

Barro, Robert J.; McCleary, Rachel M.

Working Paper

Protestants and Catholics and educational investment in Guatemala

AEI Economics Working Paper, No. 2017-09

Provided in Cooperation with:

American Enterprise Institute (AEI), Washington, DC

Suggested Citation: Barro, Robert J.; McCleary, Rachel M. (2017) : Protestants and Catholics and educational investment in Guatemala, AEI Economics Working Paper, No. 2017-09, American Enterprise Institute (AEI), Washington, DC

This Version is available at:

<https://hdl.handle.net/10419/280562>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Protestants and Catholics and Educational Investment in Guatemala

Rachel M. McCleary
Harvard University

Robert J. Barro
Harvard University

AEI Economics Working Paper 2017-09
May 2017

© 2017 by Rachel M. McCleary and Robert J. Barro. All rights reserved.

The American Enterprise Institute (AEI) is a nonpartisan, nonprofit, 501(c)(3) educational organization and does not take institutional positions on any issues. The views expressed here are those of the author(s).

Protestants and Catholics and Educational Investment in Guatemala

Rachel M. McCleary and Robert J. Barro

Harvard University

April 2017

Abstract

Recent empirical research on the relation of religion to human capital has focused on the distinction between Mainline Protestantism and Catholicism. Our research emphasizes differential investment in education across *types* of Protestantism. We apply this framework to Guatemala, a country that was historically dominated by Catholicism but has moved in recent decades toward Protestantism. Our research was motivated by theological differences between Mainline Protestant denominations and premillennialist movements (Evangelical, Pentecostal) that arose at the end of the nineteenth century. These denominations placed less emphasis than Mainline Protestants on investment in education. Consistent with this perspective, literacy is enhanced more by Mainline Protestant schools than by Other Protestant schools. Catholic schools have the weakest relation with literacy, likely because the ouster of Catholic orders and schools in the liberal reforms of the 1870s had a lasting influence.

I. Introduction

Beginning in the early nineteenth century, British and U.S. Protestant missions invested worldwide in traditional forms of human capital, namely education and healthcare. Recent empirical studies comparing Protestant with Catholic missions in Asia, the Indian subcontinent, Oceania, and Africa support this assessment (Grier [1997], Woodberry and Shah [2004], Woodberry [2009, 2012], Nunn [2014], and Bai and Kung [2012]).

These studies are part of a broader discussion of the Protestant Reformation (1517-1555) and its long-term effects on literacy and mass education in Europe (Becker and Wöessmann [2009], Schaltegger and Torgler [2009], Becker, Hornung, and Wöessmann [2011], Boppart, et al. [2013], Boppart, et al. [2014], and Cantoni [2015]).¹ Within the context of the Reformation, mass literacy and formal education became the hallmarks of Protestantism. Protestant sects stressed individual reading of the Bible as the basis of one's salvation (*sola scriptura-sola fide*). The leaders of Protestantism—Martin Luther, John Calvin, and Huldrych Zwingli—emphasized reading the Bible as well as broader educational goals (Boppart, et al. [2014]). The Bible became the source of personal spiritual life, communal worship, and evangelization. Through vernacular translations, printing, and international distribution networks, Protestants created a public demand for reading (Becker and Wöessmann [2009], Becker, Hornung, and Wöessmann [2011], Boppart, et al. [2014], Cantoni [2015]). Protestantism is often linked with economic growth because education is a major factor in the development of countries, particularly with regard to productivity, technological innovation, and participation in commercial enterprises.

Research on Protestant foreign missions during the nineteenth century shows that missionaries established schools and hospitals in countries such as China, Korea, and British

¹For a review of the literature on the relationship between Protestantism and human capital, see Becker, Pfaff, and Rubin (2016).

colonies such as India.² A strong positive correlation exists between the historical presence of British and U.S. Protestant missionaries and educational attainment. British and U.S. Protestant missionaries during the nineteenth century came from societies that highly valued education. By 1870, 76 and 80 percent, respectively, of British and U.S. males were literate, the highest rates in the world at that time. Therefore, it is not surprising that Protestant missions from these countries promoted education abroad.

These empirical studies have limitations. First, they take as their starting point a comparison of Protestant versus Catholic investment in human capital. In this view, Protestant missions in geographic regions where Catholicism had a monopoly, for example, in Latin America, succeeded due to an indolent Catholic hierarchy and a paucity of national priests. Official prohibitions on vernacular Bibles coupled with the reading of the Latin Vulgate restricted to ordained clergy or, in their absence, a native *maestro cantor*, created a demand for access to reading materials including the Bible.

The Catholic reaction to the Reformation was to extend its control over the publication and translation of the Bible so as to limit heretical interpretations.³ The Council of Trent (1545-1563) emphasized equally apostolic traditions and the Bible. For Catholics, the Bible was a communal, liturgical resource whose message was mediated by clerical authority. The goal was to convert people into the Catholic Church where they would receive instruction through baptismal catechism and the lectionary. A culture of discouraging public access to reading the Bible was actively enforced by the Catholic Church until Vatican II (1962-65).

²For China, see Cohen (1963), Bai and Kung (2012), and Woodberry (2012). For Korea, see Shearer (1965), Lee (1989), Woodberry (2007), and McCleary (2013). For Africa, see Nunn (2009, 2010, 2014).

³There were many exceptions prior to the Council of Trent, see Crehan (1963, 199-237).

A second, important limitation of recent studies is that Protestantism is treated as synonymous with Mainline Protestant denominations and their missions.⁴ Mainline denominations share a cluster of beliefs, such as viewing the Bible as the inspired word of God but also as an historical document subject to textual analysis and criticism. Henry Sloane Coffin, one of the more famous U.S. Mainline ministers in the early twentieth century, succinctly expressed this secular view. The Bible should be subject to “the methods of ascertaining and imparting religious truth which are employed in all departments of human knowledge” (Coffin [1915]).

Woodberry (2012, p. 244) referred to Mainline or liberal Protestant missionaries as “conversionary Protestant” and defined them as those who “(1) actively attempt to persuade others of their beliefs, (2) emphasize lay vernacular Bible reading, and (3) believe that grace/faith/choice saves people, not group membership or sacraments. Notably, this definition does not include Evangelical, Pentecostal, neo-Pentecostal, and charismatic groups of believers.⁵ That is, the definition does not take into account the supernatural manifestations of the holiness and Pentecostal movements beginning in the late nineteenth century, as well as the development of neo-Pentecostal and independent charismatic churches in the second half of the twentieth century.

⁴Hutchison (1989) referred to seven Mainline or liberal Protestant groups as the Seven Sisters of American Protestantism. The seven are United Methodist Church, Evangelical Lutheran Church in America, Presbyterian Church, Episcopal Church USA, United Church of Christ, American Baptist Churches USA, and Disciples of Christ. In his earlier work, Hutchison (1976) identified as Mainline Methodist, Presbyterian, Congregational, Episcopal/Anglican, Baptist, and Disciples of Christ. The Pew Research Center for Religion and Public Life identifies as Mainline Methodist, Lutheran, Presbyterian, Baptist, Episcopalian/Anglican, Congregational, Disciples of Christ, Restorationist, Anabaptist, Friends (Quakers), Reformed, and other small churches. For a discussion of the history of Mainline denominations in the United States, see Thuesen (2002, 27-53).

⁵The term “charismatic” refers to those who share with Pentecostals and neo-Pentecostals a belief in Holy Spirit manifestations. Some charismatics formed independent churches while others remained as members of Mainline Protestant denominations (Synan [1975, 1-4], Johnson [2014, 274-276]).

In the early twentieth century, Mainline Protestant theology was in crisis and under sharp attack. New groups emerging—holiness (to become known as Evangelical) and Pentecostal—were theologically and organizationally distinct from Mainline and preached premillennial theology.⁶ Their biblically-based missiology required evangelizing to the world before Christ’s imminent return. Premillennialist missions steadily increased as Mainline Protestant (post-millennial) missions declined. The focus on evangelizing coupled with premillennialist urgency meant that mission work could not wait for missionaries to receive a college and graduate seminary education. Biblical prophetic passages supported the view that the gospel had to be preached before Christ’s coming. “So near in fact that there was scarcely time to do more than preach, throw up cheap ‘sheds’ in which to preach, and then to preach. . . . The urgency of the case demands shortcut methods in preparing for the work” (Wynkoop [1976, 33-34]). Further, many premillennialist preachers viewed colleges and seminars as too secularizing, dulling one’s faith and spiritual zeal. The famous holiness preacher, Edward Franklin Walker, evangelized one night at the annual convention of the Pentecostal Mission: “...the tendency of the times is to trust too much in learning. . . . We have seen uneducated, frail women, filled with the Spirit, more powerful in winning souls than half a dozen cultured doctors of divinity” (Wynkoop [1976, 34]). Faith was all one needed.

By the early 1950s, the premillennial Evangelical and Pentecostal missions were in the majority among Protestants in many countries. Therefore, a satisfactory approach to Protestant missions and their impact on human capital must include an analysis of this growing segment of Protestantism—Evangelicals and Pentecostals.

⁶Premillennialism is biblically grounded in the book of Revelation, 20:1–6, of the New Testament. These passages prophesy Jesus's coming to earth and his subsequent reign at the end of an apocalyptic period of tribulation. Premillennialism interprets this future historic period as a time of fulfillment for the prophetic hope of God's people as given in the Old Testament. For a discussion of premillennialism, see Bosch (2003, 315-31), who draws heavily on Marsden (1980).

This study compares investment in education across *types* of Protestantism (Mainline, Evangelical, Pentecostal, and neo-Pentecostal) as well as between Protestant and Catholic. We hypothesize that the propensity to invest in education is higher for Mainline Protestant churches and schools than for Evangelical and Pentecostal. In Guatemala and some other parts of Latin America, the connection with education is likely to be weakest for Catholic because the ouster of Catholic orders and schools in the liberal reforms of the 1870s had a persisting influence. Guatemala is a particularly good place to test these hypotheses because of the historical dominance of Catholicism, followed by sharp growth of Protestantism, notably among Evangelicals and Pentecostals.

All but one of the original Protestant missions in Guatemala were Evangelical and Pentecostal. In 1964, the last year the Guatemalan national census reported religious affiliation, 8.2 percent of Guatemalans were Protestant, with the majority of those adhering to Evangelical and Pentecostal faiths. In 2001, an estimated 30 percent of Guatemalans were Protestant; in 2007, it was 35.5 percent.⁷ In 2010, an estimated 40 percent of Guatemalans were Protestant, with 56 percent of Protestants being Pentecostal and a strong majority falling into the broad Evangelical category. The World Religion Database estimates that in 2010, 50.3 percent of Guatemalans professed belief in the manifestations of the Holy Spirit (Pentecostal, charismatic, or independent charismatic).⁸

⁷See Gallup Survey, gallup.com/poll/101905/gallup-poll.aspx, 2007 and Latino Barometer, latinobarometro.org, 2007.

⁸The World Religion Database uses the term “charismatic” to refer to those individuals who believe in the Pentecostal post-conversion religious experience referred to as baptism in the Holy Spirit and “that a Spirit-baptized believer may receive one or more of the supernatural gifts known in the early church” yet they belong to a non-Pentecostal denomination or church (Anglican, Protestant, Catholic, Orthodox Catholic). Guatemalans use the term “charismatic” to refer exclusively to Roman Catholics who believe in *charismata pneumatika* (gifts of the Holy Spirit), including Holy Spirit baptism (but with glossolalia understood as optional). Therefore, we do not use the term charismatic in our analysis of Guatemala.

II. Forms of Protestantism in Guatemala

Starting at the end of the nineteenth century, U.S. Protestant missions—Mainline, holiness (which came to be called Evangelical), and later Pentecostal—entered Guatemala to evangelize for the purpose of conversion.⁹ Holiness and Pentecostal missionaries had minimal education, some attended a Bible or missionary training institute.¹⁰ Holiness missionaries practiced John Wesley's creed to be "... at full liberty, simply to follow the Scriptures and the Primitive Church" (Telford [1931: 237-8]). The holiness movement, out of which Evangelicals came, believed the church was formed by the calling together of the people (*ecclesia*). This approach contrasts with the Mainline Protestant emphasis on the authority of ordained ministers. For Evangelicals, the spiritual calling—"el llamado"—rather than an academic degree became the predominant requirement for the ministry.

⁹According to Marsden (1987, 1991), an Evangelical is defined as believing in: (a) the supreme authority of inspired Scripture for faith and practice, (b) the divinity of Jesus Christ as incarnate God, (c) Jesus Christ as savior and the only means of saving sinful humanity, (d) the importance of personal conversion as the central criterion for salvation, and (e) a commitment to sharing the transforming "good news" of new life in Jesus Christ, which comes by God's Grace alone through faith in the crucified and risen savior. In this paper, the term "Evangelical" encompasses holiness churches and denominations that formed during the first decades of the twentieth century, including Keswickian faith missions such as the Central American Mission (CAM), known today as Camino Global, Wycliffe Bible Translators, and its sister organization the Summer Institute of Linguistics, and Christian and Missionary Alliance.

¹⁰Institutes, such as the Christian and Missionary Alliance's Nyack Missionary Training Institute (founded in 1882), were established to train young people to use the Bible as their resource in evangelistic methods and outreach. The Moody Bible Institute (founded by Dwight L. Moody in 1886, Chicago, IL), the Altamont Bible and Missionary Institute (founded by Nickels J. Holmes in 1896, Greenville, S.C.), Trevecca College originally named Bible Training School (founded by James O. McClurkan in 1901, Nashville, TN) and the Bible Institute of Los Angeles now Biola University (founded by Lyman Steward, Thomas Horton, and Augustus Prichard in Los Angeles in 1908) were the beginning of the trend of establishing vocational centers to train Sunday school teachers, missionaries, preachers, evangelists, and Christian lay workers. James McClurkan advertised the purpose of his school as "to better equip for the home and foreign field Christian men and women who need and desire a better knowledge of God's word" (Wynkoop [1976, 65]). By the 1930s, there were 50 such institutes in the United States. The independent mission institutes evolved into Bible institutes providing preparatory courses for the lay as well as ordained ministers and evangelizing missionaries. The emphasis on lay Christian evangelists was in sharp contrast to the ordained, college-educated missionaries of the mainline denominations. See Blodgett (1997), Robert (1990), and Rupert (1974).

An important trend in the early 20th century was the rise of Pentecostalism.¹¹ The key distinguishing feature of Pentecostalism is the belief in speaking in tongues (glossolalia), which accompanies a second act of grace, Holy Ghost baptism. Pentecostals emphasize Holy Spirit manifestations, such as prophesying, miracle healing, and exorcism. Similar to Evangelicals, Pentecostals emphasize the imminent return of Christ on earth, an idea that focuses human efforts and resources on evangelization. For our purposes, the critical point is that Pentecostals share with Evangelicals a stress on rapid evangelizing with a de-emphasis on institution-building or investment in education and health (Svelmoe [2008, 67]).

In contrast to Evangelicals and Pentecostals, Mainline Protestant denominations invested heavily in civilizing aspects of religion: establishing schools, literacy campaigns, and vernacular translations of the Bible and religious materials (McCleary [2013]).¹² This approach did not accord well with the prominence of oral communication among indigenous communities in Guatemala. Only two indigenous languages, K'iche and Kaqchikel, had a Latin alphabet with colonial Spanish orthography. Thus, the services conducted by Evangelicals and Pentecostals typically appealed more to indigenous people because of the use of oral communication methods with charismatic manifestations. Evangelicals and Pentecostals particularly valued shared communal and spontaneous worship involving singing, music, clapping, praying out loud, spiritual exhortations, shouting, crying, testimonials, and glossolalia (Spittler [1988, 411-416]).

Reading a Bible or hymnal—a typical feature of Mainline Protestantism—has minimal utility in a church service of this type. Although the Bible affects the religious service even for Evangelicals and Pentecostals, it is central not because it is written and read, but because it is the

¹¹The accepted history of Pentecostalism is that it became a recognized movement after the 1906 Azusa Street revival in California (Wacker [1984, 354]).

¹²For a discussion of this emphasis on literacy, see McLuhan (1964), Ong (1982), Schmidt (2000), and Eisenstein (1997).

inerrant word of God. Biblical authority, not biblical interpretation, guides and justifies the believer's actions (Spittler [1988, 420]). How believers receive God's word is usually oral (McCleary [2017]).

The traditional Mainline Protestant emphasis on individual reading of the Bible was shared to some extent by Evangelicals and Pentecostals. However, Mainline Protestantism's promotion of the broader goal of formal education and mass literacy was much weaker for Evangelicals and even less so for Pentecostals. In particular, the large numbers of conversions to Protestantism over the decades in Guatemala cannot primarily be attributed to the reading of the Bible. Illiteracy rates among indigenous peoples (measured in Spanish) in the late nineteenth century and still today are particularly high in departments with a majority indigenous population and where several indigenous languages are spoken. In fact, a strong negative relationship exists between literacy rates and the indigenous share of the population. Figures 1 and 2 show this relationship across 22 departments of Guatemala in 1950 and 2011.

The dominant argument from scholars of Protestantism in Guatemala has been that Evangelical missions positively influenced human capital, especially through education. U.S. missions purportedly championed the cause of universal literacy in Guatemala (Garrard [1986, 74-75, 77, 81]), with investment in education perceived as a means of social mobility (Sherman [1997, 43], Martin [1990, 89], Rose and Shultze [1993, 415-451, esp. 428]) and material prosperity (O'Neill [2010, 10, 15], Althoff [2014, 369-370]). Support for these claims of causation from evangelicalism to education and prosperity are in need of empirical investigation, particularly in the form of long-term quantitative analysis. As we demonstrate with long-term data for Guatemala, Evangelicals, Pentecostals, and neo-Pentecostals were different from Mainline Protestants in terms of investing in human capital. In particular, schools run by

Evangelicals, Pentecostals, and neo-Pentecostals contributed less than Mainline Protestant schools to literacy.

III. Data for Departments of Guatemala

To test our hypotheses on the connection between religion and schooling, we constructed two data sets. The first data set enumerates Protestant churches by type in Guatemala from 1882, the year that Protestant churches first entered Guatemala, until 2010. This data set contains 12,861 churches, geocoded to the village and street level using the ArcGIS World Geocode service. The churches are classified by type (Mainline, Evangelical, Pentecostal, neo-Pentecostal) across the 22 current departments of Guatemala. Second, we constructed a data set on the numbers of Protestant schools by type from 1882 to 2010, applying to the 22 current departments of Guatemala. Prior to 1882, the numbers of Protestant churches and schools were zero.

We have data on numbers of Catholic schools and parishes by department and over time. A parish is a geographically designated portion of a diocese to which at least one priest is assigned. A diocese, currently numbering 29 in Guatemala, is a geographic unit that falls under the authority of a bishop. The sources of our information are annual publications by the Vatican, *Anuario Pontificio*, and the Archbishop of Guatemala, *Anuario Eclesiástico de la Iglesia Católica en Guatemala*. We have incomplete information by department on numbers of Catholic priests and were unable to gather reliable data on numbers of Catholic churches.

The Liberal reforms instituted by the governments of Miguel Garcia Granados (1871-1873) and Justo Rufino Barrios (1873-1885), including the constitution of 1879, altered the religion market in Guatemala by introducing religious freedoms and breaking the monopoly of

the Catholic Church. Catholic religious orders that operated schools, including the Jesuits, Dominicans, and Franciscans, were expelled from the country.¹³ The government also expropriated Catholic properties (monasteries, convents, seminaries) and converted them to public use, especially for public schools. The Liberal government abolished the *Ley Pavón*, which emphasized religion as the foundation of a good education. Schools under that law were administratively linked to the local parish. In place of the *Ley Pavón*, the Liberal government established a national public educational system providing free, universal, and obligatory primary schooling without religious instruction. Between 1872 and 1879, legislation was enacted to secularize and centralize education in the newly created Ministry of Education (Miller [1966]: 251-263).

At the same time that Barrios was expelling Catholic religious orders and expropriating Church property, he actively encouraged the entry of U.S. Protestant missions into the country. Presbyterian, Friend's (Quaker), and Nazarene missions established schools under the direction of the government. Barrios's children attended the fledgling Presbyterian school in Guatemala City. Paul Burgess, in his biography of Barrios, states that Liberals throughout Latin America favored Protestantism over Catholicism as a means of creating political space for the secular state (Burgess [1946]: 196-197, n. 3). Barrios was also an admirer of the United States and sought to introduce U.S. progressive ideas and modern technology into Guatemala (Rippy [1942, 595-605]).

¹³Paul Burgess, a Presbyterian missionary, in his biography of Barrios, provides a detailed description of how Barrios used his position as General of the Guatemalan army under President Granados to round up the Jesuits and force them onto a boat to Panama (Burgess [1946, 89-90]). For a more detailed discussion of these events, see Miller (1969). Priests who wished to remain in the country were required to give up their vows and become secular priests, thereby submitting to the authority of the Archbishop of Guatemala.

A 1925 report that we obtained from the Vatican Secret Archives, signed by Guatemalan Archbishop Muñoz y Capurón, indicates that 108 Catholic parishes existed in the country in 1925. Half of these lacked a parish priest. This pattern is corroborated by the data in the *Anuario Eclesiastico Catolico de Centro America* (1925). The report from the Vatican Secret Archives also mentions that there were 70 secular priests in Guatemala in 1925, concentrated in Guatemala City and mainly serving the Catholic Church's administration. Two years later, the *Anuario* reported only 58 parish priests, with most concentrated in the capital.

Barrios's successors maintained the Liberal reforms until December 1933, when the Pope appointed the first Papal Nuncio for Guatemala. With the agreement of the Guatemalan government, Catholic religious order reentered Guatemala in 1937 (Jesuits), 1943 (American Maryknolls), 1947 (Franciscans), 1955 (Spanish Franciscans of the Order of the Sacred Heart), 1959 (Belgian Catholics), and 1962 (American Benedictines). The constitution of 1955 legally recognized the juridical personality of religious institutions, including the Catholic Church. Correspondingly, the official presence of the Catholic Church expanded greatly in Guatemala. The number of dioceses went from 1 in 1921 to 3 in 1937, 7 in 1955, and 29 in 2010. The number of parishes expanded from 87 in 1955 to 494 in 2010, and the number of Catholic schools went from 36 in 1955 to 340 in 2010. Guatemala had 4484 Catholic priests in 1995 and 26,696 in 2010. In our data set, the number of Catholic schools in each department is entered as zero from 1880 to 1939. That is, only as of 1940 was there a start of the revival of Catholic education.

With respect to education, we use two indicators that are available over the long term and across departments—literacy rates and primary-school enrollment ratios. Literacy is an outcome measure (based on answers to questions on censuses or surveys), whereas enrollment is an input

measure, based on whether children in the appropriate age range are reported to be attending primary school.¹⁴ One problem with the enrollment numbers is that children may be listed as attending primary school without actually attending or learning much. A limitation of the literacy numbers is that they capture only an early stage of acquisition of human capital—without considering numeracy and more advanced forms of education.

We gathered data on literacy and population by municipality and department from 1880 to 2011 from government censuses and surveys. For these data, we used the national censuses as well as information from the Ministry of Education, the bilingual literacy program (DIGEBI), and the adult literacy program (CONALFA). The census and survey data on literacy rates go back to 1880 and are available by department for 11 dates: 1880, 1893, 1921, 1940, 1950, 1964, 1973, 1981, 1994, 2002, and 2011.¹⁵ The corresponding data on primary-school enrollment ratios are available by department starting in 1973, covering the five years: 1973, 1981, 1994, 2002, and 2011. Therefore, the literacy data provide information over a much longer period.

National census data on ethnic composition by municipality and department were collected from 1880 to 2011. We focus on the fraction of the population identified as indigenous. As already mentioned, the relationship between literacy and the indigenous share is strongly negative. Particularly since the Peace Accords of 1996, the government of Guatemala has expressed the objective of bringing literacy among indigenous peoples up to the levels attained by Ladinos. The implementation of bilingual programs in designated public schools has been one method employed by the government. However, we do not find reliable statistical

¹⁴The Government of Guatemala measures literacy in two ways. First, the national censuses ask for children aged 7 to 15 years, “Can you read?” or “Do you know how to read?” The same question is sometimes targeted toward Mayan languages. Second, literacy information is gathered through survey data using national sampling techniques (Fernando Rubio, Director and Chief of Party, United States Agency for International Development, Guatemala, e-mail correspondence with Rachel McCleary, August 5, 2013). In recent years, primary and secondary education is mandatory and offered free as public schooling for children between the ages of 7 and 14.

¹⁵These are the years of national population censuses, except for 2011. The last national census was in 2002.

evidence that the negative relationship between literacy and the indigenous share has been weakening over time.

IV. Long-Term Evidence on Religion and Human Capital in Guatemala

Our central empirical objective is to isolate the effects of Protestantism and Catholicism on the accumulation of human capital in Guatemala. We focus on the roles of religious schools and churches.

Tables 1 and 2 contain regressions to assess determinants of human capital across 22 departments of Guatemala for years in which the data are available. The sample for literacy rates has 239 observations (22 departments, 11 dates¹⁶) and that for school-enrollment ratios has 110 observations (22 departments, 5 dates). Table 3 shows the sample means and standard deviations of the variables used in Tables 1 and 2. Table 4 lists the departments.¹⁷

An important advantage of the regression framework is that it allows an examination of effects of religious schools and churches on human capital, while holding constant important background variables. These variables include the indigenous share of the population and population density (urbanization). These background variables are correlated with the human-capital measures and also with the numbers of religious schools and churches. Therefore, if these variables were not held constant, effects on literacy from religious schools and churches might reflect these correlation patterns. For example, Mainline Protestant schools per capita may seem to have a positive linkage with literacy because these schools are higher when the indigenous share of the population is lower, and this share has a negative relation with literacy.

¹⁶Data prior to 1940 for El Progreso are unavailable because this area was included with other departments until 1934.

¹⁷All departments are included, except for Amatitlán, which was a separate department until 1935, after which it became part of the Department of Guatemala. Amatitlán is excluded throughout because of missing data. El Progreso is included as a distinct department since 1934.

More generally, we would like to isolate the exogenous parts of the variations in the numbers of religious schools and churches—of which we consider Mainline Protestant, Other Protestant (Evangelical, Pentecostal, neo-Pentecostal), and Catholic. Then we could clearly isolate causation from religious schools and churches to human capital, rather than the reverse. In the regression analysis, we take several approaches to assessing potential endogeneity with regard to numbers of religious schools.

Key elements in the cross-department locations of religious missionaries, churches, and schools are the comity agreements reached in the early 20th century. The first two Protestant missions to Guatemala were the Mainline Presbyterians and the Evangelical Central American Mission (CAM). These two groups differed greatly in evangelizing styles and theology. In order to moderate competition between the groups, they came to an agreement in 1903 to divide Guatemala City into respective mission zones. In addition, they divided up various departments outside of the capital into distinct, non-competing evangelizing territories. This agreement was extended in 1907 to include another Evangelical enterprise, the California Yearly Friends' Society mission. In 1916, a new comity agreement was reached to incorporate additional Evangelical groups—the independent Brethren medical mission and the Church of the Nazarene. This agreement included reaffirmation of the territory reserved for CAM and the Friends' Society. A final comity agreement, in 1935, included the Presbyterians along with the various Evangelical groups, with the addition of the Evangelical Primitive Methodists. The main point is that the locations of these Protestant religious groups reflected political decision-making and were unlikely to reflect substantial reverse causation from human capital to religious missionaries, churches, and schools.

The comity agreements of the early 20th century omitted Pentecostal (and, later, neo-Pentecostal) groups. Pentecostal missionaries focused their initial entry in 1901 on a few departments (notably Totonicapán, El Quiché, Alta Verapaz and Zacapa) but subsequently spread throughout Guatemala. Pentecostal groups competed aggressively with other forms of Protestants and other groups of Pentecostals, as well as with Catholics. The locations and numbers of Pentecostal missionaries were driven by the desire to proselytize and convert people as rapidly as possible. The evangelizing campaigns by Pentecostals were particularly aggressive in the 1940s and 1950s, resulting in thousands of conversions. For our purposes, the central point is that we do not expect significant causation from human capital (gauged, for example, by literacy and school enrollment) to numbers of Pentecostal churches and schools. Pentecostal leaders were basically uninterested in promoting human capital.

A. Regression results for literacy rates

The regression results for literacy rates are in Table 1, Panel A. These results apply to the 22 departments of Guatemala for 11 dates from 1880 to 2011.¹⁸ The error terms are clustered by department. The setting includes time effects (year dummies), which capture the sharp long-term upward trend in literacy. The basic setting in column 1 excludes fixed effects for departments. Therefore, these regression coefficients reflect information from the 11 cross sections—with levels of literacy related to levels of religious schools and churches and the other variables. The key assumption is that the error terms are independent of these level variables.

1. Results on background variables. We first assess the results in Table 1, Panel A, column 1 for the background variables, starting with the indigenous share of the population. The overall relationship between literacy and the indigenous share is strongly negative, with an

¹⁸Because of missing data, the numbers of churches and religious schools per capita in 2011 were assumed to be the same as those observed in 2010.

estimated coefficient of -0.254 (s.e.=0.017). Thus, a one-standard-deviation rise in the indigenous share (by 0.30 in Table 3) associates with a decline in the literacy rate by 0.08, compared with the mean of the literacy rate of 0.38 (Table 3).

An important question is whether the relation of literacy rates to the indigenous share has weakened over time. We first broke up the sample into the six time observations from 1880 to 1964 versus the five from 1973 to 2011. With this division, there is no evidence of a weakening relationship.¹⁹ The estimated coefficient on the indigenous share for the 1880-1964 period is -0.230 (s.e.=0.024), whereas that for the 1973-2011 period is -0.276 (0.023). This pattern suggests, if anything, a strengthening in the inverse relationship between literacy and the indigenous share. However, the difference between the estimated coefficients is not statistically significantly different from zero at usual significance levels (p-value = 0.16). Therefore, the results accord with a stable relationship over the full sample from 1880 to 2011.

As already noted, the Government of Guatemala has tried particularly since the signing of the Peace Accords in December 1996 to raise literacy among the indigenous population by providing extra bilingual educational resources to areas with high indigenous shares of the population.²⁰ The 2003 Law of National Languages, while affirming Spanish as the official language of the country, states that the government “recognizes, respects, and promotes the development and usage of indigenous languages including non-Maya Garifuna and Xinka.” The Directorate for Bilingual Education (*Dirección General de la Educación Bilingüe* or DIGEBI), operating out of the Ministry of Education, oversees school bilingual programs as a means of

¹⁹In this system, the coefficients of all variables other than the indigenous share were constrained to be the same across the two sub-periods.

²⁰The term “bilingual education” as used in Guatemala refers to learning in the first language to achieve competency in a second language (transitional), or developing communication skills in the first language while achieving competency in a second (parallelism). See Consejo Nacional de la Educación Maya (2003) and Richards and Richards (1996, 208-221).

transitioning to the official language, Spanish. DIGEBI operates in departments with large numbers of indigenous-speaking children. There are also a number of other bilingual education programs with international funds operating at the department level.

If government promotion of bilingual education were successful, we would expect that the negative relation between literacy rates and the indigenous share would be weaker in the last two periods compared with that in the earlier periods. We find that the estimated coefficient on the indigenous share for the nine dates for 1880-1994 is -0.263 (s.e.=0.019), whereas that for the two dates for 2002-2011 is -0.220 (0.035). This pattern is consistent with a weakening relationship between ethnicity and the indigenous share, but the difference in estimated coefficients is not statistically significantly different from zero (p-value = 0.27). Hence, there is no reliable statistical evidence even since 2002 that the government has diminished the negative relation between literacy and the indigenous share.

The regression for literacy in Table 1, Panel A, column 1, includes population density and its square as explanatory variables. The results show a statistically significant, non-linear relationship. The estimated coefficients imply that the literacy rate rises with population density until this density becomes very high—2014 persons per square mile, compared with the mean of 265 (Table 3). Beyond that—that is, in the most urban areas—the estimated relationship becomes negative. The rising segment likely reflects weak educational systems in departments that are extremely rural. However, the positive linkage between population density and literacy tends to weaken as density rises, likely because of diminishing effects of urbanization on the availability and quality of schooling. When density becomes extremely high, the estimated relationship becomes negative, possibly because of adverse effects from crowding and crime. We also found that the estimated non-linear relationship between literacy rates and population

density is stable over time. The hypothesis that the relationship in the six periods from 1880 to 1964 is the same as that for the five from 1973 to 2011 is accepted with a p-value of 0.20.²¹

The regression in Table 1, Panel A, column 1, also includes a dummy variable for each time period, with the 2011 period being the left-out variable. Thus, each coefficient shows estimated literacy (for 1880, 1893, ...), compared to that in 2011, for given values of the other explanatory variables. The negative coefficient estimates (except for 2002) indicate the overall long-term trend toward higher literacy rates, given the values of the explanatory variables.

2. Results on religious schools. The results of most interest for our study concern the connections between literacy rates and numbers of religious schools per capita. Our main thesis is that Mainline Protestant schools will be more favorable than Other Protestant schools toward literacy. Given the government's historical antagonism toward Catholic orders and schools, we also anticipate that Catholic schools will have the weakest effect. For the Protestant data, we separate Mainline from Others, which comprise Evangelical, Pentecostal, and neo-Pentecostal (see Table 3).

For religious schools, one finding in Table 1, Panel A, column 1, is the large and significantly positive coefficient, 6.9 (s.e.=2.0), on Mainline Protestant schools per 1000 persons. This result compares with the significantly positive (at the 10% level) but smaller estimated coefficient, 0.93 (0.48), for Other Protestant schools. These two estimated coefficients differ with a p-value of 0.003.

If we separate Evangelical schools from Pentecostal/neo-Pentecostal schools, we get respective coefficients of 0.91 (s.e.=0.65) and 0.95 (0.74). These two estimated coefficients do

²¹In this case, the coefficients of all variables other than population density and its square were constrained to be the same for the two sub-periods.

not differ significantly (p-value = 0.97). That is, we lack evidence that Evangelical schools differ from Pentecostal/neo-Pentecostal in terms of impacts on literacy.

The estimated coefficient on Catholic schools per 1000 persons, 0.28 (0.25), is positive but insignificantly different from zero.²² This coefficient differs from that of Mainline Protestant schools with a p-value of 0.001 but does not differ significantly from that of Other Protestant schools (p-value=0.28). Consistent with our expectations, the point estimates reveal a ranking whereby literacy is enhanced most by Mainline Protestant schools, then by Other Protestant schools, and then by Catholic schools.

We now consider whether the estimated effects of religious schools on literacy rates are stable over the long term. We estimated one set of the three coefficients for the first six sub-periods, from 1880 to 1964, and another over the last five periods, from 1973 to 2011.²³ For Mainline Protestant schools, the estimated coefficient is 7.23 (s.e.=3.28) for the first interval and 5.88 (2.32) for the second. For Other Protestant, the respective estimated coefficients are 1.24 (0.78) and 0.79 (0.60). For Catholic, they are 0.86 (0.53) and 0.15 (0.28). A joint test that these three pairs of coefficients are the same across the two intervals is accepted with a p-value of 0.44. Therefore, the data are consistent with a stable connection over the long history between religious schools and literacy rates.

3. Results on churches. The results for churches in Table 1, Panel A, column 1 are weaker than those for religious schools. The estimated coefficients on Mainline Protestant and

²²Recall that the numbers of Catholic schools are entered as zero in each department prior to 1940. However, the inclusion of these years—for 1880, 1893, and 1921—does not have much influence on the results. If the sample begins only in 1940, the estimated coefficient of Catholic schools per capita is 0.28, s.e.=0.26.

²³The coefficients of other variables were constrained to be the same over the two sub-periods.

Other Protestant churches per 1000 persons are each positive but statistically insignificantly different from zero.²⁴

For Catholic, we lack data on numbers of churches and, therefore, use instead the number of Catholic parishes per capita. In Table 1, Panel A, column 1, Catholic parishes per 1000 persons has a positive estimated coefficient, 0.65 (s.e.=0.17), that is statistically significantly different from zero. It is not meaningful to compare the size of this coefficient with those for Protestant churches because a parish often has more than one church.

B. Department fixed effects for literacy rates

A common practice in regressions with panel data, particularly to try to deal with endogeneity issues, is to add cross-sectional (in our case, department) fixed effects. These effects capture long-term differences in levels of the dependent variable (literacy rates) across departments. Therefore, the remaining basis for identification of effects of independent variables on the dependent variable comes from differences across departments in the trends (changes) in the independent variables. The idea—not necessarily correct—is that these differential trends in the independent variables may be more exogenous than the differences in levels.

The panel regression estimates for literacy rates with the inclusion of department fixed effects is in Table 1, Panel A, column 2. In this case, the estimated coefficients associated with religious schools and churches become statistically insignificantly different from zero. That is, the identification based on differential trends in these schools and churches across departments is too weak to obtain statistically significant results. Importantly, however, the broad pattern of point estimates for religious schools is the same as that in column 1. That is, the estimated

²⁴If we separate Evangelical churches from Pentecostal/neo-Pentecostal churches, we get respective coefficients of -0.001 (s.e.=0.019) and 0.022 (0.014). These two estimated coefficients do not differ significantly (p -value = 0.34).

coefficient is largest for Mainline Protestant schools, next largest for Other Protestant schools, and smallest for Catholic schools.

Table 1, Panel B shows the estimated fixed-effects coefficients for the 22 departments.²⁵ These estimated coefficients are jointly statistically significantly different from zero (p-value = 0.000). That is, the departments exhibit clear differences in average levels of literacy, given the values of the independent variables. Notably, the department of Guatemala (containing the national capital) has a fixed-effects coefficient of 0.193 (s.e.=0.029) so that, other things equal (including population density), the literacy rate in the capital is higher than that in the typical department by 19 percentage points.

We further attempted to deal with endogeneity concerns by using the method developed by Sims (1972). Consistent with his approach, we included as explanatory variables a 10-year lag and lead of the numbers of each type of religious school, along with the contemporaneous values already included.²⁶ The Sims idea is that statistical significance for the lag suggests causation from school numbers to literacy, statistical significance for the lead suggests the opposite direction of causation, and statistical significance contemporaneously could reflect a mixture of effects. We carried out this estimation in the setting with department fixed effects.

For Mainline Protestant schools, the estimated coefficients are 6.53 (s.e.=3.96) for the lag, -8.08 (5.14) contemporaneously, and 6.17 (3.43) for the lead. The corresponding estimates for Other Protestant schools are 1.27 (0.52) for the lag, -0.77 (0.78) contemporaneously, and 0.50 (0.82) for the lead. For Catholic schools, the results are 0.08 (0.37) for the lag, 0.26 (0.34) contemporaneously, and 0.25 (0.26) for the lead. The p-values for the joint statistical

²⁵The regression includes a constant term, and the sum of the estimated department fixed effects is constrained to be zero.

²⁶The sample now uses 9 dates for the literacy rate, from 1893 to 2002. Results are similar with 5-year lags and leads.

significance of each set of three estimated coefficients are 0.15 for Mainline Protestant schools, 0.11 for Other Protestant Schools, and 0.34 for Catholic schools.

For Other Protestant schools, the significantly positive estimated coefficient on the 10-year lag, along with the statistically insignificant estimates for the contemporaneous and lead values, suggest causation from school numbers to literacy. This result accords with our informal discussion about the location of non-Mainline Protestant schools and churches—dictated by political agreements and the desire to evangelize rather than to promote human capital. Despite the lack of major concern by these religious authorities with human capital, these schools do appear to promote literacy.

For Mainline Protestant schools, the estimated 10-year lag coefficient is significantly positive with a p-value of 0.10, and the estimated 10-year lead coefficient is significantly positive with a p-value of 0.07. Therefore, the results suggest a mixture of effects whereby Mainline Protestant schools promote human capital and are also more likely to locate in areas with high human capital. Although the evidence on causation is not clear cut, the results do indicate a much stronger overall interaction between religious schools and literacy for Mainline Protestant than for Other Protestant.

For Catholic schools, the results suggest little interaction in either direction between schools and literacy. Again, this finding likely reflects the elimination of Catholic schools and orders in the 1870s and the delay in reintroduction of these schools and orders until around 1940.

C. Regression results for school-enrollment ratios

The regression results for primary-school enrollment ratios are in Table 2. These results apply for the 22 departments of Guatemala for 5 dates from 1973 to 2011. As before, the error terms are clustered by department, and the regression includes time effects (year dummies). The

basic setting in column 1 excludes fixed effects for departments. The overall influences of the background variables—indigenous share of the population, population density, and the dummies for time periods—accord with those in the literacy-rate regression (Table 1, Panel A, column 1).

One difference from the results for literacy rates arises in the relation between school-enrollment ratios and the indigenous share. The overall relation, shown in Table 2, column 1, is significantly negative, with an estimated coefficient of -0.193 (s.e.=0.028). However, this relationship has weakened in recent periods. The coefficient estimated for the three periods from 1973 to 1994 is -0.289 (0.028), whereas that for the two periods since 2002 is -0.058 (0.033). These two estimated coefficients differ significantly from each other (p-value=0.000), and the one since 2002 differs significantly from zero only at the 10% level. That is, the Government of Guatemala seems to have succeeded in eliminating most of the inverse relationship between primary school enrollment and the indigenous share, likely because of legal requirements for attendance of children at primary school. It is, therefore, surprising that the success in getting indigenous children to attend school (as reported) has been unsuccessful in promoting literacy among indigenous people.

For religious schools, we find no statistically significant effects on attendance at primary schools (Table 2, column 1). These results may arise because attendance at religious primary schools is mostly a substitute for attendance at non-religious schools. For churches, the one statistically significant effect is a positive impact on primary-school attendance from Mainline Protestant churches per 1000 persons. The estimated coefficient, 0.142 (s.e.=0.050), differs significantly from zero. This estimated coefficient differs significantly from that on Other Protestant churches (0.022 [0.017]) with a p-value of 0.017. The estimated coefficient on

Catholic parishes per capita is essentially zero. Thus, the main inference is that Mainline Protestant churches have promoted overall attendance at primary schools.

Table 2, column 2 shows the regression results for school-enrollment ratios with the inclusion of department fixed effects. In this case, the estimated fixed-effects coefficients are jointly insignificantly different from zero (p -value = 0.26). As a consequence, the overall pattern of results for school enrollment is not greatly affected by the addition of department fixed effects. One new finding, however, is that Mainline Protestant and Other Protestant churches per 1000 persons both have statistically significant positive effects on school-enrollment ratios. The estimated coefficient for Mainline Protestant is larger than that for Other Protestant, and the p -value for equal coefficients is 0.17.

V. Conclusion

A good deal of recent empirical research on the relation of religion to human capital has focused on Mainline Protestantism versus Catholicism. Our research emphasizes differential investment in education across *types* of Protestantism. In addition, we compare Protestantism with Catholicism. Our research was motivated by theological differences between Mainline Protestant denominations and later premillennialist movements (Evangelical, Pentecostal) that arose in Guatemala at the end of the nineteenth century. Premillennialist denominations came to dominate missions in the twentieth century. These religious groups placed less emphasis than Mainline Protestants on investment in education. Our findings bear out this idea. Specifically, literacy is enhanced more by Mainline Protestant schools than by Other Protestant schools. Catholic schools have the weakest effect, likely because of the ouster of Catholic orders and schools from Guatemala in the Liberal reforms of the 1870s.

Our findings suggest that future research on Protestantism and human capital investment should take into account types of Protestantism. Evangelicals, Pentecostals, and neo-Pentecostals—which now dominate the religious landscape in Guatemala and many other countries—differ greatly from Mainline Protestants.

References

- Althoff, Andrea. 2014. *Divided by Faith and Ethnicity: Religious Pluralism and the Problem of Race in Guatemala*. Berlin and Boston: Walter de Gruyter GmbH.
- Anuario Eclesiástico Católica de Centro America*. 1925. Arquidiócesis de Santiago de Santa Ana, El Salvador.
- Anuario Eclesiástico de la Iglesia Católica en Guatemala*, Arquidiócesis de Santiago de Guatemala, Guatemala City.
- Anuario Pontificio*. Vatican City. Libreria Editrice Vaticana.
- Bai, Ying and James Kai-sing Kung. 2012. "Diffusing Knowledge while Spreading God's Message: Protestantism and Economic Prosperity in China, 1840-1920," unpublished, April.
- Becker, Sascha O. and Ludger Wöessmann. 2009. "Was Weber Wrong? A Human Capital Theory of Protestant Economic History." *Quarterly Journal of Economics* 124 (2): 531-596.
- Becker, Sascha O., Erik Hornung, and Ludger Wöessmann. 2011. "Education and Catch-Up in the Industrial Revolution." *American Economic Journal: Macroeconomics*, 3 (3): 92-126.
- Becker, Sascha O., Steven Pfaff, and Jared Rubin. 2016. "Causes and Consequences of the Protestant Reformation." Warwick Economics Research Paper Series No. 1105. University of Warwick: Coventry, England, January.
- Boppart, Timo, Josef Falkinger, Volker Grossmann, Ulrich Woitek, and Gabriela Wüthrich. 2013. "Under which Conditions Does Religion Affect Educational Outcomes?" *Explorations in Economic History*, 50 (2): 242-266.
- Boppart, Timo, Josef Falkinger and Volker Grossmann. 2014. "Protestantism and Education: Reading (the Bible) and Other Skills." *Economic Inquiry*, 52 (2): 874-895.
- Bosch, David J. 2003. *Transforming Mission: Paradigm Shifts in Theology of Mission*. American Society of Missiology Series No. 16. Maryknoll, NY: Orbis Books.
- Burgess, Paul. 1946. *Justo Rufino Barrios: A Biography*. Guatemala: Quetzaltenango.
- Cantoni, Davide. 2015. "The Economic Effects of the Protestant Reformation: Testing the Weber Hypothesis in the German Lands." *Journal of the European Economic Association*, 13, 4 (August): 561-598.
- Coffin, Henry Sloan. 1915. *The Practical Aims of a Liberal Evangelicalism; Closing Address*, May 18. New York: Union Theological Seminary.

- Cohen, Paul A. 1963. *China and Christianity: The Missionary Movement and the Growth of Chinese Antiforeignism, 1860-1870*. Cambridge: Harvard University Press.
- Consejo Nacional de la Educación Maya. 2003. "Las Escuelas Mayas: Una Experiencia Educativa en Guatemala," edbiuatemala.org/articleview/8511/121.
- Crehan, F.J. 1963. "The Bible in the Roman Catholic Church from Trent to the Present Day." S.L. Greendale (ed.), *The Cambridge History of the Bible v.3: The West from the Reformation to the Present*. Cambridge: Cambridge University Press, 199-237.
- Eisenstein, Elizabeth L. 1997. *The Printing Press as an Agent of Change: Communication and Cultural Transformations in Early-Modern Europe*. Cambridge: Cambridge University Press.
- Garrard, Virginia. 1986. "A History of Protestantism in Guatemala." Doctoral thesis, Tulane University.
- Grier, Robin. 1997. "The Effect of Religion on Economic Development: A Cross National Study of 63 Former Colonies." *KYKLOS*, 50 (1): 47 – 62.
- Hutchison, William R. 1976. *The Modernist Impulse in American Protestantism*. Cambridge: Harvard University Press.
- Hutchison, William R. 1989. *Between the Times: The Travail of the Protestant Establishment in America, 1900-1960*. Cambridge: Cambridge University Press.
- Johnson, Todd M. 2014. "Counting Pentecostals Worldwide." *Pneuma* (36): 265-288.
- Latino Barometer. 2007. Santiago de Chile: Latinobarometro Corporation.
<http://www.latinobarometro.org>.
- Lee, Sungho. 1989. "The Emergence of the Modern University in [the Republic of] Korea." *Higher Education*, 18, 1: 87-116.
- Marsden, George M. (1980). *Fundamentalism and American Culture: The Shaping of Twentieth-Century Evangelicalism, 1870-1925*. New York: Oxford University Press.
- Marsden, George M. 1987. "Evangelical and Fundamental Christianity." In Mircea Eliade, ed., *The Encyclopedia of Religion*. Volume 15: 190-197. New York: Collier Macmillan.
- Marsden, George M. 1991. *Understanding Fundamentalism and Evangelicalism*. Grand Rapids, MI: William B. Eerdmans.
- Martin, David. 1990. *Tongues of Fire: The Explosion of Protestantism in Latin America*. Oxford and New York: Blackwell Press.

- McCleary, Rachel M. 2013. "Protestantism and Human Capital in Guatemala and the Republic of Korea," Asian Development Bank Economics Research Paper, Series 332. Manila: Asian Development Bank.
- McCleary, Rachel M. 2017. "Protestant Innovative Evangelizing to Oral Cultures in Guatemala." In Susan Fitzpatrick Behrens and Father David Orique, eds., *Oxford Handbook of Latin American Christianity*, Oxford University Press, forthcoming 2017 (digital) and 2018 (print).
- McLuhan, Marshall. 1964. *Understanding Media: The Extensions of Man*. New York: McGraw-Hill, 1964.
- Miller, Hubert J. 1966. "Positivism and Educational Reforms in Guatemala, 1871-1885." *Journal of Church and State* 8, 2, (Spring): 251-263.
- Miller, Hubert J. 1969. "The Expulsion of the Jesuits from Guatemala in 1871." *The Catholic Historical Review*, 54, 4 (January): 636-654.
- Nunn, Nathan. 2009. "Christians in Colonial Africa." Unpublished manuscript, March.
- Nunn, Nathan. 2010. "Religious Conversion in Colonial Africa." *American Economic Review* 100, 2 (May): 147-152.
- Nunn, Nathan. 2014. "Gender and Missionary Influence in Colonial Africa." In Emmanuel Akyeampong, Robert H. Bates, Nathan Nunn and James A. Robinson (eds.), *Africa's Development in Historical Perspective*. Cambridge: Cambridge University Press, 489-512.
- O'Neill, Kevin Lewis. 2010. *City of God: Christian Citizenship in Postwar Guatemala*. Berkeley, CA: University of California Press.
- Ong, Walter. 1982. *Orality and Literacy: Technologizing of the Word*. London: Routledge.
- Richards, Julia Becker and Michael Richards. 1996. "Maya Education: A Historical and Contemporary Analysis of Mayan Language Education Policy," in Edward F. Fischer and R. McKenna Brown (eds.), *Maya Cultural Activism in Guatemala*. Austin, TX: University of Texas Press, 208-221.
- Rippy, J. Fred 1942. "Relations of the United States and Guatemala during the Epoch of Justo Rufino Barrios," *The Hispanic American Historical Review*, 22, 4 (November): 595-605.
- Robert, Dana L. 1990. "'The Crisis of Missions': Premillennial Mission Theory and the Origins of Independent Evangelical Missions." In Joel A. Carpenter and Wilbert R. Shenk (eds.), *Earthen Vessels: American Evangelicals and Foreign Missions, 1880-1980*. Grand Rapids, MI: William B. Eerdmans, 29-46.

- Rose, Susan D. and Quentin Shultze. 1993. 'The Evangelical Awakening in Guatemala: Fundamentalist Impact on Education and Media.' In, Martin E. Marty and R. Scott Appleby (eds.), *Fundamentalisms and Society: Reclaiming the Sciences, the Family, and Education* vol. 2. Chicago and London: The University of Chicago Press, 415-451.
- Rupert, Marybeth. 1974. *The Emergence of the Independent Missionary Agency as an American Institution, 1860-1917*. Doctoral dissertation, Yale University, May.
- Schaltegger, Christopher A and Benno Torgler 2009. "Was Weber Wrong? A Human Capital Theory of Protestant Economic History: A Comment on Becker and Woessmann." Center for Research in Economics, Management and the Arts. Working Paper No. 2009 - 06. Basel: CREMA.
- Schmidt, Leight Eric. 2000. *Hearing Things, Religion, Illusion, and the American Enlightenment*. Cambridge, MA: Harvard University Press.
- Shearer, Roy E. 1965. *Wildfire: Church Growth in Korea*. Grand Rapids MI, Eerdmans.
- Sherman, Amy. 1997. *The Soul of Development: Biblical Christianity and Economic Transformation in Guatemala*. New York: Oxford University Press.
- Sims, Christopher A. 1972. "Money, Income, and Causality," *American Economic Review*, 62 (September), 540-552.
- Spittler, Russell P. 1988. "Implicit Values in Pentecostal Missions." *Missiology: An International Review*, 16, 4 (October): 411-416.
- Svelmoe, William Lawrence. 2008. *A New Vision for Missions: William Cameron Townsend, the Wycliffe Bible Translators, and the Culture of Early Evangelical Faith Missions, 1896-1945*. Tuscaloosa, Alabama: The University of Alabama Press.
- Synan, Vinson. (ed.). 1975. *Aspects of Pentecostal-Charismatic Origins*. Plainfield, NJ: Logos International.
- Telford, John. (ed.). 1931. *The Letters of the Rev. John Wesley*, 9 vols. London: Epworth Press. Volume 7: 237-238.
- Thuesen, Peter. J. 2002. "The Logic of Mainline Churchliness: Historical Background since the Reformation." Robert Wuthnow and John H. Evans (eds.), *The Quiet Hand of God: Faith-based Activism and the Public Role of Mainline Protestantism*. Berkeley: University of California Press, 27-53.
- Wacker, Grant. 1984. "The Functions of Faith in Primitive Pentecostalism." *The Harvard Theological Review*, 77, 3/4 (Jul. - Oct.): 353-375.

- Woodberry, Robert D. 2007. "The Social Impact of Missionary Higher Education." Philip Yuen Leung and Peter Tze Ming, eds., *Christian Responses to Asian Challenges*. Hong Kong: Center for the Study of Religion and Chinese Society, 99-120.
- Woodberry, Robert D. 2009. "Dividing Elites: Religious Liberty, Protestant Competition, and Democracy in the Global South." Working Paper 002, Project on Religion and Economic Change.
- Woodberry, Robert D. 2012. "The Missionary Roots of Liberal Democracy." *American Political Science Review*, 106, 2 (May): 244-274.
- Woodberry, Robert D. and Timothy S. Shah. 2004. "Christianity and Democracy: The Pioneering Protestants." *Journal of Democracy* 15, 2 (April): 47-61.
- World Religion Database. World Religion Database. www.worldreligiondatabase.org.
- Wynkoop, Mildred Bangs. 1976. *The Trevecca Story: 75 Years of Christian Service*. Nashville, TN: Trevecca Press.

Table 1, Panel A, Regressions for Literacy Rates

	(1)	(2)
	No Dept. Fixed Effects	Dept. Fixed Effects
Constant	0.575 (0.024)***	0.580 (0.028)***
Mainline Prot. Schools per 1000 Persons	6.86 (1.96)***	2.91 (2.50)
Other Protestant Schools per 1000 Persons	0.93 (0.48)*	0.56 (0.42)
Catholic Schools per 1000 Persons	0.28 (0.25)	0.16 (0.22)
Mainline Prot. Churches per 1000 Persons	0.014 (0.012)	-0.006 (0.013)
Other Protestant Churches per 1000 Persons	0.012 (0.012)	0.008 (0.011)
Catholic Parishes per 1000 Persons	0.65 (0.17)***	0.20 (0.16)
Indigenous Share of Population	-0.254 (0.017)***	-0.044 (0.039)
Population Density (1000s per square mile)	0.290 (0.038)***	0.216 (0.043)***
Population Density Squared	-0.072 (0.012)***	-0.064 (0.011)***
1880 Dummy	-0.342 (0.029)***	-0.423 (0.028)***
1893 Dummy	-0.380 (0.029)***	-0.476 (0.028)***
1921 Dummy	-0.357 (0.027)***	-0.452 (0.026)***
1940 Dummy	-0.219 (0.025)***	-0.299 (0.024)***
1950 Dummy	-0.271 (0.026)***	-0.340 (0.024)***
1964 Dummy	-0.301 (0.027)***	-0.342 (0.023)***

1973 Dummy	-0.201 (0.027)***	-0.243 (0.023)***
1981 Dummy	-0.087 (0.024)***	-0.125 (0.019)***
1994 Dummy	-0.029 (0.022)	-0.061 (0.018)***
2002 Dummy	0.038 (0.021)*	0.016 (0.017)
R-squared	0.922	0.955
Standard error of regression	0.069	0.055
Number of observations	239	239

***Statistically significant at 1 percent level.

**Statistically significant at 5 percent level.

*Statistically significant at 10 percent level.

Standard errors of estimated coefficients are in parentheses. Estimation is by panel least squares, using 22 departments of Guatemala in years with available data. The 11 dates are 1880, 1893, 1921, 1940, 1950, 1964, 1973, 1981, 1994, 2002, and 2011. Standard errors are clustered by department. The left-out dummy variable is for 2011.

Statistics on the dependent and independent variables are in Table 3.

Table 1, Panel B	
Estimated Department Fixed Effects in Panel A, column 2	
Department	Estimated coefficient (s.e.)
Alta Verapaz	-0.117 (0.031)***
Baja Verapaz	-0.064 (0.014)***
Chimaltenango	-0.014 (0.023)
Chiquimula	-0.043 (0.017)**
El Progreso	0.069 (0.026)***
Escuintla	0.073 (0.018)***
Guatemala (capital)	0.193 (0.029)***
Huehuetenango	-0.086 (0.016)***
Izabal	0.090 (0.019)***
Jalapa	-0.020 (0.015)
Jutiapa	0.028 (0.021)
Peten	0.113 (0.024)***
Quetzaltenango	0.007 (0.026)
Quiche	-0.111 (0.027)***
Retalhuleu	0.043 (0.019)**
Sacatepéquez	0.070 (0.019)***
San Marcos	0.009 (0.016)
Solola	-0.149 (0.020)***
Santa Rosa	0.021 (0.024)
Suchitepequez	-0.022 (0.020)
Totonicapan	-0.109 (0.024)***
Zacapa	0.021 (0.022)

Note: The sum of the estimated fixed-effects coefficients is constrained to be zero. The p-value for the hypothesis that these coefficients are all equal (so that each department has the same intercept, corresponding to the constant term) is 0.000.

Table 2 Regressions for School-Enrollment Ratios		
	(1)	(2)
	No Dept. Fixed Effects	Dept. Fixed Effects
Constant	0.876 (0.031)***	0.849 (0.085)***
Mainline Prot. Schools per 1000 Persons	1.85 (2.21)	2.43 (4.44)
Other Protestant Schools per 1000 Persons	0.32 (0.60)	-0.81 (1.05)
Catholic Schools per 1000 Persons	-0.04 (0.34)	0.46 (0.45)
Mainline Prot. Churches per 1000 Persons	0.142 (0.050)***	0.190 (0.082)**
Other Protestant Churches per 1000 Persons	0.022 (0.017)	0.075 (0.036)**
Catholic Parishes per 1000 Persons	-0.03 (0.41)	-0.81 (0.80)
Indigenous Share of Population	-0.193 (0.028)***	0.007 (0.111)
Population Density (1000s per square mile)	0.148 (0.043)***	0.148 (0.123)
Population Density Squared	-0.045 (0.012)***	-0.047 (0.023)**
1973 Dummy	-0.391 (0.030)***	-0.447 (0.056)***
1981 Dummy	-0.346 (0.025)***	-0.395 (0.046)***
1994 Dummy	-0.106 (0.022)***	-0.143 (0.031)***
2002 Dummy	-0.022 (0.021)	-0.048 (0.023)**
R-squared	0.893	0.922
Standard error of regression	0.069	0.067
Number of observations	110	110

***Statistically significant at 1 percent level.

**Statistically significant at 5 percent level.

*Statistically significant at 10 percent level.

Standard errors of estimated coefficients are in parentheses. Estimation is by panel least squares, using 22 departments of Guatemala in years with available data. The 5 dates are 1973, 1981, 1994, 2002, and 2011. Standard errors are clustered by department. The left-out dummy variable is for 2011.

Statistics on the dependent and independent variables are in Table 3.

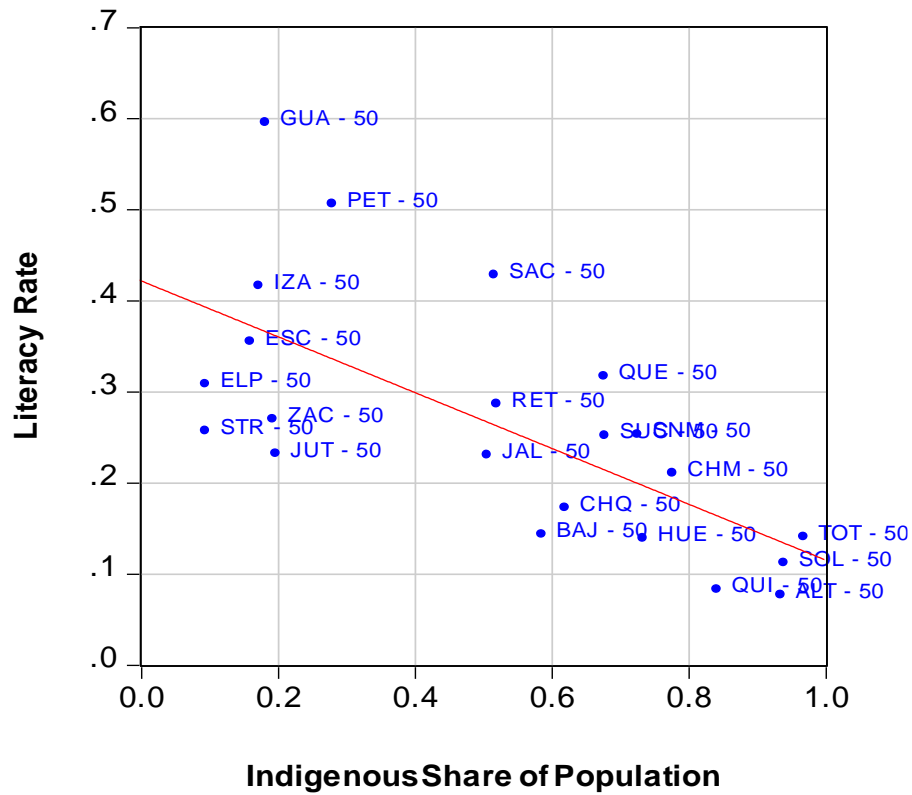
Table 3 Means and Standard Deviations of Variables		
Variable	Mean	Std. Dev.
Literacy-rate sample: 22 departments, 11 years, 239 observations		
Literacy Rate	0.378	0.236
Indigenous Share of Population	0.484	0.302
Protestant Schools per 1000 Persons	0.0124	0.0178
Evangelical Schools per 1000 Persons	0.0088	0.0133
Mainline Schools per 1000 Persons	0.00063	0.0022
Neo-Pentecostal Schools per 1000 Persons	0.00061	0.0022
Pentecostal Schools per 1000 Persons	0.0024	0.0080
Protestant non-Mainline Schools per 1000 Persons	0.0118	0.0176
Protestant Churches per 1000 Persons	0.788	0.635
Evangelical Churches per 1000 Persons	0.292	0.313
Mainline Churches per 1000 Persons	0.156	0.406
Neo-Pentecostal Churches per 1000 Persons	0.021	0.036
Pentecostal Churches per 1000 Persons	0.319	0.373
Protestant non-Mainline Churches per 1000 Persons	0.632	0.556
Catholic Schools per 1000 Persons	0.0185	0.0271
Catholic Parishes per 1000 Persons	0.0441	0.0324
Population Density (1000s per square mile)	0.265	0.418
Population Density Squared	0.245	1.207
Population (1000s)	252.5	341.5
Area (square miles)	1926	2795
Enrollment-ratio sample: 22 departments, 5 years, 110 observations		
Primary-School Enrollment Ratio	0.699	0.198
Literacy Rate	0.574	0.163
Indigenous Share of Population	0.418	0.320
Protestant Schools per 1000 Persons	0.0221	0.0195
Mainline Schools per 1000 Persons	0.00085	0.0025
Protestant non-Mainline Schools per 1000 Persons	0.0212	0.0193
Protestant Churches per 1000 Persons	0.885	0.456
Mainline Churches per 1000 Persons	0.086	0.131
Protestant non-Mainline Churches per 1000 Persons	0.799	0.425
Catholic Schools per 1000 Persons	0.0318	0.0302
Catholic Parishes per 1000 Persons	0.0405	0.0208
Population Density (1000s per square mile)	0.429	0.559
Population Density Squared	0.494	1.748
Population (1000s)	413.6	441.2
Area (square miles)	1911	2788

Table 4 Departments of Guatemala*	
Department	Acronym
Alta Verapaz	ALT
Baja Verapaz	BAJ
Chimaltenango	CHM
Chiquimula	CHQ
El Progreso	ELP
Escuintla	ESC
Guatemala	GUA
Huehuetenango	HUE
Izabal	IZA
Jalapa	JAL
Jutiapa	JUT
Peten	PET
Quetzaltenango	QUE
Quiche	QUI
Retalhuleu	RET
Sacatepéquez	SAC
San Marcos	SNM
Solola	SOL
Santa Rosa	STR
Suchitepequez	SUC
Totonicapan	TOT
Zacapa	ZAC

*Amatitlan was a separate department until 1935 (after which it became part of Department of Guatemala), but Amatitlan is excluded throughout as a separate department because of missing data. El Progreso is included as a distinct department since 1934.

Figure 1

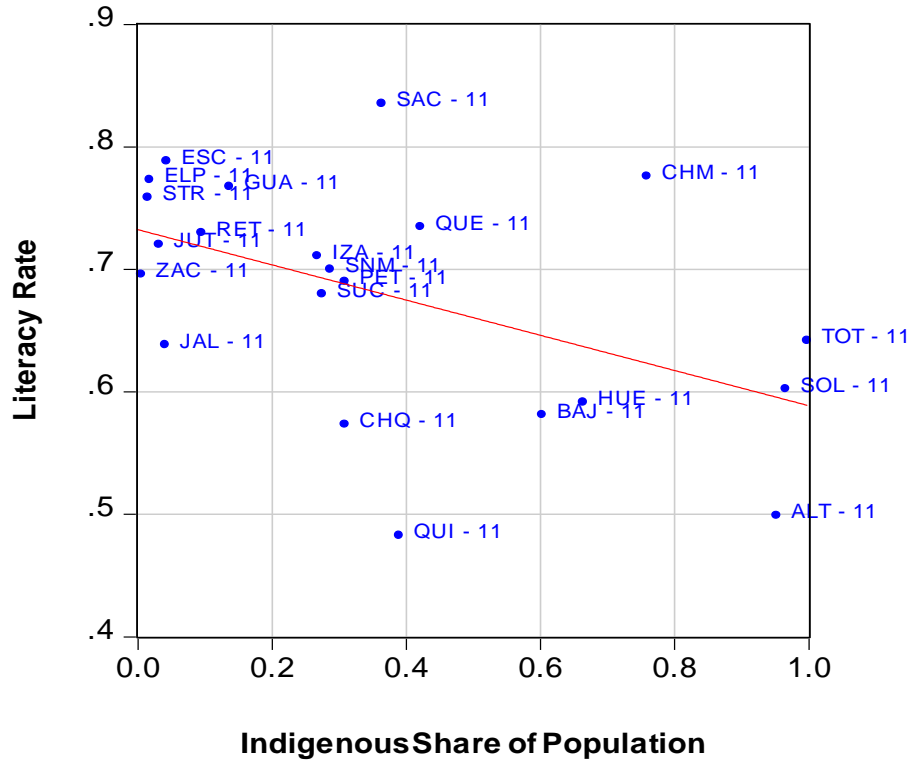
Literacy Rate and Indigenous Share across Departments of Guatemala in 1950



See Table 4 for acronyms of departments.

Figure 2

Literacy Rate and Indigenous Share across Departments of Guatemala in 2011



See Table 4 for acronyms of departments.