

ONLINE APPENDIX

I. DATA APPENDIX

I.A. Human Capital

Illiteracy: Illiteracy rates are measured in percentages of the relevant population. Data for Brazil are also from the IBGE is for people aged 15 or 25 and above in 2000. Data for Paraguay come from DGEEC and are for people aged ten years and above in 2002. Literacy data for Argentina are again from INDEC for people aged ten years and above in 2001.

Median Years of Schooling: Brazil's IBGE reports data on median years of schooling for people 25 aged years and above in 2000. No similar information is reported for Argentina or Paraguay.

Postwar Education: Illiteracy rates for Argentina (1970, 1980 and 1991) and Paraguay (1962, 1972 and 1982), and median years of schooling in Brazil (1980 and 1991) at the individual level were obtained through the IPUMS project.

I.B. Income and Poverty

Income: Data for Brazil comes from the *Instituto Brasileiro de Geografia e Estatística* (IBGE) and can be accessed through IPEA.¹ The data measures total annual income in 2000 in contemporary Brazilian R\$. As is standard, I take the natural logarithm of this number. Comparable data for Paraguay are available from the World Bank (2008) World Development Report on Reshaping Economic Geography, for details see Maloney and Valencia Caicedo (2016).

Poverty: Since income data are not available at the municipality level for Argentina, I instead use poverty data on the Unsatisfied Basic Needs (UBN) index measured for both households and individuals. The data for Argentina are from the *Instituto Nacional de Estadística y Censos* (INDEC) for 2001.² Similar data for Paraguay comes from the *Dirección General de Estadística, Encuestas y Censos* (DGEEC) and is for 2002. The UBN index is normalized from 0 to 100.³

¹<http://www.ibge.gov.br/home/> and <http://www.ipeadata.gov.br/>

²<http://www.indec.mecon.ar/>

³<http://www.dgeec.gov.py/>

Nighttime Satellite Data: I use the nighttime satellite data from the F18-2010 mission, available at <http://ngdc.noaa.gov/eog/dmsp/downloadV4composites.html>.

I.C. Missionary Presence

Missionary Dummy: Is the coarsest measure and takes the value of 1 for the municipality that had a mission historically and 0 otherwise.

Missionary Distance: This more continuous variable denotes the distance between a municipality's centroid and the closest historical mission. It is measured in kilometers and calculated using STATA and ArcGIS. A similar measure is used to study the effect of abandoned and Franciscan missions.

Missionary Population: For most of the thirty Jesuit missions I was able to obtain historical information on the indigenous population from the *Archivo General de Indias* and the Roman Jesuit Archive (Vatican). Though incomplete, the records cover the period from 1650 to 1790, giving a rough picture of the contemporary conditions of the religious establishments (see Figure A.3). Comparable information is also available for Franciscan missions.

Year of Foundation: I obtained the year of foundation of Guarani Jesuit missions from these same sources.

Mission Moved: I construct a dummy variable taking the value of 1 if the mission moved and 0 otherwise.

I.D. Geographic and Weather Controls

Area: Total area in squared kilometers taken from IBGE (2010) for Brazil, and calculated with ArcGIS for Argentina and Paraguay.

Altitude: Elevation measured in meters over sea level originally available at high resolution from WorldClim and processed using ArcGIS.⁴ Similar data are also available from IBGE (2000) for Brazil.

Latitude and Longitude: Measured in decimal degrees for the municipal centroid and taken from IPEA (2000) for Brazil, and calculated with ArcGIS for Argentina and Paraguay.

Temperature: Annual mean temperature measured in °C x 10 available originally at very high resolution (around 1 kilometer grid cells) from BIOCLIM (BIO12) and processed using ArcGIS.⁵

⁴<http://worldclim.com/>

⁵<http://www.worldclim.org/bioclim>

Rainfall: Annual precipitation in millimeters also available from BIOCLIM (BIO1) converted using ArcGIS. Alternative data are also available for Brazil from IPEA based on the CRU-UEA project.

Ruggedness: Terrain ruggedness index in millimeters, originally available from Nunn and Puga (2012) at high-resolution (30 x 30 arc-seconds) and later processed using ArcGIS.⁶

Slope: Similar to ruggedness, in thousandths of a percentage point, also originally from Nunn and Puga (2012) at the grid cell level and processed with ArcGIS.

Distance to the Nearest River: Distance to the nearest river in decimal degrees is calculated using ArcGIS with the waterways shape file for South America.⁷

Distance to the Nearest Coast: Distance to the nearest coast in decimal degrees is also calculated using ArcGIS using the world coastline shape file.⁸

Coastal Dummy: Alternatively, a simple dummy taking the value of 1 for a municipality that has direct access to the coast and 0 if landlocked, also calculated using ArcGIS.

I.E. Historical Outcomes

Historical Education: Illiteracy rates are measured in percentages over the relevant population. Data for Argentina comes from the 1895 and 1914 censuses.⁹ Data for Brazil is from the 1920 and 1940 censuses and data for Paraguay from the 1950 census.¹⁰ The municipal level data provides information for different age groups and for males and females separately. Data for Argentina (1895 and 1914) and Brazil (1920) further distinguish between native and foreign literacy rates. The Argentinean Census of 1914 and the Brazilian Census of 1940 also provide data on instruction, and the 1914 School and Education Census for Argentina the number of schools.

Religion: The religion of the respondent is first recorded in the 1890 Brazilian Census. The Brazilian IBGE also reports the religion of the respondent in modern times.

Mixed Marriage: Data on the partner's race (white, mixed, caboclo and mestizo) are available from the 1890 Brazilian Census.

⁶<http://diegopuga.org/data/rugged/>

⁷Available at: <http://mapcruzin.com/>

⁸See: <http://openstreetmapdata.com/data/coastlines>

⁹The 1869 Argentina Census does not report data for the province of Misiones.

¹⁰The 1890 Brazil Census does not report literacy.

I.F. Occupational and Cultural Variables

Occupation: From the Paraguayan Household Survey of 2012, the Argentinean Census of 2001 and the Brazilian Census of 2000 and 2010, I collect information on occupations including agriculture, manufacturing, commerce and services. The Argentinean and the Brazilian censuses also have more detailed occupations and professions. The Brazilian 2010 Census also has data on specific industries, which I match with the Ciccone and Papaioannou (2009) and Romalis (2004) skill intensity measures. Individual-level data was obtained through the IPUMS project.

Soy Cultivation: Data on soy suitability, soy farmed, changes in Genetically Engineered soy and non GE soy is all from Bustos, Caprettini, and Ponticelli (2016). The authors also report data on changes in agricultural productivity and labor force in agriculture, manufacturing and services from 1996-2006.

Handicrafts: The Brazilian Municipal Survey of 2006 records very detailed information on handicraft production, most importantly, embroidery.

Knowledge Transmission: The Paraguayan Cultural Module of 2011 contains specific information about traditional knowledge of skills, medicine and folktales, as well as diary usage and library visits.

Language: The main language of the respondent (Spanish, Guarani, both or other) was asked in Paraguay in the 2012 Household Survey.

Race: The percentage of indigenous population is reported by the IBGE for Brazil in 2010.

Hours Worked: Total number of hours worked for people 10 and older is taken from the 2010 Brazilian Census and the 2012 Paraguayan Household Survey.

Labor Force Participation: Labor force participation is available for Brazil through IPEA for 2000.

I.G. Additional Data

Population Density: Population counts are taken from the 2001 census for Argentina, the 2000 Brazilian census and the 2002 Paraguayan census, and area is as reported previously.

Pre-colonial Population Density: Number of indigenous people per square kilometer, taken from and described in detail in Maloney and Valencia Caicedo (2016).

Migration: Data on migration and resident status are reported for Brazil by the IBGE in 2010.

Inequality: A Theil index on income is available for Brazil from IPEA for 2000 and for Paraguay from the World Bank (2008).

Health: A series of health variables including mortality under 5, infant mortality, number of doctors, and Health Development Indexes are available for Brazil from IPEA for 2000. The health index includes items such as the number of prenatal visits and deaths due to ill-defined and avoidable causes.

Tourism: Data on the prevalence of touristic activities come from the Brazilian Municipal Survey of 2006. Similar data for visits to museums and national monuments is from the Paraguayan 2012 Household Survey.

Media: Data on the prevalence of newspapers and radio stations also come from the Brazilian Municipal Survey of 2006.

II. ADDITIONAL EMPIRICAL RESULTS

II.A. Alternative Specifications, Proxies and Controls

As a first pass, I explore the impact of missions on income in Brazil using dummy variables. In this first specification, a municipality receives a value of 1 if it had a Jesuit mission in the past and 0 otherwise. The missionary effect on logarithm of income appears positive, large and statistically significant at different distance thresholds (Figure A.11). This is true both for the full sample at around 0.8 log points as well as for progressively smaller samples (starting with 500 kilometers to the nearest mission in 100 decreases). Because missionary presence might just be capturing different geographic and weather characteristics, I control for these variables directly next. Although now smaller in magnitude, at around 0.6 log points, the results are largely unchanged. The coefficients are positive and significant, stable and larger at the local level.

To formally assess the role of observable variables and unobservable characteristics, I calculate Altonji ratios (Altonji, Elder, and Taber, 2005; Bellows and Miguel, 2009, and Nunn and Wantchekon, 2011). The intuition of this exercise is to see how large the selection in unobservables would need to be relative to observables in order for it to drive the results observed. For the full sample the ratio is 4.15 (Altonji, Elder, and Taber 2005 report 3.55) meaning that selection in unobservables would need to be that much higher in order to drive the results.¹¹

I also explore other non-linear formulations in Table A.4 to complement the baseline results in the text. The first is a log-log rather than a log-linear specification for income. As can be seen in the first two columns, this variation leaves the results largely unchanged. The coefficients are negative, significant and stable and, if anything, they appear larger in the reduced sample. The second uses a dummy for places less than 50 kilometers from a mission, again showing lower illiteracy and higher income (columns (3) to (4)). I also use a matching specification based on geographic characteristics. The results are again statistically significant for illiteracy and income (columns (5) and (6)). Lastly, I estimate a quantile regression model,

¹¹Technically, for this result to hold the R-squared of the regressions should be approaching the maximum R-squared (Oster, 2017). In this case the R-squared increases from around .3 to (a very high) .66 in the localized sample. The beta using this methodology is 0.80 for illiteracy and -0.48 for income.

which shows that the missionary effect works not only at the mean but also at the median level of the sample (columns (7) and (8)).¹² Taken together, the results using alternative formulations show the robustness of the Jesuit missionary results.

To illustrate the impact of the Jesuit missions on income on the three countries I use nighttime satellite data (Henderson, Storeygard and Weil, 2012). From outer space, the missionary area is depicted in Figure A.12, along with municipal level boundaries. Though missions are located in very isolated areas, far away from the principal population centers, many of the light spots associated with higher income correspond to the historical placing of the Jesuit missions. Econometric estimates using this alternative income measure are presented next in Table A.5.¹³ Results for Brazil are without and with geographic controls (columns (1) and (2)). I also present alternative income proxies such as logarithm of income in 1991, a human development index, the equivalent Brazilian IFDM Index and logarithm of lights (columns (3) to (6)). All specifications preserve the sign and significance, indicating lower levels of development farther away from Jesuit missions. Results using poverty indices appear significantly positive (columns (7) and (8)). For Argentina and Paraguay I show results using the alternative household (as opposed to the individual) poverty index in column (9). I also present an interactive specification (column (10)) and alternative specifications using nighttime satellite data (columns (11) and (12)). The results confirm the findings in the main text and show robust effects in all specifications, only some of the interactions retain their sign but not their significance.

Table A.6 presents results using dummies. I present first a regression using a dummy for places less than a hundred kilometers from a mission. These reveal lower illiteracy levels and higher income, in columns (1) and (3). I parametrize the remaining distances using concentric distance rings. In columns (2) and (4), it seems that the effect is partially present for longer distances, suggesting possible externalities.¹⁴ Because of the relationship between education and income I also perform a Principal Component Analysis

¹²This formulation also allows for testing robustness for outliers. As is standard, I use bootstrapped standard errors for in the estimation. The effect is stable throughout and larger for illiteracy at higher levels of the distribution.

¹³Michalopoulos and Papaioannou (2013) use nighttime satellite data due to the lack of reliable GDP per capita and income measures for the African continent, while Acemoglu and Dell (2010) and Maloney and Valencia Caicedo (2016) use preferred available income measures for Latin America.

¹⁴In Table A.7 I show similar formulations and results for median years of schooling and the individual poverty index.

(column (5)).¹⁵ Moving farther away from the nearest mission leads to worse outcomes.

Lastly, Table A.14. presents specifications with additional controls.¹⁶ In columns (1) and (6), I control directly for distance to exploration routes, which are also a good proxy for nearby colonial centers. In columns (2) and (7), I use a second degree polynomial on latitude and longitude. In columns (3) and (8), I add the square of all geographic controls. Results retain their sign and general level of significance. In columns (4) and (9), I cluster all of the abandoned missionary nuclei and in columns (5) and (10), I control for distance to Tordesillas, which divided the Spanish and Portuguese empires. Results for Jesuit missions remain robust throughout.

II.B. Robustness: Intensity of Treatment

In this section I provide intensity of (missionary) treatment results. In particular, I exploit historical information on the year of foundation, indigenous population and a dummy variable for whether a given mission moved or not. Instead of only using distance to the nearest mission as in Equation 1, I interact this variable with the year of foundation and / or the mean of the indigenous population of the nearest Jesuit mission. The results of this exercise can be seen in Table A.15. In the Distance x Year of Foundation formulation in the first column, the log coefficient is negative and significant, reflecting that not only distance to the nearest mission was important, but also how many years it was active. The results are positive and significant when I use instead the mean of indigenous population divided by distance, again in logs (column (2)). So not only the number of years, but also the quantity of people treated appears to matter. These duration results are consistent with the placebo results presented in the text. Combining all information, I estimate a model with population interacted with years of missionary activity normalized by distance. Once again the log coefficient is positive and statistically significant (column (3)). Additional results (Figure A.18) illustrate the intensity of treatment effects for income and historical population and literacy and year of foundation. Missions with larger number of families historically have higher incomes and those founded earlier have higher levels of literacy, though the results are only marginally

¹⁵A Seemingly Unrelated Regression analysis reveals highly significant coefficients of 0.027 for illiteracy and -0.002 for income. Figure A.13 shows the binned scatter plot conditional on geographic controls and country fixed effects, and Figures A.14 and A.15 presents spline results at 200 kilometer intervals.

¹⁶I thank Melissa Dell and an anonymous referee for suggesting these formulations.

significant at the 10%. I also explore whether missions that moved during some point in their history have a differential effect. I find using a dummy variable that indeed such movers had less of an impact on income (significant at the 10%) in the long-run (column (4)).¹⁷ Lastly, I interact distance to the nearest mission with distance to the nearest river, as a proxy for isolation or market access, finding a negative effect for income (column (5)) and a positive for education (column (6)). Taken together, the results in this section show that the intensity of the Jesuit treatment in terms of years of exposure and population size mattered in the long run.

II.C. Instrumental Variables

An alternative way to address the potential endogeneity of the placement of Jesuit missions is to use instrumental variable techniques. I present two strategies using early exploration routes and distance to Asunción, for the Brazilian sub-sample of the data.

1. Exploration Routes

As described in the text, Jesuit missions were located in remote areas of the Spanish and Portuguese colonies that remain relatively isolated even today. I use distance from early exploration routes as a measure of isolation that can be used to proxy for missionary location (Figure A.20). Historical exploration routes such as Lewis and Clark's in the US have been commonly as instruments for highway development (Duranton and Turner 2012; Duranton, Morrow, and Turner, 2014). The first European expeditions in the missionary area were conducted by Pedro de Mendoza (1535-1537) and Alvar Nuñez Cabeza de Vaca (1541-1542).

Under the aegis of the Spanish Crown, Pedro de Mendoza explored the Río de la Plata (River Plate) region of South America. Sailing from Spain and the Canary islands and following the delta of the River Plate, he founded the city of Buenos Aires in 1535. Mendoza became the first Governor of the Río de la Plata region, but died shortly thereafter from syphilis in 1539 (Chipman, 2014). From Buenos Aires, lieutenant governor Juan de Ayolas sailed almost 1,000 kilometers up the Paraná River and founded the

¹⁷These interaction specifications are insignificant for education.

fort of Corpus Christi in 1536. Similarly, interim governor Domingo de Irala founded Nuestra Señora Santa María de la Asunción (nowadays Asunción) in 1541. Alvar Núñez Cabeza de Vaca, famous for his conquest of Florida and the Gulf of Mexico, also played an important role in the exploration of South America. Cabeza de Vaca was given permission to explore the Río de la Plata region in 1540. He started off in the island of Santa Caterina (modern-day Brazil) and instead of sailing to Buenos Aires crossed the interior and walked barefoot more than 1,200 kilometers to Asunción (Figure A.20). After four and a half months of traversing “a trackless wilderness filled with cannibals, impassable rivers, jungles and poisonous snakes” (Chipman, 2014, p. 54) he arrived to Asunción the morning of March 11, 1542.

The rationale of the instrumental strategy is to proxy for the remoteness of the Jesuit missions using distance from the expedition routes (negative first stage). These routes served to found the initial settlements, whereas the missionary area remained relatively unexplored.¹⁸ At the same time, as in North America, the exact path of the expeditions was somehow arbitrary. The results of instrumenting missionary location with distance to the exploration routes can be seen in Table A.18. The first stage is negative and significant (F-statistic well above 10). The second stage results are positive for illiteracy (column (1)) and negative in the income formulation (column (4)), as before. The magnitudes are similar for education and slightly larger for income.

2. Distance to Asunción

The first Jesuit priests arrived in Asunción on the 11th of August of 1588. From that base, Fathers Manuel Ortega and Thomas Fields started their evangelical expedition in the territory of Guayra. Subsequent expeditions explored the area controlled by the Guarani, leading to the foundation of the first mission of San Ignacio Guazú in 1609. Asunción would remain an exploratory base throughout the missionary period (Figure A.21). Still, one should not overemphasize the importance of this city, which had a population of only 6,451 in 1761, twenty times less than that of the Guarani Jesuit missions combined (Ganson, 2003).

¹⁸Alternatively, I control directly for distance to these routes in Table A.14.

In 1750, less than twenty years before the expulsion of the Jesuits, the Treaty of Madrid redrew the Spanish and Portuguese borders in South America. This treaty replaced the Tordesillas Treaty of 1494, largely leaving the territory of Brazil in its current form.¹⁹ In the missionary area, the modern state of Rio Grande do Sul passed to Portuguese hands along with the seven missions (*sete povos*) of São Borja, São Luiz Gonzaga, São Nicolau, São Miguel, São Lourenço Martir, São Joao and Santo Angelo. The center of influence for this state shifted abruptly from the Spanish to the Portuguese empire, diminishing the importance of Asunción as a colonial capital. My working assumption is that this Paraguayan city is even less relevant for Rio Grande do Sul in modern times, but that it was influential for the original establishment of the Jesuit missions.²⁰

I instrument distance to the nearest Jesuit mission using distance from Asunción, only for the Brazilian subsample of the data. I exclude the states in Paraguay given the importance of the national capital and Argentina, which remained part of the Spanish Empire after the borders were changed in 1750 —until it became independent in 1810. The results of this instrumental variables exercise can be found in Table A.18. The first stage is very robust (F-statistic > 10), and the instrumented coefficients appear significantly positive for illiteracy (column (2)) and negatively significant for income (column (5)). The IV coefficients for education appear slightly larger than the OLS results and the ones for income have a similar magnitude. It does not seem that this is caused by weak instruments or by the difference in samples. Beyond measurement error, this might be due to differences between average and local treatment effects (Imbens and Angrist, 1994). To further explore the robustness of the instrumental variables results, I combine all instruments in columns (3) and (6) of Table A.18. I restrict the sample to the Brazilian municipalities, to be able to use the distance to Asunción instrument. The sign and significance is preserved both for the education and income results. I cannot reject an overidentification test for the two instruments. Still, it is possible that the instruments may be violating the exclusion restriction, in light of the very strong first stages.²¹ By and large, the instrumental variable results confirm

¹⁹The San Idelfonso Treaty of 1777 would confirm the 1750 boundaries. As an alternative, I control for distance to Tordesillas directly in Table A.14.

²⁰Despite being a neighboring country, Paraguay is not among the main trading partners of Brazil and its trade share (exports plus imports) was less than 2% in 2010. For robustness, I control directly for distance to São Paulo, which became the new pole of influence for the state.

²¹Results are robust to estimation with both 2SLS and LIML. Exogeneity tests à la Conley, Hansen, Christian, and Rossi (2012) reveal more robust effects for the exploratory distance formulation, especially for illiteracy.

the OLS results for income and education.

D. Labor Force Participation

An important source of variation in labor patterns, at the intensive margin, can be observed in Figure A.23. The figure is a smoothed local polynomial plot of the percentage of people per municipality working 15 to 39 hours a week. The relationship is significant at the standard confidence level. It appears that those located closer to the missions are working more hours, consistent with Weberian cultural explanations.²² According to Weber this same ethic was found among the Catholic orders, “as early as St. Benedict [480-547], more so for the Cistercians [1098], and, finally, most decisively, for the Jesuits [1534].” (Weber, 2011, p. 130).²³ He concluded that, “The gradual rationalization of asceticism into an exclusively disciplinary method reached its apex in the Jesuit order.” (Weber, 1978, p. 1172). Statistically, more people participate in the labor force in general and this effect is concentrated among females relative to males, though results (not shown) are not robust to geographic controls.

E. Specific Occupations

I further examine more specific professions beyond broad occupational aggregates (see Dell and Olken, 2017). Embroidery was one craft in which the Jesuit missionaries trained the Guarani. Father Antonio Sepp, S.J., (1655-1773) describes in his letters how he instructed the indigenous people to copy Dutch lace and embroidery in the workshops (Amable, 1996, p. 58). Surprisingly, hundreds of years after the Jesuit expulsion, former missionary areas report more prevalence of this activity (Table A.25, column (1)) with a beta coefficient of around -0.2. More generally, using individual-level data, I also find a larger number of professionals and “market-oriented” skilled agricultural workers in the area (columns (2) and (3)), perhaps reflecting the cultivation of *yerba mate*. In terms of specific occupations, I find more teachers and blacksmiths (columns (4) and (5)). This is consistent with historical descriptions of the missions where, “full-time craftsmen included blacksmiths, carpenters, statuary artisans, gilders, silversmiths, tailors, hat makers, and bronze fabricators such as bell makers” (Crocitti, 2002, p. 9). The

²²A similar pattern can be observed for Paraguay, not reported.

²³For recent evidence comparing the thrift of these Catholic orders, see Andersen et al. (2017) for the Cistercian order in England and Akcomak, Webbink, and Weel (2016) for the Brethren of the Common life in the Netherlands.

results for Argentina are similar to those for Brazil.²⁴ Again, I find more artisans and teachers in former Jesuit missionary territories, consistent with their technical and educational roles (columns (6) and (7)). Lastly, I look at accounting, which was introduced by the Jesuits and taught in the missions (Crocitti, 2002 and Blumers, 1992). This practice is more prevalent in missionary areas (column (8)). Results for specific occupations are consistent with the broader structural transformation results described in the text.

F. Knowledge Transmission

I examine intergenerational knowledge transmission as a cultural mechanism that can explain the persistence of positive outcomes.²⁵ First, I find that people closer to missionary areas report having acquired from their parents more knowledge about skills (such as mechanical or agricultural skills, carpentry, sewing and embroidery), as well knowledge of traditional medicine and folktales (Table A.26, columns (1) to (3)). Moreover, in areas closer to historical missions, people report more transmission of these same skills and traditional knowledge to others (columns (4) to (6)). Thus the empirical evidence suggests that, though the explanatory power is low, intergenerational knowledge transmission could be a cultural mechanism behind the persistent outcomes observed.²⁶

I also examine other cultural practices that are more related to the Jesuit interventions. Just as with embroidery and accounting before, we now observe a significant results for outcomes directly related to literacy and education, such as keeping a diary and visiting a library or a museum (columns (7) to (9)). Overall, it appears that areas closer to missions have higher levels of transmitted indigenous knowledge and imported skills. The long-lasting prevalence of these portable skills is consistent with theoretical models of intergenerational transmission (Cavalli-Sforza and Feldman, 1981, Boyd and Richerson 1985, Bisin and Verdier, 2000 and 2001). After the “oblique” transmission of skills from the part of the Jesuits, some of these traits may well have been transmitted “vertically”, from generation to generation.²⁷

²⁴I am, however, no longer able to distinguish between Jesuit and Franciscan missions.

²⁵Special thanks to Yolanda Barrios, Norma Medina and Zulma Sosa from the Paraguayan statistical office for sharing these data.

²⁶A Seemingly Unrelated Regression approach reveals significant coefficients at the standard significance levels. Ongoing work confirms the importance of this channel of transmission Valencia Caicedo and Voth (work in progress).

²⁷Oblique transmission refers to the “transmission from individuals other than the parents but who belong to the same generation as the parents” (Cavalli-Sforza and Feldman, 1981, P. 130). I do not find significant effects for horizontal transmission.

G. Indigenous Assimilation

As a final way to analyze long-term cultural behavior I look at indigenous assimilation (Diaz-Cayeros and Jha, 2012). Presumably, indigenous inhabitants that attended religious missions had an easier time assimilating into colonial society when the Jesuits left, due to the skilled training they acquired. An early indication of this mechanism can be observed in the 1890 Brazilian Census.²⁸ In Table A.27 we can see that people reported more mixed marriages (general mixed and *caboclo*: European and indigenous) in places closer to religious missions (columns (1) and (2)). Interestingly, they also report being more Catholic, albeit from a very high base of 93% (column (3)). The prevalence of indigenous people in the missionary area can also be observed up until recent times. In 2010, slightly more people report being indigenous the closer they are to a mission (column (4)). This is interesting, since in Latin America areas with higher modern indigenous population density have been associated with lower levels of income (Easterly and Levine, 2016).

A similar pattern can be found for Paraguay, when focusing on language. Guarani is one of the two official languages of Paraguay, along with Spanish, in itself a remarkable testament to the survival of the indigenous tribes. In fact, linguists point directly to the religious missions for the survival of Guarani (Engelbretch and Ortiz, 1983). Results using this data can be seen in columns (5) to (7). It appears that there are less people speaking Guarani in the missionary areas and more people speaking Spanish. Notably, there are more people who report speaking both languages in these areas, again suggesting a differential process of assimilation. These results also hold using data from the 1950 Census (not shown).²⁹ From early records of mixed marriages to contemporary data on indigenous population and indigenous languages, it appears that indigenous people assimilated better in the missionary areas from colonial times up until the present day.

²⁸Technically this is the first Republic Census of Brazil, which declared independence from Portugal on November 15, 1889.

²⁹The colloquial combination of Spanish and Guarani is termed *Yopará*.

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APPENDIX FIGURES

FIGURE A.1. LOCATION OF THE GUARANI JESUIT MISSIONS IN LATIN AMERICA



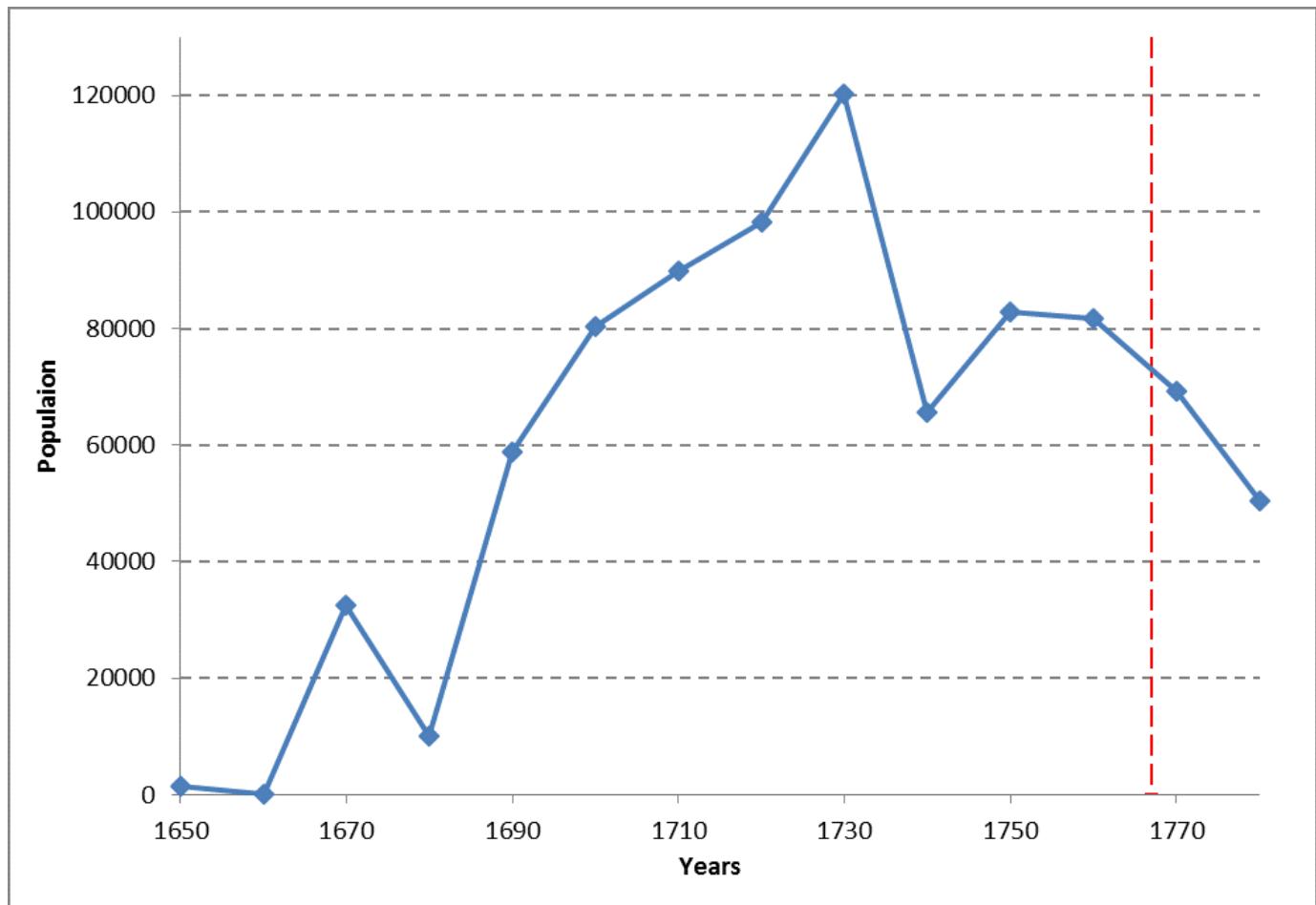
The map shows the location of the Guarani Jesuit missions, along with state level boundaries for Argentina, Brazil and Paraguay, and national level boundaries for the rest of Latin American countries.

FIGURE A.2. HISTORICAL TIMELINE



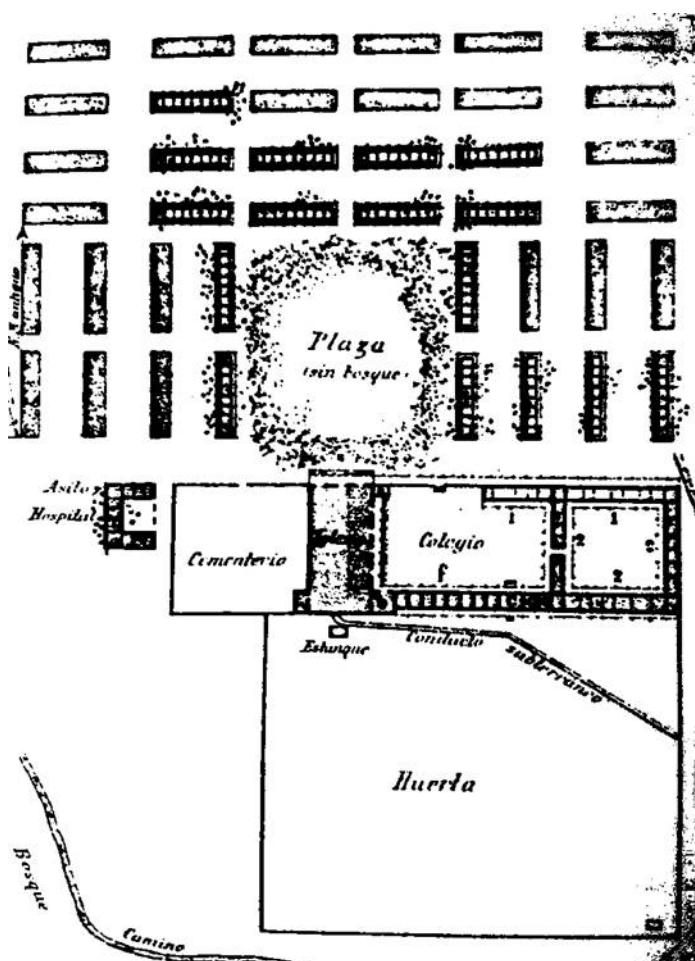
The figure depicts the key historical events studied in the paper, the darker shaded periods depict the 158 years of Jesuit missionary intervention.

**FIGURE A.3. HISTORICAL POPULATION OF THE GUARANI JESUIT MISSIONS
(1650-1780)**



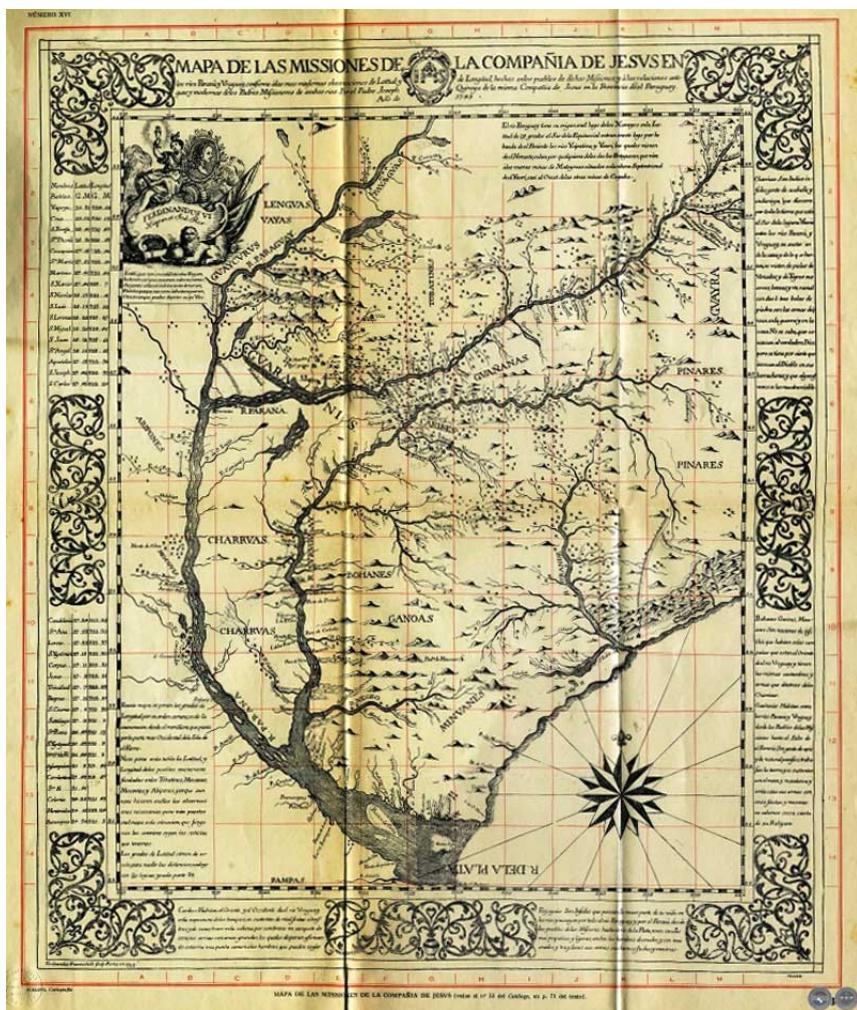
Total contemporaneous Guarani Jesuits missions population counts from surviving records. Author's calculations. The dashed line represents 1767, which corresponds to the expulsion of the Jesuits from Latin America.

FIGURE A.4. HISTORICAL BLUEPRINT OF A GUARANI JESUIT MISSION



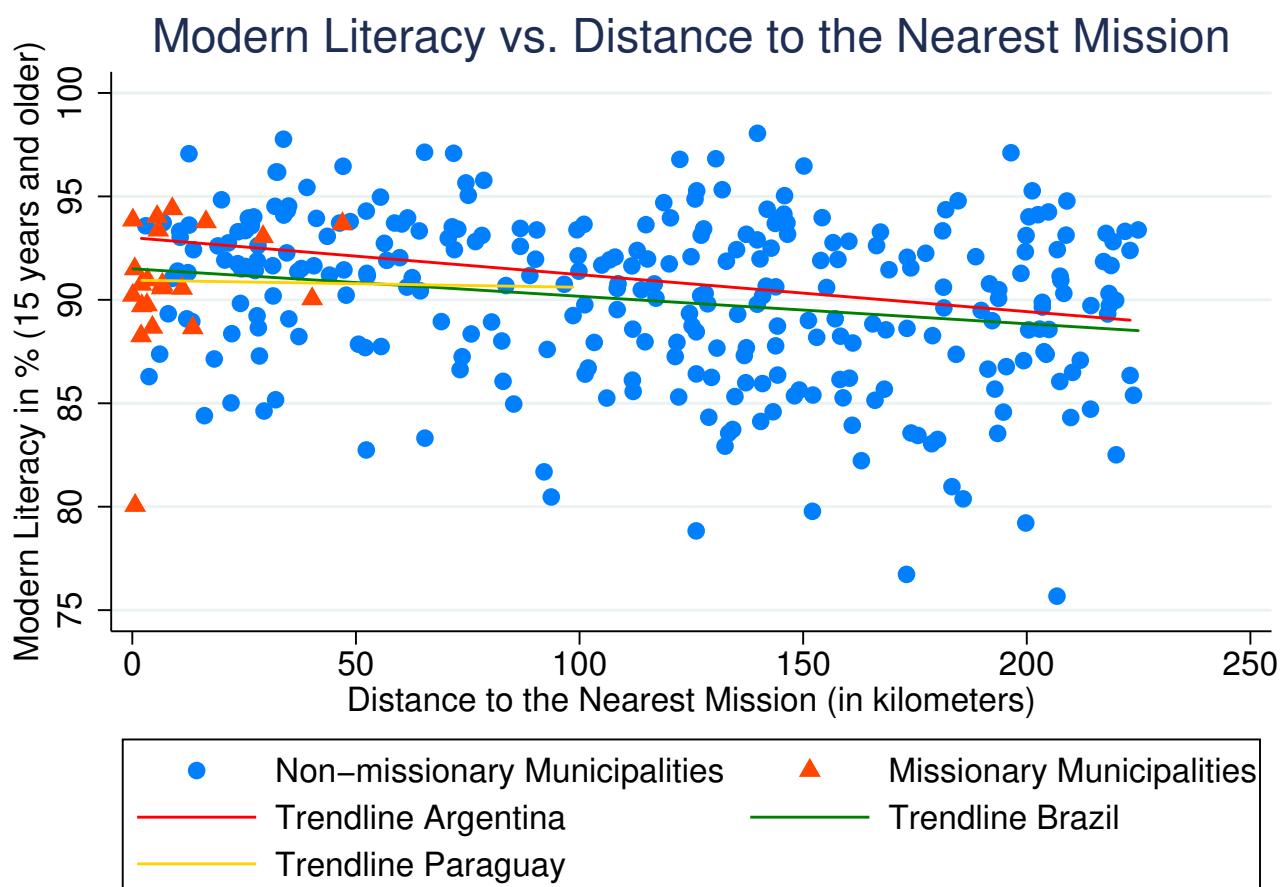
Urban blueprint of the Jesuit mission of San Ignacio Miní taken in 1899 by Juan Queirel, taken from Hernández (1913).

FIGURE A.5. HISTORICAL MAP OF THE JESUIT MISSIONS OF PARAGUAY



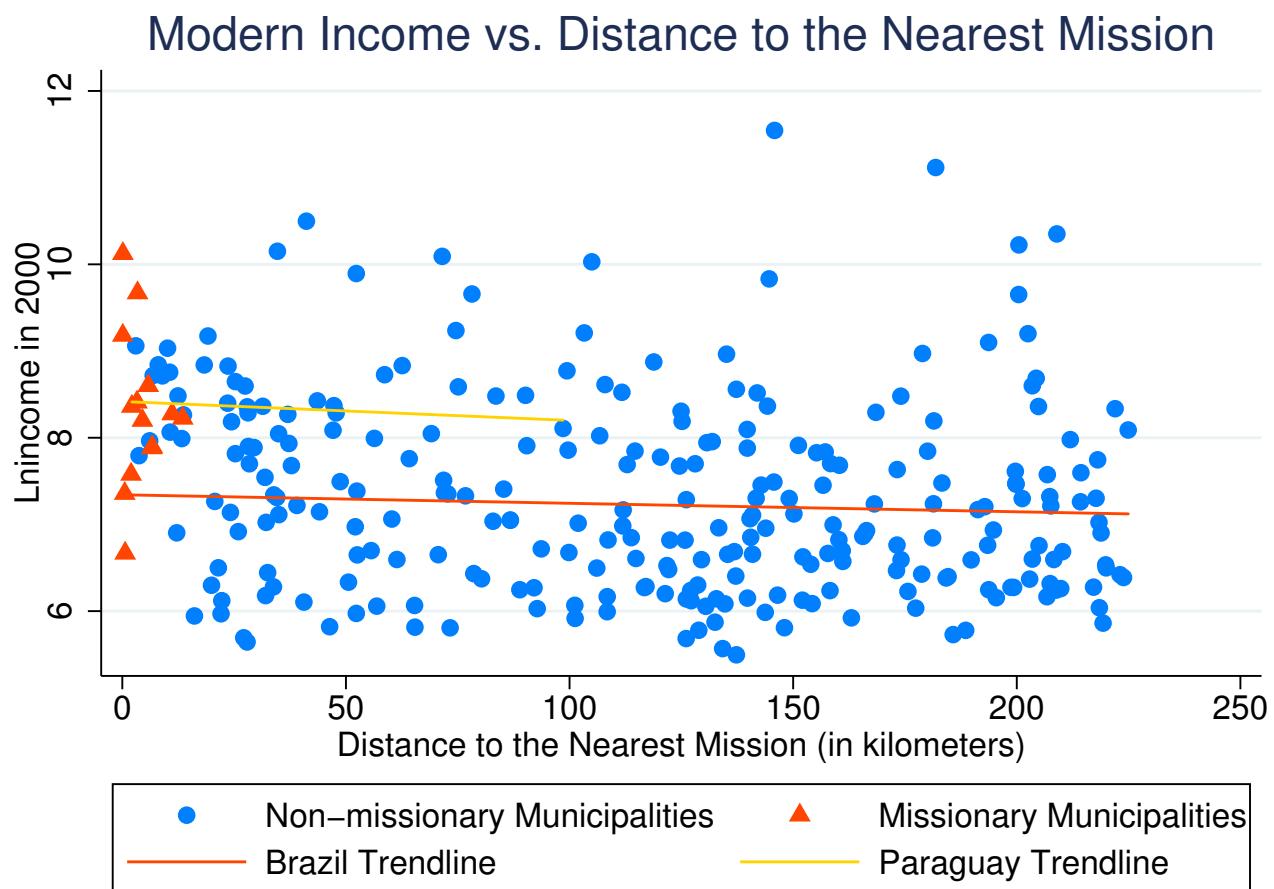
Source: Drawn by Gustavo Laterza (1647).

FIGURE A.6. LITERACY VS. MISSIONARY DISTANCE: UNCONDITIONAL PLOT, BY COUNTRY



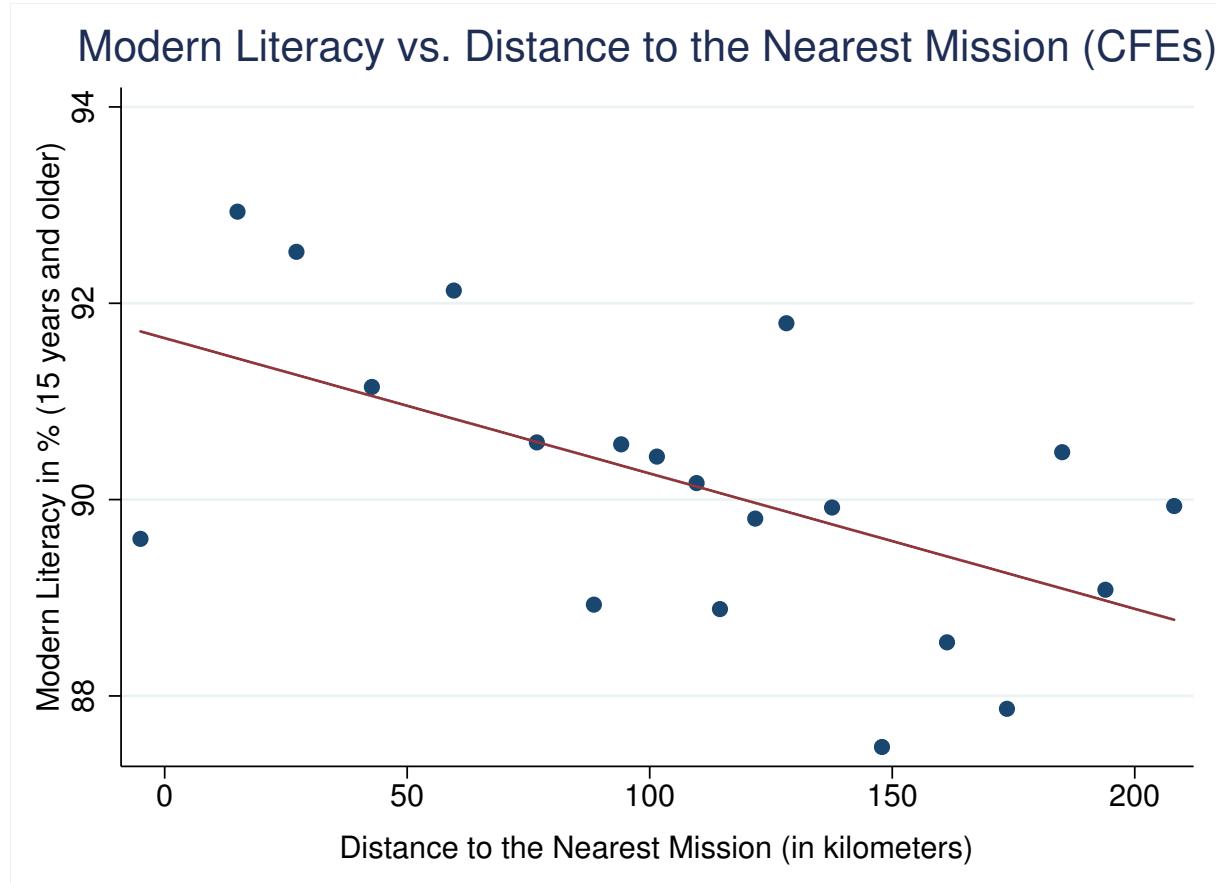
Unconditional plot of 2000 literacy in percentages for people aged 15 and older in Argentina, Brazil and Paraguay versus distance (of the municipality centroid) to the nearest Jesuit mission in kilometers. Triangles represent missionary municipalities and dots non-missionary ones. Linear trendlines by country. The sample is restricted to a 225 kilometers distance threshold.

FIGURE A.7. INCOME VS. MISSIONARY DISTANCE: UNCONDITIONAL PLOT, BY COUNTRY



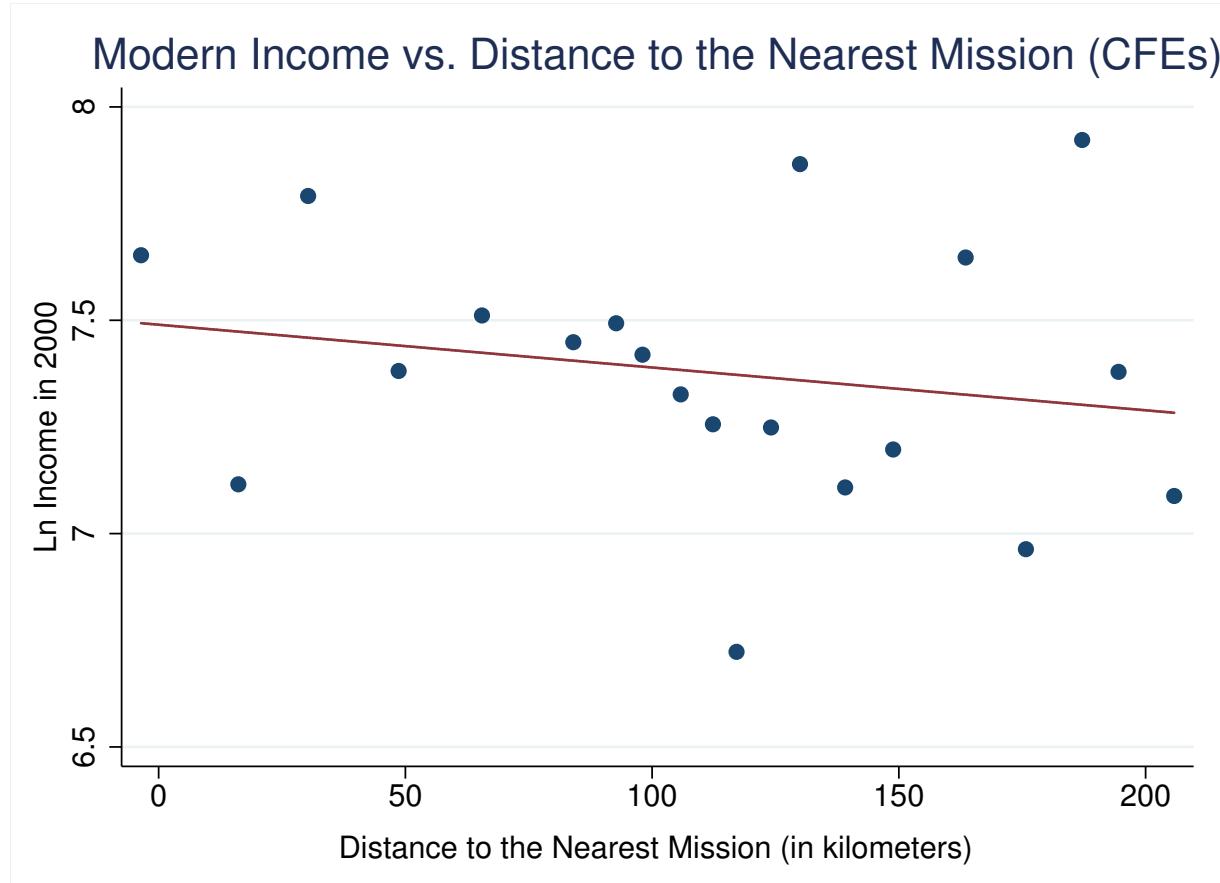
Unconditional plot of 2000 logarithm of income in Brazil and Paraguay versus distance (of the municipality centroid) to the nearest Jesuit mission in kilometers. Data at this level of disaggregation is not available for Argentina. Triangles represent missionary municipalities and dots non-missionary ones. Linear trendlines by country. The sample is restricted to a 225 kilometers distance threshold.

**FIGURE A.8. BINSCATTER OF LITERACY ON MISSIONARY DISTANCE:
COUNTRY FIXED EFFECTS**



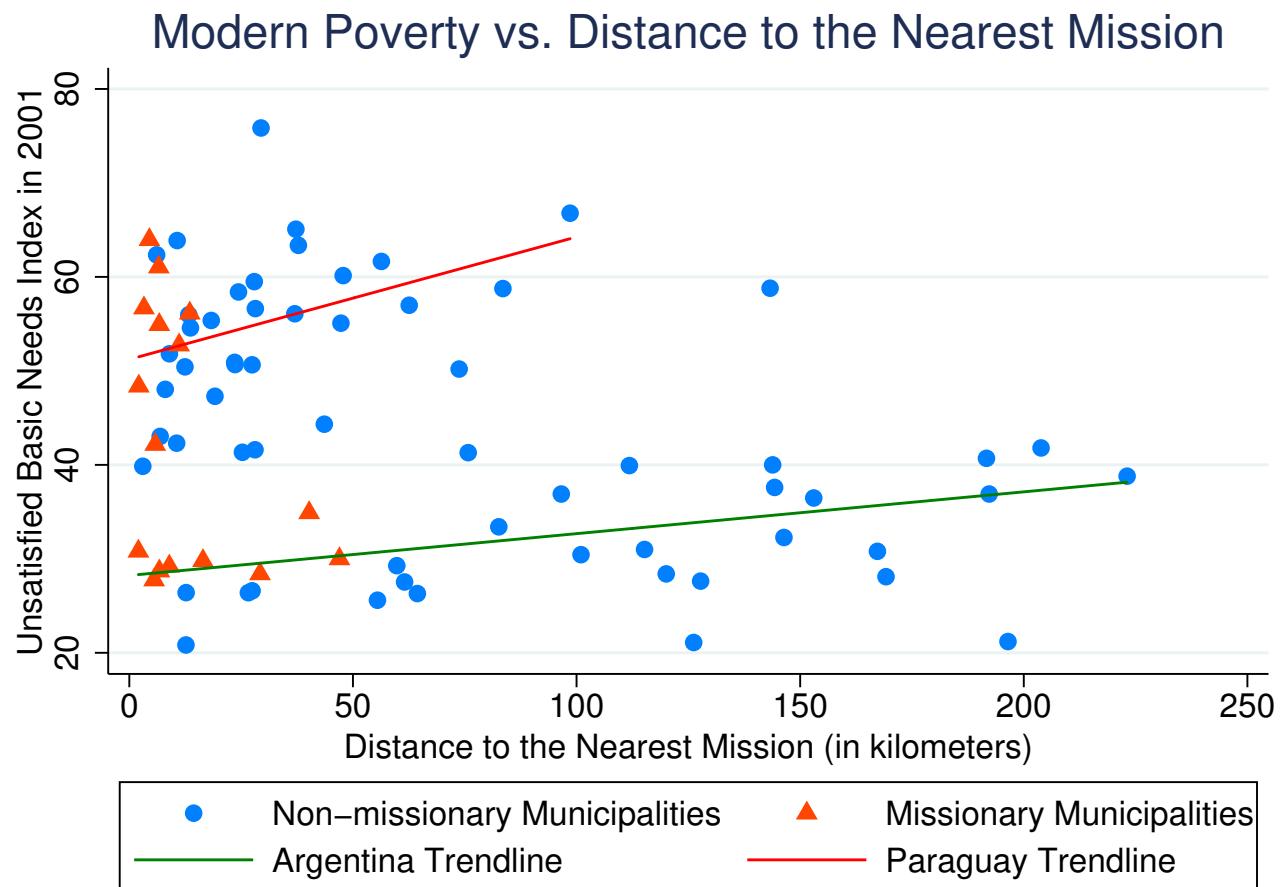
Conditional binned scatter plot of literacy in 2000 (circles) with fitted line for Argentina, Brazil and Paraguay versus distance to the nearest Jesuit mission in kilometers. Net of country fixed effects. The sample is restricted to a 225 kilometers distance threshold.

FIGURE A.9 BINSCATTER OF INCOME ON MISSIONARY DISTANCE: COUNTRY FIXED EFFECTS



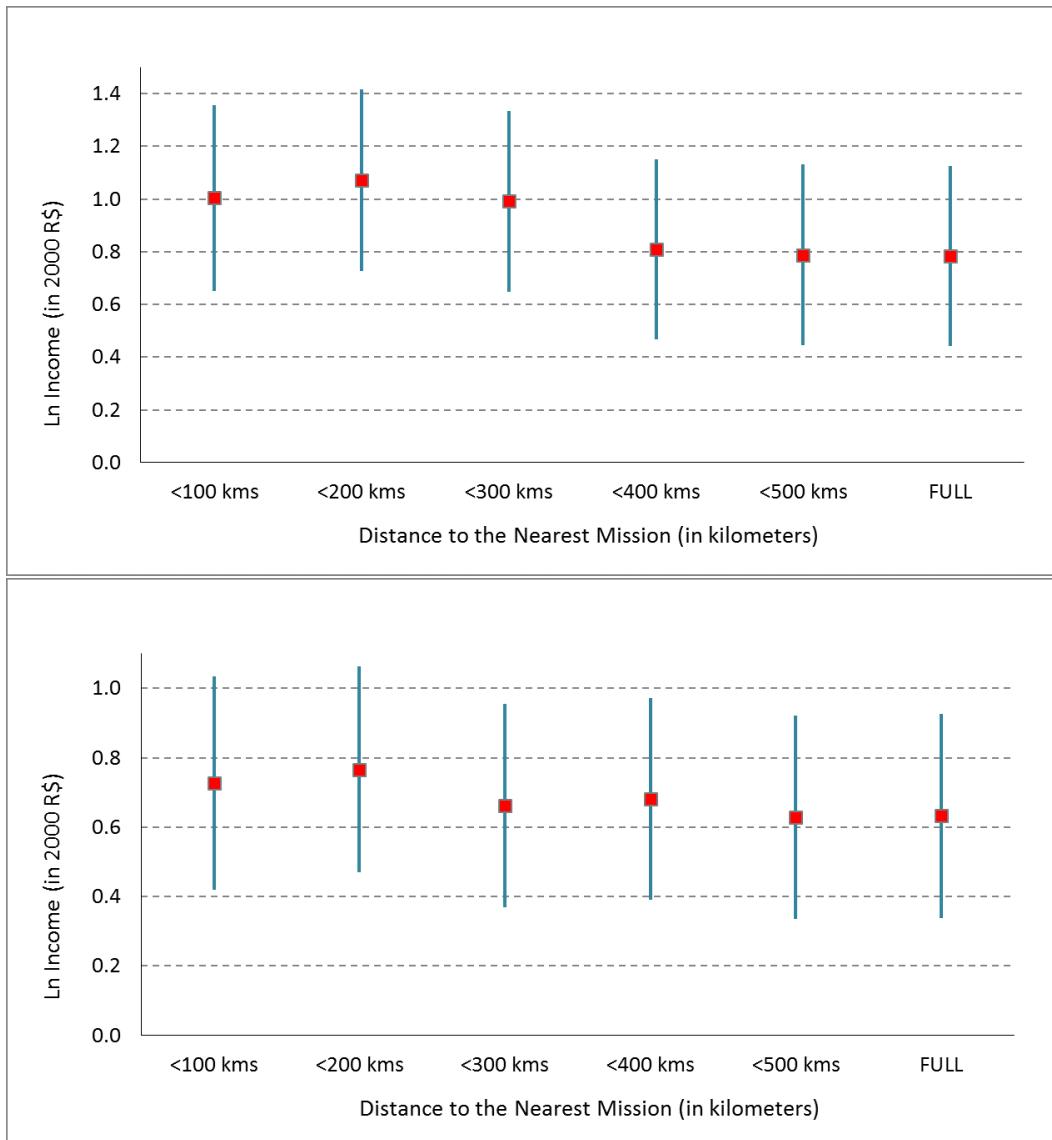
Conditional binned scatter plot of logarithm of income in 2000 (circles) with fitted line for Brazil and Paraguay versus distance to the nearest Jesuit mission in kilometers. Net of country fixed effects. Data at this level of disaggregation is not available for Argentina. The sample is restricted to a 225 kilometers distance threshold.

FIGURE A.10. POVERTY VS. MISSIONARY DISTANCE: UNCONDITIONAL PLOT, BY COUNTRY



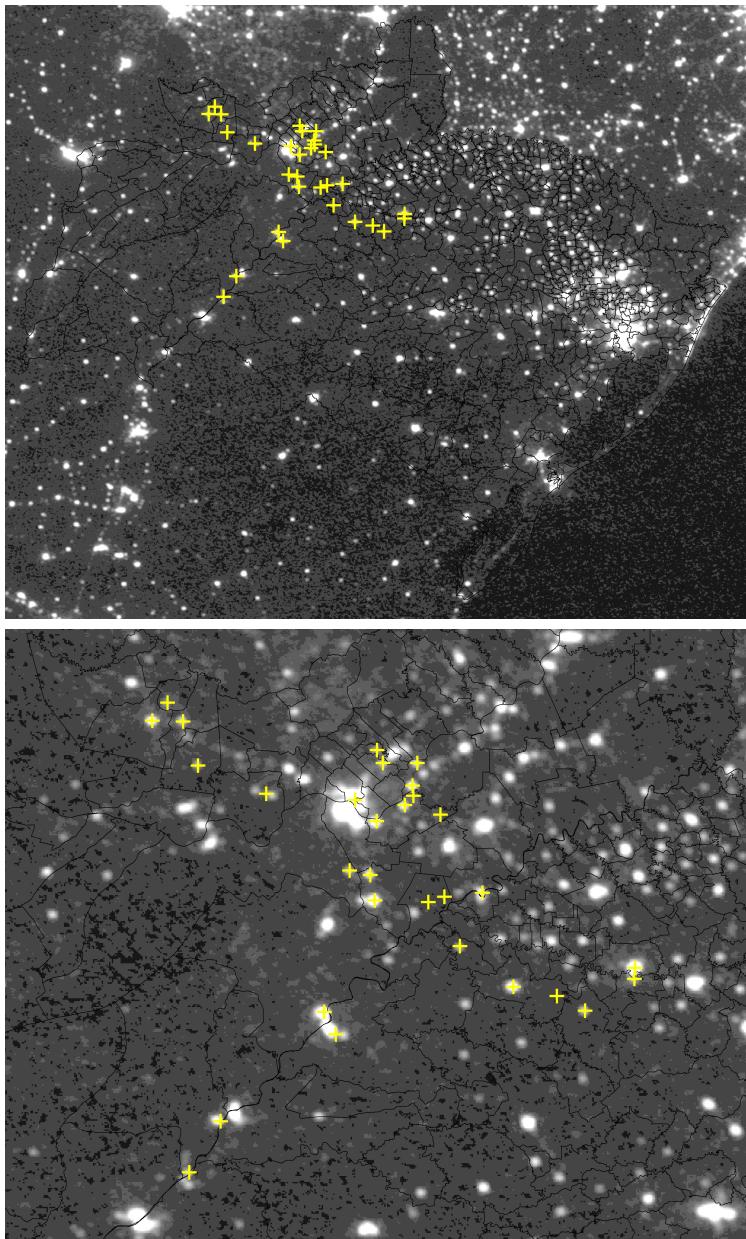
Unconditional plot of the Unsatisfied Basic Needs (UBN) Poverty Index for Argentina and Paraguay versus distance (of the municipality centroid) to the nearest Jesuit mission in kilometers. Triangles represent missionary municipalities and dots non-missionary ones. Linear trendlines by country. The sample is restricted to a 225 kilometers distance threshold.

FIGURE A.11. MISSIONARY EFFECT ON INCOME (DUMMY FORMULATION) IN BRAZIL



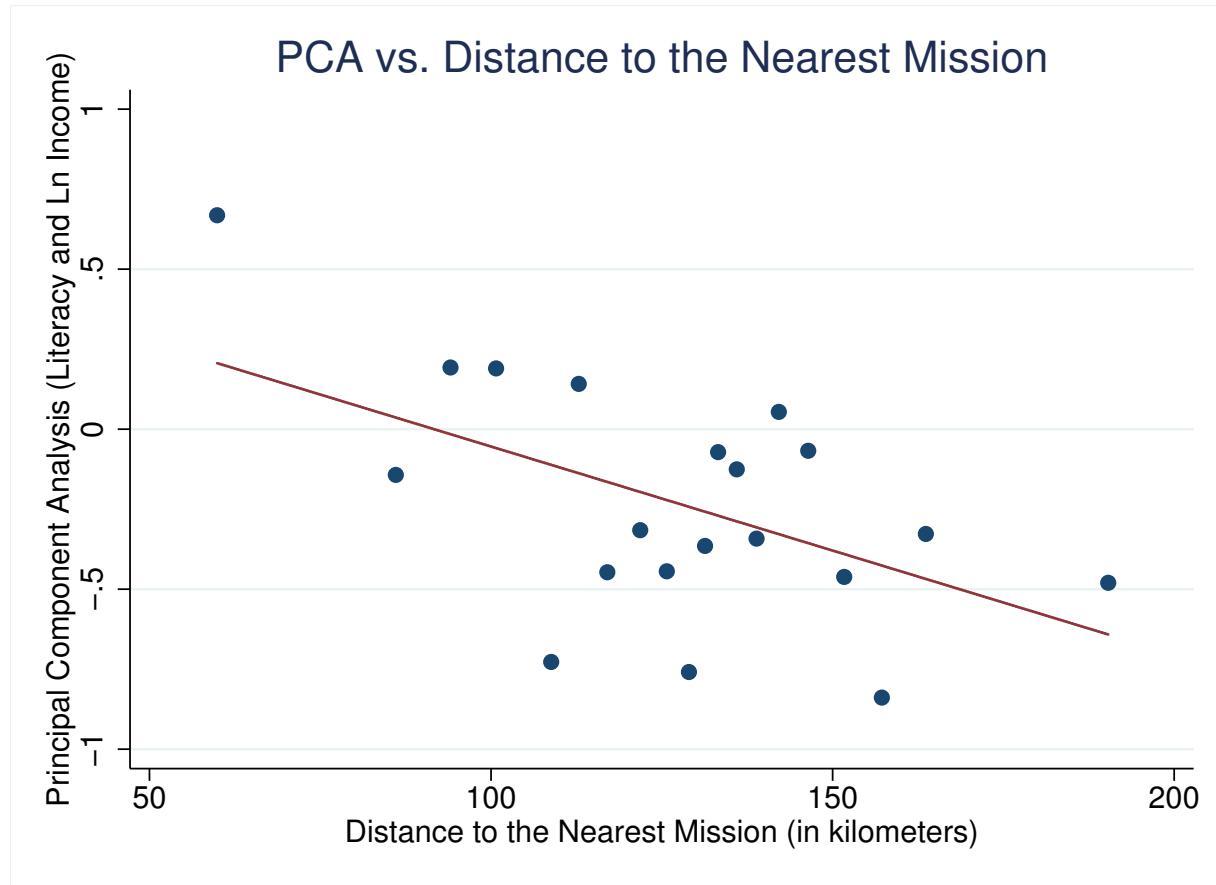
The graph plots the coefficients for a regression of the logarithm of (2000) income in Brazilian Reals on a dummy for missionary presence at different distance thresholds without (top) and with (bottom) geographic and weather controls (including altitude, area, temperature and rain). Point estimates are represented by squares and 95% robust error bands by lines.

FIGURE A.12. NIGHTTIME SATELLITE MAPS OF THE GUARANI JESUIT MISSIONARY AREA



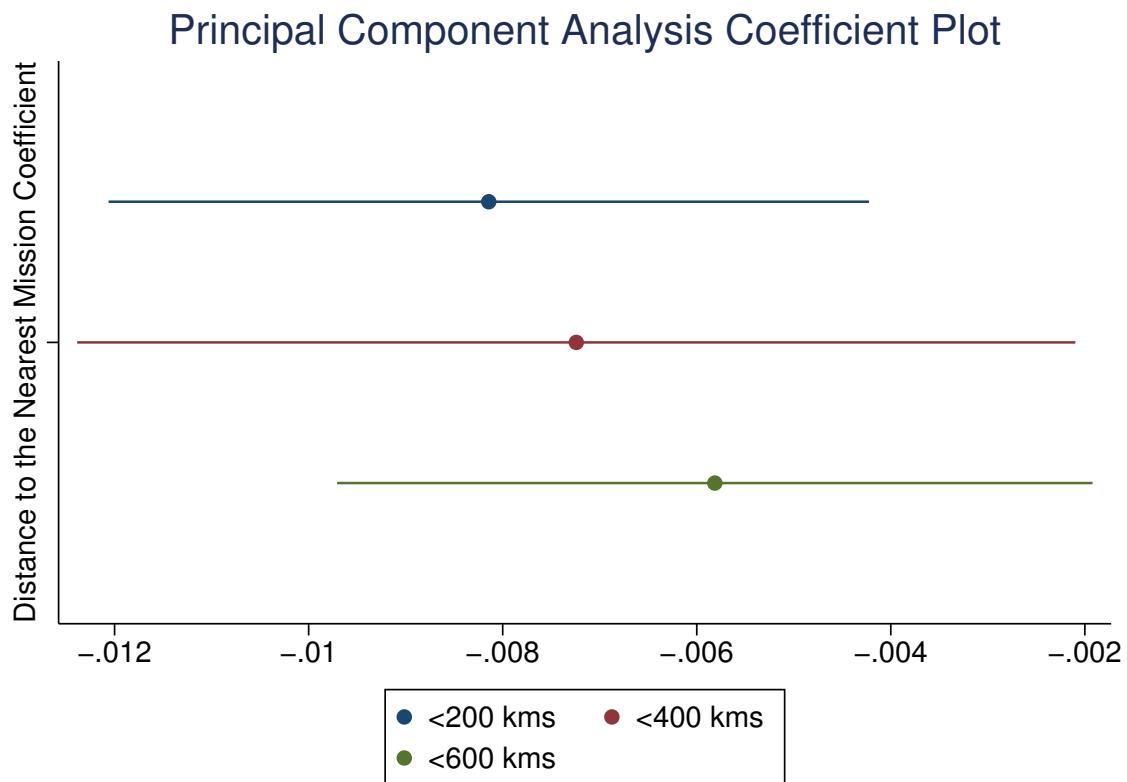
The maps depict the nighttime satellite images of the Guarani Jesuit missionary area along with municipal level boundaries for the states of Corrientes and Misiones (Argentina), Itapúa and Misiones (Paraguay) and Rio Grande do Sul (Brazil), with the location of the Guarani Jesuit missions (depicted by crosses). Full and zoomed areas.

**FIGURE A.13. MISSIONARY EFFECT ON MODERN EDUCATION AND INCOME
(PRINCIPAL COMPONENT ANALYSIS) WITH GEOGRAPHIC CONTROLS**



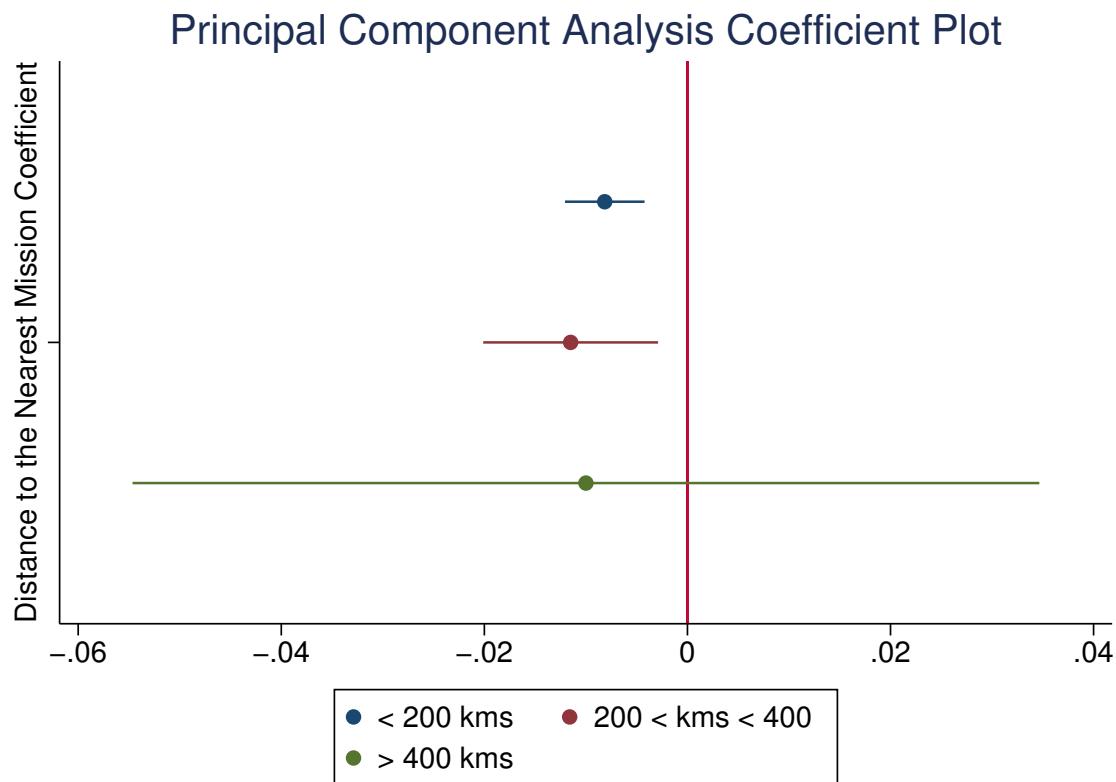
Conditional binned scatter plot of Principal Component Analysis of literacy and the logarithm of income (circles) with fitted line for Brazil and Paraguay versus distance to the nearest Jesuit mission in kilometers. Geographic controls include latitude, longitude, area and a dummy for Paraguay. The sample is restricted to a 225 kilometers distance threshold.

FIGURE A.14. MISSIONARY EFFECT ON MODERN EDUCATION AND INCOME (PRINCIPAL COMPONENT ANALYSIS): DISTANCE THRESHOLDS



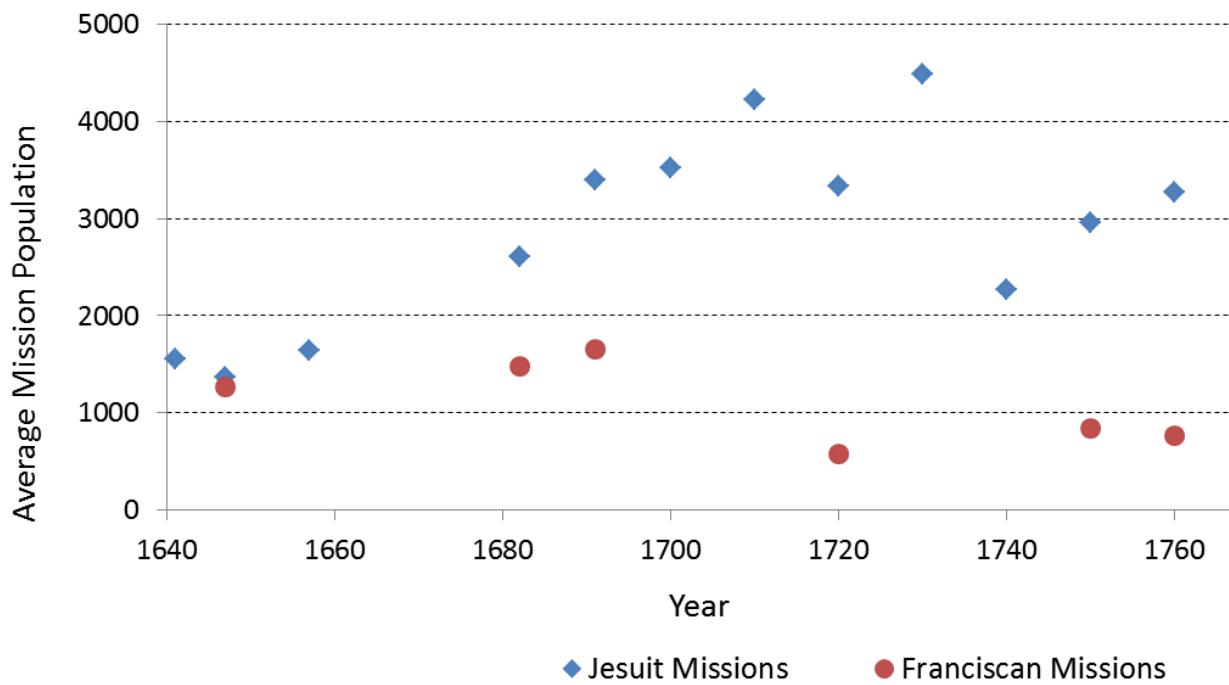
Plot of the distance to the nearest mission coefficient for the PCA of literacy and the logarithm of income for Brazil and Paraguay using distance thresholds at less than 200 kilometers, less than 400 kilometers and less than 600 kilometers with 95% confidence intervals. Geographic and weather controls as in Table A.6.

**FIGURE A.15. MISSIONARY EFFECT ON MODERN EDUCATION AND INCOME
(PRINCIPAL COMPONENT ANALYSIS): DISTANCE SPLINES**



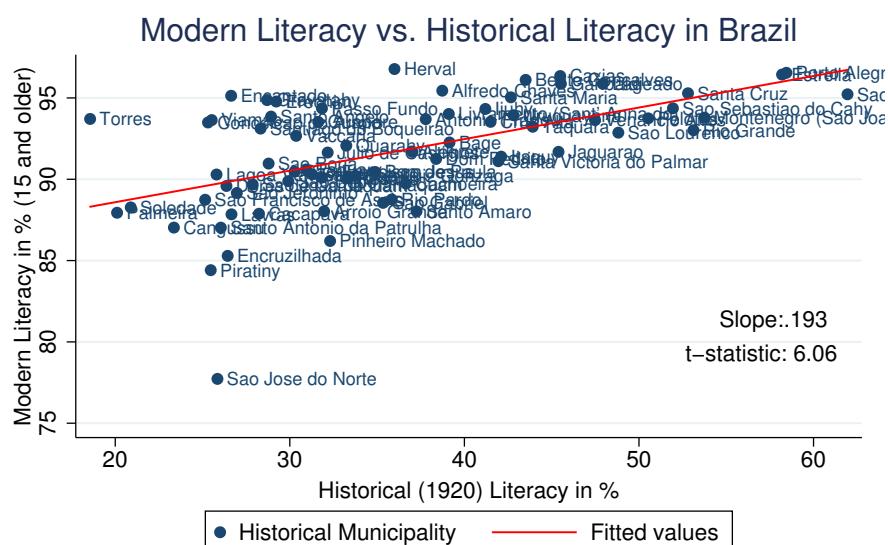
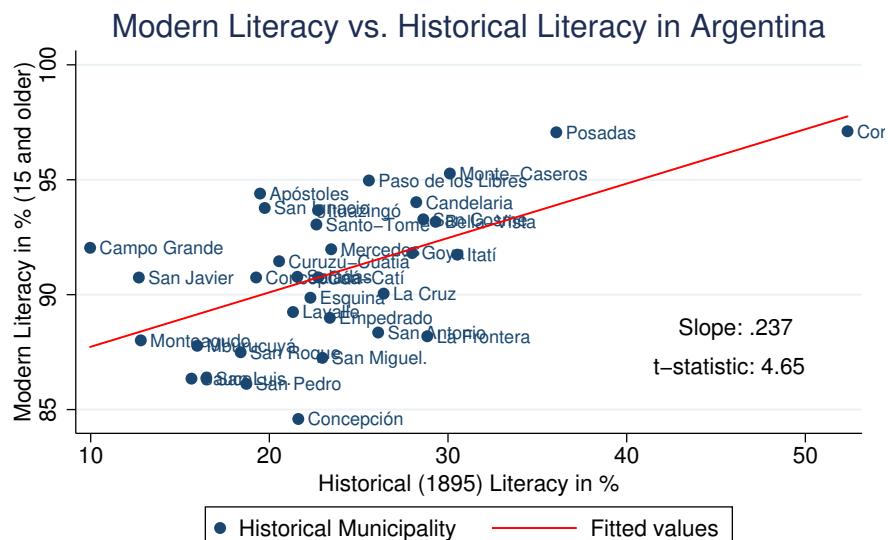
Plot of the distance to the nearest mission coefficient for the PCA of literacy and the logarithm of income for Brazil and Paraguay using distance splines at 200 kilometer intervals with 95% confidence intervals, for less than 200 kilometers, between 200 and 400 kilometers and over 400 kilometers. Geographic and weather controls as in Table A.6.

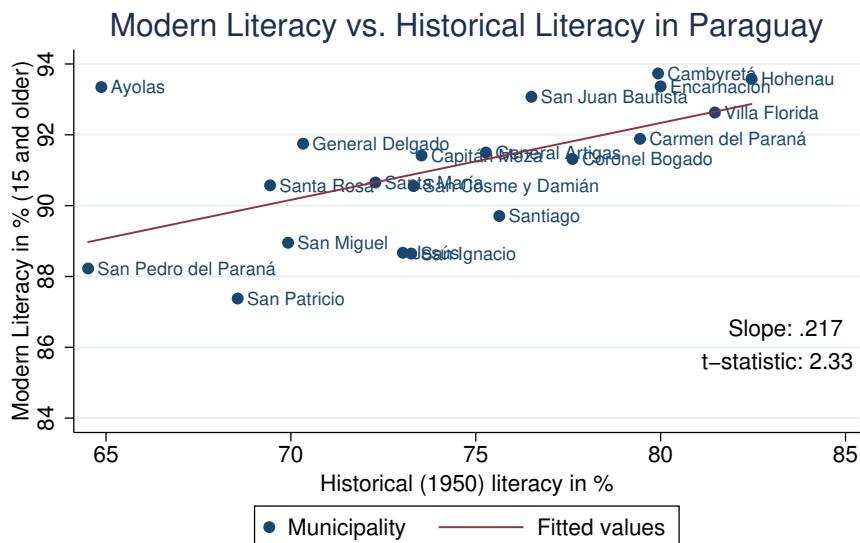
FIGURE A.16. HISTORICAL POPULATION OF JESUIT AND FRANCISCAN GUARANI MISSIONS (1640-1760)



The graph plots average indigenous population for Jesuit (in diamonds) and Franciscan (in dots) missions from 1640 to 1760.

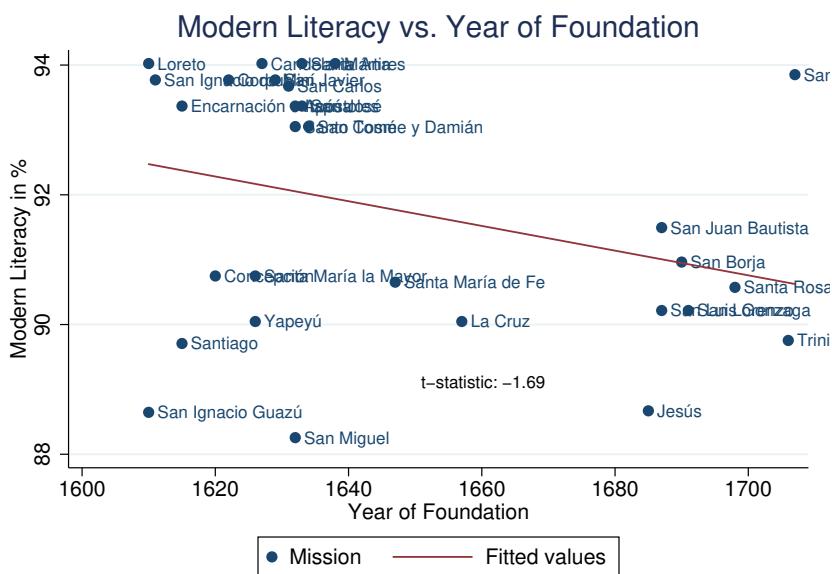
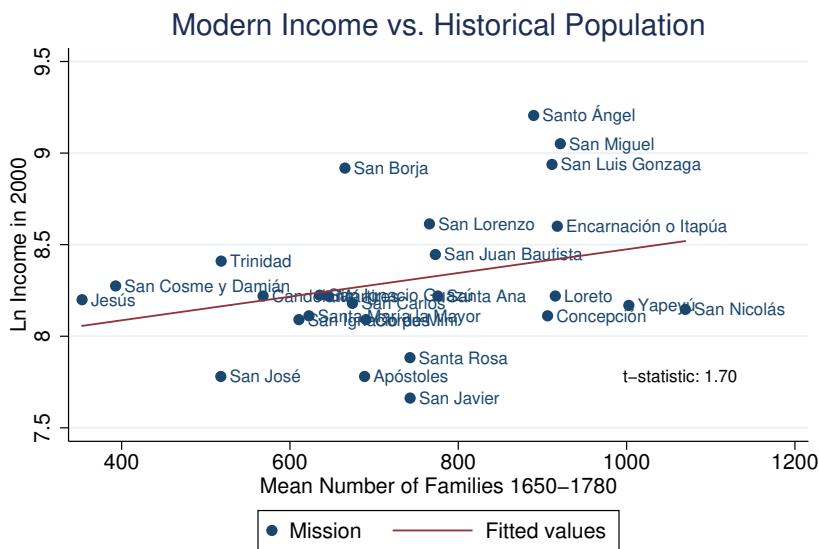
FIGURE A.17. MODERN VS. HISTORICAL LITERACY IN ARGENTINA, BRAZIL AND PARAGUAY: UNCONDITIONAL PLOTS





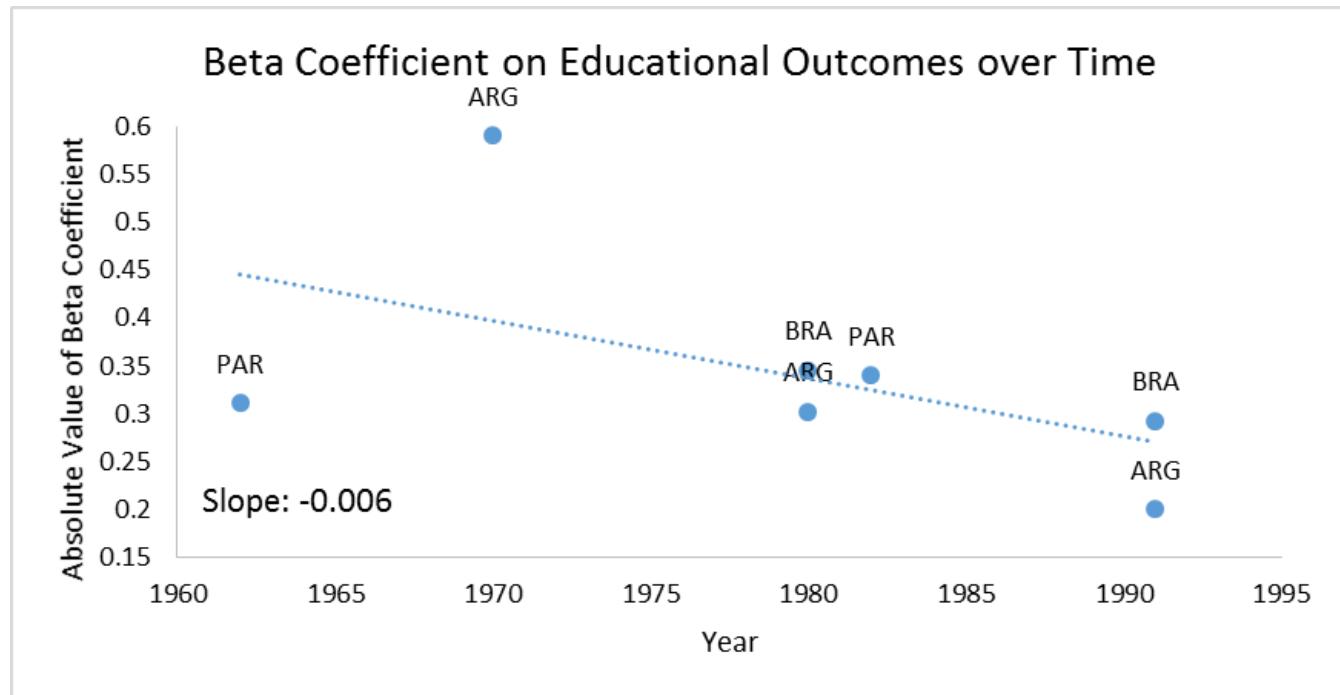
Unconditional plots of 2000 literacy in percentages for people aged 15 years and older in Argentina, Brazil and Paraguay on 1895 literacy in percentages in Argentina, 1920 in Brazil and 1950 in Paraguay respectively. Dots represent municipalities with historical names and linear trends.

FIGURE A.18. INTENSITY OF TREATMENT FOR MISSIONARY MUNICIPALITIES



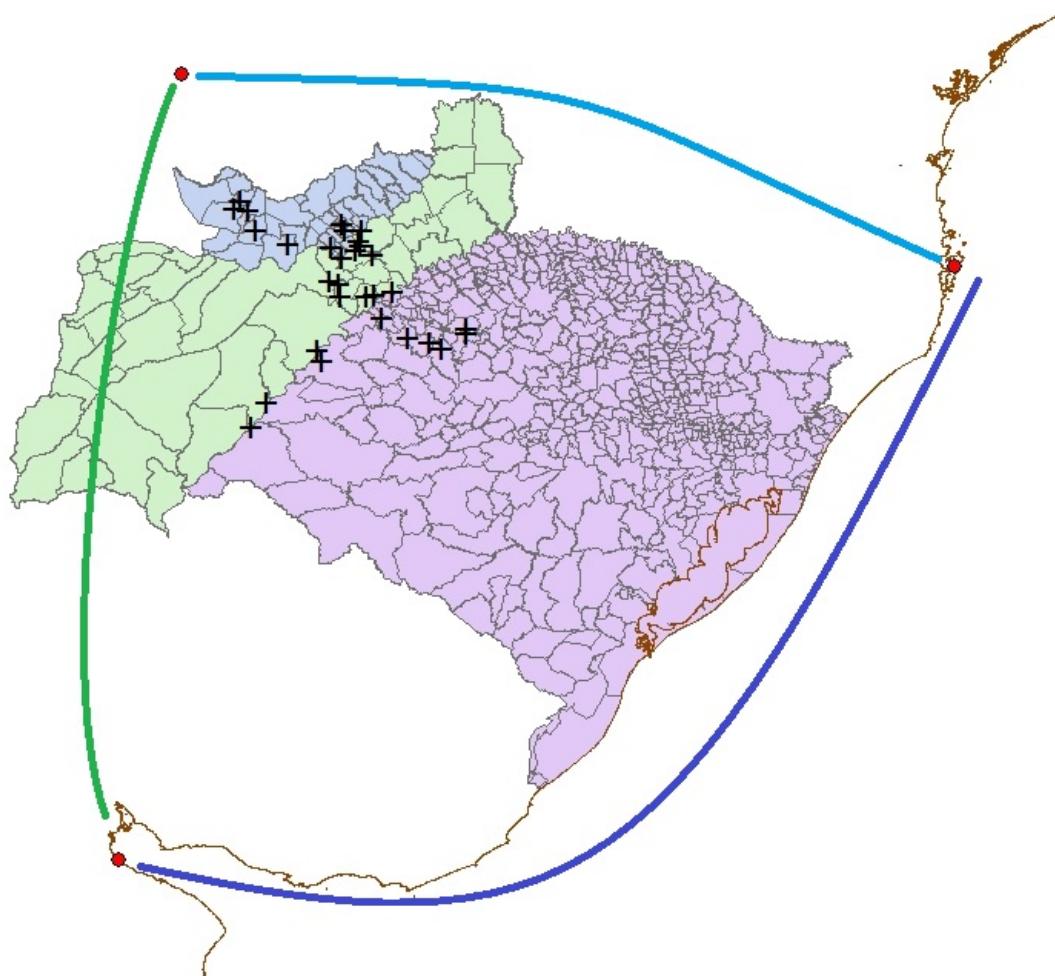
Unconditional plots of modern income versus historical missionary population and modern literacy versus year of foundation. Missions in circles with municipality names and linear trends. San Nicolás is excluded from the second figure.

FIGURE A.19. BETA COEFFICIENTS OF EDUCATIONAL OUTCOMES OVER TIME



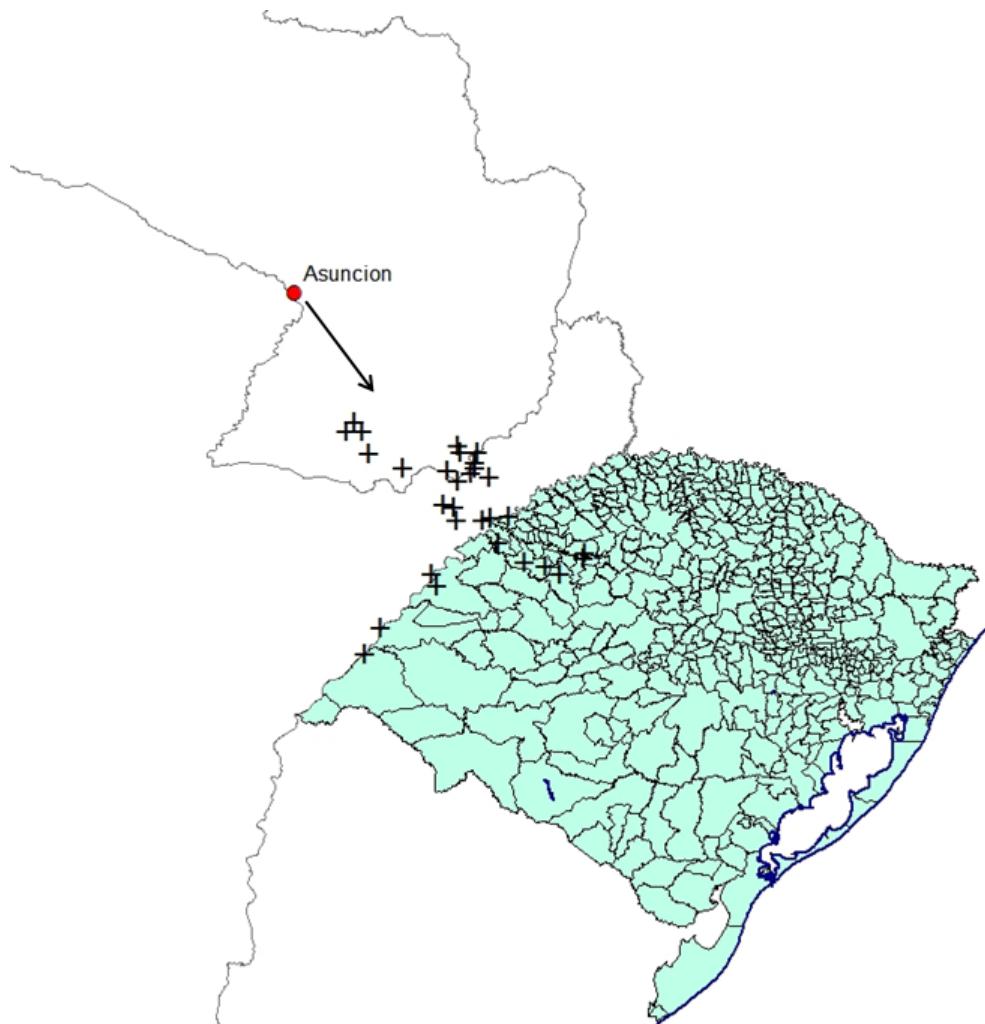
The chart plots the absolute value of the beta coefficients of the regressions on illiteracy in Argentina in 1970, 1980 and 1991, Brazil in 1980 and 1991, and Paraguay in 1962, 1972 and 1982, with a dotted linear trendline.

FIGURE A.20. MAP OF THE GUARANI JESUIT AREA ALONG WITH EXPLORATION ROUTES



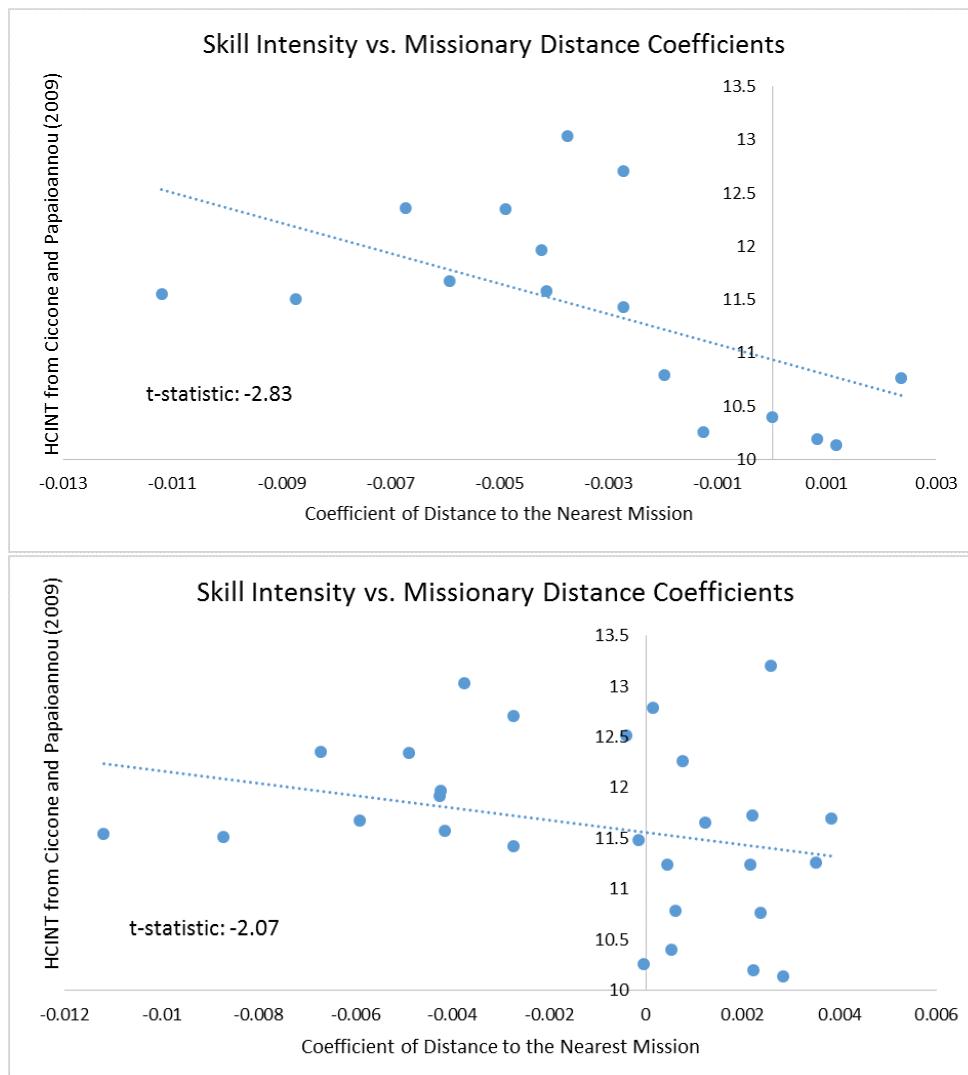
The map shows the location of the Guarani Jesuit missions along with municipal level boundaries for the states of Misiones and Corrientes (Argentina), Misiones and Itapúa (Paraguay) and Rio Grande do Sul (Brazil). The lines mark the expeditions by Pedro de Mendoza, Alvar Nuñez Cabeza de Vaca, Juan de Ayolas and Domingo de Irala. The points demarcate Asunción, Buenos Aires and Santa Caterina.

FIGURE A.21. MAP OF RIO GRANDE DO SUL WITH THE DIRECTION OF THE JESUIT MISSIONS FROM ASUNCIÓN



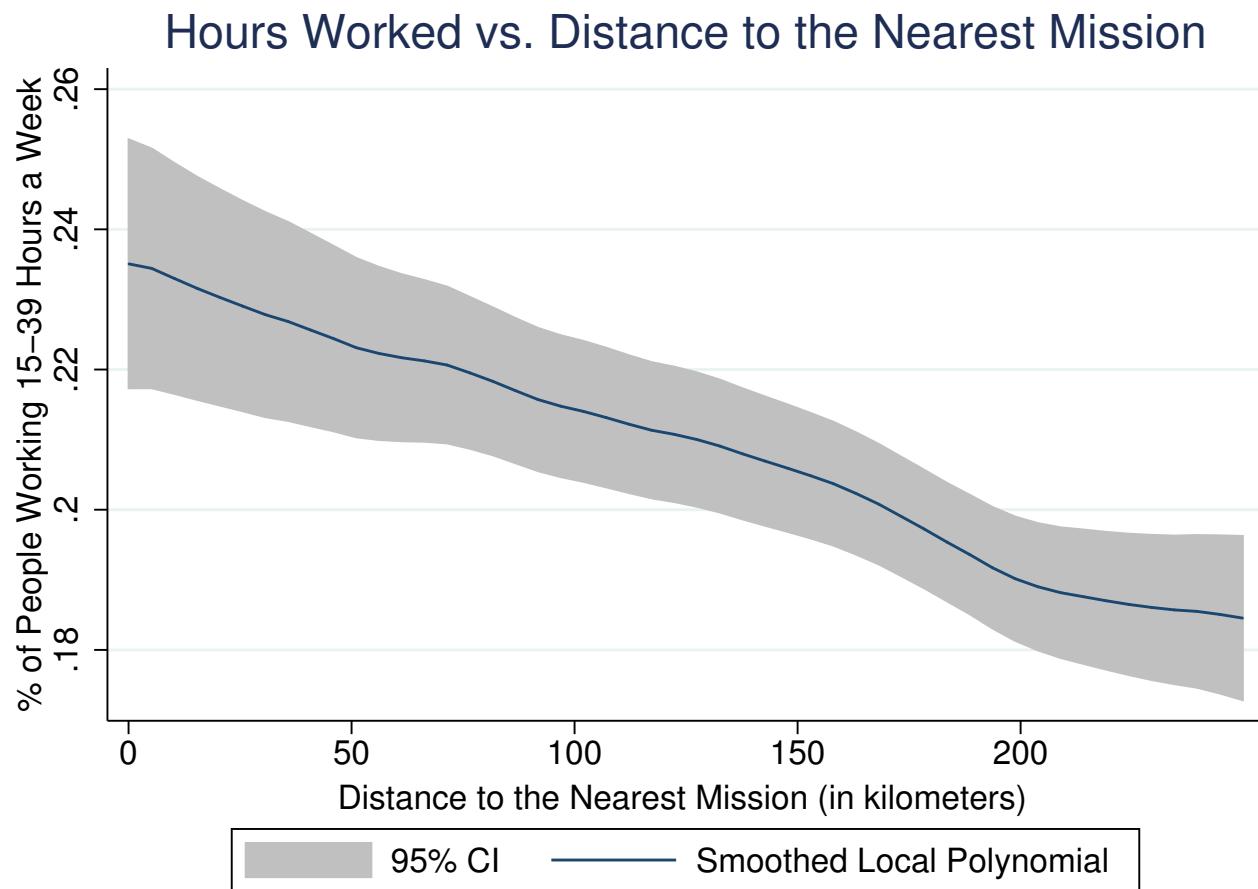
The map shows the location of Asunción, Paraguay, the Guarani Jesuit missions, along with municipal level boundaries for the state of Rio Grande do Sul (Brazil), and national level boundaries for Argentina and Paraguay.

FIGURE A.22. SKILL INTENSITY VS. MISSIONARY DISTANCE COEFFICIENTS



The charts plot the Human Capital Intensity HCINT measure from Ciccone and Papaioannou (2009) against the coefficient of a probit regression of these (high and low) skill-intensive industries as well as their entire industrial categorization on distance to the nearest Jesuit mission with geographic and weather controls, along with a linear trendline. Specifications as in Tables X and A.21.

FIGURE A.23. HOURS WORKED VS. MISSIONARY DISTANCE: BRAZIL



Smoothed local polynomial plot of the percentage of people per municipality reporting working 15 to 39 hours in Brazil in 2010 versus distance to the nearest Jesuit mission in kilometers. Smoothed local polynomial line and 95% confidence interval. The sample is restricted to a 225 kilometers distance threshold.

APPENDIX TABLES

TABLE A.1. GUARANI JESUIT MISSIONS: 1609-1767

#	Mission Name	Year of Foundation	Country	Mean Number of Inhabitants	Mean Number of Families
1	San Ignacio Guazú	1609	Paraguay	2,610	635
2	Loreto	1610	Argentina	3,797	915
3	San Ignacio de Miní	1611	Argentina	2,464	611
4	Santiago	1615	Paraguay	-	-
5	Encarnación o Itapúa	1615	Paraguay	4,239	918
6	Concepción	1620	Argentina	3,867	906
7	Corpus	1622	Argentina	3,209	690
8	Santa María la Mayor	1626	Argentina	2,480	623
9	San Nicolás	1626	Brazil	4,692	1,070
10	Yapeyú	1626	Argentina	4,202	1,003
11	Candelaria	1627	Argentina	2,361	568
12	San Javier	1629	Argentina	3,000	743
13	San Carlos	1631	Argentina	2,854	674
14	San Miguel	1632	Brazil	3,870	921
15	Apóstoles	1632	Argentina	2,999	689
16	Santo Tomé	1632	Argentina	-	-
17	San José	1633	Argentina	2,391	518
18	San Cosme y Damián	1634	Paraguay	1,611	393
19	Santa Ana	1638	Argentina	3,409	776
20	Mártires	1638	Argentina	2,554	646
21	Santa María de Fe	1647	Paraguay	-	-
22	La Cruz	1657	Argentina	-	-
23	Jesús	1685	Paraguay	1,719	353
24	San Luis Gonzaga	1687	Brazil	3,765	911
25	San Juan Bautista	1687	Brazil	3,310	773
26	San Borja	1690	Brazil	2,960	665
27	San Lorenzo	1691	Brazil	3,067	766
28	Santa Rosa	1698	Paraguay	3,195	743
29	Trinidad	1706	Paraguay	2,459	518
30	Santo Ángel	1707	Brazil	3,614	890

Notes. Author's calculations, based on Maeder and Gutiérrez (2009).

TABLE A.2. MISSIONARY EFFECT ON MODERN EDUCATION AND INCOME WITH ALTERNATIVE STANDARD ERRORS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Illiteracy Argentina, Brazil and Paraguay		Median Years of Schooling Brazil		Ln Income Brazil and Paraguay		Individual Poverty Index Argentina and Paraguay	
Mission Distance	0.0105*** (0.00368)	0.0112** (0.00495)	-0.00247** (0.00118)	-0.00679*** (0.00164)	-0.00166*** (0.00044)	-0.00204*** (0.00062)	0.0409*** (0.01370)	0.0938** (0.04283)
Robust SE								
Conley SE .1	{0.00372}	{0.00502}	{0.00118}	{0.00161}	{0.00045}	{0.00062}	{0.01327}	{0.04275}
Conley SE .25	{0.00439}	{0.00638}	{0.00129}	{0.00169}	{0.00048}	{0.00065}	{0.01340}	{0.04221}
Conley SE .5	{0.00562}	{0.00872}	{0.00153}	{0.00184}	{0.00056}	{0.00075}	{0.01369}	{0.04122}
Bootstrapped SE	[0.00370]	[0.00611]	[0.00127]	[0.00162]	[0.00042]	[0.00062]	[0.01412]	[0.05467]
State Clustered SE	<0.00536	<0.00631	<0.00142	<0.00198	<0.00024	<0.00021	<0.02364	<0.06729
GEO Controls	NO	YES	NO	YES	NO	YES	NO	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	547	548	427	427	506	506	82	81
Within R-squared	0.037	0.068	0.013	0.142	0.029	0.036	0.035	0.064
R-squared	0.042	0.073	0.042	0.171	0.869	0.876	0.704	0.733

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers (Equation 1). The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay in columns (1) to (2); median years of schooling in Brazil in columns (3) to (4), the logarithm of income in 2000 for Brazil and Paraguay in columns (5) to (6), and the Unsatisfied Basic Needs (UBN) Poverty Index in Argentina and Paraguay in columns (7) and (8). Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses, Conley standard errors at different windows in curly brackets, bootstrapped standard errors in brackets and errors clustered at the state level in angled brackets *** p<.01, ** p<.05, *p<.1

TABLE A.3. MISSIONARY EFFECT ON MODERN EDUCATION AND INCOME AT DIFFERENT DISTANCE THRESHOLDS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Illiteracy		Median Years of Education		Ln Income		Poverty Index	
	Argentina, Brazil and Paraguay <400 kms	<200 kms	Brazil <400 kms	Brazil <200 kms	Brazil and Paraguay <400 kms	Brazil and Paraguay <200 kms	Argentina and Paraguay <200 kms	Argentina and Paraguay <100 kms
Mission Distance	0.0205*** (0.006) {0.006}	0.0296*** (0.007) {0.007}	-0.0112*** (0.002) {0.002}	-0.00545* (0.003) {0.003}	-0.00378*** (0.001) {0.001}	-0.00187* (0.001) {0.001}	0.143*** (0.052) {0.054}	0.160*** (0.059) {0.066}
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	YES	YES	NO	NO	NO	NO	YES	YES
Observations	514	281	400	205	472	255	75	59
R-squared	0.113	0.134	0.2	0.237	0.889	0.937	0.767	0.78

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers (Equation 1). The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay in columns (1) to (2); median years of schooling in Brazil in columns (3) to (4), the logarithm of income in 2000 for Brazil and Paraguay in columns (5) to (6), and the Unsatisfied Basic Needs (UBN) Poverty Index in Argentina and Paraguay in columns (7) and (8). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Results are for the <400, <200 and <100 kilometers from the nearest Jesuit mission samples. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.4. MISSIONARY EFFECT ON MODERN INCOME AND EDUCATION: ALTERNATIVE FORMULATIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Income			Illiteracy	Ln Income	Illiteracy	Ln Income	Illiteracy	Ln Income
Brazil and Paraguay			ARG BRA PAR	BRA & PAR	ARG BRA PAR	BRA & PAR	ARG BRA PAR	BRA & PAR
Full	<200kms		Distance Dummies					
Mission Distance	-0.217*** (0.08) {0.08}	-0.202** (0.09) {0.09}			0.237* (1.28) {1.25}	-1.486*** (0.47)	0.228*** (0.07)	
Mission Dummy (<50 kms)								
Mission Distance (Q-reg)							0.0319*** {0.010}	-0.00380** {0.002}
Fixed Effects	NO	NO	YES	YES	YES	NO	YES	YES
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES
Observations	506	245	361	321	548	506	548	506
R-squared	0.336	0.409	0.125	0.923	0.925	0.924	0.924	0.925

Notes. The table shows the coefficient of the logarithm of distance to the nearest Jesuit mission in kilometers in columns (1) and (2), a dummy for whether a municipality is within 50 kilometers in columns (3) to (6), and distance to the nearest Jesuit mission in kilometers in columns (7) and (8). The dependent variables are the logarithm of income in 2000 for Brazil and Paraguay in columns (1), (2), (4), (6) and (8) and illiteracy for Argentina, Brazil and Paraguay in columns (3), (5) and (7). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS and using quantile regressions in columns (7) and (8). Robust standard errors in parentheses; bootstrapped and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<1

TABLE A.5. MISSIONARY EFFECT ON MODERN INCOME: ALTERNATIVE PROXIES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Brazil						Argentina and Paraguay					
	Ln Income	Ln Inc. 1991	HD Index	IFDM Index	Ln Lights	Poor	Poor Under 14	HH Poverty Index	Argentina and Paraguay Poverty Index	Ln Lights	Ln Lights	
Mission Distance	-0.00152*** (0.000) {0.000}	-0.00275*** (0.001) {0.001}	-0.00425*** (0.001) {0.001}	-0.0398*** (0.008) {0.008}	-0.0556*** (0.014) {0.014}	-0.00497** (0.002) {0.002}	0.156*** (0.026) {0.026}	0.199*** (0.033) {0.034}	0.139*** (0.048) {0.051}	-0.00806* (0.048) {0.044}	-0.00604 (0.005) {0.005}	
Mission Distance x PAR									0.0945 (0.064) {0.058}	0.0945 (0.064) {0.058}	0.0945 (0.064) {0.058}	
GEO Controls	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Observations	467	427	406	467	467	466	467	467	467	81	81	81
R-squared	0.183	0.178	0.155	0.131	0.156	0.585	0.332	0.323	0.323	0.771	0.561	0.577

Notes. The table shows the coefficient of distance to the nearest Jesuit mission interacted with a dummy for Paraguay in columns (10) and (12). The dependent variables are the logarithm of income for Brazil in column (3), the Human Development Index in column (4), the Brazilian IFDM Index in column (5), the logarithm of nighttime satellite divided by population in columns (6), (11) and (12), the percentage of poor people and poor people under 14 in columns (7) and (8), and the UBN Index for households in column (9) and for individuals in column (10). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<0.01, ** p<0.05, * p<0.1

**TABLE A.6. MISSIONARY EFFECT ON MODERN EDUCATION AND INCOME:
ALTERNATIVE SPECIFICATIONS**

	(1)	(2)	(3)	(4)	(5)
	Illiteracy		Ln Income		PCA
	Argentina, Brazil and Paraguay		Brazil and Paraguay		
	Dummy		Dummy		Distance
Mission Dummy	-1.984***	-5.748***	0.296*	0.420**	-0.0102***
Distance	(0.627)	(1.819)	(0.164)	(0.174)	(0.002)
	{0.644}	{1.872}	{0.163}	{0.179}	{0.002}
100 km to 200 km		-3.322**		0.314**	
		(1.504)		(0.135)	
		{1.500}		{0.140}	
200 km to 300 km		-4.824***		0.418***	
		(1.156)		(0.100)	
		1.158		{0.104}	
300 km to 400 km		-4.021***		0.149**	
		(0.976)		(0.074)	
		{0.982}		{0.079}	
GEO Controls	YES	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES	YES
Observations	548	548	506	506	506
Within R-squared	0.073	0.132	0.372	0.0403	0.222
R-squared	0.078	0.134	0.401	0.88	0.234

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers (Equation 1) of a dummy for whether a municipality is within 100 kilometers of a Jesuit mission in columns (2) and (3), along with distance dummies in columns (2) and (4). The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay in columns (1) and (2), the logarithm of income per capita in 2000 in Brazil and Paraguay in columns (3) and (4), and the Principal Component of literacy and the logarithm of income in column (5). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

**TABLE A.7. MISSIONARY EFFECT ON MODERN EDUCATION AND POVERTY:
ALTERNATIVE SPECIFICATIONS**

	(1)	(2)	(3)	(4)
	Median Years of Schooling		Individual Poverty Index	
	Brazil		Argentina and Paraguay	
Mission Dummy	0.391*** (0.143) {0.156}	1.207** (0.471) {0.497}	-5.241* (3.173) {3.296}	-6.235* (3.282) {3.389}
100 km to 200 km		0.693* (0.385) {0.410}		-3.388 (2.698) {2.832}
200 km to 300 km		0.590** (0.275) {0.303}		
300 km to 400 km		0.579*** (0.223) {0.249}		
GEO Controls	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES
Observations	427	427	81	81
Within R-squared	0.130	0.145	0.073	0.079
R-squared	0.149	0.164	0.742	0.748

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers (Equation 1) of a dummy for whether a municipality is within 100 kilometers of a Jesuit mission in column (1) and 50 kilometers in column (3), along with distance dummies in columns (2) and (4). The dependent variables are median years of schooling in Brazil in columns (1) and (2) and the Unsatisfied Basic Needs (UBN) Poverty Index in Argentina and Paraguay at the individual level in columns (3) and (4). Median years of schooling is only available for Brazil at the municipal level. Mesoregion fixed effects included for Brazil. Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

**TABLE A.8. PLACEBO EFFECT OF ABANDONED JESUIT MISSIONS ON MODERN EDUCATION AND INCOME,
WITHOUT CONTROLS**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Argentina, Brazil and Paraguay	Illiteracy Argentina, Brazil and Paraguay	Median Years Education Brazil	Median Years Education Brazil	Ln Income Brazil and Paraguay	Ln Income Brazil and Paraguay	Ln Income Brazil and Paraguay	Individual Poverty Index Argentina and Paraguay	Individual Poverty Index Argentina and Paraguay
Alto Parana Mission Distance	-0.00483 (0.003) {0.004}		0.001 (0.005) {0.005}	-0.00126 (0.005) {0.021}	-0.00336 (0.003) {0.003}	-0.00359 (0.003) {0.001}	-0.15 (0.107) {0.104}	-0.143 (0.094) {0.091}	
Guayra Mission Distance	-0.00654 (0.007) {0.007}	0.00360* (0.002) {0.001}	0.00366* (0.002) {0.011}	-0.00320*** (0.001) {0.001}	-0.00281*** (0.001) {0.001}	-0.00281*** (0.001) {0.001}	0.121 (0.078) {0.075}	0.106 (0.068) {0.065}	
Itatin Mission Distance		-0.000909 (0.006) {0.007}	0.00411 (0.007) {0.007}	0.0116 (0.008) {0.044}	0.00952* (0.005) {0.005}	0.0121** (0.005) {0.005}	0.0279 (0.041) {0.039}	0.0275 (0.037) {0.035}	
Jesuit Mission Distance			-0.00324** (0.001) {0.002}	-0.00324** (0.001) {0.002}	-0.00207*** (0.000) {0.000}	-0.00207*** (0.000) {0.000}	0.431*** (0.014) {0.014}		
GEO Controls	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fixed Effects	YES	YES	YES	NO	NO	YES	YES	YES	NO
Observations	549	549	549	467	467	506	506	82	82
Within R-squared	0.030	0.028	0.030	0.026	0.041	0.029	0.035	0.041	0.056
R-squared	0.032	0.030	0.032	0.045	0.060	0.876	0.876	0.736	

Notes. The table shows the coefficient of distance to the nearest abandoned and Jesuit mission in kilometers (Equation 1). The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay in columns (1) to (3), median years of schooling in Brazil in columns (4) and (5), the logarithm of income per capita in 2000 in Brazil and Paraguay in columns (6) and (7), and the Unsatisfied Basic Needs (UBN) Poverty Index in Argentina and Paraguay at the individual level in columns (8) and (9). Median years of schooling is only available for Brazil at the municipal level and income is not available for Argentina. Mesoregion fixed effects included for Brazil. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with country fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, * p<1

TABLE A.9. PLACEBO EFFECT OF ABANDONED JESUIT MISSIONS ON MODERN EDUCATION, BY COUNTRY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Brazil									
Illiteracy									
						Argentina			Paraguay
Alto Parana Mission Distance	0.036 (0.076)	0.0486 (0.077)	0.164** {0.075}	0.0523 {0.046}	0.0693 {0.045}	-0.00682 (0.047)	0.0313 (0.133)	-0.144*** (0.049)	0.0932 (0.233)
Guayra Mission Distance	-0.0014 (0.011)	-0.00224 {0.011}	0.0484*** {0.016}	-0.154 (0.186)	-0.0547** (0.024)	-0.0983*** (0.028)	{0.039} {0.023}	{0.047} {0.207}	{0.181} (0.224)
Itatin Mission Distance	-0.0874 (0.132)	-0.139 (0.135)	-0.399*** (0.131)	0.0223 (0.038)	-0.0237 (0.027)	0.134** (0.059)	-0.125 (0.110)	0.0131 (0.021)	-0.163 (0.310)
Jesuit Mission Distance	0.0281*** (0.007)	0.0359*** {0.008}	0.0108* (0.008)	0.0327*** {0.005}	0.0108* {0.005}	0.0327*** {0.009}	-0.0319 (0.011)	-0.0507 (0.021)	
GEO Controls	NO YES	NO YES	YES YES	NO YES	NO YES	NO YES	NO YES	NO YES	NO (0.041) {0.031}
Fixed Effects	467	467	467	42	42	42	40	40	39
Observations	0.032	0.076	0.151	0.163	0.162	0.658	0.289	0.296	0.678
Within R-squared	0.036	0.08	0.155	0.226	0.225	0.721	0.29	0.297	0.679
R-squared									

Notes. The table shows the coefficients of distance to the nearest abandoned and Jesuit missions in kilometers (Equation 1). The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Brazil in columns (1) to (3), Argentina in columns (4) to (6) and Paraguay in columns (7) to (9). Geographic controls include distance to the nearest coast, distance to the nearest Franciscan mission, distance to the nearest river, altitude, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with country fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, * p<1

TABLE A.10. PLACEBO EFFECT OF ABANDONED JESUIT MISSIONS ON MODERN EDUCATION

	1	2	3	4	5	6	7
Illiteracy Argentina, Brazil and Paraguay							
Alto Parana Mission Dist.	-0.0123*** (0.004) 0.004			-0.000503 (0.013) 0.019	-0.014 (0.024) 0.025	-0.0031 (0.017) 0.019	0.00122 (0.026) 0.030
Guayra Mission Dist.		-0.00371 (0.008) 0.008		-0.0015 (0.010) 0.010	0.0380*** (0.013) 0.013	-0.00932 (0.010) 0.011	0.0247* (0.013) 0.014
Itatin Misision Dist.			-0.0258*** (0.008) 0.009	-0.00728 (0.023) 0.033	-0.028 (0.044) 0.045	-0.0469 (0.030) 0.034	-0.0874* (0.046) 0.053
Jesuit Mission Dist.						0.0244*** (0.005) 0.010	0.0230*** (0.006) 0.006
GEO Controls	YES	YES	YES	NO	YES	NO	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Observations	548	548	548	549	548	549	548
Within R-squared	0.075	0.061	0.077	0.028	0.122	0.078	0.122
R-squared	0.079	0.065	0.081	0.032	0.126	0.078	0.126

Notes. The table shows the coefficients for distance to the nearest abandoned and Jesuit missions in kilometers (Equation 1). The dependent variable is illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay. Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with country fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.11. PLACEBO EFFECT OF ABANDONED JESUIT MISSIONS ON DEVELOPMENT PROXIES IN BRAZIL, ARGENTINA AND PARAGUAY

	(1)	(2)	(3)	(4)	(5)	(6)
	Median Years Education Brazil		Ln Income Brazil and Paraguay		Individual Poverty Index Argentina and Paraguay	
Alto Parana Mission Distance	0.00634 (0.005) {0.005}	-0.0235 (0.018) {0.021}	-0.0015 (0.001) {0.001}	-0.0005 (0.001) {0.001}	-0.381*** (0.136) {0.125}	-0.303** (0.141) {0.125}
Guayra Mission Distance	-0.00144 (0.001) {0.001}	0.0106 (0.011) {0.011}	-0.0006 (0.001) {0.001}	-0.00296*** (0.001) {0.001}	0.0647 (0.189) {0.184}	0.41 (0.247) {0.229}
Itatin Misision Distance	-0.00448 (0.007) {0.007}	0.0394 (0.041) {0.044}	0.0031 (0.002) {0.002}	0.00556** (0.002) {0.002}	0.326 (0.213) {0.210}	0.127 (0.252) {0.220}
Jesuit Mission Distance		-0.00728*** (0.002) {0.002}		-0.00273*** (0.000) {0.000}		0.108** (0.045) {0.045}
GEO Controls	YES	YES	YES	YES	YES	YES
Fixed Effects	NO	NO	YES	YES	YES	YES
Observations	467	467	506	506	81	81
Within R-squared	0.111	0.169	0.032	0.040	0.110	0.132
R-squared	0.14	0.198	0.872	0.88	0.758	0.777

Notes. The table shows the coefficients for distance to the nearest abandoned and Jesuit missions in kilometers (Equation 1). The dependent variables are median years of schooling in Brazil in columns (1) and (2), as well as the logarithm of income per capita in 2000 in Brazil and Paraguay columns (3) to (4), and the Unsatisfied Basic Needs (UBN) Poverty Index in Argentina and Paraguay at the individual level in columns (5) and (6). Median years of schooling is only available for Brazil at the municipal level and income is not available for Argentina. Mesoregion fixed effects included for Brazil. Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with country fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<1

TABLE A.12. FRANCISCAN AND JESUIT MISSIONARY EFFECT ON DEVELOPMENT PROXIES IN BRAZIL, ARGENTINA AND PARAGUAY, WITHOUT CONTROLS

	(1)	(2)	(3)	(5)	(6)	(7)
	Median Brazil	Years Education Brazil	Ln Income Brazil and Paraguay		Individual Poverty Index Argentina and Paraguay	
Franciscan Mission Distance	0.00134 (0.002) {0.002}	0.00716** (0.003) {0.003}	-0.00061 (0.001) {0.001}	0.00322*** (0.001) {0.001}	0.00544 (0.021) 0.021	-0.0399 (0.026) {0.026}
Jesuit Mission Distance		-0.00439** (0.002) {0.002}		-0.00326*** (0.001) {0.001}		0.0627*** (0.021) {0.022}
GEO Controls	NO	NO	NO	NO	NO	NO
Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	467	467	506	506	82	82
Within R-squared	0.008	0.021	0.024	0.032	0.014	0.044
R-squared	0.027	0.040	0.864	0.872	0.683	0.713

Notes. The table shows the coefficients for distance to the nearest Franciscan and Jesuit missions in kilometers. The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Brazil in columns (1) to (3), Argentina in columns (4) to (6) and Paraguay in columns (7) to (9). Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A13. FRANCISCAN AND JESUIT MISSIONARY EFFECT ON MODERN EDUCATION, BY COUNTRY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Brazil									
Franciscan Mission Distance	0.01680 (0.010) {0.010}	0.00390 (0.017) {0.017}	-0.01780 (0.015) {0.016}	0.01010 (0.010) {0.009}	0.02360 (0.024) {0.020}	-0.0608** (0.024) {0.023}	-0.01330 (0.012) {0.012}	-0.02960 (0.029) {0.025}	-0.02340 (0.015) {0.015}
Jesuit Mission Distance			0.0246*** (0.009) {0.009}			0.0617*** (0.020) {0.019}			0.0219 (0.018) {0.017}
GEO Controls	NO	YES	NO	NO	YES	NO	NO	YES	NO
Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	467	467	467	42	42	42	40	39	40
Within R-squared	0.031	0.065	0.048	0.041	0.529	0.210	0.030	0.267	0.063
R-squared	0.035	0.069	0.052	0.104	0.592	0.273	0.031	0.268	0.064

Notes. The table shows the coefficients for distance to the nearest Franciscan and Jesuit missions in kilometers. The dependent variables are illiteracy for people aged 15 years and older in 2000 in percent for Brazil in columns (1) to (3), Argentina in columns (4) to (6) and Paraguay in columns (7) to (9). Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, * p<.1

TABLE A.14. MISSIONARY EFFECT ON MODERN EDUCATION AND INCOME: ADDITIONAL CONTROLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Illiteracy										
	Argentina, Brazil and Paraguay	X Y Polynomial	Quadratic	Placebo	Tordesillas	Explorer Distance	X Y Polynomial	Brazil and Paraguay	Quadratic	Ln Income
Mission Distance	0.0314*** (0.006) {0.006}	0.0177*** (0.009) {0.009}	0.0223*** (0.010) {0.009}	0.0322*** (0.006) {0.006}	0.0384*** (0.007) {0.006}	-0.00356*** (0.001) {0.001}	-0.00328*** (0.001) {0.001}	-0.00305*** (0.001) {0.001}	-0.00368*** (0.001) {0.001}	-0.00368*** (0.001) {0.001}
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	548	548	548	548	548	506	506	506	506	506
R-squared	0.112	0.113	0.144	0.112	0.12	0.879	0.881	0.885	0.879	0.879

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers (Equation 1). The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay in columns (1) to (5) and the logarithm of income for Brazil and Argentina in columns (6) to (10). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Additional controls include distance to exploration routes, a quadratic polynomial of latitude and longitude, quadratic geographic controls, distance to the nearest abandoned mission and distance to the Tordesillas line. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in curly brackets *** p<.01, ** p<.05, * p<.1

TABLE A.15. INTENSITY OF TREATMENT EFFECT OF JESUIT MISSIONS ON INCOME AND EDUCATION

	(1)	(2)	(3)	(4)	(5)	(6)
			Ln Income Brazil and Paraguay			
						Illiteracy ARG BRA PAR
Ln (Mission Distance X Foundation)	-0.316*** (0.0707) {0.0714}					
Ln (Population / Mission Distance)		0.336*** (0.0794) {0.0817}				
Ln (Population X Years Active) / Mission Distance			0.333*** (0.0833) {0.0850}			
Mission Moved				-0.101* (0.0583) {0.0573}		
Mission Distance X River Distance					-0.00510*** (0.0016) {0.0016}	0.0180*** (0.0059) {0.0059}
GEO Controls	YES	YES	YES	YES	YES	YES
Fixed Effects	NO	NO	NO	YES	YES	YES
Observations	506	498	498	506	506	548
R-squared	0.583	0.582	0.622	0.873	0.401	0.098

Notes. The table shows the coefficient of the logarithm of distance to the nearest Jesuit mission interacted with year of foundation, mean population and distance to the nearest river in columns (1) to (3), (5) and (6), and a dummy variable for whether a mission moved is in column (4). The dependent variable is the logarithm of income in 2000 for Brazil and Paraguay in columns (1) to (5) and illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay in column (6). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.16. GEOGRAPHIC AND WEATHER CHARACTERISTICS FOR JESUIT AND FRANCISCAN MISSIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Argentina, Brazil and Paraguay								
	Area	Altitude	Ruggedness	Rainfall	Temperature	River Distance	Landlocked	Distance to Capital
Jesuit Mission	3.612*** (1.348)	-0.896*** (0.150)	-94.98*** (32.720)	-1.494*** (0.188)	0.0254*** (0.005)	-0.00111*** (0.0002)	-0.000931*** (0.0002)	-3.509*** (0.321)
Distance	{1.348}	{0.154}	{32.69}	{0.189}	{0.005}	{0.000}	{0.000}	{0.322}
Franciscan Mission	-3.301*** (0.945)	0.678*** (0.080)	51.44** (21.730)	0.618*** (0.135)	-0.0714*** (0.003)	0.000925*** (0.001)	0.000199*** (0.0001)	3.844*** (0.251)
Distance	{0.944}	{0.082}	{21.67}	{0.135}	{0.003}	{0.000}	{0.000}	{0.252}
Observations	549	548	548	548	548	548	549	549
R-squared	0.04	0.042	0.014	0.239	0.603	0.065	0.165	0.697

Notes. The table shows the coefficients for distance to the nearest Jesuit and Franciscan missions in kilometers. The dependent variables in columns (1) to (8) are area, altitude, ruggedness, rainfall, temperature, distance to the nearest river, a landlocked dummy and distance to the capital for Argentina, Brazil and Paraguay. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<0.01, ** p<0.05, * p<1

TABLE A.17. JESUIT AND FRANCISCAN MISSIONARY EFFECT ON MODERN EDUCATION, INCOME, INEQUALITY AND HEALTH

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Illiteracy Argentina, Brazil and Paraguay Spillovers	Ln Income Brazil and Paraguay Dist. Capital	Income Inequality BRA & PAR	Brazil Mortality Under 5	Brazil Mortality Infant		
Jesuit Mission Distance	0.0270*** (0.0071) {0.0070}	0.0220*** (0.006) {0.006}	-0.00371*** (0.0007) {0.0007}	-0.00352*** (0.001) {0.001}	0.0603*** (0.023) {0.023}	0.0369*** (0.013) 0.013	0.0367*** (0.013) 0.013
Distance to Capital		0.00989*** (0.003) 0.003		-0.0001 (0.001) 0.001			
Franciscan Mission Distance					-0.126*** 0.038 {0.038}	0.013 0.028 0.028	0.022 0.028 0.028
GEO Controls	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	NO	YES	NO	YES	YES	NO	NO
Observations	526	548	492	506	506	466	466
R-squared	0.091	0.092	0.859	0.879	0.448	0.107	0.109

Notes. The table shows the coefficients for distance to the nearest Jesuit and Franciscan missions, and distance to the capital in kilometers. The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay (columns (1) and (2)); the logarithm of income in 2000 for Brazil and Paraguay (columns (3) and (4)), the Theil index of income for Brazil and Paraguay (column (5)), child mortality and infant mortality (columns (6) and (7)). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the capital, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.18. INSTRUMENTAL VARIABLES ESTIMATION OF JESUIT MISSIONS ON MODERN EDUCATION AND INCOME

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Illiteracy			Ln Income		
Second Stage	Explorers	Asuncion	Both	Explorers	Asuncion	Both
	ARG	BRA	PAR	Brazil	Brazil	Brazil
Mission Distance	0.0140** (0.006)	0.0215** (0.011)	0.0245*** (0.009)	-0.00337*** (0.001)	-0.00199*** (0.001)	-0.00243*** (0.001)
GEO Controls	YES	YES	YES	YES	YES	YES
Fixed Effects	YES	NO	NO	YES	NO	NO
Observations	548	467	467	506	467	467
R-Squared	0.058	0.143	0.145	0.874	0.262	0.262

Panel B	Mission Distance		Mission Distance	
First Stage	-0.6874 (0.021) {0.021}	2.0410 (0.205) {0.203}	-0.4832 (0.027) {0.027}	2.0410 (0.205) {0.203}
T-statistic	-33.40	9.94	-17.91	9.94
F-test		798.258		798.258
Overidentification Test		0.289813		1.46545
P-value		0.5903		0.2261

Notes. The table shows the instrumented coefficient of distance to the nearest Jesuit mission in kilometers in Panel A. The instrumental variables are distance to exploration routes and distance to Asunción. The dependent variables are illiteracy for people aged 15 years and older in 2000 in percentages for Argentina, Brazil and Paraguay in columns (1) to (3), and the logarithm of income in 2000 for Brazil and Paraguay in columns (4) to (6). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to São Paulo, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. The first stage in Panel B for missionary distance is for exploration routes in columns (1) and (4), distance to Asunción in columns (2) and (5), and both instruments in columns (3) and (6). Please refer to the Data Appendix for units and additional details of these variables. Estimation is by two stage least squares with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.19. MISSIONARY EFFECT ON HISTORICAL EDUCATION: ARGENTINA (1914) AND BRAZIL (1940)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Argentina 1914				Brazil 1940			
	Illiteracy Argentinean	Instruction Foreigners	Schols pc Total		Total	Illiteracy 7 to 14	5 to 39	Instruction Total
Mission Distance	0.0641*** (0.019) {0.016}	-0.0472*** (0.010) {0.009}	-0.313* (0.1770) {0.180}	-0.00333** (0.002) {0.003}	0.146*** (0.053) {0.059}	0.0325** (0.0125) {0.017}	0.0364** (0.0143) {0.020}	-0.0770** (0.0301) {0.039}
GEO Controls	NO	NO	YES	YES	YES	YES	YES	YES
Observations	32	32	32	24	37	37	37	37
R-squared	0.298	0.193	0.584	0.671	0.401	0.394	0.418	0.381

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers (Equation 1). The dependent variable is illiteracy in percentages in Argentina in 1914 in columns (1) and (2), instruction in column (3), schools per capita in column (4), illiteracy in Brazil in 1940 in columns (5) to (7), and instruction in column (8). Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS. Robust standard errors in parentheses and bootstrapped standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.20. MISSIONARY EFFECT ON STRUCTURAL TRANSFORMATION IN BRAZIL, PARAGUAY AND ARGENTINA: ALTERNATIVE FORMULATION

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Agriculture	Brazil 2010 Employed in Manufacturing	Commerce	Agriculture	Argentina 2001 Employed in Manufacturing	Commerce	Agriculture	Paraguay 2012 Employed in Manufacturing	Commerce	Paraguay 2012 Employed in Manufacturing
Mission Dummy (<50 kms)	-0.178*** {0.034}	0.0460** {0.021}	0.0301*** {0.009}	-1.062*** (0.221)	-0.554*** (0.066)	0.377*** (0.048)	-1.481*** (0.339)	1.642*** (0.516)	1.937*** (0.485)
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects									
Observations	426	426	426	48,476	48,476	48,476	1,928	1,928	1,928
Within R-squared	0.154	0.278	0.196	0.151	0.015	0.012	0.122	0.054	0.063
R-Squared	0.320	0.348	0.278	0.170	0.016	0.013	0.139	0.054	0.063

Notes. The table shows the coefficient for a dummy for whether a municipality is within 50 kilometers of a Jesuit mission. The dependent variables are the percentage of the population working in Agriculture, Manufacturing and Commerce in Brazil in columns (1) to (3), whether that a person is working in Agriculture, Manufacturing and Commerce in Argentina in 2001 in columns (4) to (6), and Paraguay in 2012 in columns (7) to (9). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS and probit with standard errors clustered at the district level in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, * p<.1

TABLE A.21. PLACEBO EFFECT ON STRUCTURAL TRANSFORMATION IN BRAZIL, PARAGUAY AND ARGENTINA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Brazil 2010			Argentina 2001			Paraguay 2012		
	Agriculture	Employed in Manufacturing	Commerce	Agriculture	Manufacturing	Commerce	Agriculture	Manufacturing	Commerce
Abandoned Missions	-0.140** {0.060}	0.180*** {0.034}	0.0205 {0.016}	0.0152 (0.016)	-0.00929*** (0.001)	-0.0102 (0.007)	-0.0179*** (0.006)	0.0131*** (0.004)	0.0135*** (0.004)
Distance	YES	YES	YES	YES	YES	YES	YES	YES	YES
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	426	426	426	48,476	48,476	48,476	1,928	1,928	1,928
Observations	0.223	0.333	0.193	0.141	0.014	0.014	0.118	0.051	0.055
Within R-squared	0.295	0.386	0.265	0.160	0.015	0.014	0.135	0.052	0.055
R-Squared									

Notes. The table shows the coefficient of distance to the nearest abandoned Jesuit mission in kilometers. The dependent variables are the percentage of the population working in Agriculture, Manufacturing and Commerce in Brazil in columns (1) to (3), whether a person is working in Agriculture, Manufacturing and Commerce in Argentina in 2001 in columns (4) to (6), and Paraguay in 2012 in columns (7) to (9). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS and probit with standard errors clustered at the municipality level in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, * p<.1

TABLE A.22. PLACEBO EFFECT ON (LOW) SKILL-INTENSIVE INDUSTRIES IN BRAZIL

	(1)	(2)	(3)	(4)	(5)	(6)
Brazil 2010						
HCINT	Leather 10.138	Clothing 10.193	Footwear 10.259	Textiles 10.397	Furniture 10.76	Wooden 10.787
Mission Distance	-0.00382 (0.002)	0.00213** (0.001)	-0.016 (0.018)	0.00403 (0.004)	0.000421 (0.001)	-0.00299** (0.001)
GEO Controls	YES	YES	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	174,964	174,964	174,964	174,964	174,964	174,964
Within R-squared	0.080	0.008	0.086	0.098	0.088	0.008
R-Squared	0.095	0.009	0.091	0.100	0.094	0.010

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers. The dependent variable is an indicator variable that equals one if an individual reports working in the Leather, Clothing, Footwear, Textiles, Furniture and Wooden Industries in Brazil in 2010, ordered from least to most by their HCINT according to Ciccone and Papaioannou (2009). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is for a probit model. Errors clustered at the municipality level in parentheses *** p<.01, ** p<.05, *p<.1

TABLE A.23. PLACEBO EFFECT ON SKILL-INTENSIVE INDUSTRIES IN BRAZIL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Brazil 2010										
Iron and Steel	Tobacco Products	Non-ferrous Metals	Fabricated Metal Products	Plastic Products	Beverages Industries	Transport Equipment	Electric Machinery	Industrial Chemicals	Chemicals Other	
HCINT	11.425	11.509	11.547	11.577	11.678	11.967	12.346	12.357	12.704	13.031
Abandoned Missions	0.00329***	0.0366***	0.0131**	0.0109***	0.00863**	-0.000109	0.0192***	0.00563	0.00975***	0.0126***
Distance	(0.000)	(0.005)	(0.006)	(0.001)	(0.003)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	174,964	174,964	174,964	174,964	174,964	174,964	174,964	174,964	174,964	174,964
Within R-squared	0.017	0.215	0.047	0.068	0.074	0.021	0.128	0.047	0.018	0.050
R-Squared	0.017	0.288	0.047	0.071	0.081	0.028	0.129	0.050	0.029	0.051

Notes. The table shows the coefficient of distance to the nearest abandoned Jesuit mission in kilometers. The dependent variable is an indicator variable that equals one if an individual reports working in the Iron and Steel, Tobacco Products, Non-ferrous Metals, Fabricated Metal Products, Plastic Products, Beverages Industries, Transport Equipment, Electric Machinery, Industrial Chemicals and Other Chemicals Industries in Brazil in 2010, ordered from least to most by their HCINT according to Ciccone and Papaioannou (2009). Geographic controls include distance to the nearest coast, distance to the nearest river, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is for a probit model. Errors clustered at the municipality level in parentheses *** p<.01, ** p<.05, * p<1

**TABLE A.24. PLACEBO EFFECT ON TECHNOLOGY ADOPTION IN
AGRICULTURE (GENETICALLY ENGINEERED SOY) AND STRUCTURAL
TRANSFORMATION IN BRAZIL**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Soy Farmed	Change in GE Soy	Non-GE Soy	Agricultural Productivity	Brazil 1996-2006	Share in Agriculture	Manufacturing Services
Abandoned Missions	-0.000473*	-0.000327	0.00027	0.00639***	-0.116***	0.159***	-0.00612
Distance	(0.0003)	(0.0004)	(0.0003)	(0.0019)	(0.0385)	(0.0244)	(0.0276)
	{0.0004}	{0.0003}	{0.0003}	{0.0011}	{0.0358}	{0.0126}	{0.0273}
GEO Controls	YES	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Observations	509	245	239	262	524	524	524
Within R-squared	0.231	0.308	0.211	0.097	0.070	0.295	0.028
R-Squared	0.580	0.498	0.535	0.145	0.334	0.359	0.253

Notes. The table shows the coefficient of distance to the nearest abandoned Jesuit mission in kilometers. The dependent variables are total area planted with soy, changes in GE soy and non-GE soy from 1996 to 2006 in columns (1) to (3), Agricultural Productivity in 1996 in column (4), and the share of the labor force in Agriculture, Manufacturing and Services in Brazil in percentages in 1996 and 2006 in columns (5) to (7). Geographic controls include latitude, longitude, distance to the nearest Franciscan mission, and soy suitability in columns (1) to (3). Data are from Bustos, Caprettini, and Ponticelli (2016). Estimation is by OLS. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.25. MISSIONARY EFFECT ON PROFESSIONS IN BRAZIL AND ARGENTINA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Brazil 2006 Embroidery	Brazil 2006		Brazil 2010					Argentina 2001
	Professionals	Skilled Agro.	Teachers	Blacksmiths		Artisans	Teachers	Accountants
Mission Distance	-0.0686* {0.036}	-0.00119* (0.001)	-0.00485*** (0.001)	-0.00139*** (0.000)	-0.00422*** (0.001)	-0.00239*** (0.000)	-0.00134** (0.001)	-0.00446* (0.003)
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	NO	NO	NO	NO	NO	YES	YES	YES
Observations	427	337,584	171,460	171,460	166,124	48,476	48,476	48,476
R-Squared	0.031	0.03	0.028	0.0045	0.0188	0.0109	0.0038	0.0233

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers. The dependent variables are the prevalence of embroidery in percentages in Brazil in 2006 in column (1), whether a person is a professional, skilled agricultural worker, teacher or blacksmith in Brazil in 1020 in columns (2) to (5) and an artisan, educator and accountant in Argentina in 2001 in columns (6) to (8). Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS in column (1) and for a probit model without and with state fixed effects elsewhere. Robust and clustered standard errors in parentheses; Conley standard errors in curly brackets *** p<.01, ** p<.05, * p<.1

TABLE A.26. MISSIONARY EFFECT ON INTERGENERATIONAL KNOWLEDGE TRANSMISSION AND SKILLS IN PARAGUAY AND MEDIA IN BRAZIL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Paraguay 2011										
Parents Transmitted										
Skills	Medicine	Tales	Skills	Medicine	Tales	Uses Diary	Visits Library	Visits Newspaper	Visits Media	Brazil 2006
Mission Distance	-0.0152*** (0.005)	-0.0107** (0.005)	-0.0135**** (0.005)	-0.00692* (0.004)	-0.0119*** (0.003)	-0.00983**** (0.004)	-0.00227** (0.001)	-0.000624* (0.000)	-0.00277*** {0.001}	0.000867 {0.001}
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	890	890	890	890	890	890	890	890	427	427
R-Squared	0.059	0.015	0.025	0.037	0.035	0.014	0.043	0.030	0.223	0.103

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers. The dependent variables are parental transmission of skills, medicinal knowledge and folktales in columns (1) to (3); intergenerational transmission of skills, medicinal knowledge and folktales in columns (4) to (6); diary usage in column (7), visits to the library column (8) and prevalence of newspaper and radio stations in columns (9) and (10). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is for a probit or OLS model with state fixed effects and errors clustered at the district level in parentheses in columns (1) to (8) and OLS in columns (9) and (10). Clustered standard errors in curly brackets *** p<.01, ** p<.05, * p<1

TABLE A.27. MISSIONARY EFFECT ON INDIGENOUS ASSIMILATION IN BRAZIL AND PARAGUAY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Brazil 1890			Brazil 2010	Paraguay 2010		
	Marriage	%	%		Language		
	Mixed	Caboclo	Catholic	Indigenous	Guarani	Spanish	GUA & SPA
Mission Distance	-0.0911*** (0.018) {0.016}	-0.0401*** (0.010) {0.012}	-0.0353* (0.019) {0.021}	-0.302** (0.136) {0.136}	0.0218*** (0.007)	-0.0172*** (0.006)	-0.00778** (0.004)
GEO Controls	YES	YES	YES	NO	YES	YES	YES
Fixed Effects	NO	NO	NO	NO	YES	YES	YES
Observations	63	63	63	467	1,928	1,928	1,928
R-squared	0.582	0.661	0.229	0.006	0.1273	0.1447	0.0291

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers. The dependent variables are the percentage of mixed and caboclo marriages in Brazil in 1890 in columns (1) and (2), percentage Catholic in column (3), percentage of indigenous population in 2010 in column (4), and percentage of people speaking Guarani, Spanish, and Portuguese in Paraguay in 2012 in columns (5) to (7). Geographic controls include distance to the nearest coast, distance to the nearest river, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS in columns (1) to (4) and for a probit model with state fixed effects in columns (5) to (7) with errors clustered at the district level. Robust and clustered standard errors in parentheses; bootstrapped and Conley standard errors in curly brackets *** p<.01, ** p<.05, *p<.1

TABLE A.28. MISSIONARY EFFECT ON ALTERNATIVE TRANSMISSION MECHANISMS, BY COUNTRY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Population Density			Road Density			Railroad Density		
	Brazil	Argentina	Paraguay	Brazil	Argentina	Paraguay	Brazil	Argentina	Paraguay
Mission Distance	-0.304 (0.405)	-1.84 (1.717)	0.114 (0.392)	-0.0264*** {0.641}	-0.00694 {0.003}	-0.0671** {0.009}	0.00483*** {0.034}	0.00268 (0.005)	0.00046 (0.0016)
GEO Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	467	42	39	467	42	39	467	42	39
Within R-squared	0.149	0.318	0.368	0.437	0.903	0.622	0.095	0.545	0.849
R-squared	0.183	0.319	0.466	0.657	0.908	0.684	0.319	0.982	0.933

Notes. The table shows the coefficient of distance to the nearest Jesuit mission in kilometers. The dependent variables are population density for Brazil, Argentina and Paraguay in columns (1) to (3), road density in columns (4) to (6) and railroad density in columns (7) to (9). Geographic controls include distance to the nearest coast, distance to the nearest river, distance to the nearest Franciscan mission, altitude, ruggedness, temperature, area, rainfall, latitude and longitude. Please refer to the Data Appendix for units and additional details of these variables. Estimation is by OLS with state fixed effects. Robust standard errors in parentheses and Conley standard errors in curly brackets *** p<.01, ** p<.05, * p<.1