

NBER WORKING PAPER SERIES

SAINTS MARCHING IN, 1590-2009

Robert J. Barro  
Rachel M. McCleary

Working Paper 16769  
<http://www.nber.org/papers/w16769>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
February 2011

We are grateful for comments from Marios Angeletos, Davide Cantoni, Ed Glaeser, Emi Nakamura, Emily Oster, and Jose Ursua. We particularly appreciate Alex McQuoid's work on the data set of blessed persons through 2005 and Todd Johnson's help with the data on religious adherence from the Global Christian Data Base. We also acknowledge some early input from Bradley Ruffle. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2011 by Robert J. Barro and Rachel M. McCleary. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Saints Marching In, 1590-2009  
Robert J. Barro and Rachel M. McCleary  
NBER Working Paper No. 16769  
February 2011  
JEL No. N10,Z1,Z12

### **ABSTRACT**

The Catholic Church has been making saints for centuries, typically in a two-stage process featuring beatification and canonization. We analyze determinants of rates of beatification and canonization (for non-martyrs) over time and across six world regions. The research uses a recently assembled data set on numbers and characteristics of beatifieds and saints chosen since 1590. We classify these blessed persons regionally in accordance with residence at death. These data are combined with time-series estimates of regional populations of Catholics, broadly-defined Protestants, Orthodox, and Evangelicals (mostly a sub-set of Protestants). Regression estimates indicate that the canonization rate depends strongly on the number of candidates, gauged by a region's stock of beatifieds who have not yet been canonized. The beatification rate depends positively on the region's stock of persons previously canonized. The last two popes, John Paul II and Benedict XVI (the only non-Italians in our sample), are outliers, choosing blessed persons at a much higher rate than that of their predecessors. Since around 1900, the naming of blessed persons seems to reflect a response by the Catholic Church to competition from Protestantism or Evangelicalism. We find no evidence, at least since 1590, of competition between the Catholic and Orthodox Churches.

Robert J. Barro  
Department of Economics  
Littauer Center 218  
Harvard University  
Cambridge, MA 02138  
and NBER  
rbarro@harvard.edu

Rachel M. McCleary

rachel\_mccleary@harvard.edu

After a long history of saint-making, the Catholic Church is experiencing an unprecedented pace of beatification and canonization under the last two popes, John Paul II and Benedict XVI. To assess this unusual pattern, one has to place the saint-making process within an historical context that goes back centuries but that became more organized between the 12<sup>th</sup> and 17<sup>th</sup> centuries. Gauging the extent to which the last two popes are outliers requires a long-term perspective that holds constant determinants of the rates of beatification and canonization.

We are particularly interested in the Church's choices over time on numbers and locations of persons designated as blessed (based on residence at death). The process has become more global in recent decades, extending outward from the traditional European focus to encompass more substantially Latin America, North America, Asia, and Africa. This geographical expansion may reflect the Church's increasing concern over competition within Christianity from Protestantism, perhaps particularly in recent decades from Evangelical or Pentecostal faiths. That is, the Catholic Church may view saint-making as a strategic mechanism for invigorating local Catholic populations and, thereby, discouraging conversion into Protestantism.

The Protestant Reformation began in 1517, with Martin Luther in Germany and, soon thereafter, with Ulrich Zwingli and John Calvin in Switzerland. The Reformation was followed by a long period of Catholic-Protestant conflict, including religious wars that ended in 1648 with the Peace of Westphalia. We use the data on saint-making to assess how the competition between Catholicism and Protestantism in Europe may have changed pre- and post-1648. We also consider competition from the Orthodox Church, which separated from the Roman Catholic Church in the Great Schism of 1054. The general idea is to evaluate changing spatial patterns of saint-making as responses to competition between alternative providers of Christian religious

services. To preview our results, we find evidence of responses of saint-making to Protestant or Evangelical competition in the period since roughly 1900 but not in earlier times. There is no clear break in the saint-making process with the Peace of Westphalia. And, at least since 1590, we see no indications of competition with the Orthodox Church.

## **I. A Brief Survey of Saint-Making and its Rules**

In a previous (and companion) paper—Barro, McCleary, and McQuoid (2011), henceforth called BMM—we described our assembly of long-term data on numbers and characteristics of blessed persons selected by the Catholic Church.<sup>1</sup> We gauge the locations of these choices by the blessed person’s residence at death. The data apply to canonizations (final approval as a saint) and beatifications (stage one for becoming a saint). Our main information covers the period since 1588, when official Vatican records began. We have less complete information covering canonizations since 1234, after which designation as a saint formally required papal approval. We focus on blessed persons known as confessors—individuals who lived a life of virtue and suffered persecution of some form for their faith but were not put to death. Hence, our analysis excludes martyrs, who were often beatified in large groups.<sup>2</sup>

Our earlier study, BMM, gave details on the history of the selection procedure for blessed persons and also gave references to sources that provide greater detail. We present here a brief summary of the major features of the saint-making process. For confessors, beatification requires the posthumous performance of a miracle—one since the 1983 reforms, two or more before that. The beatification stage is (normally, but not always) a prerequisite for the second

---

<sup>1</sup>The data are from Catholic Church, *Congregatio pro Causis Sanctorum* (1999), Burns (1995 and later years), and McBrien (1995, 2000). Information for recent years comes from the Vatican website. The data will eventually be provided on our websites.

<sup>2</sup>An earlier list of blessed persons, covering 993 to 1967, was compiled by Delooz (1962). However, this list includes martyrs, as well as persons described as blessed but who lacked formal approval by the pope.

stage, canonization, which requires a second, post-beatification miracle (two additional miracles before the 1983 reforms). In contrast to confessors, martyrs (whom we do not study) require no miracles to be beatified. We have information on when the canonizations and beatifications occurred and, hence, under which pope. Our data set contains characteristics of the blessed persons, including dates and places of birth and death, gender, urban versus rural residence, whether ever married or a convert, indicators of education and occupation, and so on.

The first recognized papal canonization took place in 993 when Pope John XV canonized Ulric of Augsburg, a mere 20 years after Ulric's death. We say "mere" because, since 1590, the time between death and canonization averaged 181 years. The process of canonization gradually became formalized up to the 12th century; by 1159, the process had become established custom with the pope making decisions in consultation with synods or general councils. In a decree in 1234, Pope Gregory IX formally declared the exclusive authority of the Holy See to bestow the title of "saint" on an individual. However, the 1234 decree did not deter bishops from conferring beatifications, thereby creating a clear distinction between "saint" and "beatified."<sup>3</sup>

Pope Sixtus V formalized the saint-making process and concentrated authority within the Holy See by creating the Congregation of Rites in 1588. The Congregation had authority over the canonization process, particularly with regard to verifying miracles and virtues; for the first time the process included medical examiners (Harvey [2007, p. 1256]). Pope Sixtus V also purged the Calendar of Saints of persons with questionable credentials.<sup>4</sup> In 1634, Pope Urban VIII issued two decrees centralizing the process from beatification to sainthood in the Holy See.

By 1917, rules for canonization and beatification were included in the *Codex Juris Canonici* and *Codex pro Postulatoribus* to guide the ecclesiastical authorities involved in the

---

<sup>3</sup>For a discussion of the evolution of the process of canonization during the Middle Ages, see Kemp (1945).

<sup>4</sup>The Calendar was first purged during the Council of Trent (1545-63) when nearly half of saints' feast days were eliminated (Klauser [1979, pp. 117-152]). Subsequent purgings took place after Vatican II in 2001 and 2005.

process. Canon 199 of the *Codex Juris Canonici* stipulated that only the pope had the authority to canonize. The Sacred Congregation of Rites was charged with overseeing the process, and local ecclesiastical authorities were required to follow canon law. A rule requiring a waiting period of 50 years after the death of a candidate before a petition could be made was reaffirmed.

In 1969, Pope Paul VI created the Congregation for the Causes of Saints (replacing the Congregation of Rites) and the Congregation for the Divine Worship. Another congregation, The Congregation for the Doctrine of the Faith, continued to play a central role. Pope John Paul II decentralized the process in 1983, while strengthening the Vatican's ability to review cases by creating the College of Relators. A relator is a high-ranking member of the Roman Curia who supervises the preparation of materials presented to the Congregation for the Causes of Saints.

In the current structure, local church authorities oversee the collection of evidentiary materials in the first phase of the beatification process. After a five-year waiting period after the death of the candidate, a formal petition can be submitted to Rome to open the case for beatification. Upon Rome's approval, the local diocese appoints a person to direct the case, the postulator, who gathers evidentiary materials—writings by the candidate, testimonials from eyewitnesses, and second-hand accounts. The body of the candidate is exhumed and examined to ensure that the person existed. When the collection of evidence is complete, the report is sent to Rome to a relator, who reviews the report and appoints a medical expert to conduct an independent inquiry into the claimed miracles. The relator oversees the writing of the position report, which is submitted to the Congregation for the Causes of Saints, consisting of 25 cardinals and bishops. If the candidate is deemed by the Congregation to have lived a virtuous life according to Catholic theology, the candidate receives the title “venerable,” the current status

of Pope Pius XII. To be beatified, the candidate must also have been verified to have performed a miracle. This verification earns the candidate the title “blessed” as a beatified, the status accorded Pope John Paul II early in 2011. A second posthumous miracle must be performed and verified after beatification before the candidate can be canonized as a saint.

Pope Benedict XVI has maintained the 1983 reforms, while making a few minor changes. The act of beatification can now take place anywhere in the world and, although a pontifical act, does not require the physical presence of the pope.<sup>5</sup> The large expansion in the number beatified by the last two popes—319 by John Paul II and 52 by Benedict XVI through 2009—stands out because the cumulative number beatified (non-martyrs) from 1590 to 2009 is only 630. At the end of 2009, the stock of beatifieds not yet canonized is 371, by far a record.

The present study analyzes determinants of rates of canonization and beatification and how these rates varied by pope and region since 1590. The analysis uses a six-way regional breakdown: Italy, other Western Europe, Eastern Europe, Asia/Africa, Latin America, and North America (defined here as Canada and the United States). We chose these regions to allow for cross-sectional variation while also avoiding consideration of small geographical entities that had mostly zeroes for persons canonized or beatified in most time periods. The regressions include effects from the cumulated stocks by region of two categories of blessed persons: those previously beatified who have not yet been canonized and those previously canonized. As noted before, we are especially interested in evaluating the conjecture that, especially in recent decades, saint-making has become part of the competition between the Catholic Church and Protestantism, especially Evangelicalism. The growth in the population of Protestants, notably

---

<sup>5</sup>For the official description of the process, see [www.vatican.va/roman\\_curia/congregations/csaints/documents/rc\\_con\\_csaints\\_doc\\_20070517\\_sanctorum-mater\\_en.html](http://www.vatican.va/roman_curia/congregations/csaints/documents/rc_con_csaints_doc_20070517_sanctorum-mater_en.html).

of Evangelicals and Pentecostals, was strong in North America early in the 20<sup>th</sup> century and became even stronger later in the 20<sup>th</sup> century in Asia/Africa and Latin America.

## **II. The Data Set of Blessed Persons and other Variables**

### **a. Popes, Beatifieds, Saints**

Table 1 gives statistics on popes' terms from Sixtus V (ID no. 225, 1585-1590) to the current pope, Benedict XVI (no. 263, 2005- ), for whom we have assembled data through 2009. The sample for our statistical analysis starts after Sixtus V's major reforms; that is, with Urban VII (ID no. 226, 1590-1590). This sample comprises 38 popes, covering 1590 to 2009.

Table 1 gives, for each pope, the ID number, name, start and end year of the term as pope, and tenure in years (based on the specific day started and ended). For the columns under the heading "Beatified," the stock is the cumulative number beatified but not yet canonized at the start of the pope's term, the duration is the mean number of years from beatification to the start of the pope's term for the stock of beatified, and the flow is the number beatified during the pope's term. Recall that our concept of beatification applies only to non-martyrs; as already noted, martyrs have different requirements (martyrdom in the cause of the Church but skipping one tranche of miracles) and often comprise groups of persons, rather than individuals. For the columns headed "Canonized," the stock is the cumulative number canonized at the start of the pope's term, and the flow is the number canonized during the term.

We computed, for each pope, the annual beatification rate, defined as the ratio of the number beatified to the pope's tenure. Figure 1 shows these beatifications per year by pope since 1590 for popes with four or more beatifications. For the 38 popes in our main sample, the mean beatification rate was 1.1, the median was 0.41, the minimum was 0 (for several popes),

and the maximum was 12.0 for John Paul II (no. 262). As indicated in the figure, the beatification rate was between 0 and 2 until the last two popes—when the rate rose sharply to 12 for John Paul II (1978-2005) and 11 for Benedict XVI (2005-2009). This pattern suggests a marked diminution of standards for beatification, a conjecture that we support later through regression analysis.

We calculated the annual canonization rate for each pope as the ratio of the number canonized to the pope's tenure. Figure 2 shows these canonizations per year since 1590 by pope for those with four or more canonizations. For the 38 popes in our main sample, the mean canonization rate was 0.74, the median was 0.18, the minimum was 0 (for several popes), and the maximum was 6.0 for Benedict XVI. The pattern shown in the figure suggests that John Paul II (at 3.0 canonizations per year) was only a moderate outlier, whereas Benedict XVI (at 6.0 per year) was a clearer outlier. One important positive influence on Benedict XVI's canonization rate is the large stock of beatified person's left behind by John Paul II. Nevertheless, we conclude in the regression analysis that Benedict XVI has been more of an outlier than John Paul II with respect to the propensity to canonize.

One way to step up the pace of beatification temporarily is to shorten the length of time between death and beatification. This interval was restricted before the 1983 reforms to be at least 50 years, although popes occasionally ignored this restriction.<sup>6</sup> Over the full sample from 1590 to 2009, the mean time from death to beatification was 118 years, and the median was 88. Figure 3, for popes with four or more beatifications, suggests that this lag time rose early on—from Paul V, no. 231, 1605-1621, to Clement XII, no. 244, 1730-1740. However, the lag fell back around the time of Pius XI, no. 257, 1922-1939, and has since been relatively stable. For

---

<sup>6</sup> From 1590 to 1982, 37 of the 285 beatifications (13%) took place less than 50 years after the blessed person's death. From 1983 to 2009, 54 of the 345 beatifications (16%) featured a lag of less than 50 years from the blessed person's death. Thus, there was no clear change before and after 1983.

the last two popes, the numbers were a mean of 109 years and a median of 86 for John Paul II and a mean of 91 and a median of 84 for Benedict XVI. These values are roughly in line with those prevailing since Pius XI.

For the time lag between beatification and canonization, the mean from 1590 to 2009 was 49 years, and the median was 21. Figure 4 indicates that John Paul II was consistent with the overall experience—a mean of 48 and a median of 18. However, Benedict XVI (2005-2009) notably shortened the lag—he had a mean of 19 and a median of 11. A recent example of the accelerated process is Benedict XVI’s beatification of his immediate predecessor, John Paul II. The process began less than a month after John Paul II’s death (in contrast to the ordinary minimum interval of five years), and, only six years after his death, his beatification ceremony will take place in the Vatican.

Figure 5 shows how some characteristics of blessed persons changed over time from 1590 to 2009.<sup>7</sup> The male share of beatifications and canonizations diminished from the 16<sup>th</sup> to the 19<sup>th</sup> century, falling from 70-80% to 50-60%. However, there has been no clear trend since 1900. Shares with some formal schooling were high throughout, averaging around 80%, and have not changed substantially over time, despite the expansion of formal schooling in the overall population. Similarly, the share coming from urban areas has averaged nearly 80% and shows no clear trend, despite the global trend toward urbanization.

Over the full sample (1590-2009), the 630 beatifications broke down (when classified in accordance with residence at death) as 45% Italy, 33% other Western Europe, 7% Eastern Europe, 2.7% Asia, 1.4% Africa, 7% Latin America, and 4% North America. The breakdown was similar for the 272 canonizations: 47% Italy, 34% other Western Europe, 7% Eastern

---

<sup>7</sup>Stark (2004, pp. 51-59) discusses analogous characteristics of saints chosen between 500 and 1500. His analysis—which includes the period before the formalization of procedures for canonization in 1234—involves a data set that Stark constructed by using a variety of criteria to filter out many commonly included “saints.”

Europe, 2.2% Asia, 0.7% Africa, 7% Latin America, and 3% North America. In the subsequent analysis, we combine the numbers for Asia and Africa, each of which accounts for a very small share of blessed persons.

Figures 6 and 7 show the changes over time in the regional composition of beatifications and canonizations. Through the 1970s, blessed persons were predominantly from Western Europe (including Italy). However, at least since 1980, there has been a clear globalization of the process. For example, from 1980 to 2009, the shares of beatifications were 10% Eastern Europe, 3.5% Asia, 1.9% Africa, 10% Latin America, and 5% North America.

### **b. Population and Religious Adherence**

We constructed rough estimates of total population by country and year from 1550 to 2009. Our starting point was McEvedy and Jones (1978), henceforth called MJ, who provide estimates since 1500 at 100-, 50-, or 25-year intervals for 68 individual countries and 16 broader groups typically centered on a principal country.<sup>8</sup> The constructs take account of border changes and provide estimates of historical population that correspond to borders around 1975. The 84 entities together come close to covering the entire world. Since we focus our statistical analysis of blessed persons chosen in six main regions—Italy, other Western Europe, Eastern Europe, Asia/Africa, Latin America, and North America (Canada plus United States)—the aggregation of countries in the 16 broader groupings does not affect this analysis.

---

<sup>8</sup>These groupings are Botswana (including Namibia), Caribbean (5 countries), Central America (7 countries), Czechoslovakia (Czech Republic and Slovak Republic), East Africa (6 sub-Saharan African countries), Guyana (including Suriname), Indian sub-continent (comprising Bangladesh, India, and Pakistan), Malaysia (including Singapore), Nigeria (including 11 other sub-Saharan African countries), Palestine (including Israel), Russia (including Belarus, Lithuania, and Ukraine), Sahara (4 African countries), Saudi Arabia (including Bahrain, Kuwait, Qatar, UAE, and Yemen), South-Central Africa (Malawi, Zambia, and Zimbabwe), South-West Africa (6 sub-Saharan African countries), and Yugoslavia (Bosnia, Croatia, Macedonia, Serbia, and Slovenia).

We adjusted the MJ data for 1975 on population in each country or group to match the estimates from the World Bank's *World Development Indicators* (WDI). We then used the available annual data from WDI to cover 1960-2009. Then we interpolated backwards (log-linearly) from 1960 to 1550, using as benchmarks the interval data from MJ (adjusted by the multiple applying to 1975) going back to 1500. In this manner, we estimated total population for each year for each country or group from 1550 to 2009. We then combined the data on countries or groups within each region to compute estimates of total population by year for the six regions: Italy, other Western Europe, Eastern Europe, Asia/Africa, Latin America, and North America.<sup>9</sup> These population data should be informative for long-term trends even if not for variations over short intervals, such as years or even decades before 1900.

The blue graph in Figure 8 shows our estimates of world population, which reached 6.6 billion in 2009. (For comparison, the number for world population in 2009 from the World Bank's *World Development Indicators* is 6.8 billion.) Figure 8 shows that 5.0 billion of the total in 2009 were in Asia/Africa, consisting of 4.0 billion in Asia and 1.0 billion in Africa. Figure 9 has the population data for Europe and its western offshoots; the total for this group in 2009 was 1.6 billion. The earlier dominance of Europe in this aggregate was gradually replaced by Latin America and North America, which reached, respectively, 576 million and 337 million in 2009.

Johnson (2010) provides estimates of adherence numbers by country for the major world religions in 1900, 1950, 1970, and 2000. We use the data for Catholic, a broad concept of Protestant (including Anglicans, independent Christian churches, and marginal Christians such as Mormons and 7<sup>th</sup>-Day Adventists), and Orthodox. Note that these adherence numbers exclude

---

<sup>9</sup>Among possibly ambiguous cases, we defined Western Europe to include Greece; Eastern Europe to include Cyprus and Russia; Asia to include Australia and other Pacific-area countries; and Latin America to include Caribbean, Cuba, and Puerto Rico.

unaffiliated Christians. The sum of the three categories gives an estimate of overall affiliated Christians.<sup>10</sup>

We also use the Johnson (2010) data on Evangelical adherence. The underlying concept is the number of persons affiliated with Evangelical churches, which are categorized as Evangelical based on their belief structure. Specifically, Evangelicals believe in the inerrancy of the Bible, one God (in trinity), Jesus as deity, personal salvation through belief in Christ, the presence of the Holy Spirit in believing Christians, and resurrection into heaven and damnation for sinners.<sup>11</sup> Most Evangelicals would fall into the broad Protestant category described above.<sup>12</sup> Pentecostals accept the Evangelical statement of faith and are considered by many scholars to be a subset of Evangelicals. The belief structure of Pentecostals adds the second coming of Christ, baptism, the Last Supper, speaking in tongues, and divine miracles.<sup>13</sup>

For years prior to 1900, we used data from Barrett and Johnson (2001, Table 7-2) to estimate adherence numbers for Catholic, Protestant (broadly defined), and Orthodox for main regions: Western Europe (including Italy), Eastern Europe, Asia, Africa, Latin America, and North America. These data are for 1500, 1650, 1750, 1800, 1850, and 1900.

For the period since 1900, we assumed that the adherence ratios for each country or group of countries after 2000 equaled those in 2000. We estimated adherence ratios from 1900

---

<sup>10</sup> Double-counting arises because some persons have affiliations to more than one Christian religion. However, the data in Barrett, Kurian, and Johnson (2001, Table 1-1) for 2000 indicate that doubly-counted religionists are less than 1% of affiliated Christians (if we assume that all the doubly-counted are Christians). It is possible, however, that Barrett, Kurian, and Johnson understate dual affiliations, particularly by neglecting continuing affiliations of “Christians” with indigenous faiths, particularly in Africa and Latin America.

<sup>11</sup> See the statement of faith of the National Association of Evangelicals, <http://www.nae.net/about-us/statement-of-faith>, accessed January 25, 2011.

<sup>12</sup> Johnson (2010) distinguishes Evangelicals—persons affiliated with an Evangelical church—from evangelicals, in the sense of persons holding Evangelical beliefs. According to Barrett and Johnson (2001, Table 10-2), in 1900, the concepts were not that different: 71 million Evangelicals worldwide versus 78 million evangelicals. However, there was a large difference in 2000: 211 million Evangelicals versus 648 million evangelicals.

<sup>13</sup> See the statement of faith of the Pentecostal Assemblies of God of America, <http://www.paga.org/statemen.htm>, accessed January 25, 2011.

to 1950, 1950 to 1970, and 1970 to 2000 by interpolating linearly between the values for the end points. We multiplied the computed adherence ratios by the estimates of total population for each country or group to estimate adherents to each religion annually since 1900 for each country or group. Finally, we added up across the countries or groups in each region to estimate adherents to each religion in our six regions: Italy, other Western Europe, Eastern Europe, Asia/Africa, Latin America, and North America.

For years prior to 1900, we interpolated the available adherence ratios for a somewhat different collection of regions (Western Europe, Eastern Europe, Asia, Africa, Latin America, and North America) between the benchmark dates: 1500, 1650, 1750, 1800, 1850, and 1900.<sup>14</sup> We then multiplied the adherence ratios by the total population of each region to estimate adherents to the Catholic, Protestant, and Orthodox religions for each year for 1550-1900. For Evangelical, we assumed that the ratio of Evangelicals to Protestants in each region in 1900 applied to all earlier years.<sup>15</sup>

Figure 10 shows the evolution of the world's estimated Christian population by major type. In 2009, the estimated total of 2.16 billion broke down into 1.09 billion Catholics, 0.83 billion Protestants (broadly defined), and 0.24 billion Orthodox. The estimated share of Catholics in the overall Christian population was 56% in 1550 and 50% in 2009. The figure also shows the number Evangelical, which equaled 0.24 billion in 2009. As already mentioned, most of this number would fall into the broad Protestant category.

---

<sup>14</sup>For Italy, included with Western Europe in these data, we assumed that the adherence ratios for 1900--nearly 100% Catholic--applied to all earlier years. A minor discrepancy is that the compositions of Western and Eastern Europe used by Barrett and Johnson (2001, Table 7-2) do not correspond precisely to those we used

<sup>15</sup> Evangelicalism might be viewed as having originated with George Whitefield and John Wesley in England and Jonathan Edwards in the United States; see Noll (2003, Introduction). However, since, as Noll observes, there were previous aspects of "evangelicalism" in England, elsewhere in Western Europe, and the United States, we did not set the world Evangelical number to zero at a date such as 1730. Our procedure generates a world Evangelical population of 17 million in 1800, 94% of which is in Western Europe and North America. In contrast, Barrett and Johnson (2001, Table 10-2) estimate the world population of Evangelicals in 1800 to be 25 million.

Figure 11 shows the breakdown of the estimated Catholic population into our six regions for selected years from 1700 to 2000. The graph shows the shift over time of Catholic numbers from Western Europe toward Latin America and Asia/Africa. In 2009, among an estimated 971 million Catholics worldwide, the distribution was 44% in Latin America, 25% in Asia/Africa, 18% in Western Europe (including Italy), 7% in North America, and 6% in Eastern Europe.

Figure 12 shows a comparable diagram for the Protestant population. Western Europe was the main home for Protestants up to the early 1800s, but North America became increasingly important during the 19<sup>th</sup> century. In the latter part of the 20<sup>th</sup> century, the dominant place for Protestants became Asia/Africa, with Latin America also rising in importance. In 2009, among an estimated 740 million Protestants worldwide, the distribution was 55% in Asia/Africa, 18% in North America, 13% in Western Europe (including Italy), 12% in Latin America, and 2% in Eastern Europe.

Figure 13 has the data for Orthodox population by region. Eastern Europe, which includes Russia, was dominant throughout.

Figure 14 has the regional breakdown for Evangelical population. In the early part of the 20<sup>th</sup> century, the largest share was in North America, with Western Europe second in importance. In the latter part of the 20<sup>th</sup> century, the key developments were the expansions of Evangelicals in Asia/Africa and Latin America. Recall that the Evangelical data prior to 1900 are not independent of the Protestant data, shown in Figure 12.

### **III. Framework for the Regression Analysis**

We use regression analysis to assess determinants of rates of beatification and canonization over time (by pope) and by region. The sample comprises 38 popes' terms, going

from Urban VII (1590-1590) to Benedict XVI (2005-2009), as described in Table 1. There are 6 regions, as noted before: Italy, other Western Europe, Eastern Europe, Asia/Africa, Latin America, and North America. The beatification rate is the number beatified during a pope's term in each region, divided by the pope's full tenure in office (in years). The canonization rate is defined analogously. Overall, there are 228 observations each for beatification and canonization rates. Tables 2 and 3 provide statistics on variables used in the regressions.

Let  $B_{ij}$  be the beatification rate and  $C_{ij}$  the canonization rate under pope  $i$  ( $i=1, \dots, 38$ ) in region  $j$  ( $j=1, \dots, 6$ ). We express the determinants of  $B_{ij}$  and  $C_{ij}$  in terms of effects from pope-related variables,  $X_i$ , and region-related variables,  $Z_j$ . In the subsequent analysis, the vector  $X_i$  includes dummy variables for the last two popes, John Paul II and Benedict XVI—who are also the only non-Italian popes in our sample—and sometimes the pope's age at the start of his term. The  $Z_j$  include the stocks of beatified and canonized in region  $j$  at the start of a pope's term and various measures of the population of region  $j$  (numbers of Catholics, Protestants, Evangelicals, etc.) at the start of a pope's term. For  $C_{ij}$ , the key component of  $Z_j$  should be the stock of persons previously beatified but not yet canonized in region  $j$ .<sup>16</sup> This stock gauges the number of candidates eligible for canonization (except for the rare cases—nine since 1590—in which beatification was skipped).

We suppose that the determination of the beatification rate (and, analogously, for the canonization rate) follows the specification:

$$(1) \quad B_{ij} = \mu_j \cdot (\beta_1 + \beta_2 \cdot X_i + \beta_3 \cdot Z_j) + u_{ij},$$

where  $u_{ij}$  is a zero-mean error term. If the saint-making process treated all regions symmetrically (corresponding to  $\mu_j=1$  for all  $j$ ), the systematic part of the right side of equation (1) would give

---

<sup>16</sup>We include in the stock of beatified the four persons who were canonized since 1590 but reported as having been beatified well before 1590. We thereby neglect the large number of persons who were beatified without formal papal approval in the pre-1590 era.

the expected beatification rate as the linear function  $\beta_1 + \beta_2 \cdot X_i + \beta_3 \cdot Z_j$ . In the main analysis, the coefficients  $\beta$  are fixed over time.

Given the value of  $\beta_1 + \beta_2 \cdot X_i + \beta_3 \cdot Z_j$ , we assume that the expected beatification rate (or canonization rate) varies systematically by region. That is, for given values of the  $Z_j$  (regional populations of Catholics, etc.) and the  $X_i$ , the Catholic Church targets some regions over others—presumably favoring the home territory of Italy and other Western Europe and giving lesser weight to other areas. We represent these regional preferences in equation (1) with the multipliers  $\mu_j > 0$ , where we normalize by setting the average of the  $\mu_j$ 's to one. We estimate one set of the  $\mu_j$ 's for the beatification rate and another for the canonization rate. In the main analysis, the  $\mu_j$ 's are fixed over time.

We think of beatifications or canonizations as arriving randomly, in a Poisson manner, with the probability per unit of time—or hazard rate—given by the systematic part of the right side of equation (1). We measure  $B_{ij}$  (analogously  $C_{ij}$ ) as the total number of beatifications during pope  $i$ 's term in region  $j$ , divided by the pope's tenure,  $T_i$  (in years). If the distribution of the unexplained part of the hazard rate does not vary over time for a given pope, the variance of the observed  $B_{ij}$  around its mean—that is, the variance of the error term,  $u_{ij}$ , in equation (1)—is proportional to the reciprocal of  $T_i$ . Therefore, to achieve homoscedasticity, the regressions weight each pope's observations by the square root of  $T_i$ .<sup>17</sup> Note from Table 1 that  $T_i$  varies substantially across the popes: the values range from less than 0.1 year for Urban VII (1590), Leo XI (1605), and John Paul I (1978) to 31.7 for Pius IX (1846-1878) and 26.5 for John Paul II (1978-2005).

---

<sup>17</sup>The regressions that we estimate are linear-probability models. An alternative, not yet explored, is a Tobit-type specification. For a given pope,  $i$ , the error terms associated with different regions,  $u_{ij}$  and  $u_{ik}$ , are likely to be correlated. To take account of this possibility, the estimation (by seemingly-unrelated regression) allows for contemporaneous correlation of the error terms across regions.

Given the initial stocks of beatifieds and saints in region  $j$ , we anticipate a positive effect on the beatification rate,  $B_{ij}$ , from an increase in the Catholic population of region  $j$  at the start of a pope's term. As discussed earlier, we are particularly interested in whether saint-making responds to competitive pressure from other religions, notably Protestants and Evangelicals. We gauge this effect from the population of Protestants or Evangelicals in region  $j$  at the start of a pope's term. A positive influence would suggest that the Catholic Church responds to enhanced competition by beatifying and canonizing at a faster rate in region  $j$ . We are also interested in whether this competitive response is a relatively recent phenomenon.

The regression analysis considers effects from additional variables, including potential competitive influences from the Orthodox population. We also consider whether the duration of the stock of beatifieds matters for the canonization rate. A desire not to leave candidates in limbo for too long suggests a rising hazard rate. However, unobserved heterogeneity in the quality of candidates could obscure this effect.

#### **IV. Regression Results**

The baseline regressions are in Table 4 for the canonization rate,  $C_{ij}$ , and Table 5 for the beatification rate,  $B_{ij}$ . The regressions follow the general form of equation (1). As noted before, the estimates weight each pope's observations by the square-root of tenure. The estimation uses the seemingly-unrelated method to allow for different variances of the regional error terms and for contemporaneous cross-region correlation of the errors (see n. 14).

##### **a. Canonization rate**

Consider the results for the canonization rate,  $C_{ij}$ , in Table 4. The regressions in columns 1 and 3 use a region's Protestant population as a measure of competition for the Catholic Church, whereas those in columns 2 and 4 use a region's Evangelical population. Columns 3 and 4 add explanatory variables to the equations in columns 1 and 2, respectively.

In Table 4, columns 1-4, the estimated regional multipliers,  $\mu_j$ , in the form of equation (1) are close to 1 for Italy and other Western Europe, around 1.4 for Eastern Europe and Latin America, 0.6-0.7 for North America, and 0.4-0.5 for Asia/Africa. Thus—although the divergences are not as great as those found next for beatification—there is regional favoritism even after conditioning on persons having been beatified. The regional multipliers (constrained to average one) are significantly different from each other ( $p$ -value=0.000 for columns 1-4), and the multiplier for Eastern Europe is about three times that for Asia/Africa.

Since the stock of beatified persons in each region at the start of a pope's term represents the number of candidates for sainthood, it is not surprising that Table 4, column 1 shows a significantly positive coefficient, 0.0117 (s.e.=0.0013). Results in columns 2-4 are similar. Thus, in the typical region, with a multiplier of one, an extra beatified person raises the estimated canonization rate by around 0.01 per year. Since John Paul II raised the overall stock of beatifieds by 239 (from 105 to 344), the estimated coefficient in column 1 predicts a boost of the canonization rate by Benedict XVI by 2.7 per year, spread across the 6 regions. (The canonization rates were 6.0 per year for Benedict XVI and 3.0 for John Paul II.)

Table 4, columns 1-4 show that the estimated coefficient of the cumulative stock of persons canonized at the start of a pope's term has a small and statistically insignificant effect on the canonization rate. We might have anticipated a negative coefficient—if popes have a target

stock of person's canonized (given a region's population measures, etc.)—but the results do not support this idea.

A region's Catholic population has a negative and marginally statistically significant coefficient in Table 4, columns 1 and 2; the result in column 1 is -0.0162 (s.e.=0.0081). In columns 3 and 4, which include additional explanatory variables, the estimated coefficients on Catholic population are no longer statistically significantly different from zero. Although a negative coefficient on Catholic population is surprising, it is worth noting that the regressions hold constant the stock of beatifieds, which already captures the number of candidates for sainthood in a region.

The results for the Protestant population in each region are more interesting. In this case, the estimated coefficient in Table 4, column 1, is positive and significant, 0.073 (s.e.=0.013) (with population measured as 100 millions). Our interpretation is that the Catholic Church responds to heightened competition from Protestants in a region by canonizing at a faster rate in that region. Quantitatively, to illustrate for Latin America, the standard deviation of 16.5 million (Table 3) means that a one-standard-deviation increase in the Protestant population raises the estimated beatification rate by 0.02 per year,<sup>18</sup> compared to Latin America's mean canonization rate of 0.06. For Asia/Africa, the corresponding estimated effect is 0.02 per year, equal to the region's mean canonization rate, whereas for North America, the estimated effect is 0.02 per year, also equal to the region's mean canonization rate. Thus, competitive responses of the Catholic Church to variations over time in Protestant populations may have a lot to do with the changes in the tendency to canonize persons in Latin America, Asia/Africa, and North America.

---

<sup>18</sup>The calculation is 0.073 (coefficient in Table 4, column 1), multiplied by the standard deviation of Latin America's Protestant population of 16.5 million (Table 3), divided by 100 (because population is measured in 100 millions in the regression), and multiplied by Latin America's multiplier of 1.398 (Table 4, column 1).

If we replace the Protestant variable with Evangelical population, in Table 4, column 2, the results are similar. The estimated coefficient for Evangelical is 0.096 (s.e.=0.017), and the rest of the coefficients are close to those in column 1. The results are quantitatively similar to those for Protestant (column 1) in terms of the predicted effects of variations in Evangelical population on the canonization rate in each region.

If we include Protestant and Evangelical populations at the same time (modifying Table 4, column 1 or 2), the estimated coefficient on Protestant becomes much larger than before, 0.45 (s.e.=0.10), while that on Evangelical becomes negative and significant, -0.56 (0.16). This result is puzzling, because we anticipated that the competition from Evangelicals would be especially influential for the Catholic Church. However, the findings may reflect mainly the difficulty in distinguishing Protestant from Evangelical trends in the data.

The dummy variables for the last two popes are each significantly positive; in Table 4, column 1, the estimated coefficients are 0.170 (s.e.=0.020) for John Paul II and 0.468 (0.061) for Benedict XVI. The p-value for a test of the hypothesis that these coefficients are the same is 0.000. (Results are similar in column 2.) Thus, Benedict XVI has been canonizing at a significantly higher rate than John Paul II even after taking account of the much higher stock of beatifieds when Benedict XVI took office. As noted before in Figure 4, the heightened canonization rate was accomplished in the short run by sharply lowering the average length of time between beatification and canonization.

Since the dummy variables for the last two popes appear for each of the six regions and the average multiplier for the regions is one, the estimated effects on the canonization rate worldwide involve multiplication by six. Therefore, the effect for John Paul II is an increased canonization rate by around 1.0 per year, whereas that for Benedict XVI is about 2.8 per year.

These values are high compared to the statistics in Table 2: mean canonization rate of 0.7 with a standard deviation of 1.3. Therefore, there is strong evidence for diminished standards for sainthood among the last two popes.

Table 4, column 3 adds the duration of the beatified stock at the start of a pope's term. The duration enters as an interaction with the stock of beatifieds at the start of the pope's term. Since the years of duration are measured net of the overall sample mean (69.8 years), the coefficient of the beatified stock now gives the effect on the canonization rate when duration equals its mean. The coefficient on the interaction variable indicates how the impact of the beatified stock on the canonization rate varies as duration moves above or below its mean. The estimated coefficient on the interaction variable is negative and marginally significant,  $-0.0057$  (s.e.= $0.0025$ ). The likely reason for the negative coefficient is that a rising hazard rate is obscured by unobserved heterogeneity in the "quality" of candidates for sainthood (see Kiefer [1988]). However, since we do not observe multiple spells for a given candidate (who never return to the pool of beatifieds once having been canonized), it is unclear how to sort out the two effects.

Aside from the dummy variables for the last two popes, we did not yet consider any effects from popes' characteristics. One variable that we can assess is the pope's age at the start of his term. Our expectation is that a higher starting age signals a shorter expected term of office. Therefore, if each pope seeks to attain at least a target number of saints, a higher starting age would generate a higher rate of canonization. However, in Table 4, columns 3 and 4, the estimated coefficient on pope's age is negative but statistically insignificantly different from zero.<sup>19</sup> We find more evidence later for an effect of pope's starting age on the beatification rate.

---

<sup>19</sup>Instead of including age at the start of a pope's term—which proxies for expected tenure in office—we can enter actual tenure. Actual tenure also does not have a statistically significant effect on the canonization rate.

## **b. Beatification rate**

Regressions for the beatification rate,  $B_{ij}$ , are in Table 5, columns 1-4. The estimated regional multipliers,  $\mu_j$ , vary more strongly across the six regions than they did for canonization. The estimates of the regional multipliers for the beatification rate are 2.3-2.4 for Italy, 1.5-1.6 for other Western Europe, 0.7-0.8 for Eastern Europe and Latin America, and around 0.3 for Asia/Africa and North America. The preference for Italy over Asia/Africa or North America involves a ratio around 7; thus, there is considerable “home-territory bias” in the naming of blessed persons. Since those beatified in the first stage become the stock of candidates for canonization in the second stage, the pattern of regional favoritism in beatification translates over time into regional preferences for saints (beyond the regional multipliers shown in Table 4).

The starting stock of canonized persons in a region has a strong influence on the beatification rate; the coefficient in Table 5, column 1, is 0.00515 (s.e.=0.00066), with similar results in the other columns. Thus, popes seem to desire to maintain a balance between a region’s number of saints (effectively senior faculty) and beatifieds (junior faculty). To gauge the magnitude of the effect, consider the other Western European region, for which the standard deviation of the stock canonized is 20 persons (Table 3). Note that the multiplier,  $\mu_j$ , for other Western Europe in Table 5, column 1, is 1.5. Putting these results together, we get that an increase by one standard deviation in the region’s canonized stock raises the estimated beatification rate by 0.15 per year, compared to the mean for other Western Europe of 0.35 (Table 3).

In Table 5, the estimated coefficient on the stock of beatifieds is negative but statistically insignificantly different from zero. Note that the pattern of coefficients on the initial stocks is

positive on beatification and zero on canonization in the regressions for the canonization rate in Table 4 but positive on canonization and negative or zero on beatification in the regressions for the beatification rate in Table 5. These reverse patterns make sense if we think of popes as caring about the balance between beatifieds and saints.

Given the starting stock of canonized persons, a region's Catholic population at the beginning of each pope's term has an estimated coefficient for the beatification rate that is negative but statistically insignificantly different from zero, -0.039 (s.e.=0.021) in Table 5, column 1. (The results are similar in the other columns, except that the estimated coefficient is significantly negative in column 3.) A negative effect is puzzling, because we anticipated that a region's Catholic population would represent the number of candidates for beatification (as well as the number of customers in a region) and, thereby, have a positive effect on the beatification rate. One consideration in terms of candidates for beatification is that blessed persons identified with a region in terms of residence at death need not be part of the region's Catholic population at an earlier time.

The results for the Protestant or Evangelical populations in each region are again more interesting. The estimated coefficient for Protestant in Table 5, column 1, is positive and significant, 0.295 (s.e.=0.041). Quantitatively, to illustrate for Latin America, the standard deviation of 16.5 million (Table 3) means that a one-standard-deviation increase in the Protestant population raises the estimated beatification rate in that region by 0.04 per year,<sup>20</sup> compared to the region's mean beatification rate of 0.08. For Asia/Africa, the corresponding estimated effect is 0.07 per year, compared to the region's mean beatification rate of 0.05, whereas for North America, the estimated effect is 0.04 per year, equal to the region's mean beatification rate.

---

<sup>20</sup>The calculation is 0.295 (coefficient in Table 5, column 1), multiplied by the standard deviation of Latin America's Protestant population of 16.5 million (Table 3), divided by 100 (because population is measured in 100 millions in the regression), and multiplied by Latin America's multiplier of 0.748 (Table 5, column 1).

Thus, competitive responses to the variations over time in Protestant population may have a lot to do with changes in beatification rates in Latin America, Asia/Africa, and North America.

If we replace the Protestant population with Evangelical (Table 5, column 2), we get similar results. The estimated coefficient, 0.622 (s.e.=0.119), is significantly positive, and the quantitative implications for responses of the beatification rate by region are close to those for the Protestant variable.

If we include Protestant and Evangelical populations at the same time (modifying Table 5, column 1 or 2), the results are similar to those for canonization: the estimated coefficient on Protestant becomes much larger than before, 0.46 (s.e.=0.10), while that on Evangelical becomes negative, though not statistically significantly different from zero, -0.45 (0.28). Again, this finding is puzzling, because we anticipated that the competition from Evangelicals would be especially influential. A possible interpretation is that the Protestant and Evangelical variables are picking up similar forces but that the Evangelical measure—subject to somewhat arbitrary classifications of churches (and lacking independent data before 1900)—is more subject to measurement error.

The dummy variables for the last two popes are even more important for beatification than they were for canonization. The estimated coefficients in Table 5, column 1, are 1.596 (s.e.=0.043) for John Paul II and 1.560 (0.090) for Benedict XVI. Unlike for the canonization rate, the estimated coefficients for the last two popes do not differ significantly from each other in the equation for the beatification rate ( $p$ -value=0.58). As before, since the dummy variables appear for each of the six regions and the average multiplier for the regions is one, the estimated effects on the beatification rate worldwide involve multiplication by six. Hence, other things equal, the last two popes have been beatifying at a rate 9-10 per year higher than their

predecessors. Table 2 shows that the sample mean of the total beatification rate was only 1.1, with a standard deviation of 2.6. Thus, the last two popes are enormous outliers on beatification compared to the history since 1590.

Our interpretation is that the sharp upward movements in rates of canonization and, especially, beatification under the last two popes represent diminished standards for declaring persons to be blessed. Another possible indicator of lowered standards is the growing tendency to beatify previous popes. The data since 1590 show only two popes canonized<sup>21</sup>—Pius V in 1712 and Pius X in 1954—and three more beatified<sup>22</sup>—Innocent XI in 1956, Pius IX in 2000, and John XXIII in 2000. Hence, the two beatifications of popes in 2000 under John Paul II is a large number in historical perspective. Moreover, Benedict XVI's rapid beatification of Pope John Paul II in 2011 and the active consideration of several other recent popes for beatification—Pius XII, Paul VI, and John Paul I—is unprecedented.

Table 5, columns 3 and 4 add the pope's age at the start of his term. Unlike for the canonization rate (Table 4, columns 3 and 4), the estimated coefficients on pope's age for the beatification rate are positive and marginally significant; for example, 0.156 (s.e.=0.077) in Table 5, column 3. Thus, there is some confirmation that older popes beatify persons at a faster rate.<sup>23</sup> However, the quantitative effect is minor. A one-standard-deviation rise in pope's age (by 7.8 years in Table 2) is estimated to increase the beatification rate worldwide by 0.07 per year, compared to the mean of 1.1 and standard deviation of 2.6 (Table 2).

---

<sup>21</sup>The data since 1234 contain one additional canonization of a pope—Celestine V (pope in the one year 1294), who was canonized in 1313 by Clement V (1305-1314).

<sup>22</sup>The data, based on Catholic Church, *Congregatio pro Causis Sanctorum* (1999), do not include as beatified two popes that are commonly described as blessed: Benedict XI (1303-1304) and Urban V (1362-1370)

<sup>23</sup>If we enter instead the pope's tenure (in 100\*years), the estimated coefficient is negative, though not statistically significantly different from zero, -0.086 (s.e.=0.074).

### **c. Orthodox population**

Thus far, we considered effects from Catholic, Protestant, and Evangelical populations. We consider now effects from the remaining Christian category, the Orthodox population. When added to the equation for the canonization rate in Table 4, column 1, the estimated coefficient on Orthodox population is significantly negative,  $-0.033$  (s.e.= $0.011$ ). For the beatification rate, in Table 5, column 1, the estimated coefficient is negative but not significantly different from zero,  $-0.040$  ( $0.024$ ).<sup>24</sup>

Overall, we find no evidence of positive competition in the sense of a greater Orthodox population encouraging higher rates of naming blessed persons. In this sense, the Catholic-Orthodox connection seems to be different from that for Catholic-Protestant or Catholic-Evangelical. Perhaps the Catholic and Orthodox Churches came to an understanding long ago (after the Great Schism of 1054 and well before the start of our data in 1590) to leave each church in charge of its own territory.

### **d. Effects from Protestantism and Evangelicalism over time**

We now consider how the influences on canonization and beatification from Protestant or Evangelical population varied over time. If we allow for different coefficients before and after 1900 (encompassing 29 popes in the first sub-period and 9 in the second), we find that the significantly positive effects from Protestant population on the canonization and beatification rates show up only in the recent period. For the canonization rate (corresponding to Table 4, column 1), the estimated coefficients on a region's Protestant population are  $-0.033$  (s.e.= $0.033$ ) pre-1900 and  $0.127$  ( $0.021$ ) since 1900. For the beatification rate (corresponding to Table 5,

---

<sup>24</sup>We get minor effects if we add each region's total population to the regressions. For the canonization rate (Table 4, column 1) and the beatification rate (Table 5, column 1), the estimated coefficients on total population are positive but insignificantly different from zero.

column 1), the results are 0.009 (0.057) pre-1900 and 0.319 (0.035) since 1900. In both cases, the estimated coefficients pre-1900 and since 1900 differ significantly from each other with a p-value of 0.000. The results are similar if we choose different breakpoints between the mid-1800s and the 1920s. We also reach the same conclusions if we use the equations with Evangelical population (Table 4, column 2 and Table 5, column 2), rather than Protestant population.

The recent response of the Catholic Church to Protestant competition—evident since around 1900—may reflect a special role for Pentecostalism, a form of Evangelicalism that came into existence in the United States in 1906 as a schism from the Holiness movement (see Wacker [2003, p. 6]). The Holiness movement emphasized the personal conversion experience (baptism by the Holy Spirit) and was central to missionary movements of the late nineteenth century. This missionary activity, expanded by Pentecostals in the twentieth century, underlies religious conversion in many countries and is, therefore, a serious threat to the Catholic Church. However, the available data (such as in Johnson [2001, Table 10-6]) do not allow us to distinguish an Evangelical effect from a Pentecostal effect.

Going back much further in time, the Peace of Westphalia was a clear watershed with regard to religious wars in Europe: “The Peace of Westphalia (1648) ended a generation of war and a century of strife. It was the end, not only of the Thirty Years War, but of religious wars in general. During the next century and a half the peace of Europe was often broken ... but religion seldom provided the pretext.” (Cragg [1960, p. 9]). However, despite this key role of the Peace of Westphalia for the interplay between religion and politics, the effects on Catholic/Protestant competition involving saint-making are not obvious. In particular, religious competition before and after 1648 involved more the preferences of princes than of ordinary citizens, and saint-

making seems more likely to inspire citizens than princes. This perspective may also explain why the positive influences of Protestant or Evangelical population on rates of naming of blessed persons seem to show up primarily in recent times, such as since 1900.

In any case, we evaluated whether different effects from Protestant population on the choices of blessed persons show up before and after the Peace of Westphalia of 1648.<sup>25</sup> (Nine popes began their terms between 1590 and 1648, 20 since 1648 and before 1900, and 9 since 1900.) For the canonization rate (corresponding to Table 4, column 1), the estimated coefficients on Protestant population are -0.12 (s.e.=0.36) before 1648, 0.023 (0.028) from 1648 to 1899, and 0.151 (0.019) since 1900. The estimated coefficients for the first two periods differ insignificantly from each other (p-value=0.69) and also differ insignificantly from zero. For the beatification rate (corresponding to Table 5, column 1), the results are similar. The estimated coefficients on Protestant population are -0.17 (0.28) before 1648, 0.053 (0.058) from 1648 to 1899, and 0.295 (0.036) since 1900. Again, the coefficients for the first two periods differ insignificantly from each other (p-value=0.44) and also differ insignificantly from zero. Thus, the conclusion is that the Peace of Westphalia did not significantly alter the relationship between Protestant population and the rates of canonization and beatification.

## **V. Concluding Observations**

Our research used a recently assembled data set that encompasses numbers and characteristics of blessed persons selected by the 38 popes that started office since 1590. We combined this information with estimates of populations for six major regions broken down into estimated adherence to Catholic, Protestant, Orthodox, and Evangelical faiths. Our results assess

---

<sup>25</sup>Since the Evangelical data pre-1900 are not independent of the Protestant data, we cannot evaluate this hypothesis separately for the Evangelical population.

determinants of rates of canonization and beatification over time for the six regions. One striking result is the substantial (and statistically significant) positive response since 1900 of the canonization and beatification rates to a region's Protestant or Evangelical population. We interpret these effects as strategic responses of the Catholic Church to competition within Christianity from Protestantism or Evangelicalism.

We verify that the last two popes are outliers in terms of increased rates of canonization and beatification. John Paul II and Benedict XVI are similar in terms of sharply higher rates of beatification, but Benedict XVI is even more of an outlier with respect to the rate of canonization—accomplished in the short run by reducing the interval between beatification and canonization.

To be more speculative, our view is that the two most recent popes have very different visions of the main competition facing the Catholic Church. For John Paul II, the main threat seemed to be Protestantism, notably in the forms of Evangelicalism and Pentecostalism. In contrast, Benedict XVI appears to be more Euro-centric and seems focused on re-evangelizing traditionally Christian countries, particularly countering secularization in Europe. Some evidence for this focus comes from the newly created Pontifical council designed to promote “a renewed evangelization in countries where the first announcement of the faith has already resounded and Churches of ancient foundation are present, but are living [through] a progressive secularization of society and a sort of 'eclipse of the sense of God'.”<sup>26</sup> Along these lines, we anticipate that Benedict XVI would change the geographical pattern of beatification (and, ultimately, canonization), returning more toward a European focus and away from John Paul II's tendency to globalize. However, the data available through 2009 (containing only five years of

---

<sup>26</sup>See <http://www.catholicnewsagency.com/news/pope-announces-council-for-renewed-evangelization-for-secularized-world>.

information on Benedict XVI) do not show a clear change in geographical focus. For John Paul II, the shares of beatifications were 39% Italy, 30% other Western Europe, 10% Eastern Europe, 5% Asia/Africa, 10% Latin America, and 6% North America, whereas for Benedict XVI through 2009, the shares are 40% Italy, 25% other Western Europe, 13% Eastern Europe, 10% Asia/Africa, 10% Latin America, and 2% North America. Thus, the overall European shares are nearly the same—79% for John Paul II and 78% for Benedict XVI. But Benedict XVI's term is still young, and we are willing to go out on the limb of predicting a heightened European share of beatification for the rest of his tenure.

Our immediate plan for future research is to apply the analysis to the Catholic Church's selection of Cardinals. For this purpose, we will be able to use the remarkable data set on Cardinals constructed over many years by Salvador Miranda (2010). This data set gives names and characteristics, including residence at birth, of the 4260 Cardinals chosen from 492 to 2010. Thus, these data cover a much longer period and comprise many more designees compared to the sample of blessed persons. We anticipate giving particular attention to the changing numbers and geographical composition of the Cardinals.

## References

- Barrett, D.B. and T.M. Johnson (2001). *World Christian Trends, AD 30-AD 2200*, Pasadena CA, William Carey Library.
- Barrett, D.B., G.T. Kurian, and T.M. Johnson (2001). *World Christian Encyclopedia*, v.1, Oxford, Oxford University Press.
- Barro, R.J., R.M. McCleary, and A. McQuoid (2011). "The Economics of Sainthood (a Preliminary Investigation)," Chapter 10 of R.M. McCleary, ed., *The Oxford Handbook of the Economics of Religion*, Oxford, Oxford University Press.
- Burns, P., ed. (1995 and later years). *Butler's Lives of the Saints*, Collegeville MN, Burns & Oates, The Liturgical Press.
- Catholic Church, Congregatio pro Causis Sanctorum (1999). *Index ac Status Causarum*, 2<sup>nd</sup> edition, Vatican City.
- Cragg, G.R. (1960). *The Age of Reason, 1648-1789*, New York, Pelican Books.
- Delooz, P. (1962). "Pour une etude sociologique di Canonizzazione della Controriforma," *Archives de Sociologie des Religions*, 13, 17-43.
- Harvey, J.C. (2007). "The Role of the Physician in Certifying Miracles in the Canonization Process of the Catholic Church III," *Southern Medical Journal*, 100, 12, December, 1255-1258.
- Johnson, T.M., general editor (2010). *World Christian Data Base*, available on the Internet at [www.worldchristiandatabase.org](http://www.worldchristiandatabase.org) through [brillonline@brill.nl](mailto:brillonline@brill.nl).
- Kemp, E.W. (1945). "Pope Alexander III and the Canonization of Saints: The Alexander Prize Essay," *Transactions of the Royal Historical Society*, fourth series, 27, 13-28.
- Kiefer, N.M. (1988). "Economic Duration Data and Hazard Functions," *Journal of Economic Literature*, 26, June, 646-679.
- Klauser, T. (1979). *A Short History of the Western Liturgy*, 2<sup>nd</sup> edition, Oxford, Oxford University Press.
- McBrien, R.P., ed. (1995). *The Harper Collins Encyclopedia of Catholicism*, New York, Harper Collins.
- McBrien, R.P. (2000). *Lives of the Popes: The Pontiffs from St. Peter to John Paul II*, San Francisco, Harper.

McEvedy, C. and R. Jones (1978). *Atlas of World Population History*, New York, Penguin Books.

Miranda, S. (2010). "The Cardinals of the Holy Roman Church," available on the Internet at [www2.fiu.edu/~mirandas/cardinals.htm](http://www2.fiu.edu/~mirandas/cardinals.htm).

Noll, M.A. (2003). *The Rise of Evangelicalism*, Downers Grove IL, InterVarsity Press.

Stark, R. (2004). *Exploring the Religious Life*, Baltimore, Johns Hopkins University Press.

Wacker, G. (2003). *Heaven Below: Early Pentecostals and American Culture*, Cambridge, Harvard University Press.

**Table 1**  
**Statistics on Popes from 1585 to 2009**

ID	Name	Start	End	Tenure (years)	Beatified			Canonized	
					Stock	Duration	Flow	Stock	Flow
225	Sixtus V	1585	1590	5.35	4	98	0	34	1
226	Urban VII	1590	1590	0.04	4	103	0	35	0
227	Gregory XIV	1590	1591	0.87	4	103	0	35	0
228	Innocent IX	1591	1591	0.17	4	104	0	35	0
229	Clement VIII	1592	1605	13.09	4	104	3	35	2
230	Leo XI	1605	1605	0.07	7	70	0	37	0
231	Paul V	1605	1621	15.72	7	70	13	37	2
232	Gregory XV	1621	1623	2.41	20	36	2	39	5
233	Urban VIII	1623	1644	20.99	17	43	8	44	2
234	Innocent X	1644	1655	10.32	24	40	3	46	0
235	Alexander VII	1655	1667	12.13	27	46	1	46	2
236	Clement IX	1667	1669	2.47	26	58	1	48	2
237	Clement X	1670	1676	6.24	25	59	5	50	5
238	Innocent XI	1676	1689	12.90	25	58	3	55	0
239	Alexander VIII	1689	1691	1.32	28	64	1	55	5
240	Innocent XII	1691	1700	9.22	24	60	0	60	0
241	Clement XI	1700	1721	20.31	24	69	2	60	4
242	Innocent XIII	1721	1724	2.83	22	82	0	64	0
243	Benedict XIII	1724	1730	5.74	22	85	3	64	9
244	Clement XII	1730	1740	9.58	16	66	4	73	4
245	Benedict XIV	1740	1758	17.69	16	66	8	77	4
246	Clement XIII	1758	1769	10.59	20	66	4	81	6
247	Clement XIV	1769	1774	5.32	18	67	2	87	0
248	Pius VI	1775	1799	24.53	20	66	19	87	0
249	Pius VII	1800	1823	23.45	39	52	7	87	4
250	Leo XII	1823	1829	5.38	41	62	5	92	0
251	Pius VIII	1829	1830	1.67	46	61	0	92	0
252	Gregory XVI	1831	1846	15.34	46	62	4	92	5
253	Pius IX	1846	1878	31.67	45	76	16	97	5
254	Leo XIII	1878	1903	25.42	55	88	23	102	11
255	Pius X	1903	1914	11.05	68	80	11	113	4
256	Benedict XV	1914	1922	7.39	75	80	4	117	3
257	Pius XI	1922	1939	17.02	76	86	30	120	24
258	Pius XII	1939	1958	19.62	83	82	38	143	30
259	John XXIII	1958	1963	4.60	92	80	6	173	10
260	Paul VI	1963	1978	15.14	88	81	33	183	16
261	John Paul I	1978	1978	0.09	105	75	0	199	0
262	John Paul II	1978	2005	26.52	105	75	319	199	80
263	Benedict XVI	2005	2009*	4.65	344	28	52	279	28
--	[as of 2009]	--	--	--	371	29	--	307	--

### Notes to Table 1

Tenure is in years, based on number of days as pope. For Beatified: Stock is the cumulative number previously beatified, but not yet canonized, at the start of a pope's term; Duration is the mean years from beatification to the start of the pope's term for the stock of beatified; and Flow is the number beatified during the pope's term. For Canonized: Stock is the cumulative number at the start of a pope's term, and Flow is the number canonized during the pope's term. The number 34 for the canonized stock at the start of the term of Sixtus V (whose term began in 1585) is the number canonized between 1234 and 1584. The year 1234 corresponds to the declaration by Pope Gregory IX (Pope ID number 176) that papal approval was required for canonization. However, the requirements for beatification remained unclear at this time. In 1588, Pope Sixtus V enacted detailed reforms of procedures for canonization and beatification. However, the Papacy did not gain complete control of the process until the regime of Urban VIII, who was pope from 1623 to 1644. Of the 272 persons canonized since 1590, the reports on canonizations indicate that 4 were beatified before 1590, and 9 (including 3 for Benedict XVI) were not noted as previously beatified. The number 4 for the stock of beatified for Sixtus V reflects the 4 pre-1590 beatifications among persons canonized since 1590. This treatment assumes that no other persons were "officially" beatified before 1590. Hence, the cumulative number beatified as of 2009 in our data is 371 (stock of beatified) + 307 (stock of canonized) – 9 (canonized since 1590 without prior beatification) – 35 (stock of canonized in 1590) = 634. Of these, 630 were beatified since 1590.

\*Currently in office.

<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>s.d.</b>	<b>Max</b>	<b>Min</b>
Number of beatifications	16.6	4.0	51.8	319	0
Number of canonizations	7.2	3.5	14.3	80	0
Beatifications per year	1.12	0.41	2.56	12.0	0
Canonizations per year	0.74	0.18	1.26	6.02	0
Stock of beatifications (start of term)	45.1	25.0	57.8	344	4
Mean duration of beatification stock (years, start of term)	69.8	68.0	18.3	104	28
Stock of canonizations (start of term)	87.8	75.0	56.0	279	35
Tenure of pope (years)	10.9	9.9	8.7	31.7	0.04
Age of pope (years, start of term)	65.5	66.0	7.8	80	51

Note: See the notes to Table 1 for further discussion. Data are for 38 popes' terms from Urban VII (start year 1590) to Benedict XVI (incumbent as of 2009). Beatifications (canonizations) per year equal the number of beatifications (canonizations) during a pope's term divided by the pope's tenure in years. Stock of beatifications is the cumulative number beatified, but not yet canonized, at the start of a pope's term. Duration, applying to the stock of beatifications at the start of a pope's term, is the mean years from beatification to the start of the pope's term. Stock of canonizations is the cumulative number at the start of a pope's term.

<b>Table 3</b>					
<b>Statistics for Popes' Terms by Region</b>					
<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>s.d.</b>	<b>Max</b>	<b>Min</b>
<b>Italy:</b>					
Catholic population (start of term)	21.4	14.2	12.9	48.0	11.0
Protestant population (start of term)	0.1	0.0	0.3	1.2	0.0
Orthodox population (start of term)	0.0	0.0	0.0	0.1	0.0
Evangelical population (start of term)	0.1	0.0	0.1	0.3	0.0
Number of beatifications	7.4	2.0	20.4	125	0
Number of canonizations	3.3	1.5	6.2	34	0
Beatifications per year	0.49	0.24	1.03	4.71	0
Canonizations per year	0.31	0.13	0.46	1.94	0
Stock of beatifications (start of term)	24.0	16.0	25.9	150	4
Mean duration of beatified stock (years)	76.7	78.0	18.5	108	37
Stock of canonizations (start of term)	41.3	34.0	29.5	131	13
<b>Other Western Europe:</b>					
Catholic population (start of term)	63.8	45.4	36.8	137.8	31.7
Protestant population (start of term)	40.5	22.1	32.7	100.6	11.4
Orthodox population (start of term)	3.4	1.9	3.1	12.9	1.3
Evangelical population (start of term)	11.7	8.2	7.0	27.4	4.2
Number of beatifications	5.4	1.0	15.6	95	0
Mean duration of beatified stock (years)	55.9	60.0	24.4	94	2.5
Number of canonizations	2.4	1.0	4.7	23	0
Beatifications per year	0.35	0.09	0.73	3.58	0
Canonizations per year	0.26	0.06	0.46	2.27	0
Stock of beatifications (start of term)	15.3	7.5	19.1	108	0
Stock of canonizations (start of term)	37.1	32.0	20.3	105	19
<b>Eastern Europe:</b>					
Catholic population (start of term)	19.2	5.9	20.3	60.1	3.2
Protestant population (start of term)	3.1	0.8	4.2	12.7	0.1
Orthodox population (start of term)	56.1	37.9	36.1	169.5	26.3
Evangelical population (start of term)	0.8	0.3	1.0	3.5	0.0
Number of beatifications	1.2	0.0	5.3	32	0
Mean duration of beatified stock (years)	78.9	60.0	56.6	176	5
Number of canonizations	0.5	0.0	1.7	9	0
Beatifications per year	0.10	0.00	0.33	1.51	0
Canonizations per year	0.06	0.00	0.21	1.08	0
Stock of beatifications (start of term)	2.6	2.0	4.3	27	0
Stock of canonizations (start of term)	4.3	4.0	2.1	15	2

<b>Table 3, continued</b>					
<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>s.d.</b>	<b>Max</b>	<b>Min</b>
<b>Asia/Africa:</b>					
Catholic population (start of term)	22.1	3.2	51.4	268.1	1.0
Protestant population (start of term)	25.8	0.8	79.3	446.8	0.2
Orthodox population (start of term)	7.5	4.0	8.4	45.6	3.6
Evangelical population (start of term)	7.5	0.3	21.8	123.4	0.1
Number of beatifications	0.7	0.0	2.7	16	0
Number of canonizations	0.2	0.0	0.7	4	0
Beatifications per year	0.05	0.00	0.20	1.08	0
Mean duration of beatified stock (years)	12.5	14.0	5.4	17	2
Canonizations per year	0.02	0.00	0.08	0.42	0
Stock of beatifications (start of term)	0.6	0.0	2.3	14	0
Stock of canonizations (start of term)	2.1	2.0	1.0	8	1
<b>Latin America:</b>					
Catholic population (start of term)	54.6	9.6	100.6	452.8	4.0
Protestant population (start of term)	5.4	0.1	16.5	90.7	0.0
Orthodox population (start of term)	0.1	0.0	0.2	0.9	0.0
Evangelical population (start of term)	2.3	0.0	7.0	38.7	0.0
Number of beatifications	1.2	0.0	5.4	33	0
Number of canonizations	0.5	0.0	1.3	6	0
Beatifications per year	0.08	0.00	0.27	1.24	0
Mean duration of beatified stock (years)	62.8	42.5	58.5	189	1
Canonizations per year	0.06	0.00	0.19	1.08	0
Stock of beatifications (start of term)	2.0	1.0	4.6	28	0
Stock of canonizations (start of term)	2.4	3.0	2.7	13	0
<b>North America:</b>					
Catholic population (start of term)	9.5	0.0	19.1	70.0	0.0
Protestant population (start of term)	24.3	1.0	40.3	141.4	0.0
Orthodox population (start of term)	0.8	0.0	1.7	6.3	0.0
Evangelical population (start of term)	12.0	0.7	17.5	48.0	0.0
Number of beatifications	0.7	0.0	3.0	18	0
Mean duration of beatified stock (years)	15.7	14.5	10.8	28	1
Number of canonizations	0.2	0.0	0.8	4	0
Beatifications per year	0.04	0.00	0.15	0.68	0
Canonizations per year	0.02	0.00	0.08	0.43	0
Stock of beatifications (start of term)	0.8	0.0	2.9	17	0
Stock of canonizations (start of term)	0.4	0.0	1.3	7	0

Notes: See notes to Table 2. Statistics are for the six regions used in the regressions. Data on population measures are described in the text. Measures of beatifications and canonizations are defined in the notes to Table 1. The statistics for the mean duration of the beatified stock apply to the subset of each region's observations for which the beatified stock at the start of a pope's term is positive.

<b>Independent variable</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
<b>Italy multiplier</b>	1.081** (0.108)	0.960** (0.091)	1.080** (0.106)	0.975** (0.093)
<b>Other W. Europe multiplier</b>	1.096** (0.093)	1.052** (0.095)	1.020** (0.088)	0.975** (0.086)
<b>Eastern Europe multiplier</b>	1.448** (0.095)	1.392** (0.089)	1.520** (0.093)	1.482** (0.087)
<b>Asia/Africa multiplier</b>	0.389** (0.059)	0.517** (0.069)	0.413** (0.063)	0.547** (0.073)
<b>Latin America multiplier</b>	1.398** (0.102)	1.429** (0.100)	1.354** (0.101)	1.346** (0.101)
<b>North America multiplier</b>	0.589** (0.044)	0.650** (0.043)	0.613** (0.044)	0.675** (0.044)
<b>Stock of Beatified (persons)</b>	0.0117** (0.0018)	0.0137** (0.0018)	0.0103** (0.0019)	0.0121** (0.0020)
<b>Stock of Beatified (persons) *duration (100*years)</b>	--	--	-0.0057* (0.0025)	-0.0071** (0.0026)
<b>Stock of Canonized (persons)</b>	-0.0001 (0.0012)	-0.0002 (0.0012)	0.0007 (0.0012)	0.0006 (0.0013)
<b>Catholic population (100*millions)</b>	-0.0162* (0.0081)	-0.0192* (0.0082)	-0.0070 (0.0090)	-0.0063 (0.0094)
<b>Protestant population (100*millions)</b>	0.073** (0.013)	--	0.066** (0.012)	--
<b>Evangelical population (100*millions)</b>	--	0.096** (0.017)	--	0.085** (0.016)
<b>Age of pope, start of term (100*years)</b>	--	--	-0.008 (0.041)	-0.021 (0.040)
<b>John Paul II, 1978-2005 (dummy)</b>	0.170** (0.020)	0.186** (0.019)	0.164** (0.020)	0.174** (0.019)
<b>Benedict XVI, 2005-2009 (dummy)</b>	0.468** (0.061)	0.440** (0.058)	0.388** (0.058)	0.339** (0.054)

#### Notes to Table 4

Observations are by pope for the 38 popes from Urban VII (1590-1590) to Benedict XVI (2005-2009); see Table 1. The dependent variable is the canonization rate. The rates are measured per year in office for each pope and are for six regions (based on a saint's residence at death): Italy, other Western Europe, Eastern Europe, Asia/Africa, Latin America, and North America. Observations are weighted by the square-root of the pope's tenure, normalized so that the mean weight is one. See Table 1 for the data on pope's tenure and section III in the text for a discussion of the weighting procedure. The system estimation is by seemingly-unrelated regression, which allows the regional error terms to be contemporaneously correlated and to have different variances. The sum of the six regional multipliers is normalized to one; see equation (1) in the text for the specification. The coefficients of the other explanatory variables are constrained to be the same across the six regions. Standard errors of the estimated coefficients are in parentheses.

For definitions of stocks of beatified and canonized persons, see the notes to Table 1. The population data are described in section II.b of the text. For the variable "Stock of Beatified (persons) \*duration (100\*years)," the duration is the mean number of years from beatification to the start of a pope's term for the stock of beatified, expressed as a deviation from the sample mean of this duration (69.8 years).

The p-values for equality of coefficients on John Paul II and Benedict XVI are 0.000 in columns 1-4.

\*Significant at 0.05 level.

\*\*Significant at 0.01 level.

<b>Table 5</b>				
<b>Regressions for Beatification Rate by Pope and Region</b>				
<b>Independent variable</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
<b>Italy multiplier</b>	2.353** (0.041)	2.298** (0.040)	2.346** (0.041)	2.292** (0.039)
<b>Other W. Europe multiplier</b>	1.494** (0.045)	1.597** (0.043)	1.502** (0.045)	1.604** (0.043)
<b>Eastern Europe multiplier</b>	0.771** (0.031)	0.749** (0.030)	0.766** (0.030)	0.744** (0.030)
<b>Asia/Africa multiplier</b>	0.320** (0.012)	0.346** (0.014)	0.320** (0.012)	0.346** (0.014)
<b>Latin America multiplier</b>	0.748** (0.036)	0.695** (0.032)	0.755** (0.035)	0.700** (0.032)
<b>North America multiplier</b>	0.315** (0.024)	0.315** (0.025)	0.313** (0.024)	0.313** (0.025)
<b>Stock of Beatified (persons)</b>	-0.0019 (0.0012)	-0.0020 (0.0013)	-0.0019 (0.0012)	-0.0021 (0.0013)
<b>Stock of Canonized (persons)</b>	0.00515** (0.00066)	0.00512** (0.00068)	0.00512** (0.00066)	0.00509** (0.00068)
<b>Catholic population (100*millions)</b>	-0.039 (0.021)	-0.014 (0.022)	-0.048* (0.020)	-0.023 (0.022)
<b>Protestant population (100*millions)</b>	0.295** (0.041)	--	0.292** (0.040)	--
<b>Evangelical population (100*millions)</b>	--	0.622** (0.119)	--	0.614** (0.117)
<b>Age of pope, start of term (100*years)</b>	--	--	0.156* (0.077)	0.147 (0.079)
<b>John Paul II, 1978-2005 (dummy)</b>	1.596** (0.043)	1.636** (0.045)	1.619** (0.044)	1.663** (0.045)
<b>Benedict XVI, 2005-2009 (dummy)</b>	1.560** (0.090)	1.678** (0.092)	1.550** (0.087)	1.660** (0.089)

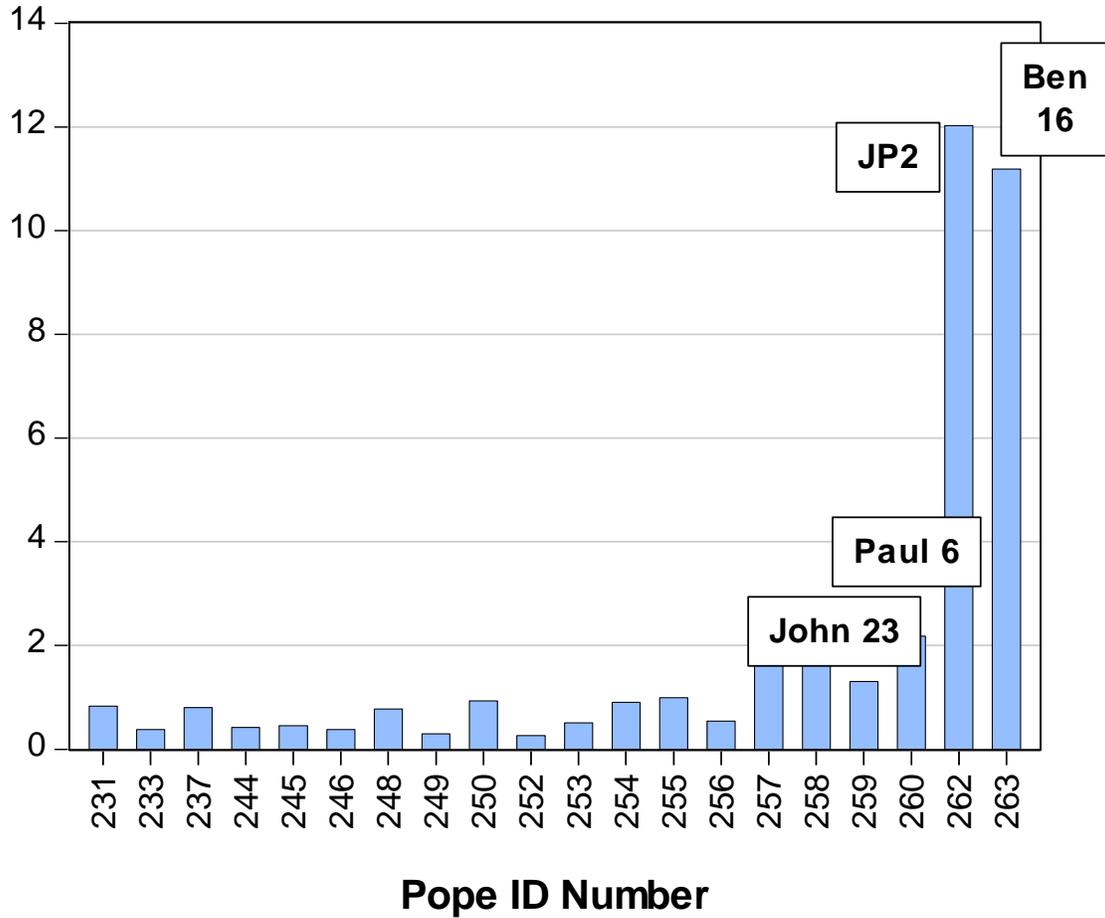
Notes: See the notes to Table 4. The dependent variable is the beatification rate. The p-values for equality of coefficients on John Paul II and Benedict XVI are 0.62 in column 1, 0.58 in column 2, 0.33 in column 3, and 0.97 in column 4.

\*Significant at 0.05 level.

\*\*Significant at 0.01 level.

**Figure 1**

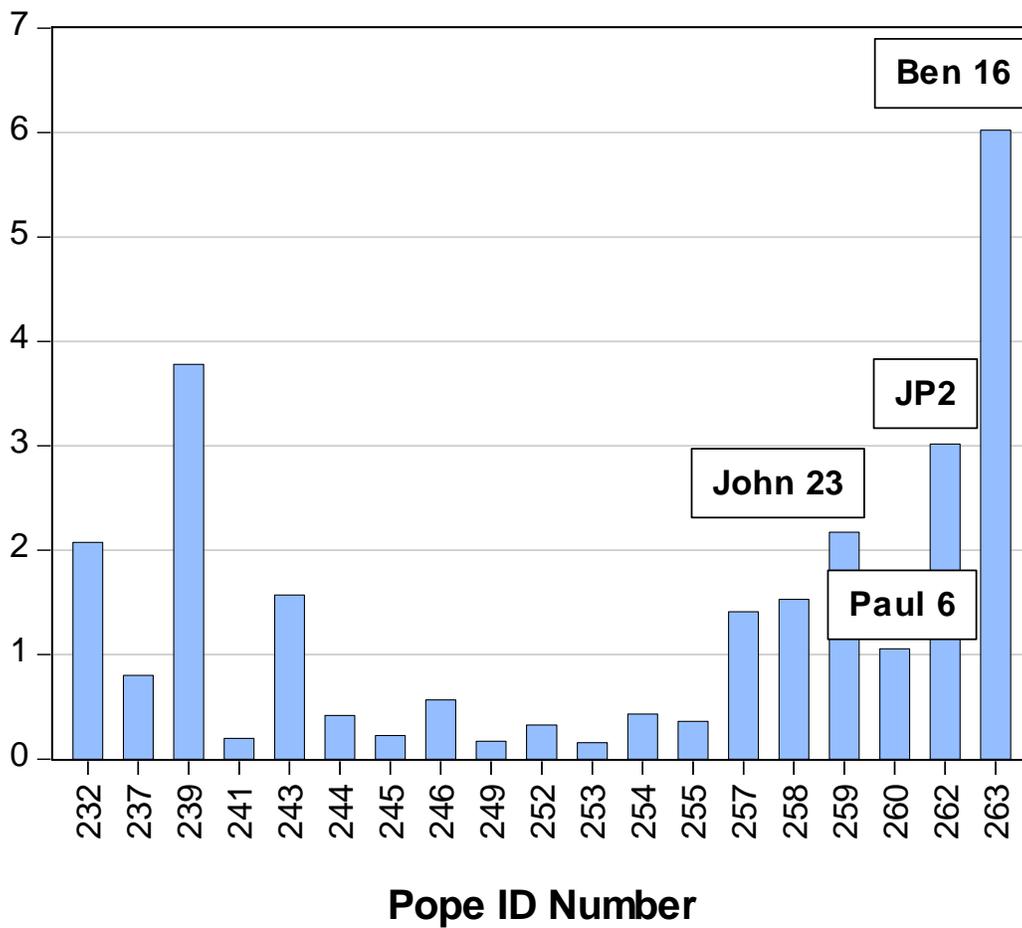
**Beatifications per Year  
(popes with 4 or more beatifications)**



Note: Data are described in Section II.a.

**Figure 2**

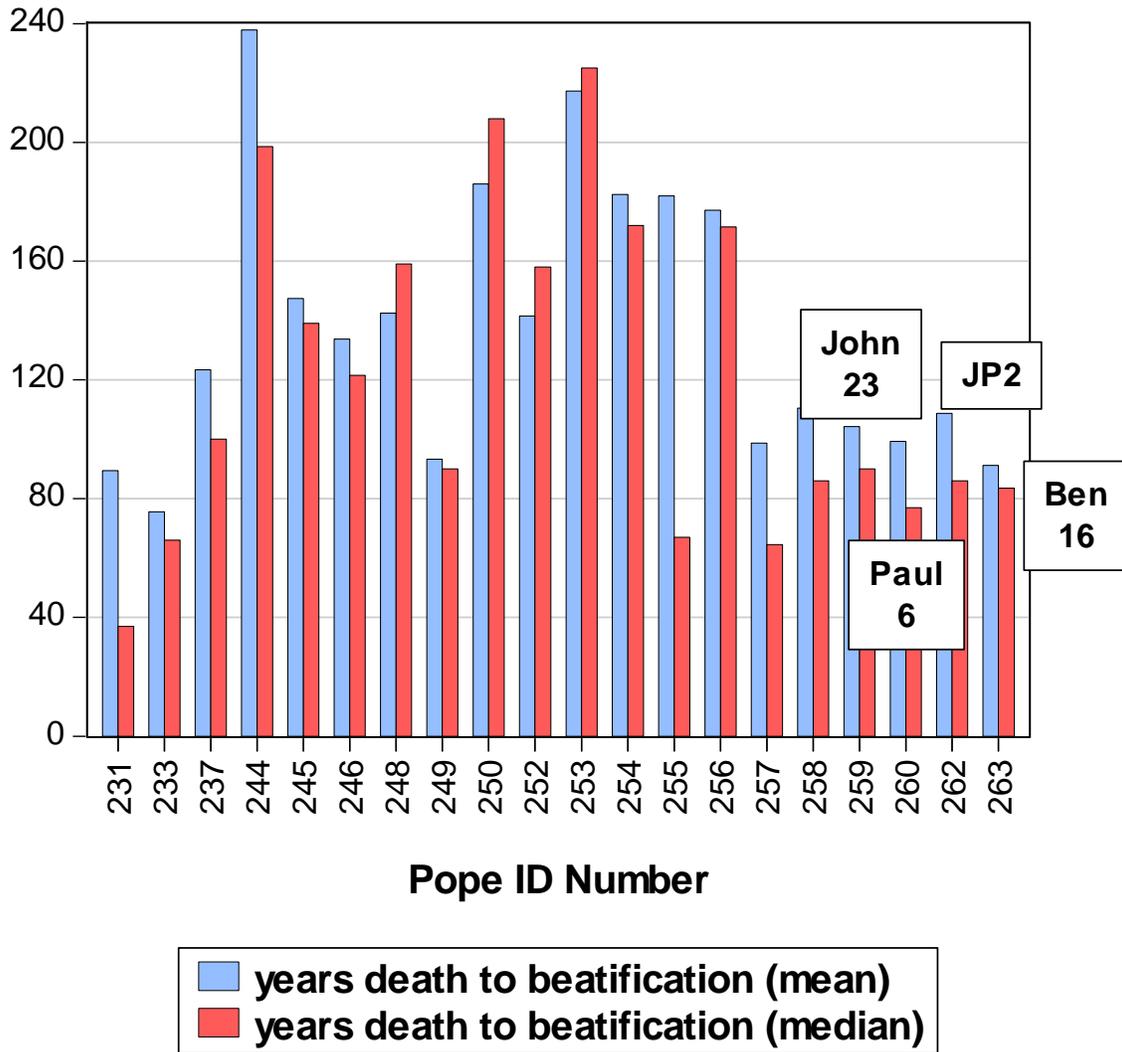
**Canonizations per Year  
(popes with 4 or more canonizations)**



Note: Data are described in Section II.a.

Figure 3

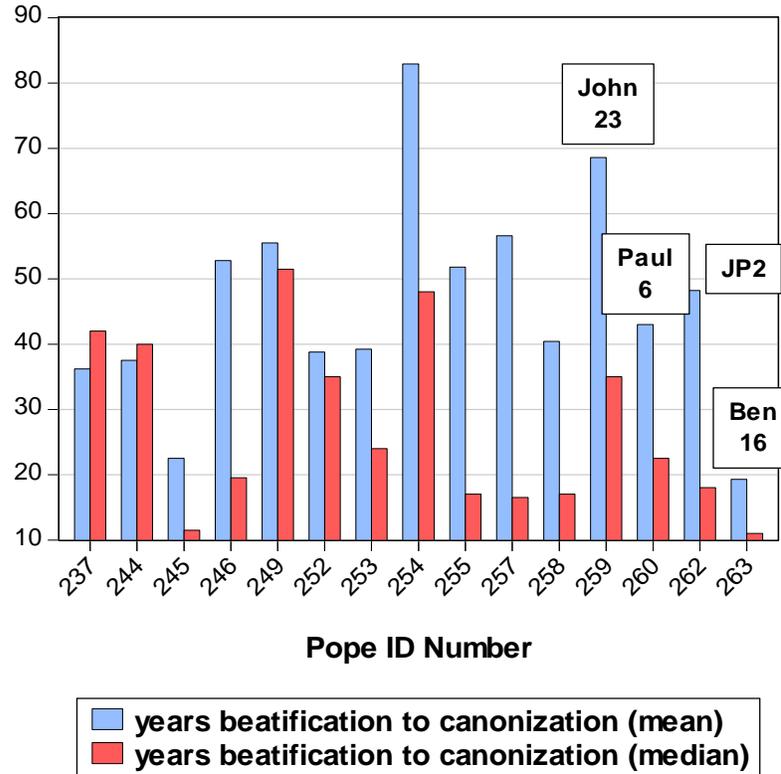
Years from Death to Beatification  
(popes with 4 or more beatifications)



Note: Data are described in Section II.a.

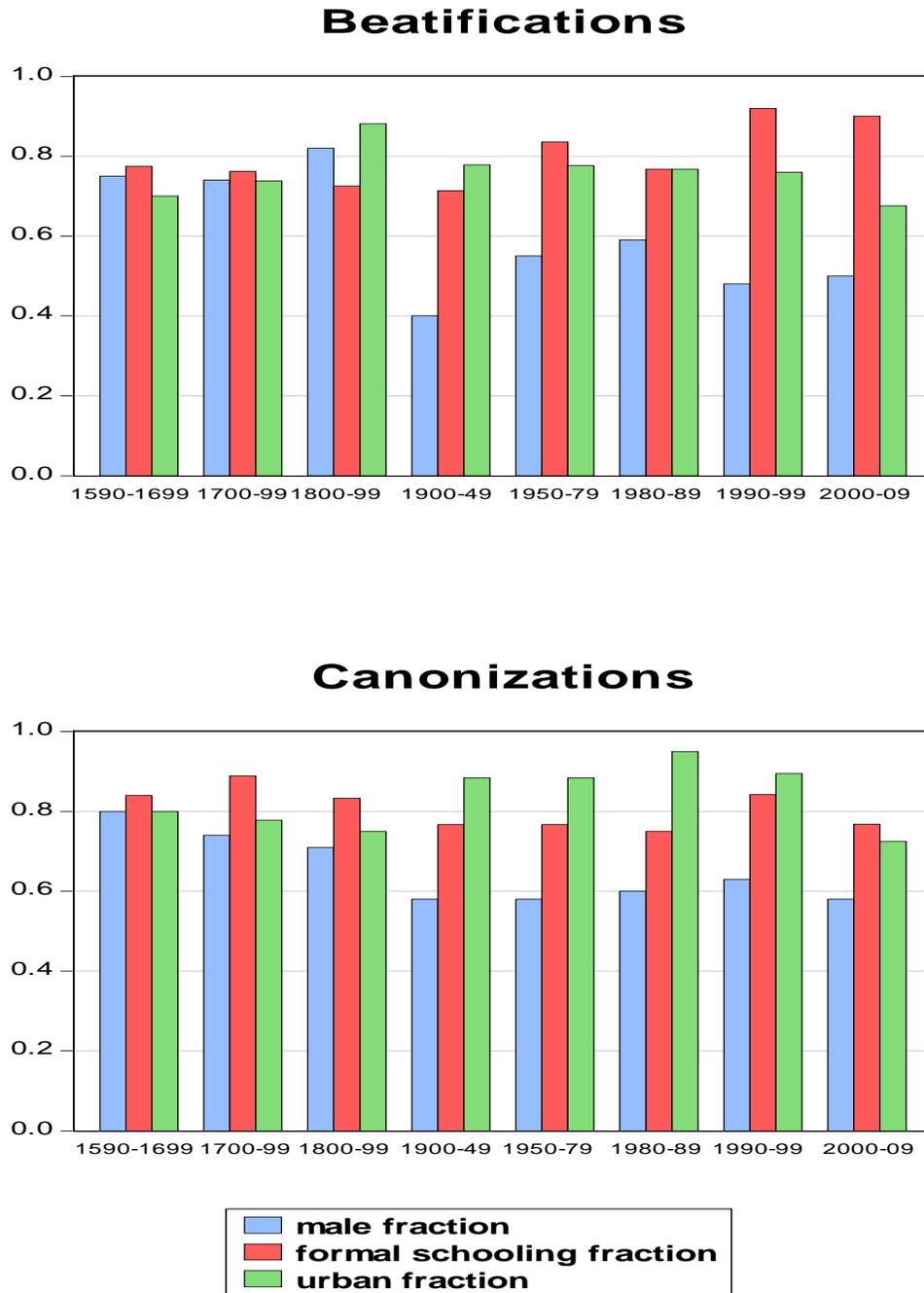
# Figure 4

## Years from Beatification to Canonization (popes with 4 or more canonizations, among previously beatified)



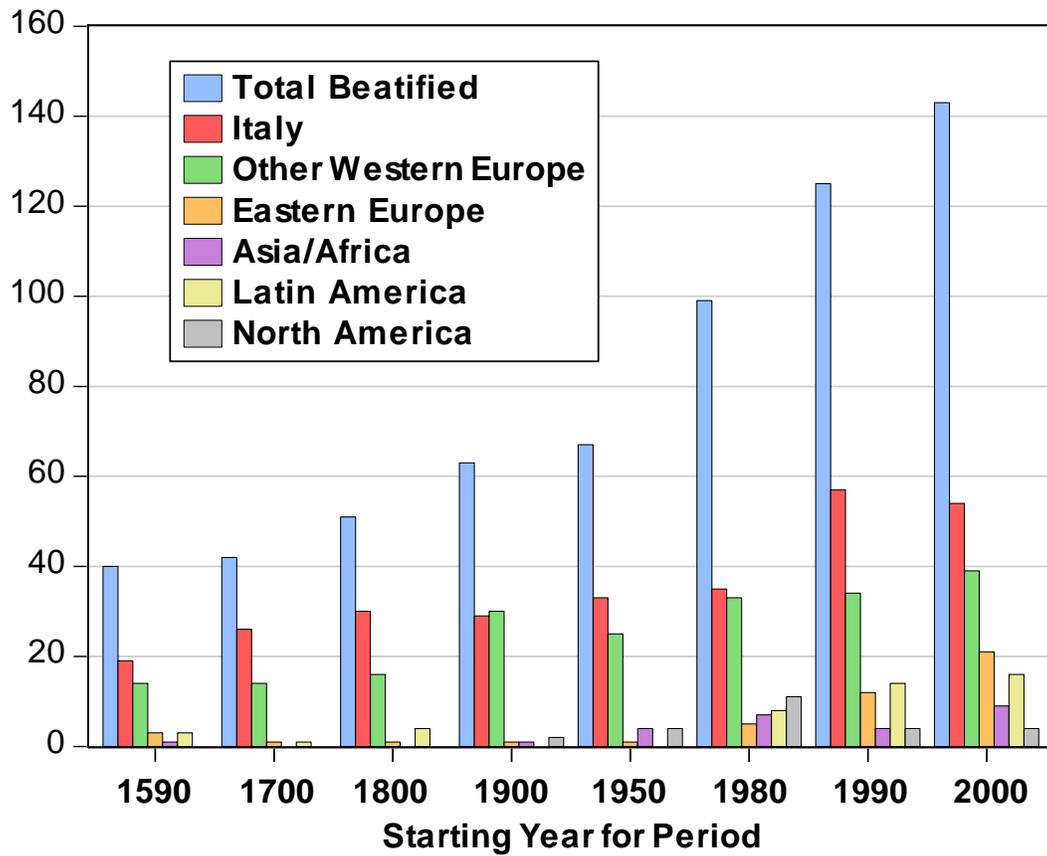
Note: Data are described in Section II.a.

**Figure 5: Beatifications and Canonizations:  
Fractions Male, Schooled, and Urban by Periods since 1590**



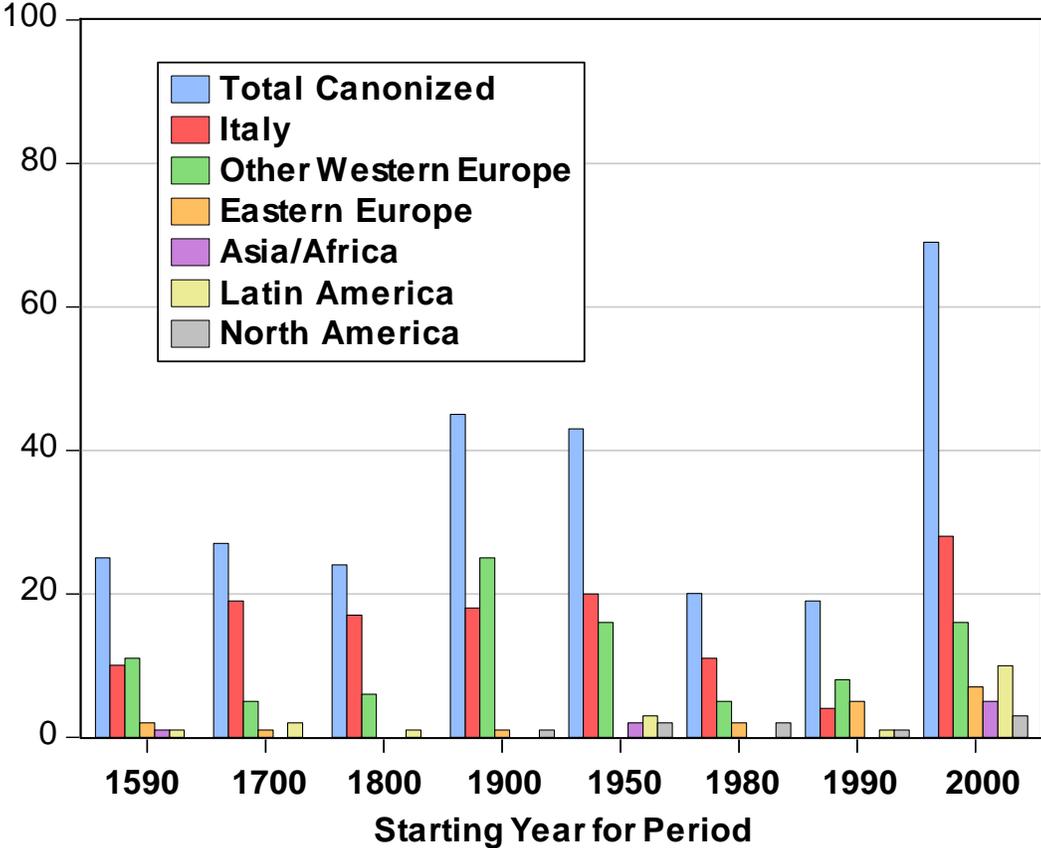
Note: Data are described in Section II.a.

**Figure 6**  
**Beatifications by Region over Time**



Note: Data are described in Section II.a.

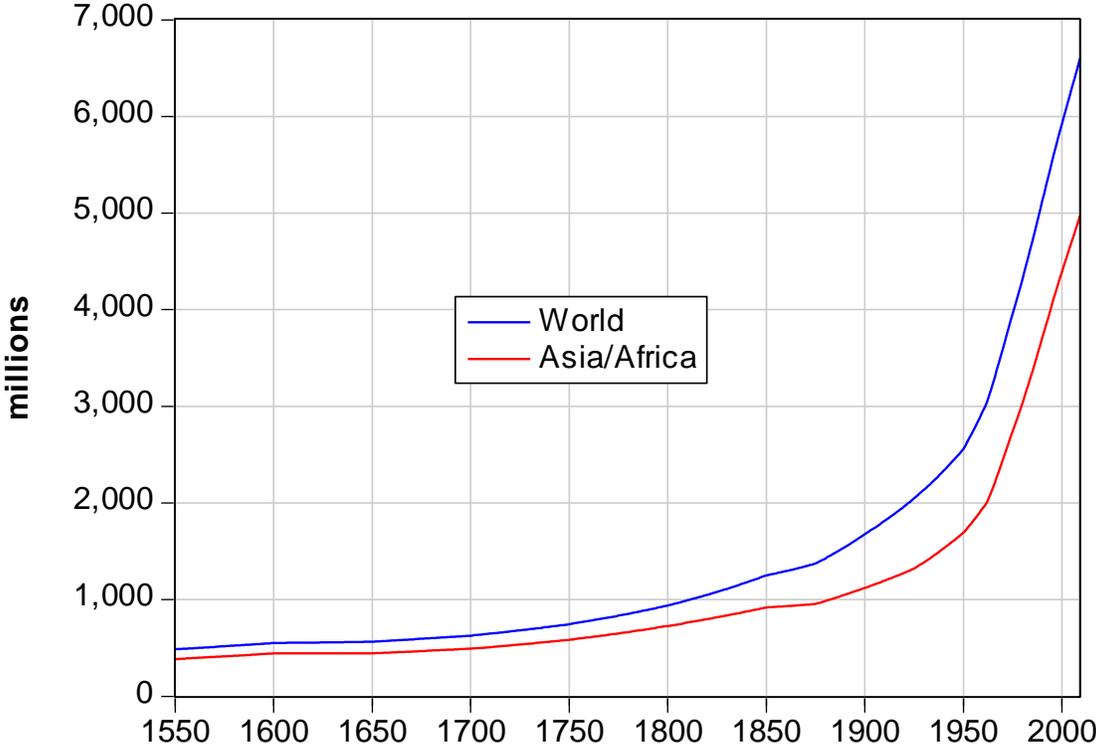
**Figure 7**  
**Canonizations by Region over Time**



Note: Data are described in Section II.a.

**Figure 8**

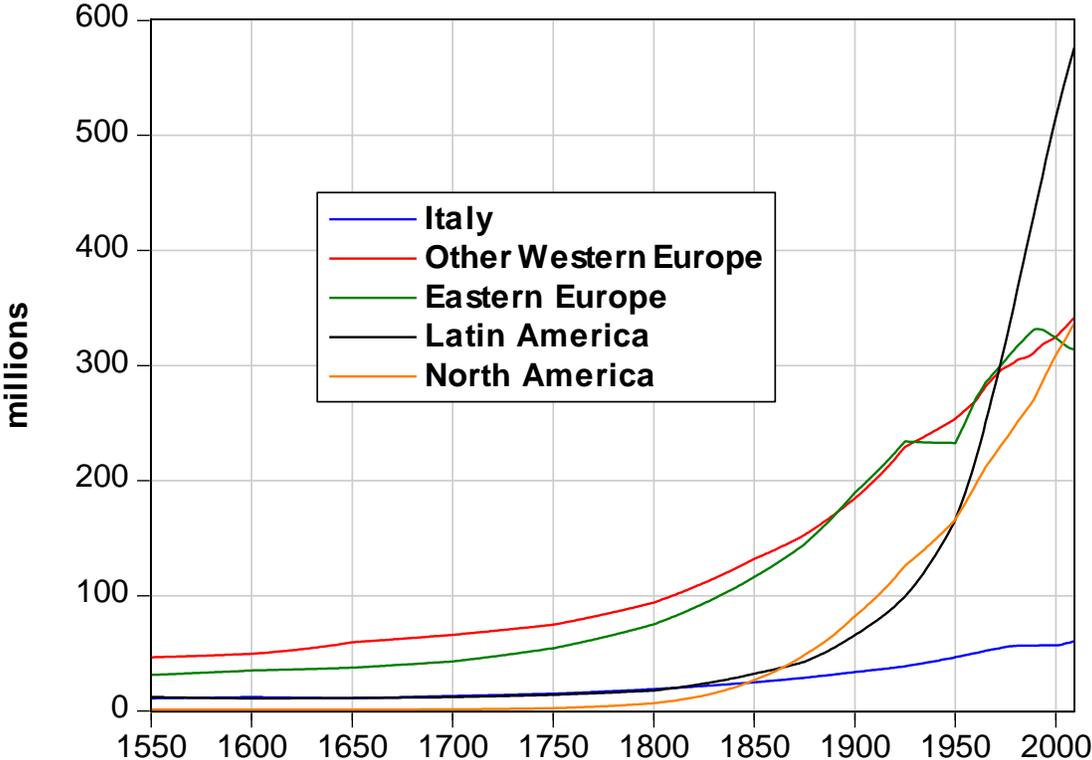
**Population: World & Asia/Africa**



Note: Data, described in section II.b, are based on McEvedy and Jones (1978) and *World Development Indicators*.

**Figure 9**

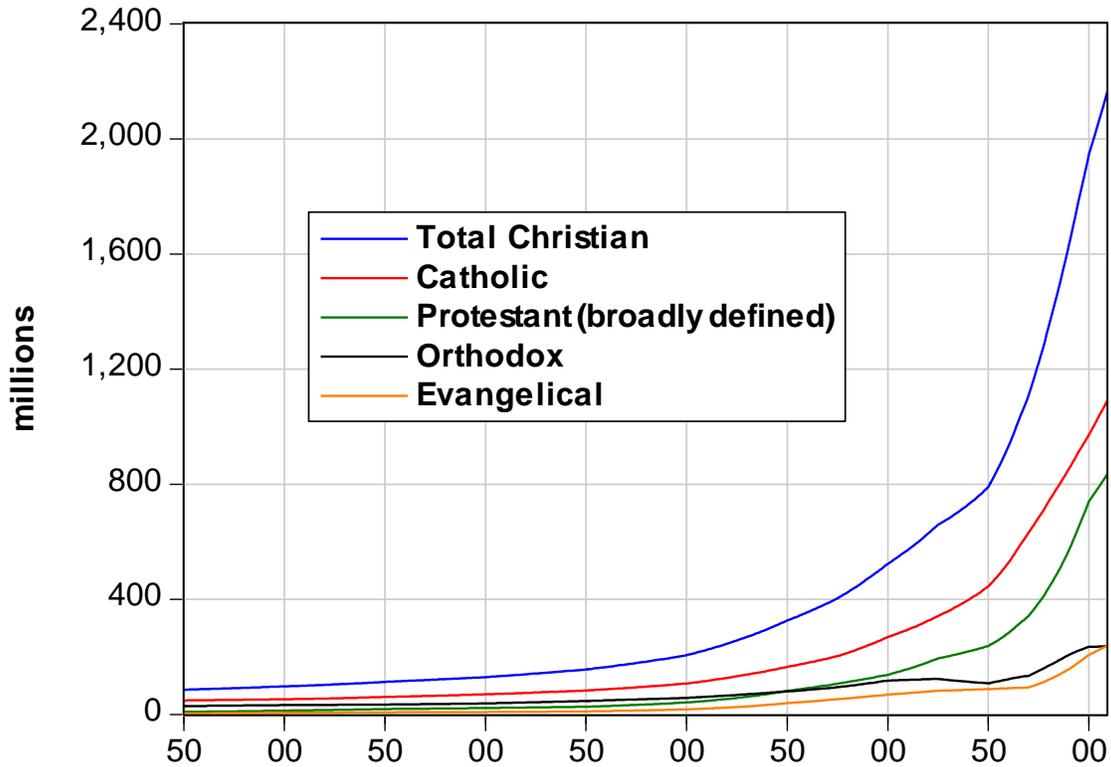
**Population: Europe & Western Offshoots**



Note: Data, described in section II.b, are based on McEvedy and Jones (1978) and *World Development Indicators*.

**Figure 10**

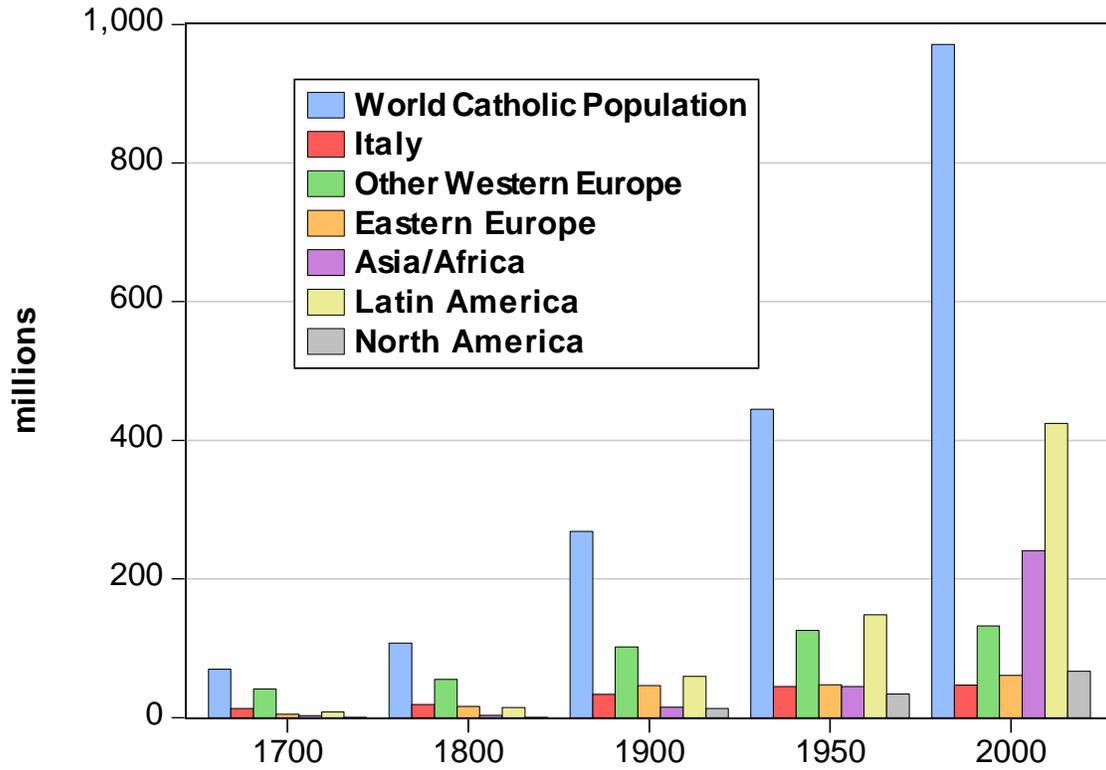
**World Christian Population by Type**



Note: Total Christian is the sum of Catholic, Protestant (broadly defined to include Anglicans, independent Christian churches, and marginal Christians such as Mormons and 7<sup>th</sup>-Day Adventists), and Orthodox. Most of the Evangelicals would fall into the Protestant category. Data, described in section II.b, apply religious-adherence shares from Johnson (2010) and Barrett and Johnson (2001) to population data in Figures 8 and 9. Before 1900, the ratio of Evangelical to Protestant population in each region was assumed to equal the ratio for 1900.

**Figure 11**

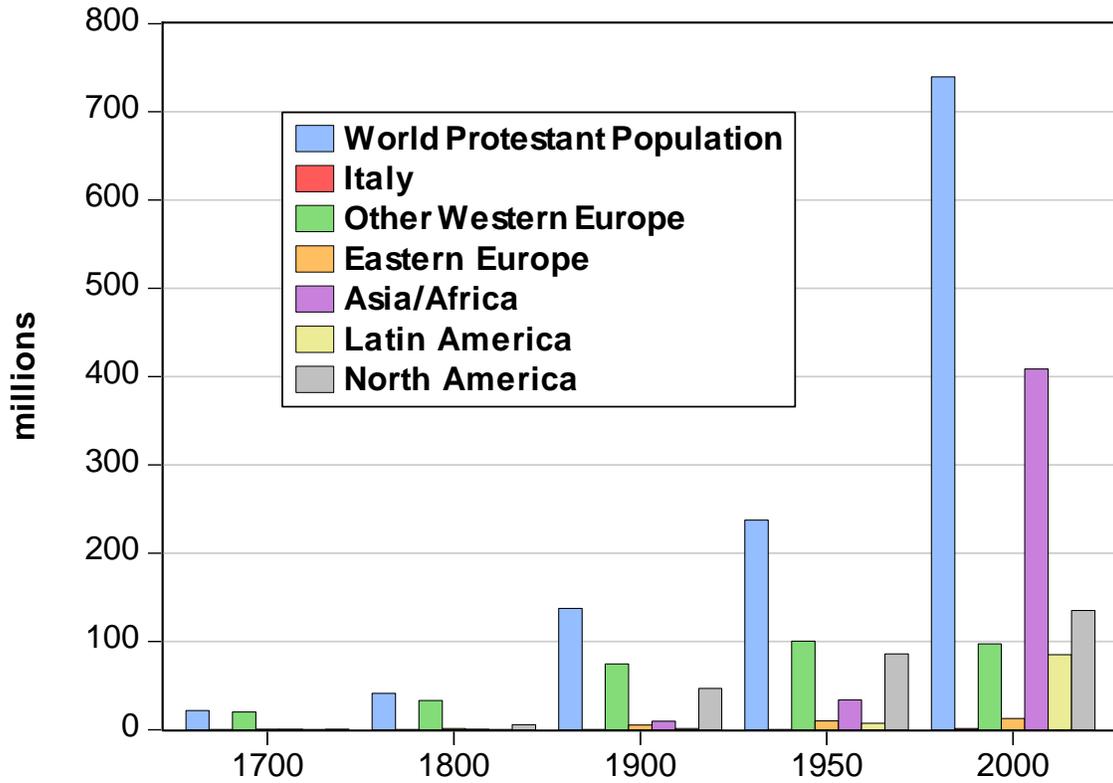
**Catholic Population by Region**



Note: Data, described in section II.b, apply religious-adherence shares from Johnson (2010) and Barrett and Johnson (2001) to population data in Figures 8 and 9.

**Figure 12**

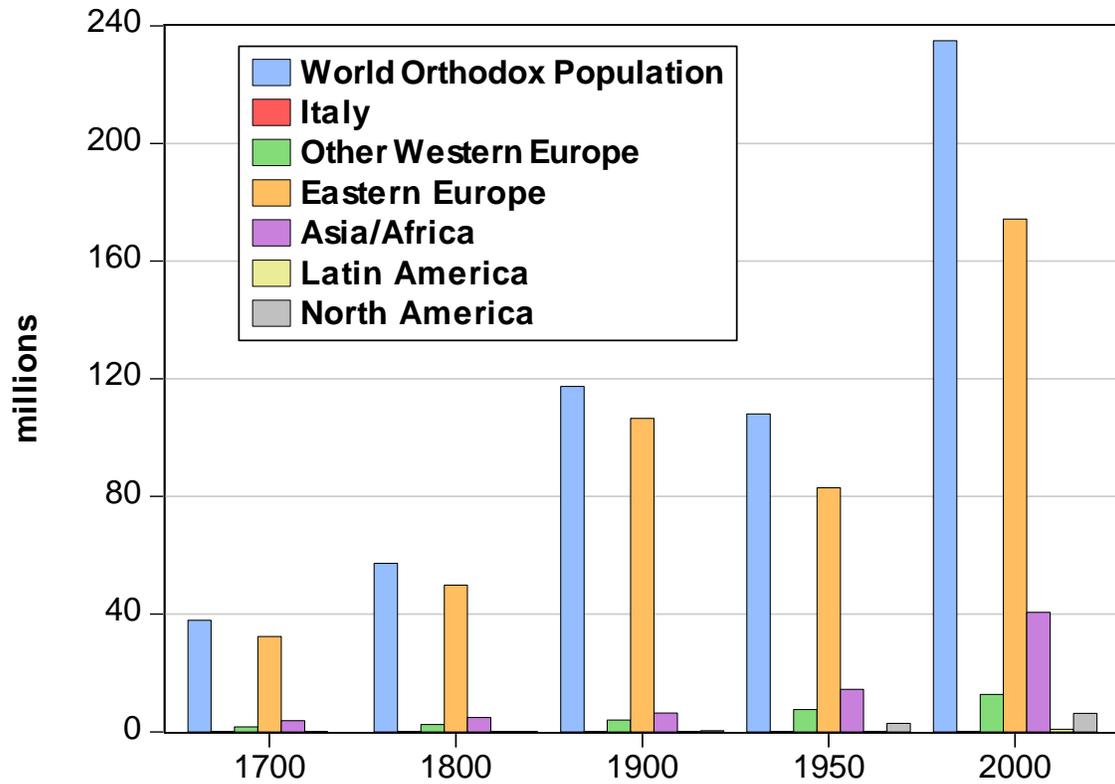
**Protestant Population by Region**



Note: Data, described in section II.b, apply religious-adherence shares from Johnson (2010) and Barrett and Johnson (2001) to population data in Figures 8 and 9.

**Figure 13**

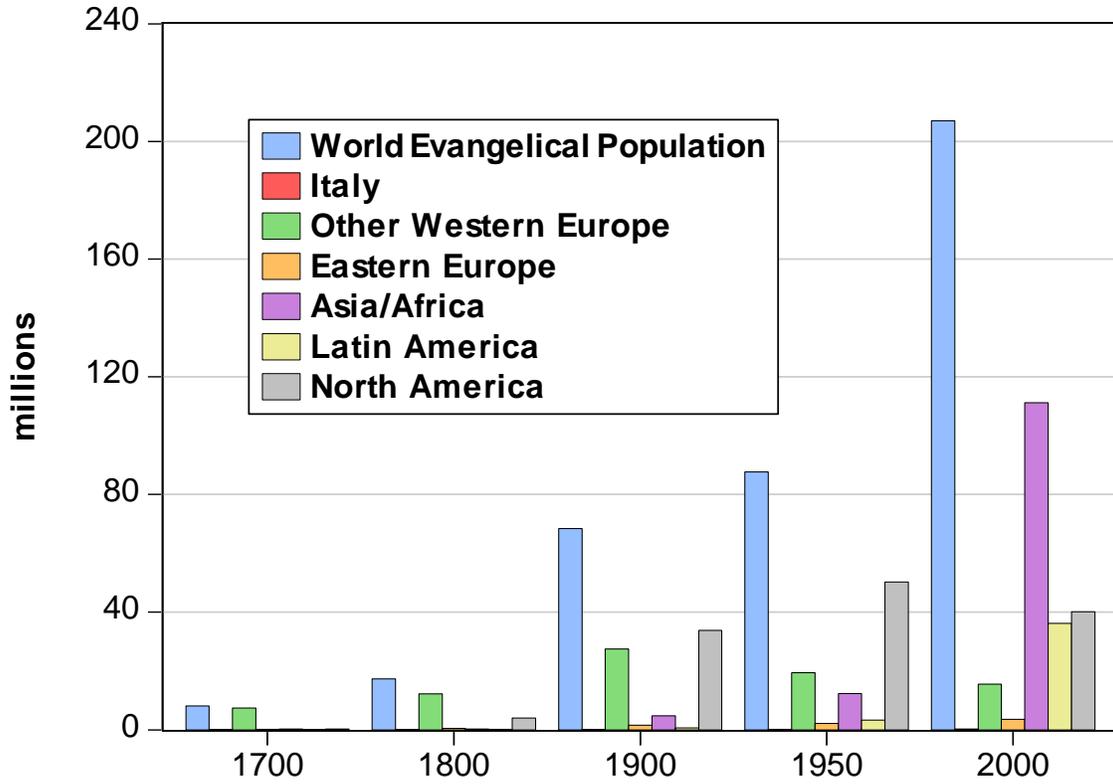
**Orthodox Population by Region**



Note: Data, described in section II.b, apply religious-adherence shares from Johnson (2010) and Barrett and Johnson (2001) to population data in Figures 8 and 9.

**Figure 14**

**Evangelical Population by Region**



Note: Data, described in section II.b, apply religious-adherence shares from Johnson (2010) to population data in Figures 8 and 9. Before 1900, the ratio of Evangelical to Protestant population in each region was assumed to equal the ratio for 1900.