undergoing an earlier phase of the structural transformation process that the regions near former Missions have already completed.

Finally, the broad patterns shown in section 6 confirm and align with this interpretation.[13] These results, albeit imprecisely estimated given the limited sample size, are comforting inasmuch as they show how, at least for the Missions established in the current state of California, it was the actually missionary treatment (and not only the potential location) which had lasting impacts on the economic development of the region and its population. In other words, the development trajectory of this region could have been different had these other sets of missions been constructed.

5.3 Instrumental Variables

To further investigate the validity of our empirical results, we implement an instrumental variable approach where we instrument the distance to the nearest Mission with the distance to the point along the exploration routes taken by the original colonizers of the area. This strategy, borrowed from the urban economics literature (Duranton & Turner,

[12]Note that the fact that we only have information on these unbuilt settlements for California means that the sample used in this subsection is sensibly reduced.

[13]The dependent variables in each table and figure is identical to the one used in the corresponding "OLS" table.

2011, 2012; Duranton et al., 2014), relies on the assumption that the first Europeans that came into this region did not have much knowledge of where they were heading or what path to take. In such a case, the actual route taken would be random (up to an extent) and, therefore, the distance from a county's centroid to the nearest segment of such routes would be arguably exogenous. Figure 5 shows the first stage relationship between the distance to the nearest route and the distance to the nearest Mission. Table 15 shows the corresponding first stage estimations. Both in the figure and across columns, there is a strong positive relationship, statistically significant and economically meaningful. We are therefore able to conclude that our instrument is relevant and does in fact capture the desired relation.

The main results of the regressions using our instrumental variable for the location of Catholic Missions are once again summarized in Figure 6, and shown in full display in section **??**. Overall, the IV results closely resemble those obtained with the OLS estimations and described at the beginning of this section. Table **??** shows how the effect of missionary exposure on religiosity is positive and significant up to the mid 20th century, and disappears in more recent times. Tables 17, 18 and 19 show if any stronger evidence in favor of the structural transformation and urbanization process initiated by the arrival and settlement of Spanish missionaries. Table 17 panel A shows that the effect of missionary activity on agricultural productivity is decreasing in time, with counties located closer to missions showing higher agricultural productivity (and value) in the 19th century, and a lower share of labor in the second half of the 20th century. Panel B, in turn, shows first a negative and then positive effect of the proximity to these sites on the share of the labor force employed by the manufacturing sector.

In terms of the effects of Missions on education and human capital accumulation, table 20 shows an initial but persistent positive effect on the level of school enrollment and completion (panel A); and an equally positive and significant effect on the accumulation of human capital on the upper ends of the distribution (panel B). Regarding individual attitudes, panel C confirms the fact that the population who currently lives close to these sites self-identify as being more liberal and holding more progressive views.

In sum, we take these results as further evidence in favor of the presence of a structural transformation process fostered by Catholic Missions. Although this dynamic effect has already been discussed and documented in previous studies (a close example of this is Valencia Caicedo (2019b)), this is the first time that these effects have been identified and studied in the setting of a rich and developed nation. Furthermore, we complement the purely "economic" aspect of the structural transformation process with some evidence that points towards a "transformation" of the population residing in these areas.

6 Conclusions

In this paper we contribute to the literature on the historical development of the United States, by studying on the relatively unexplored role of the Spanish empire. We focus on an area that was peripheral historically and conquered through the frontier institutions of missions and presidios. We first find that areas closer to historic missions were more religious, but that this effect has dissipated over time. We show that these areas were historically more agricultural, and have moved into manufacturing during more recent times in a process of structural transformation. Missions also fostered human capital accumulation, results that persisted until modern times. In terms of attitudes, areas closer to missions appear to be more liberal nowadays.

Because the establishment and development of missions might have been endogenous to other economic factors and decisions, we use two independent identification strategies. The first one looks at the case of missions that were planned, but were never built in modern-day California. The other, encompassing the whole Southwest, uses the early exploration routes of colonizers of this region. These identification strategies confirm our results and allow us to get closer to causal estimates of the missionary effect.

More broadly, our paper advances the literature on several dimensions. First, it presents a more dynamic picture of the missionary and Spanish colonization processes in the United States. It also focuses on a developed, as opposed to a developing economy, where most of the missionary literature has been centered. Hence, it allows us to study persistence in a context where not only economic incomes, but also mobility are larger. We also expand on the set of outcomes that can be analyzed, beyond economic measures, to also include more attitudinal responses. By and large, the (positive) impact of missions seem to extend to the most advanced economy in the planet.

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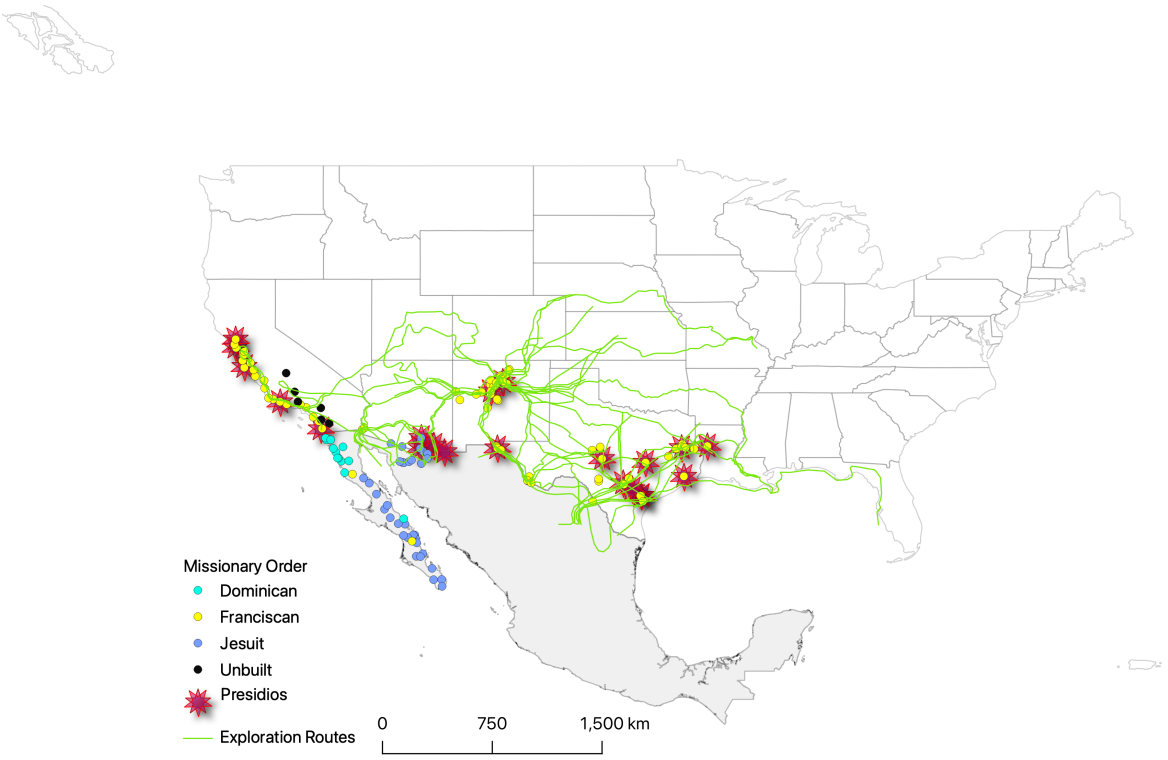
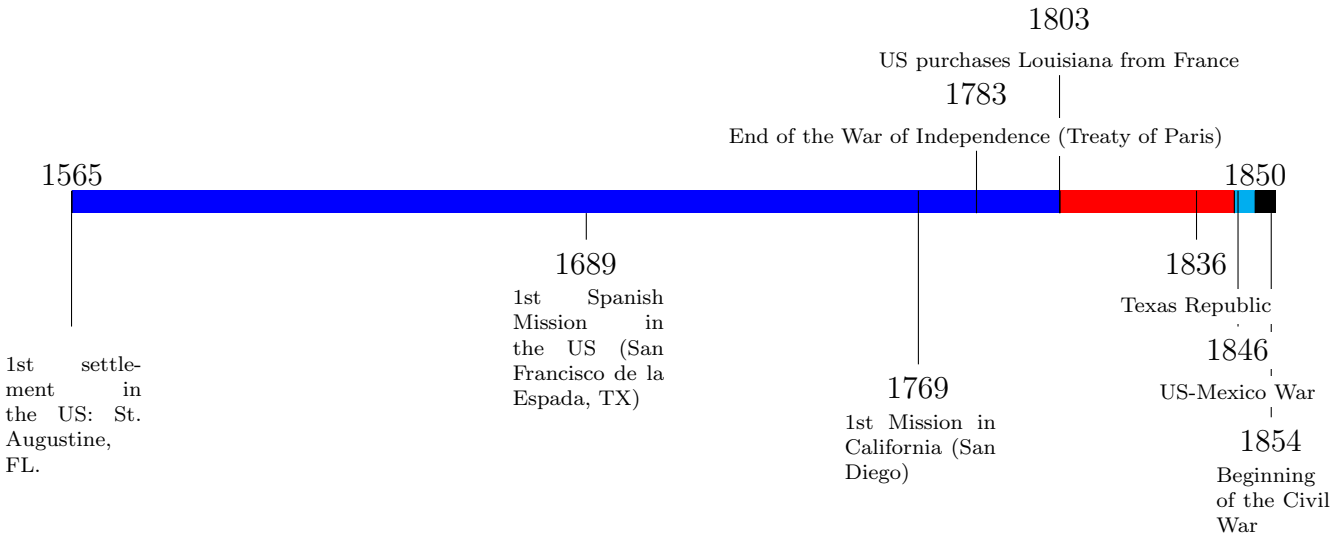
Figures

Figure 1: Missions, presidios and exploration routes in the US



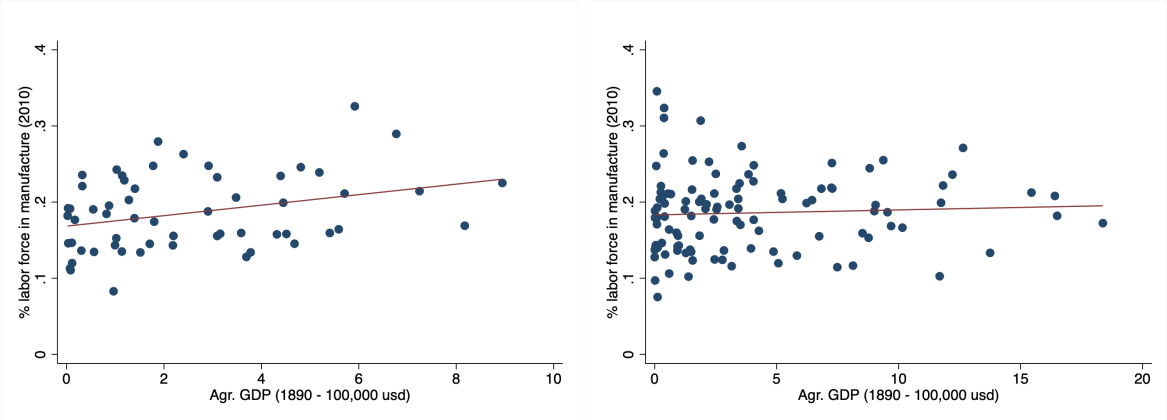
Notes: The figure shows the location of all the colonial Spanish settlements (Missions and Presidios) in the states of Arizona, California, New Mexico and Texas, and as those in Baja California (Mexico). The figure also includes the routes used by the early Spanish explorers in the area. Missions are color coded according to the Catholic order that administered them. See Table A1 for the source of the data.

Figure 2: Main events in the US during sample period



Notes: The figure presents the most relevant events in US history taken place in the region between the arrival of the first Europeans and consolidation of the territories in the region under US control.

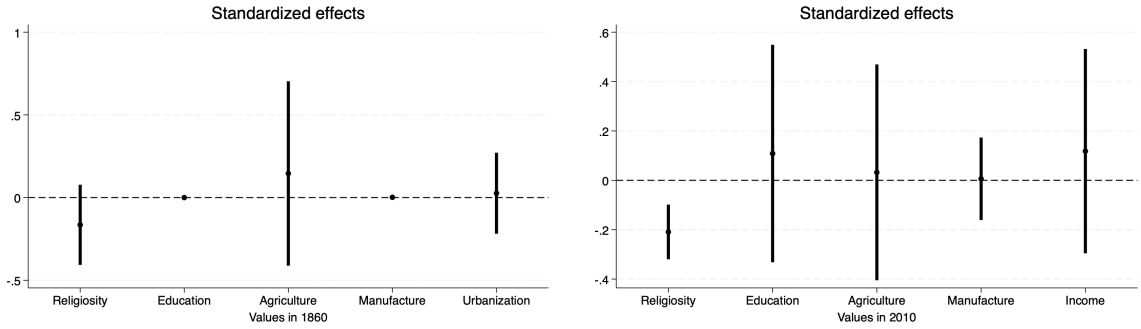
Figure 3: Structural transformation process as in Eckert et al. (2023)



(a) Counties with Mission **(b) Counties with no Mission**

Notes: The figure shows the OLS correlation between the agricultural GDP of counties in 1890 and the share of the labor force in manufacture in 2010. Counties with a Spanish Mission included in panel A, counties without a Mission included in panel B.

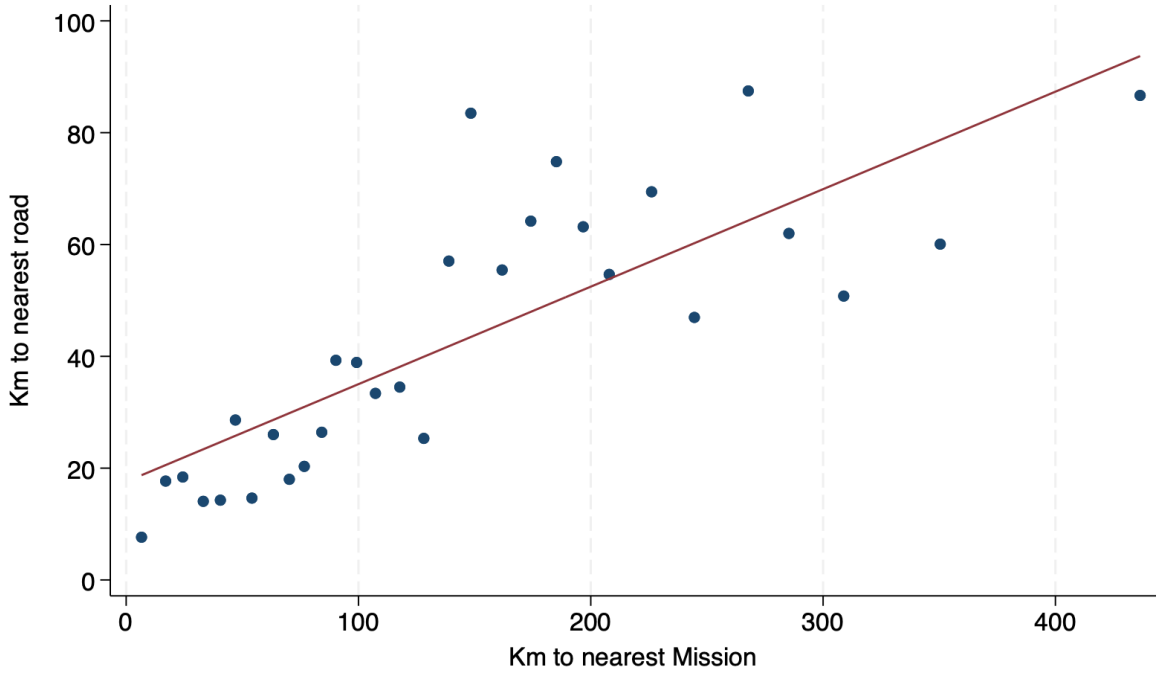
Figure 4: Distance to nearest unbuilt Mission in California



(a) Historical outcomes **(b) Modern outcomes**

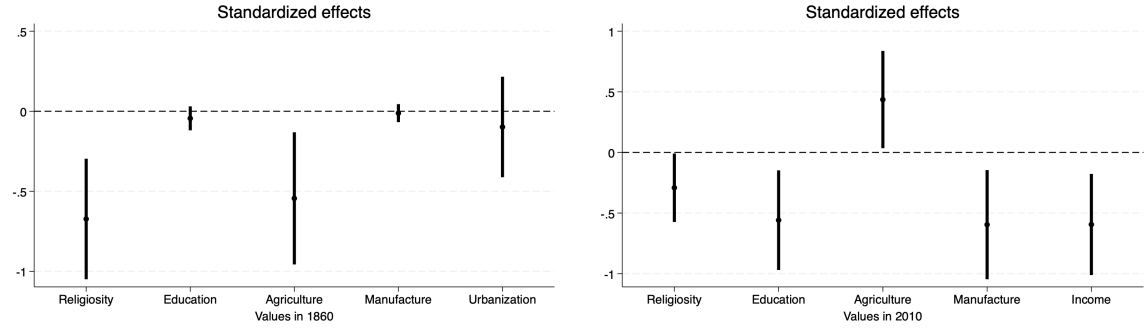
Notes: The figure shows the results of estimating (1) using as dependent variable the distance to the nearest unbuilt Mission. Only counties in California included. All regressions control for average rainfall, temperature spread, ruggedness spread, # of soil types in the county, distance to the coast and # of fresh water sources. Panel A use as outcomes variables drawn from the 1860-70 US censuses, panel B outcomes from the 2010 census. Standard errors clustered at the Mission level.

Figure 5: First stage correlation



Notes: The figure shows the first stage relationship between the distance to the nearest Mission and the distance to the nearest exploration routes. Standard errors clustered at the Mission level.

Figure 6: IV estimates - selected set of outcomes



(a) Historical outcomes **(b) Modern outcomes**

Notes: The figure shows the results of estimating (1), instrumenting the distance to the nearest Mission with the distance to the nearest exploration route. All regressions control for average rainfall, temperature spread, ruggedness spread, # of soil types in the county, distance to the coast and # of fresh water sources. Panel A use as outcomes variables drawn from the 1860-70 US censuses, panel B outcomes from the 2010 census. Standard errors clustered at the Mission level.

OLS results

Table 1: Distance to the closest Catholic Mission and persistence of religiosity

Dependent variable:	# of churches	# of church goers		% of Catholics	
	1860	1860	1890	1980	2000
	(1)	(2)	(4)	(4)	(5)
Distance to nearest Mission (100 k's)	-1.251**	-331.5**	-1,585***	0.00323	-0.000182
	(0.533)	(158.8)	(531.6)	(0.0340)	(0.0230)
Observations	360	360	360	357	357

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, total county area, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast, # of fresh water sources and total population.

Table 2: Distance to the closest Catholic Mission and evidence of structural transformation

	(1)	(2)	(3)
Panel A: Agriculture. Dependent variable:	# of farms 1860	% of labor force in agriculture	
		1970	2010
Distance to nearest Mission (100 k's)	-33.41*	1.169	1.071
	(18.88)	(0.740)	(0.753)
Observations	360	358	360
Panel B: Manufacture. Dependent variable: % of L force in manufacture in:			
	1870	1970	2010
Distance to nearest Mission (100 k's)	65.31	-0.795	-0.801
	(62.30)	(0.613)	(0.491)
Observations	318	358	360

Standard errors clustered at the mission level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. Observation is the county. All regressions control for state fixed effects, total county area, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Distance to nearest mission in kilometers. Only counties in California, Texas, Arizona and New Mexico included.

Table 3: Distance to the nearest Catholic Mission, urbanization and population composition

Dep var: % of ... pop in:	1860			2010		
	urban	white	foreign	urban	white	foreign
	(1)	(2)	(3)	(4)	(5)	(6)
Distance to nearest Mission (100 k's)	-0.657	86,156	1,463	-0.254	4.811***	-0.220
	(0.674)	(85,687)	(1,447)	(2.450)	(0.921)	(0.417)
Observations	318	318	318	360	360	360

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 4: Distance to the nearest Catholic Mission and Infrastructure projects

	(1)	(2)	(3)	(4)	(5)
Panel A: Dep. var. is an indicator of whether a county was connected to Railroads network by...					
	1880	1890	1900	1910	1920
Distance to nearest Mission (100 k's)	-0.134***	-0.0892	-0.0862	-0.0558	-0.0470**
	(0.0419)	(0.0567)	(0.0563)	(0.0497)	(0.0226)
Observations	342	342	342	342	342
Panel B: Dep. var. is the # of miles of Highways completed by:					
	1960	1970	1980	1990	2000
Distance to nearest Mission (100 k's)	-0.299	-3.170**	-3.303	-2.774	-2.764
	(0.548)	(1.530)	(2.255)	(2.324)	(2.317)
Observations	342	342	342	342	342

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Railroads data from (Sequeira, Nunn, & Qian, 2020). Highways data from (Baum-Snow, 2007).

Table 5: Distance to the nearest Catholic Mission - education

	(1)	(2)	(3)
Panel A: Dep var. is ...:	Iliteracy (1860)	Med. schooling years (1950)	Education level (2010)
Distance to nearest Mission (100 k's)	0.00948	-0.605**	-0.0646*
	(0.0263)	(0.181)	(0.0373)
Observations	318	354	12,339
Panel B: Dep var. is ...:	Enrollment (1860)	Enrollment (1950)	% without schooling (2010)
Distance to nearest Mission (100 k's)	-2,457	-0.00314	0.00373
	(1,859)	(0.00189)	(0.00250)
Observations	298	360	12,339

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 6: Distance to the nearest Catholic Mission - upper tails of human K & attitudes

	(1)	(2)	(3)
Panel A: upper tails of human K. Dep. var. is the # of ... per 100,000 inhabitants in 1950			
	Patents	Engineers	Doctors & Lawyers
Distance to nearest Mission (100 k's)	0.0423	-0.00376	-0.00914**
	(0.103)	(0.00274)	(0.00345)
Observations	254	260	277
Panel B: CCES outcomes. Dependent var. is an indicator of whether the respondent is:			
	Democrat	Pro-abortion	Anti-immigration
Distance to nearest Mission (100 k's)	-0.0489***	-0.0335***	0.0298**
	(0.0182)	(0.0106)	(0.0130)
Observations	9,121	12,330	2,353

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 7: Distance to the nearest Mission and economic outcomes

Dependent var. is:	% poor population	Income PC	Gini	Median HH income
	(1)	(2)	(3)	(4)
Distance to nearest Mission (100 k's)	1.176**	154.1	-0.00105	-529.2
	(0.508)	(820.8)	(0.00331)	(1,491)
Observations	360	360	360	360

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Placebo exercises: Unbuilt Missions in California

Table 8: Placebo - Distance to the closest (unbuilt) Mission and persistence of religiosity

Dependent variable:	# of churches	# of church goers		% of Catholics	
	1860	1860	1890	1980	2000
	(1)	(2)	(4)	(4)	(5)
Distance to nearest unbuilt Mission (100 k's)	-1.041	-348.1	-2,004	-0.0123	-0.0441**
	(0.608)	(242.8)	(1,725)	(0.0121)	(0.0157)
Observations	58	58	58	58	58

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, total county area, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast, # of fresh water sources and total population.

Table 9: Placebo - Structural Transformation

	(1)	(2)	(3)
Panel A: Agriculture. Dependent variable:	# of farms 1860	% of labor force in agriculture	
		1950	2010
Distance to nearest unbuilt Mission (100 k's)	31.08	1.510	0.290
	(56.38)	(2.230)	(1.863)
Observations	58	58	58
Panel B: Manufacture. Dependent variable: % of L force in manufacture in:			
	1870	1970	2010
Distance to nearest unbuilt Mission (100 k's)	1.453	0.781	0.0339
	(3.340)	(0.577)	(0.440)
Observations	58	58	58

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, total county area, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 10: Placebo - Urbanization and population composition

Dep var: % of ... pop in:	1860			2010		
	urban	white	foreign	urban	white	foreign
	(1)	(2)	(3)	(4)	(5)	(6)
Distance to nearest unbuilt Mission (100 k's)	-1.745	20.97	11.17	-4.345	-0.918	-0.318
	(1.604)	(39.49)	(28.63)	(4.096)	(2.054)	(0.750)
Observations	58	58	58	58	58	58

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 11: Placebo - Infrastructure

	(1)	(2)	(3)	(4)	(5)
Panel A: Dep var is an indicator of whether county was connected to Railroads network by:					
	1880	1890	1900	1910	1920
Distance to nearest unbuilt Mission (100 k's)	0.129	-0.0223	0.0291	-0.0399	-0.0451**
	(0.116)	(0.0841)	(0.0729)	(0.0382)	(0.0182)
Observations	58	58	58	58	58
Panel B: Dep var is # of miles of Highway's completed by:					
	1960	1970	1980	1990	2000
Distance to nearest unbuilt Mission (100 k's)	2.532	11.20**	10.72*	12.38*	12.43**
	(2.388)	(4.034)	(5.264)	(5.923)	(5.856)
Observations	58	58	58	58	58

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Railroads data from (Sequeira et al., 2020); highways data from (Baum-Snow, 2007).

Table 12: Placebo - education

	(1)	(2)	(3)
Panel A: Dep var. is ...:	Iliteracy (1860)	Med. schooling years (1950)	Education level (2010)
Distance to nearest unbuilt Mission (100 k's)	-0.00726	-0.764	0.00249
	(0.00619)	(0.460)	(0.0480)
Observations	58	57	6,021
Panel B: Dep var. is ...:	Enrollment (1860)	Enrollment (1950)	% without schooling (2010)
Distance to nearest unbuilt Mission (100 k's)	-0.0258*	-0.00378	0.000388
	(0.0132)	(0.00343)	(0.00300)
Observations	58	58	6,021

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 13: Placebo - upper tails of human K & attitudes

	(1)	(2)	(3)
Panel A: upper tails of human K. Dep. var. is the # of ... per 100,000 inhabitants in 1950			
	Patents	Engineers	Doctors & Lawyers
Distance to nearest unbuilt Mission (100 k's)	-0.117	0.0178	0.0182
	(0.0680)	(0.0156)	(0.0150)
Observations	51	49	52
Panel B: CCES outcomes. Dependent var. is an indicator of whether the respondent is:			
	Democrat	Pro-abortion	Anti-immigration
Distance to nearest unbuilt Mission (100 k's)	0.00790	-0.00665	0.00593
	(0.0266)	(0.0141)	(0.0177)
Observations	4,523	6,016	1,093

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 14: Placebo - Economic outcomes

Dependent var. is:	% poor population	Income PC	Gini	Median HH income
	(1)	(2)	(3)	(4)
Distance to nearest unbuilt Mission (100 k's)	1.384***	705.1	-0.00259	-1,171
	(0.380)	(1,170)	(0.00251)	(2,462)
Observations	58	58	58	58

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Instrumental Variable regressions - Exploration routes

Table 15: First stage regressions: Distance to nearest Mission/Presidio & distance to nearest exploration route

Dependent variable: distance to nearest Mission		
	(1)	(2)
Dist. to nearest exploration route	0.754***	0.638***
	(0.133)	(0.139)
# of exploration routes through county		-1.744
		(5.618)
1000 km's of routes in county		-0.0868
		(0.0962)
Observations	360	360
R-squared	0.611	0.619
F-stat	127.5	173.5

Standard errors clustered at the mission level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. Observation is the county. Dependent variable the distance to the nearest mission. Column 2 controls for the number of different roads and the amount of "road-kms" in county. Covariates included are state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Only counties in California, Texas, Arizona and New Mexico included. All distances measured in km.

Table 16: IV - Distance to the nearest exploration route and persistence of religiosity

Dependent variable:	# of churches	# of church goers		% of Catholics	
	1860	1860	1890	1980	2000
	(1)	(2)	(4)	(4)	(5)
Distance to nearest Mission (100 k's)	-4.324***	-1,422***	-5,319***	0.0270	0.0420
	(1.196)	(259.1)	(1,823)	(0.101)	(0.0576)
Observations	360	360	360	357	357
1st stage F-test	33.50	33.50	33.50	33.46	33.46

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, total county area, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast, # of fresh water sources and total population.

Table 17: IV - Structural Transformation

	(1)	(2)	(3)
Panel A: Agriculture. Dependent variable:	# of farms 1860	% of labor force in agriculture	
		1950	2010
Distance to nearest Mission (100 k's)	-116.1***	5.460***	3.921**
	(44.92)	(2.080)	(1.839)
Observations	360	358	360
1st stage F-test	23.33	22.35	23.35
Panel B: Manufacture. Dependent variable: % of L force in manufacture in:			
	1870	1970	2010
Distance to nearest Mission (100 k's)	-10.43	-4.391**	-3.304***
	(25.32)	(1.842)	(1.274)
Observations	318	358	360
1st stage F-test	56.12	22.35	23.35

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, total county area, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 18: IV - Urbanization and population composition

Dep var: % of ... pop in:	1860			2010		
	urban	white	foreign	urban	white	foreign
	(1)	(2)	(3)	(4)	(5)	(6)
Distance to nearest Mission (100 k's)	-0.974	-53,552	-483.9	-5.936	9.760***	-0.0126
	(1.588)	(53,978)	(781.0)	(4.561)	(1.425)	(0.679)
Observations	318	318	318	360	360	360
1st stage F-test	56.12	56.12	56.12	23.35	23.35	23.35

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 19: IV - Infrastructure

	(1)	(2)	(3)	(4)	(5)
Panel A: Dep var. is an indicator of whether county was connected to Railroads network by:					
	1880	1890	1900	1910	1920
Distance to nearest Mission (100 k's)	-0.271**	-0.318***	-0.323***	-0.310***	-0.184***
	(0.112)	(0.103)	(0.0944)	(0.0923)	(0.0616)
Observations	342	342	342	342	342
1st stage F-test	17.58	17.58	17.58	17.58	17.58
Panel B: Dep var is the # of miles of Highway's completed by:					
	1960	1970	1980	1990	2000
Distance to nearest Mission (100 k's)	-0.560	-5.536	-7.789	-7.760	-7.556
	(2.200)	(4.619)	(6.397)	(6.466)	(6.434)
Observations	342	342	342	342	342
1st stage F-test	17.58	17.58	17.58	17.58	17.58

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Railroads data from (Sequeira et al., 2020); highways data from (Baum-Snow, 2007).

Table 20: IV - education

	(1)	(2)	(3)
Panel A: Dep var. is ...:	Iliteracy (1860)	Med. schooling years (1950)	Education level (2010)
Distance to nearest Mission (100 k's)	0.0119	-0.394	-0.316***
	(0.0352)	(0.513)	(0.101)
Observations	318	354	12,339
1st stage F-test	56.12	22.13	13.39
Panel B: Dep var. is ...:	Enrollment (1860)	Enrollment (1950)	% without schooling (2010)
Distance to nearest Mission (100 k's)	-606.8	-0.0116**	0.00896*
	(522.7)	(0.00481)	(0.00541)
Observations	298	360	12,339
1st stage F-test	67.76	23.33	13.39

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, total county area, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 21: IV - upper tails of human K & attitudes

	(1)	(2)	(3)
Panel A: upper tails of human K. Dep. var. is the # of ... per 100,000 inhabitants in 1950			
	Patents	Engineers	Doctors & Lawyers
Distance to nearest Mission (100 k's)	-0.0321	-0.0106	-0.0282**
	(0.175)	(0.0138)	(0.0126)
Observations	254	260	277
1st stage F-test	18.79	11.27	16.08
Panel B: CCES outcomes. Dependent var. is an indicator of whether the respondent is:			
	Democrat	Pro-abortion	Anti-immigration
Distance to nearest Mission (100 k's)	-0.0448	-0.0657***	0.0107
	(0.0340)	(0.0212)	(0.0307)
Observations	9,121	12,330	2,353
1st stage F-test	27	27.65	23.21

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table 22: IV - Economic outcomes

Dependent var. is:	% poor population	Income PC	Gini	Median HH income
	(1)	(2)	(3)	(4)
Distance to nearest Mission (100 k's)	-0.758	-3,543***	0.00236	-9,996***
	(1.248)	(1,269)	(0.00582)	(2,908)
Observations	360	360	360	360
1st stage F-test	23.35	23.35	23.35	23.35

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

A Appendix Figures

Figure A1: Catholic Missions in Baja California

Figure A2: Early exploration routes in the US - Original data

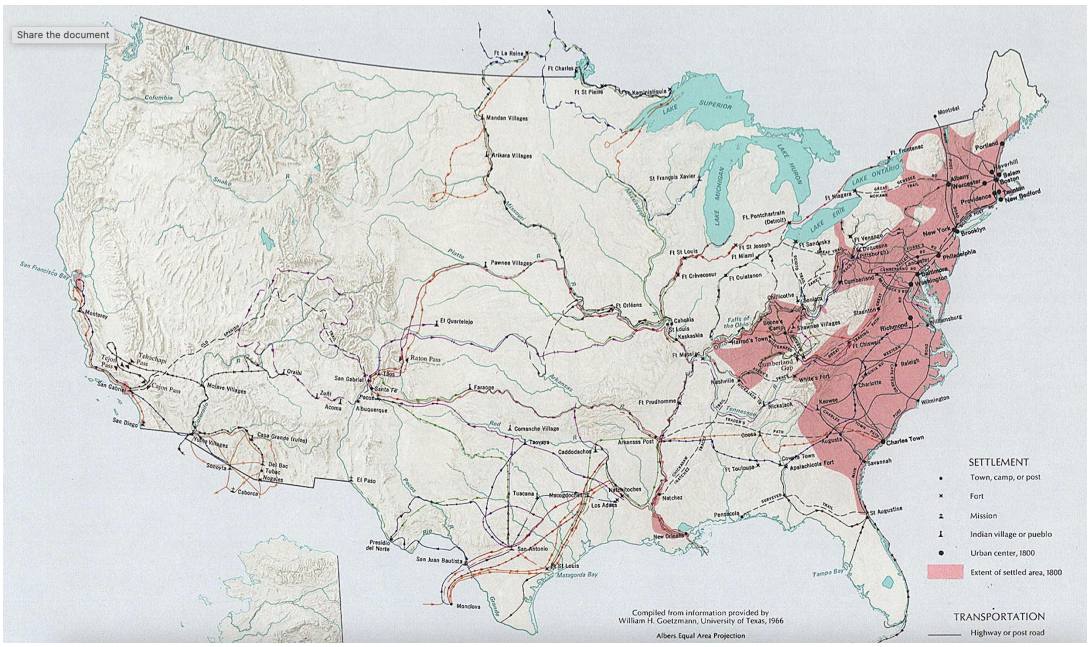
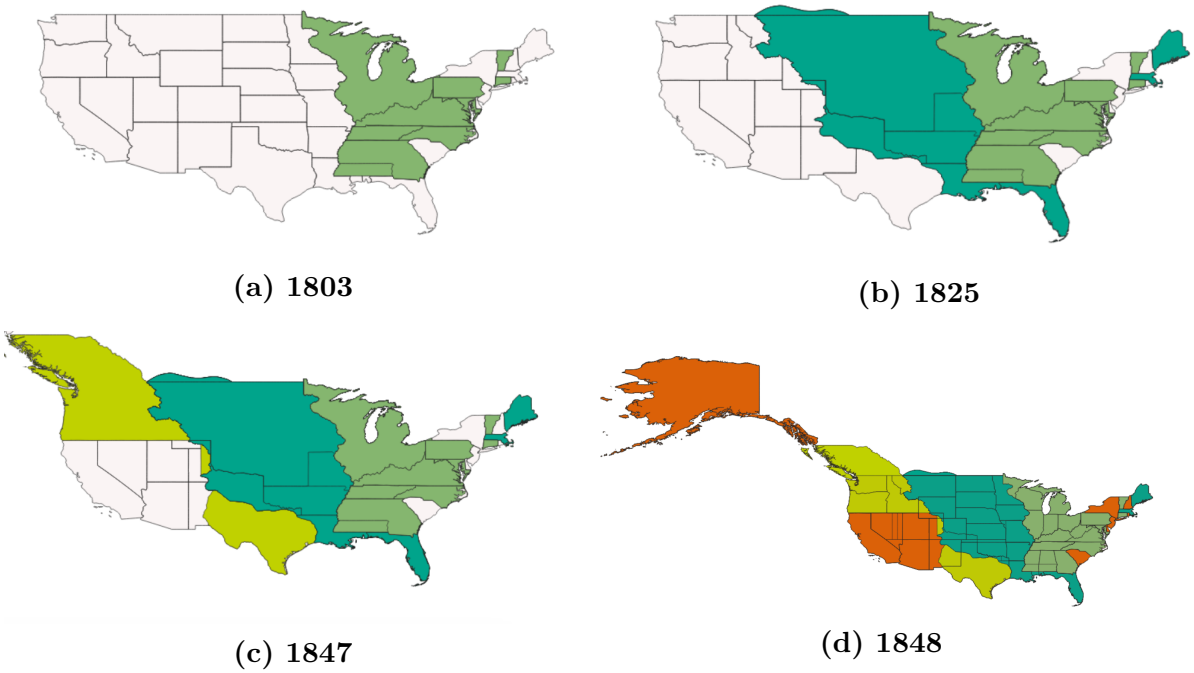


Figure A3: Territorial evolution of the United States



(a) 1803 **(b) 1825**

(c) 1847 **(d) 1848**

Appendix Tables

Table A1: Variables and sources

Variable	Description	Source
Panel A. Dependent variables: Census data		
# of churches	# of religious establishments in county	United States Census Bureau and NHGIS
# of church goers	Estimated total capacity of religious establishments in county	
% of school enrollment (whites)	Ratio of students to total population of schooling age. White students to white total population of schooling age.	
% of illiteracy (whites)	Share of population that can not read (analogous for white population).	
Agricultural GDP	Total value of agricultural production	
Value of farms	Cash value of all farms in county	
# of farms	Number of farms in county	
% of labor in agriculture	Ration of labor in manufacture to total labor force	

Continued on next page

Table A1 – Variables and sources, continued from previous page

Variable	Description	Source
# of manufacture establishments	Number of establishments in the manufacture sector in county	
Share of Catholics	Ratio of Catholic population to total population	
Value of agricultural capital	Cash value of all assets (machinery, stocks, etc.) of farms in county	
% of labor in agriculture	Ration of labor in agriculture to total labor force	
Median school years		
% of schooling completion (by "category")	Share of population that has completed, at most, each schooling category.	
Panel B. Dependent variables: Cooperative (Congressional) Election Study		
Indicator of being a democrat	= 1 whenever the participant reports supporting the democratic party.	(Ansolabehere & Rivers, 2013)
Indicator of being a liberal	= 1 whenever the participant reports being a liberal	
Indicator of approving of Obama's government	= 1 whenever the participant reports not approving Obama's government.	
Indicator of supporting abortion	= 1 whenever the participant reports supporting abortion in all cases.	
Indicator of being against limits to abortion	= 1 whenever the participant reports being against any type of limit to abortion (time, cases, etc.).	
Indicator of not supporting immigrants	= 1 whenever the participant thinks immigration is one of the biggest issues the US faces.	
Panel C. Independent variables		
Distance to nearest Mission	Linear distance from county's centroid to the nearest Missionary settlement.	(Deasy & Gerhard, 1944; Weber, 2000; Beattie, 1929; Fontana, 2013)

Continued on next page

Table A1 – Variables and sources, continued from previous page		
Variable	Description	Source
Distance to nearest unbuilt Mission	Linear distance from county's centroid to the nearest location where a Mission was to be built but never was. Only for counties in the state of California	
Distance to nearest exploration route Mission	Linear distance from county's centroid to the nearest point that along any route followed by the early explorers in the region	(Perry-Castaneda, 2022)
Panel D. Other covariates		
% of county's area in land	Ratio between square kilometers of county's area in land and under water.	ArcGIS hub (link)
Average rainfall	Average rainfall level in county between 1990 and 2009.	NOAA National Weather Service (link).
Temperature Spread	Maximum temperature in county between 1990 and 2009 minus minimum temperature in county in same period.	GBLCC - Data Basin (link).
Ruggedness spread	Maximum elevation in county minus minimum elevation in county.	Natural Earth Data (link).
# of different soil types	Number of different types of soil (out of 68 possible types) found within county in 2015.	USDA (link).
Distance to the coast	Linear distance from the county's centroid to the nearest point along the (ocean) coast	NOAA shoreline (link).
# of fresh water sources	Number of different sources of fresh water available within county's boundaries.	ArcGIS hub (link)

Presidios: alternative Spanish settlements

Robustness: Log (distances)

Table A2: Presidios - (instrumented) Distance to the nearest presidio and persistence of religiosity

Dependent variable:	# of churches	# of church goers		% of Catholics	
	1860	1860	1890	1980	2000
	(1)	(2)	(4)	(4)	(5)
Distance to nearest Presidio (100 k's)	-0.0461***	-15.16***	-56.71***	0.000291	0.000452
	(0.0102)	(1.903)	(21.77)	(0.00108)	(0.000590)
Observations	360	360	360	357	357
1st stage F-test	91.95	91.95	91.95	57.88	57.88

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast, # of fresh water sources and total population.

Table A3: Presidios IV - Structural Transformation

	(1)	(2)	(3)
Panel A: Agriculture. Dependent variable:	# of farms 1860	% of labor force in agriculture	
		1950	2010
Distance to nearest Presidio (100 k's)	-1.238**	0.0585***	0.0415**
	(0.484)	(0.0223)	(0.0194)
Observations	360	358	360
1st stage F-test	22.02	21.25	23.06
Panel B: Manufacture. Dependent variable: % of L force in manufacture in:			
	1870	1970	2010
Distance to nearest Presidio (100 k's)	-11.40	-4.701**	-3.499***
	(27.72)	(1.893)	(1.328)
Observations	318	358	360
1st stage F-test	41.10	21.25	23.06

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A4: Presidios IV - Urbanization and population composition

Dep var: % of ... pop in:	1860			2010		
	urban	white	foreign	urban	white	foreign
	(1)	(2)	(3)	(4)	(5)	(6)
Distance to nearest Presidio (100 k's)	-0.0106	-585.3	-5.289	-0.0629	0.103***	-0.000134
	(0.0174)	(593.6)	(8.525)	(0.0484)	(0.0168)	(0.00720)
Observations	318	318	318	360	360	360
1st stage F-test	41.10	41.10	41.10	23.06	23.06	23.06

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A5: Presidios IV - Infrastructure

	(1)	(2)	(3)	(4)	(5)
Panel A: Dep var. is an indicator of whether county was connected to Railroads network by:					
	1880	1890	1900	1910	1920
Distance to nearest Presidio (100 k's)	-0.329***	-0.334***	-0.321***	-0.190***	
	(0.102)	(0.0972)	(0.0950)	(0.0634)	
Observations	342	342	342	342	
1st stage F-test	18.83	18.83	18.83	18.83	
Panel B: Dep var is the # of miles of Highway's completed by:					
	1960	1970	1980	1990	2000
Distance to nearest Presidio (100 k's)	-5.726	-8.055	-8.025	-7.814	
	(4.606)	(6.311)	(6.373)	(6.355)	
Observations	342	342	342	342	
1st stage F-test	18.83	18.83	18.83	18.83	

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Railroads data from (Sequeira et al., 2020); highways data from (Baum-Snow, 2007).

Table A6: Presidios IV - education

	(1)	(2)	(3)
Panel A: Dep var. is ...:	Iliteracy (1860)	Med. schooling years (1950)	Education level (2010)
Distance to nearest Presidio (100 k's)	0.0130	-0.422	-0.451**
	(0.0383)	(0.557)	(0.189)
Observations	318	354	12,339
1st stage F-test	41.10	20.84	7.233
Panel B: Dep var. is ...:	Enrollment (1860)	Enrollment (1950)	% without schooling (2010)
Distance to nearest Presidio (100 k's)	-673.5	-0.0124**	0.0128*
	(574.1)	(0.00509)	(0.00769)
Observations	298	360	12,339
1st stage F-test	44.70	22.02	7.233

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A7: Presidios IV - upper tails of human K & attitudes

	(1)	(2)	(3)
Panel A: upper tails of human K. Dep. var. is the # of ... per 100,000 inhabitants in 1950			
	Patents	Engineers	Doctors & Lawyers
Distance to nearest Presidio (100 k's)	-0.0360	-0.0116	-0.0300**
	(0.196)	(0.0148)	(0.0134)
Observations	254	260	277
1st stage F-test	15.06	9.795	14.86
Panel B: CCES outcomes. Dependent var. is an indicator of whether the respondent is:			
	Democrat	Pro-abortion	Anti-immigration
Distance to nearest Presidio (100 k's)	-0.0646	-0.0939**	0.0148
	(0.0587)	(0.0413)	(0.0428)
Observations	9,121	12,330	2,353
1st stage F-test	11.26	11.87	9.834

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A8: Presidios IV - Economic outcomes

Dependent var. is:	% poor population	Income PC	Gini	Median HH income
	(1)	(2)	(3)	(4)
Distance to nearest Presidio (100 k's)	-37.53***	2.50e-05	-105.9***	
	(13.10)	(6.10e-05)	(29.05)	
Observations	360	360	360	
1st stage F-test	23.06	23.06	23.06	

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A9: First stage regressions: log distance to nearest Mission/Presidio & log distance to nearest exploration route

Dependent variable: log distance to nearest Mission		
	(1)	(2)
Log dist. to nearest exploration route	0.204***	0.0793
	(0.0471)	(0.0520)
# of exploration routes through county		-0.154***
		(0.0533)
1000 km's of routes in county		-0.000309
		(0.000881)
Observations	360	360
R-squared	0.438	0.481
F-stat	35.66	29.79

Standard errors clustered at the mission level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. Observation is the county. Dependent variable the distance to the nearest mission. Column 2 controls for the number of different roads and the amount of "road-kms" in county. Covariates included are state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Only counties in California, Texas, Arizona and New Mexico included. All distances measured in km.

Table A10: Log distance to the closest Catholic Mission and persistence of religiosity

Dependent variable:	# of churches	# of church goers		% of Catholics	
	1860	1860	1890	1980	2000
	(1)	(2)	(4)	(4)	(5)
Log distance to nearest Mission	-0.951*	-243.9*	-1,283**	-0.000908	-0.00685
	(0.478)	(135.1)	(578.0)	(0.0251)	(0.0177)
Observations	360	360	360	357	357

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast, # of fresh water sources and total population.

Table A11: IV - Log distance to the nearest exploration route and persistence of religiosity

Dependent variable:	# of churches	# of church goers		% of Catholics	
	1860	1860	1890	1980	2000
	(1)	(2)	(4)	(4)	(5)
Log distance to nearest Mission	-4.122***	-1,347***	-2,350	-0.0381	-0.0123
	(1.166)	(204.5)	(2,134)	(0.0902)	(0.0472)
Observations	360	360	360	357	357
1st stage F-test	9.037	9.037	9.037	11.60	11.60

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast, # of fresh water sources and total population.

Table A12: Log distance to the closest Catholic Mission and evidence of structural transformation

	(1)	(2)	(3)
Panel A: Agriculture. Dependent variable:	# of farms 1860	% of labor force in agriculture	
		1970	2010
Log distance to nearest Mission	-18.78	1.133*	1.140**
	(15.45)	(0.652)	(0.551)
Observations	360	358	360
Panel B: Manufacture. Dependent variable: % of L force in manufacture in:			
	1870	1970	2010
Log distance to nearest Mission	50.53	-0.113	-0.409
	(48.69)	(0.639)	(0.408)
Observations	318	358	360

Standard errors clustered at the mission level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Distance to nearest mission in kilometers. Only counties in California, Texas, Arizona and New Mexico included.

Table A13: IV - Structural Transformation

	(1)	(2)	(3)
Panel A: Agriculture. Dependent variable:	# of farms 1860	% of labor force in agriculture	
		1950	2010
Log distance to nearest Mission	-40.63	3.365**	1.759
	(28.01)	(1.633)	(1.728)
Observations	360	358	360
1st stage F-test	18.33	18.01	18.94
Panel B: Manufacture. Dependent variable: % of L force in manufacture in:			
	1870	1970	2010
Log distance to nearest Mission	100.7	-1.176	-0.892
	(105.6)	(1.889)	(1.525)
Observations	318	358	360
1st stage F-test	33.36	18.01	18.94

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A14: Log distance to the nearest Catholic Mission, urbanization and population composition

Dep var: % of ... pop in:	1860			2010		
	urban	white	foreign	urban	white	foreign
	(1)	(2)	(3)	(4)	(5)	(6)
Log distance to nearest Mission	-0.696	59,296	1,324	-1.337	4.028***	-0.337
	(0.702)	(58,971)	(1,297)	(2.369)	(0.718)	(0.407)
Observations	318	318	318	360	360	360

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A15: IV - Urbanization and population composition

Dep var: % of ... pop in:	1860			2010		
	urban	white	foreign	urban	white	foreign
	(1)	(2)	(3)	(4)	(5)	(6)
Log distance to nearest Mission	-3.554	21,493	525.0	-7.450	5.288**	-0.664
	(3.849)	(36,238)	(987.2)	(5.680)	(2.117)	(1.012)
Observations	318	318	318	360	360	360
1st stage F-test	33.36	33.36	33.36	18.94	18.94	18.94

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A16: Log distance to the nearest Catholic Mission and Infrastructure projects

	(1)	(2)	(3)	(4)	(5)
Panel A: Dep. var. is an indicator of whether a county was connected to Railroads network by...					
	1880	1890	1900	1910	1920
Log distance to nearest Mission	-0.0820*	-0.0663*	-0.0614*	-0.0404	-0.0330*
	(0.0426)	(0.0352)	(0.0345)	(0.0287)	(0.0166)
Observations	342	342	342	342	342
Panel B: Dep. var. is the # of miles of Highways completed by:					
	1960	1970	1980	1990	2000
Log distance to nearest Mission	-1.559*	-5.546**	-5.922*	-5.837*	-5.907*
	(0.794)	(2.628)	(3.388)	(3.478)	(3.513)
Observations	342	342	342	342	342

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Railroads data from (Sequeira et al., 2020). Highways data from (Baum-Snow, 2007).

Table A17: IV - Infrastructure

	(1)	(2)	(3)	(4)	(5)
Panel A: Dep var. is an indicator of whether county was connected to Railroads network by:					
	1880	1890	1900	1910	1920
Log distance to nearest Mission	-0.0285	-0.105	-0.0878	-0.0562	-0.0246
	(0.122)	(0.0931)	(0.0977)	(0.0933)	(0.0786)
Observations	342	342	342	342	342
1st stage F-test	15.66	15.66	15.66	15.66	15.66
Panel B: Dep var is the # of miles of Highway's completed by:					
	1960	1970	1980	1990	2000
Log distance to nearest Mission	-1.001	-11.43*	-15.87*	-16.99*	-17.04*
	(2.323)	(6.827)	(8.916)	(9.297)	(9.341)
Observations	342	342	342	342	342
1st stage F-test	15.66	15.66	15.66	15.66	15.66

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources. Railroads data from (Sequeira et al., 2020); highways data from (Baum-Snow, 2007).

Table A18: Log distance to the nearest Catholic Mission - education

	(1)	(2)	(3)
Panel A: Dep var. is ...:	Iliteracy (1860)	Med. schooling years (1950)	Education level (2010)
Log distance to nearest Mission	-0.00600	-0.0666	-0.114***
	(0.0185)	(0.115)	(0.0376)
Observations	318	354	12,339
Panel B: Dep var. is ...:	Enrollment (1860)	Enrollment (1950)	% without schooling (2010)
Log distance to nearest Mission	-4,065	-0.00172	0.00398**
	(3,405)	(0.00159)	(0.00177)
Observations	298	360	12,339

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A19: IV - education

	(1)	(2)	(3)
Panel A: Dep var. is ...:	Iliteracy (1860)	Med. schooling years (1950)	Education level (2010)
Log distance to nearest Mission	-0.0318	1.622*	-0.241**
	(0.0447)	(0.840)	(0.101)
Observations	318	354	12,339
1st stage F-test	33.36	17.12	12.91
Panel B: Dep var. is ...:	Enrollment (1860)	Enrollment (1950)	% without schooling (2010)
Log distance to nearest Mission	-1,808	-0.00374	0.00960*
	(1,552)	(0.00342)	(0.00568)
Observations	298	360	12,339
1st stage F-test	38.32	18.33	12.91

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A20: Log distance to the nearest Catholic Mission - upper tails of human K & attitudes

	(1)	(2)	(3)
Panel A: upper tails of human K. Dep. var. is the # of ... per 100,000 inhabitants in 1950			
	Patents	Engineers	Doctors & Lawyers
Log distance to nearest Mission	-0.0501	-0.00628*	-0.00889**
	(0.0708)	(0.00335)	(0.00348)
Observations	254	260	277
Panel B: CCES outcomes. Dependent var. is an indicator of whether the respondent is:			
	Democrat	Pro-abortion	Anti-immigration
Log distance to nearest Mission	-0.0356***	-0.0259***	0.0159*
	(0.0121)	(0.00632)	(0.00911)
Observations	9,121	12,330	2,353

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A21: IV - upper tails of human K & attitudes

	(1)	(2)	(3)
Panel A: upper tails of human K. Dep. var. is the # of ... per 100,000 inhabitants in 1950			
	Patents	Engineers	Doctors & Lawyers
Log distance to nearest Mission	0.169	-0.00656	-0.0185
	(0.317)	(0.0135)	(0.0131)
Observations	254	260	277
1st stage F-test	17.49	11.84	17.75
Panel B: CCES outcomes. Dependent var. is an indicator of whether the respondent is:			
	Democrat	Pro-abortion	Anti-immigration
Log distance to nearest Mission	0.000659	-0.0331	0.00609
	(0.0365)	(0.0204)	(0.0243)
Observations	9,121	12,330	2,353
1st stage F-test	13.66	12.76	13.42

Standard errors clustered at the mission level in parenthesis. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A22: Log distance to the nearest Mission and economic outcomes

Dependent var. is:	% poor population	Income PC	Gini	Median HH income
	(1)	(2)	(3)	(4)
Log distance to nearest Mission	0.972**	-247.6	-0.00302	-969.4
	(0.481)	(642.4)	(0.00313)	(1,225)
Observations	360	360	360	360

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.

Table A23: IV - Economic outcomes

Dependent var. is:	% poor population	Income PC	Gini	Median HH income
	(1)	(2)	(3)	(4)
Log distance to nearest Mission	0.670	-2,812**	0.00694	-7,961**
	(1.632)	(1,408)	(0.00845)	(3,270)
Observations	360	360	360	360
1st stage F-test	18.94	18.94	18.94	18.94

Standard errors clustered at the mission level in parenthesis. Observation is the county. All regressions control for state fixed effects, % of county's are that in land, average rainfall, temperature spread, ruggedness spread, # of soil types in county, distance to the coast and # of fresh water sources.