From Investiture to Worms: A Political Economy of European Development and the Rise of Secular Authority

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Abstract

The endogenous consequences of competition between the Roman Catholic Church and secular rulers set into motion by the Investiture Controversy contribute new insights into European economic development, the rise of secular political authority, and the decline of the Catholic Church’s political power. In particular, the resolution of the Investiture Controversy in the Concordats of London (1107), Paris (1107), and Worms (1122) resulted in an increase in the bargaining power of secular rulers in wealthier polities relative to poorer polities. This created an institutional environment in which the Catholic Church had incentives to limit economic development while secular rulers could expand their political control by promoting development within their domain. Empirical evidence shows that the behavior of popes and of secular rulers changed in ways consistent with these incentives. The evidence indicates that the incentives created by the Concordats played a central role, starting hundreds of years before the Protestant Reformation, in the rise of secular political authority and its association with economic prosperity.

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At least since the seminal work of Weber (1930), discussions of the political and economic development of Europe have sought to understand the linkage between economic prosperity, the rise of secular authority, and the decline of the Catholic Church as a political power. We shed new light on these issues by focusing on the strategic implications of a critical portion of Europe’s economic, political, and religious development, namely the resolution of the Investiture Controversy through three Concordats, the Concordats of London and Paris signed in 1107 between the Catholic Church and the kings of England and France (respectively) and the Concordat of Worms, signed in 1122 between the Church and the Holy Roman emperor (Chodorow and Sweeney, 1989; Baldwin, 1986). Although the impact of new rules governing the selection of bishops established by the Concordats was substantial, it is largely misunderstood or underestimated. For instance, Cantor (1993) and Spruyt (1994), as well as others, have noted that the Investiture Controversy influenced subsequent changes in secular authority, but they lack an explanatory mechanism and miss the linkage between Europe’s economic development and the secularization of its politics. Our political economy analysis specifies a mechanism that directly links variation in secularization of politics across Europe to variation in economic prosperity and shows how both shaped the declining political role of the Church in much of Europe.

We develop a formal model that captures the new institutional incentives that were codified in the Concordats and show that the model’s predictions are consistent with diocese-level data on the rise of secular authority. The model elucidates the implications of secular leaders’ newly extracted power to reject bishops and, in so doing, temporarily retain control of local economic resources that would otherwise belong to the Church. We show that this feature of the Concordats shifted bargaining power, expanding substantially the bargaining power of secular leaders in their dealings with the Church in wealthier dioceses relative to poorer dioceses. This led to the endogenous rise of secular control over territory and policy in wealthier dioceses.

The model also shows that the incentives institutionalized in the Concordats drove a wedge between the interests of secular leaders and the Church. In particular, secular leaders benefited from policies that fostered economic development, thereby improving their bargaining leverage, while the Church had incentives to limit such development in order to contain the loss of political control.

Our approach is a departure from the conventional terms of debate. The literature (which we discuss in more detail in Section 6) has examined the implications of the Investiture Controversy and its resolution for the absolute level of power of central versus local authorities and of religious versus secular interests. Our arguments and evidence,
by contrast, are about the differential impact of the Concordats on the power of religious versus secular leaders in wealthier versus poorer dioceses. This interaction between the political, religious, and economic is essential to our account of the incentives created by the Concordats.

We provide several pieces of evidence in support of our new theoretical account. Most importantly, we show, quantitatively, that the period when the Concordats were in force was indeed associated with an increase in the bargaining power of secular leaders in more prosperous relative to less prosperous dioceses, but only where the Concordats were binding. Then we discuss historical evidence in support of the model’s prediction that, following the resolution of the Investiture Controversy, the interests of secular rulers and the Church diverged. In particular, we argue that, while secular rulers pursued economic development, Church leaders often imposed policies designed to either curtail economic development or move the revenue associated with such development out of the control of local religious elites, in order to avoid the erosion of the Church’s bargaining power.

Thematically, we share with Belloc, Drago and Galbiati (2016) a focus on the contest for political power between local secular and religious leaders in the Middle Ages. They study the differential effect of earthquakes in Italian cities where religious and secular power were and were not unified in a single person, in the years 1000–1300. They find that, by heightening religious faith, earthquakes increased the relative political power of religious authorities in cities where that power was contested.

Conceptually, our approach aligns with Bueno de Mesquita (2000). That study, however, differs in important respects from this one. First, Bueno de Mesquita’s analysis focuses on the contribution of the Concordat of Worms to the origin of sovereign states. In contrast, we are interested in the bargain between the Church and secular rulers over secular political control of local religious institutions and the relationship to economic development. Moreover, Bueno de Mesquita’s empirical analysis only covers France during the reign of King Philip Augustus (1179-1223). It shows that, of the 82 French bishops during that time period, those who were the king’s blood relatives were more likely to be located in wealthy dioceses while those from the pope’s court were more likely to be located in poorer dioceses. That analysis is unable to say anything about changes in the distribution of bargaining power, or the comparison of locations covered versus not covered by the agreement, since the data are drawn exclusively from a period and location in which the Concordat was operative. Such comparative conclusions are precisely the point of our empirical analysis, covering thousands of bishops across much of Europe over many centuries.

Our study complements, as well, recent research on economic secularization following
the advent of the Protestant Reformation. Cantoni, Dittmar and Yuchtman (2018) present evidence of an emphatic shift away from the religious and toward the secular, showing, for instance, that there was a swift and dramatic increase in the study of secular topics in universities, a shift to construction of major secular edifices at the expense of religious construction, and so forth. That work establishes, in the German context, a plausible causal path from the Reformation to the secularization of Protestant Europe’s economy. But, as Cantoni, Dittmar and Yuchtman note, “[s]urprisingly little evidence exists establishing a direct link from the Reformation to secularization.” We propose to establish that differential political secularization was fostered by the crisis in Europe launched in 1046 and resolved in the Concordats. This political secularization in Europe’s more prosperous regions was already established by the time of the Avignon papacy in 1309, two hundred years before the Protestant Reformation.

In addition to being a case study of the economic and political forces underlying a critical historical period of European development, our analysis relates to important broader themes. Our focus on how the rules put in place by the Concordats affected European development is related to the literature on how institutions shape development (e.g., North and Thomas, 1973; North and Weingast, 1989; Przeworski and Limongi, 1993; Acemoglu, Johnson and Robinson, 2001; Bueno de Mesquita et al., 2003; Acemoglu and Robinson, 2013). Moreover, our account of how secular authority emerged through a process of bargaining away the power of centralized religious authority relates to questions about the emergence of the modern state (e.g., Tilly, 1992; Ertman, 1997; Alesina and Spolaore, 2005; Gancia, Ponzetto and Ventura, 2017), the spread of secularism (e.g., Dimont, 2004; Barro and McCleary, 2005; Gruber and Hungerman, 2008; Cantoni, 2012), and the relationship between religion and economic development (e.g., Weber, 1930; McCleary and Barro, 2003; Durlauf, Kourtellos and Tan, 2012; Cantoni, 2015). And our analysis of religious leaders’ incentives to curtail economic development relates to other arguments about how perverse incentives with respect to economic policy can arise from the desire to retain political power (Acemoglu and Robinson, 2006). Finally, our results relate to a literature on the efficacy of international treaties (see Simmons, 2010, for a review). Of course, as in much of that literature, there remain questions as to whether the change in behavior is the effect of the treaty itself, or whether the treaty reflects more fundamental shifts in economic or political power.

The paper proceeds as follows. Section 1 provides a brief historical background to the Investiture Controversy and its culmination in the Concordats. Section 2 analyzes a model that captures the key institutional incentives created by the Concordats. The model genera-
ates testable predictions and elucidates a wedge driven between religious and secular rulers. Section 3 introduces the data and variables used to evaluate the empirical implications of the model. Section 4 tests the theoretical implications regarding the relationship between local economic prosperity and secularization of control over local religious institutions. Section 5 discusses qualitative evidence to suggest that secular rulers in fact pursued policies designed to foster economic development and wrest political power from the Church, while the Church pursued the opposite. Section 6 concludes by situating our account relative to other views in the literature on Europe’s economic, political, and religious development, including literatures on the causes and consequences of the Protestant Reformation.

1 Brief Historical Background

The eleventh century saw major struggles between Europe’s religious and secular rulers over political and economic authority. Much of this conflict revolved around who had the power to appoint bishops (including the pope)—the key religious-political figures. This Investiture Controversy began in 1046, when Pope Benedict IX sold the papacy to his godfather, Gratian, who became Pope Gregory VI. The Holy Roman Emperor, Henry III, stepped in, usurping the role of bishops in choosing popes. He deposed Gregory VI, installing in his place, Suidger of Bamberg, a German, like Henry. The emperor, in removing the pope, raised the potential for secular authority to trump the ecclesiastical in the selection and removal of high church officials.

The Church fought back against this possibility. Speaking to the selection of the pope, the anonymous author of the influential De Ordinando Pontifice (“On the Establishment of the Pope”) argued in 1048, “Who elects the one that we work for? Those who stand closest to the church; if he is not called by the bishops, he is not received immediately by the church; if so, he is not legitimate.” (Melve, 2007, p. 151). And, according to the views of the reformist Pope Gregory VII (1073-85), a similar argument applied more broadly. Only the Church, he claimed, could appoint or select bishops. As Bishop Abo explained,

[T]he Holy Spirit has said through the mouth of the blessed Pope Gregory ‘that that benediction shall turn for them into a malediction who is thus promoted to be a heretic, and by this malediction he shall have no profit who thinks for the sake of money to invade an office in the church.’ The custom has now grown so much that laymen sell bishoprics. . . And if you ask them who made them bishops they will answer quite freely, saying ‘I was recently ordained by the archbishop,
and gave him a hundred shillings to have episcopal consecration.’ (Lutz, 1977, p. 43-50)

Gregory VII was seeking a way to normalize and institutionalize the selection of bishops. For several centuries bishops had been selected through varying, even haphazard practices. Depending on locale and time period, bishops might have been chosen through local election (a clero et populo), appointment by Church authorities (e.g., archbishops), appointment by local secular authorities, by monarchs, or other practices. King Clovis (466–511), for instance, launched the Christianization of the nascent country of France and almost always respected the Church’s authority to select bishops. Subsequent Merovingian monarchs, however, intruded themselves in the process with the Church fighting back through Councils such as in 533 and 535 to restore selection a clero et populo in keeping with previous canons, but with mixed results. Charlemagne (742-814), like Clovis, respected Church authority over the appointment of bishops but subsequent Carolingian monarchs as well as powerful dukes did not. Similarly mixed practices could be found across western Europe (Costigan, 1966).

Thus, in the run up to the Investiture Controversy, bishops had been appointed sometimes exclusively by Church practices, sometimes by local rulers like dukes and counts and even in France by the mayors of the palace rather than the king, making for poorly established norms for the appointment of high clerics.

These struggles between religious and secular power over the appointment of bishops culminated in a diplomatic treaty signed at Worms in 1122, with similar treaties signed in England and France 15 years earlier, establishing the essential terms agreed to in Worms. In the Concordat of Worms, the Holy Roman Emperor, Henry V, and the Pope, Calixtus II, resolved that the right to nominate bishops resided in the hands of the metropolitans (archbishops in modern terms) and the bishops under the metropolitan who generally sought and received advice from their Cathedral canons. Further, when the provincial bishops were not unanimous in their choice, then the power of nomination in practice defaulted to the hands of the pope. The right of the secular authorities was to accept or reject the nominee and, in the event that the nominee was rejected then during the time of the interregnum between bishops, the income from the diocese would go to the secular ruler. This latter condition—which we will argue critically shaped the conflict between religious and secular leaders over the next several hundred years—overrode canon 25 agreed to in 451 at Chalcedon. That canon stated, “Let the ordination of bishops be within three months: necessity however may make the time longer. But if anyone shall ordain counter to this decree, he shall be liable to punishment. The revenue shall remain with the œconomus”; that

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is, the Church’s chosen financial manager or steward of the diocese’s temporal accounts.¹ During the 11th and 12th centuries, the Church was by far the largest land holder in Europe, so control over these revenues was a non-trivial matter (Brown, 2015).

These terms were legally binding on the Pope, the Holy Roman Emperor, and the secular rulers of Burgundy and Italy (both of whom generally were the Holy Roman Emperor in the period of the Concordats. The terms in Burgundy and Italy were slightly different, but not in consequential ways through the Concordat of Worms and on the secular leaders of England and France through similar Concordats agreed to in 1107 (see, Chodorow and Sweeney (1989, p. 14) and Baldwin (1986, p. 62)).²

The competition between the Church and secular rulers over the appointment of bishops was indicative of broad issues surrounding power and wealth. The identity and loyalty of bishops was critical to the relative political power of the Church and monarchs. As Gilchrist (1969, p. 22) notes, control of the bishoprics had important implications for “control of church property and money.” But the power of bishops was not limited just to syphoning revenue to the Church or to the secular ruler. The office of bishop could be and was used to muster the local community’s loyalty on behalf of the pope or on behalf of the secular ruler. For instance, consider how policy was influenced by the loyalties of bishops during the reign of Philip Augustus (1179-1223) in France and Pope Innocent III in Rome. Pope Innocent III interdicted Philip, depriving Philip’s subjects of access to the sacraments unless Philip succumbed to the pope’s will on important political questions of the day. The interdiction was faithfully observed by virtually every French bishop whose background indicated close personal ties to the pope. Almost every bishop who was a blood relative of the king, by contrast, ignored the interdiction and continued to provide the king’s subjects in their domain with the sacraments (Baldwin (1986, appendix), Bueno de Mesquita (2000)).

The Concordats were written against this backdrop of secular-religious political struggle to control the selection of bishops, and thereby, the flow of political authority and diocesan revenue. By granting secular rulers the newly institutionalized right to refuse bishops-nominees and making them residual claimants to diocesan income in the event of an interregnum, the Concordats, we will argue, formalized and institutionalized conditions that differentially affected the bargaining power of secular rulers in a way that depended

²In terms of modern states, the Concordats applied largely to what is today Germany, Austria, France, Belgium, the Netherlands, Italy north of Rome and excluding the Veneto region, and England as well as the dioceses of Basel (Switzerland), Lebus from 1125 (Poland), Wroclaw (Poland), Gniezo (Poland), Poznań (Poland), Lavant (Slovenia) after 1228, and Olomouc (Czech Republic). Figure 3.2 provides a detailed picture of the covered and uncovered regions of Europe.
on the wealth of their dioceses.

By way of illustration, consider the behavior of Henry II of England toward vacant bishoprics, a half-century after his grandfather, Henry I, signed the Concordat of London. As Warren (1973, p. 211) relates, “[Henry] would delay approving an appointment so that the revenues of the see could be drawn into the royal exchequer.” And this incentive to retain diocesan revenues seems to have translated into differential bargaining power over bishops in wealthier diocese. Warren (1973, p. 535) describes Henry holding onto the revenues from wealthy dioceses until he could appoint loyalist bishops (here, describing the period following the assassination of Archbishop Becket):

Richard of Ilchester, confidant of the king...in the immensely wealthy bishopric of Winchester. Geoffrey Ridel...was promoted to the bishopric of Ely, the revenues of which he had already for several years exploited as royal custodian. The see of Bath received Reginald FitzJocelin, who had been one of Henry’s trusted messengers to Rome...John of Oxford was promoted...to the bishopric of Norwich. He had been...the king’s envoy to the emperor’s council at Würzburg...their presence on the episcopal bench gave Henry II the voice and vote which had so signally lacked in 1164.

But, as Warren notes, “Not all the bishoprics...were filled by royal clerks: the obscure John of Greenford was appointed to Chichester, and Robert Foliot...to Hereford.” Importantly, by contrast to the wealthy dioceses where Henry II installed loyalists, “[t]hese were the less wealthy and less important sees.”

Popes, of course, also had bargaining power. In addition to proposal power within the Church hierarchy, popes had an arsenal of punishment tools at their disposal. They could challenge a secular leader’s credibility through harsh public declarations (Melve, 2007); by absolving subjects of oaths given on behalf of the ruler as Pope Innocent III did to England’s King John in 1208; by excommunicating the secular ruler or his entire domain. They could interdict specific territories (dioceses) controlled by the secular ruler, denying the people access to some or all of the sacraments, thereby potentially denying them any hope of entry into heaven. Even if a secular ruler were not religious, he would surely have been mindful that the Church was the monopoly provider of salvation and so its support was essential for his political well being.

In codifying the shifting relations between religious and secular leaders during the period of the Investiture Controversy, the Concordats of London, Paris, and Worms fostered an alteration in the balance of power between these two domains. By the late thirteenth
century, Church authority over prosperous dioceses was so challenged that Pope Boniface VIII found it necessary to try to reassert papal power. He issued the Bull *Clericus Laicos*, banning the clergy from paying taxes to secular leaders without papal approval. He did so in response to the efforts of England’s King Edward I and France’s King Philip IV, who were at war with each other and tried to raise their war chests at the expense of the local Church. Matters further deteriorated in 1302 when Boniface, reacting to continued assaults on the Church’s authority, issued the Bull *Unam Sanctam*. Here he declared his unique right, as Pope, to depose any secular ruler, including kings. This resulted in Philip IV sending an army against Boniface. Philip’s army seized the Pope, who died a short while later. The rift between Church and secular authorities deteriorated still further, ultimately resulting in the appointment of a new French Pope, Clement V, in 1305. In 1309 Clement moved the papacy to Avignon. Although Avignon was nominally not in France, it was nevertheless subject to strong political influence by the French king.

Throughout the Avignon papacy, popes were French and the seat of Church power (the curia) resided in Avignon rather than Rome. So strong was the French king’s influence over the papacy, that starting in 1307 he got the pope to back the main elements of his condemnation of the Knights Templar (allowing Philip, who owed a great deal of money to the Templars, to seize much of their banking wealth). The Avignon papacy prevailed from 1309-1376, resumed as the Western schism in 1378, ending with the Council of Constance in 1417. During that period, some of the Avignon popes can be said to have acted fully on behalf of the French king. Others, such as the first, Clement V, understood the importance of survival and so frequently, as necessary, succumbed to the king’s pressures. As Stephen (1855, p. 240) observed, “the Popes were little more than vassals of the French monarchs at Avignon.”

In short, the Avignon popes generally acted as the agents of the King of France, who was sometimes in partnership with the Holy Roman Emperor and sometimes in conflict with him during that period. Since the Avignon papacy turned the pope and his bishops on secular matters into agents of secular rule, from our perspective, the beginning of the Avignon papacy in 1309 marks the end of the period in which the Concordats defined relations between religious and secular authorities in an observable way (Gilchrist, 1969).

1.1 Pre-Concordat Bishop Selection

In what follows, we will compare incentives and bargaining power in wealthy versus poor dioceses during the period the Concordats were and were not in force. Thus, it is important to have some sense of what bishop selection looked like prior to the adoption of the
Concordats.

The Concordats altered how bishops were selected in two fundamental ways. First, they placed the Church unambiguously in the position of the nominator of bishop-candidates. Second, they placed the secular ruler in a position to veto nominees and retain the diocesan revenue during an interregnum, whereas that income had previously flowed to the Church whether a bishop was agreed on or not.

As we’ve already noted, prior to the Concordats, bishop selection was characterized by a variety of different customs. But these generally followed one of three patterns: (1) the local community and clergy nominated and elected a bishop who was then accepted or rejected by the local metropolitan bishop; (2) the metropolitan put a candidate forward who had to then be elected by the local clergy and Catholic community; or (3) a secular ruler, whether an emperor, king, duke, count or some other powerful local family, put a candidate forward who was then either accepted or rejected by the Church leaders (Costigan, 1966). Of course, as is well known, in each of these systems there was the possibility of simony—the buying and selling of bishoprics.

The frequency with which these three means of choosing bishops was used is hard to know. However, for us the key fact is that, no matter the system, the revenues from the bishopric flowed to the Church, regardless of whether or not there was a bishop in place. As such, there is no institutional reason to think that bargaining power and the alignment of the bishop should have been systematically related to the wealth of the diocese. This is why our theoretical and empirical story is about the relative change in bargaining power before and after the Concordats, not the absolute level of bargaining power. And, indeed, in our data we find no correlation between our measures of diocesan wealth and bishop alignment in the pre-Concordats period.

2 The Model

In this section we introduce a theoretical model that captures, in stylized form, the key institutional features created by the Concordats. The model highlights the consequences of the Church’s power to nominate bishops, a secular ruler’s right to accept or reject, and the secular ruler’s status as a residual claimant of local church resources. In particular, the model addresses the conditions under which the bishop (and, thus, local religious policy) could be expected to be aligned with the Church or secular ruler; who ended up with control over the economic resources of the diocese; and the likelihood of a bishop being successfully appointed and approved. Our model’s predictions will be implicitly compared to a pre-
Concordats baseline in which bargaining power was not tied to diocesan wealth through institutional rules, as discussed in Section 1.1.

There are two players: the Church and the (secular) Ruler. The game occurs over an infinite number of periods.

The game begins with no bishop in office. At the beginning of each period \( t \) in which there is no bishop in office, the Church nominates a bishop with policy position \( r_t \in [r, \bar{r}] \subset \mathbb{R} \). The Ruler either accepts or rejects the nominee. If the Ruler accepts the nominee, that nominee serves as bishop for the remainder of the game. If the Ruler rejects the nominee, there is no bishop in office in the next period.

In each period, the diocese has income \( y > 0 \). (For the remainder of the paper, we will use the terms “income” and “wealth” interchangeably, since they are not distinguished in our model or our data.) If no bishop is accepted, the diocese has a status quo policy \( q \in [r, \bar{r}] \), which represents whatever policy will be pursued until a new bishop is in place, and the Ruler suffers an instantaneous cost \( c > 0 \), representing punishments imposed on the Ruler or diocese by the Church.

Finally, we assume that, whenever a bishop is nominated in period \( t \), there is a shock, \( \epsilon_t \), to the Ruler’s instantaneous payoff from accepting the bishop. This shock captures a variety of unforeseen local diocesan political, economic and social conditions that may influence the Ruler’s willingness to accept a nominee in the short-run. Equivalently, it could represent a shock to the costs the Church is able to impose on the Ruler for rejecting a bishop-nominee.\(^3\)

The \( \epsilon \)'s are independently and identically distributed according to a cumulative distribution function, \( F \), with full support on the real line and associated log-concave density \( f \). We slightly abuse notation by using \( \epsilon \) to refer both to the random variable and to its realization.

All players discount the future with a common discount factor \( \delta \in (0, 1) \).

Payoffs are as follows. In each period in which there is a bishop of position \( r \) in office, the Church’s payoff is:

\[
\lambda_C r + (1 - \lambda_C)y.
\]

In any period in which there is no bishop in office, the Church’s payoff is

\[
\lambda_C q,
\]

where \( \lambda_C \in (0, 1) \) is the weight the Church puts on policy relative to income.

\(^3\)Of course, without some such shock, the model would predict that a bishop-nominee is never rejected. The exact form that such shocks take (e.g., short-run versus persistent) is unimportant for any of the conclusions of the model.
In any period in which the Ruler rejects the bishop, the Ruler’s payoff is

\[-\lambda_R q + (1 - \lambda_R)y - c.\]

If the Ruler accepts a nominee of position \( r \) in period \( t \), his payoff in that period is

\[-\lambda_R r + \epsilon_t\]

and his payoff in all future periods is

\[-\lambda_R r.\]

The parameter \( \lambda_R \in (0, 1) \) is the weight the Ruler puts on policy relative to income.

2.1 Comments on the Model

Before turning to the analysis, it is worth commenting briefly on a couple of aspects of the model.

First, the key feature of the payoffs is that the Ruler and Church disagree about the kind of policy positions they would like the bishop to have. The utility functions capture this idea by assuming the Ruler always prefers a lower \( r \) and the Church always prefers a higher \( r \). This is meant to reflect the idea that the bishop’s alignment determines whether he pursues policies favored by the Ruler or the Church. As such, we can interpret the equilibrium value of \( r \) as indicating the extent to which the bishop is aligned with the Ruler or Church. A model in which each of the Ruler and the Church had different ideal points and disliked deviations from that ideal point would be qualitatively equivalent to this model.

Second, we assume that the Ruler and Church do not have diminishing marginal utility from money. One might worry that allowing for diminishing marginal utility would introduce a counter-veiling effect to the one we emphasize. On the one hand, there is more income to lose in a wealthier diocese. On the other hand, the ruler of a wealthier diocese might be wealthier and, thus, value money less on the margin. In practice, because both Church and secular leaders collected revenues from many dioceses, rather than just one, we think this latter effect is likely to be second order. As such, we believe the assumption of linear utility focuses us on the first-order forces at work.

2.2 Equilibrium

We now turn to characterizing equilibrium. The solution concept is pure strategy Subgame Perfect Nash Equilibrium (with the natural extension to games with moves by Nature).
Because the game is stationary, we focus on stationary equilibria.

We begin with the Ruler’s strategy and then turn to the Church’s. Suppose the Ruler conjectures that the Church’s strategy is \( s_C \). The Ruler’s payoff from accepting a bishop of alignment \( r_t \) in period \( t \) is:

\[-\lambda_R \frac{r_t}{1 - \delta} + \epsilon_t.\]

His expected payoff from rejecting is:

\[-\lambda_R q + (1 - \lambda_R) y - c + \delta \max_{s_R} V_R(s_R, s_C),\]

where \( \max_{s_R} V_R(s_R, s_C) \) is the Ruler’s discounted expected payoff for the continuation game under his best response \((s_R)\) to the Church’s strategy \( s_C \). Comparing these two payoffs, the Ruler accepts if and only if:

\[\epsilon_t \geq \lambda_R \left( \frac{r_t}{1 - \delta} - q \right) + (1 - \lambda_R) y - c + \delta \max_{s_R} V_R(s_R, s_C).\]  

This gives the following result.

**Lemma 1** In any equilibrium, the Ruler’s strategy is a vector of cutoff rules \((\tau_t(\cdot))_{t=1,2,...}\) such that, if a bishop of alignment \( r_t \) is nominated in period \( t \), the Ruler accepts if \( \epsilon_t > \tau_t(r_t) \) and rejects if \( \epsilon_t < \tau_t(r_t) \).

**Proof.** Follows from the argument in the text. \( \blacksquare \)

Lemma 1 tells us that, no matter what strategy the Church uses, the Ruler uses a cutoff rule in every period. From this, it is straightforward that if the Church uses a stationary strategy, the Ruler does too. (All omitted proofs are in Appendix A.)

**Lemma 2** Suppose the Church’s strategy calls for proposing a bishop of alignment \( r \) in every period. Then the Ruler’s best response is stationary. In particular, there is a function \( \tau^*(\cdot) : [\underline{r}, \overline{r}] \to \mathbb{R} \) such that, if a bishop of alignment \( r_t \) is nominated in period \( t \), the Ruler accepts if \( \epsilon_t > \tau^*(r_t) \) and rejects if \( \epsilon_t < \tau^*(r_t) \).

We have seen that, if the Church uses a stationary strategy, then the Ruler’s best response is the stationary cutoff rule \( \tau^*(\cdot) \). To establish that a stationary equilibrium exists, then, all that remains is to see that if the Ruler uses that stationary strategy, it is a best response for the Church to use a stationary strategy. This is straightforward, since the Church faces the same optimization problem in every period.
Lemma 3 If the Ruler’s strategy, \( \tau^*(\cdot) \), is a best response to a stationary strategy by the Church, then the Church has exactly one stationary best response, \( r^* \). It has the following form: There exist numbers \( \underline{y} < \bar{y} \) such that

\[
r^* = \begin{cases} 
\tau & \text{if } y < \underline{y} \\
\hat{r} & \text{if } y \in [\underline{y}, \bar{y}] \\
r & \text{if } y > \bar{y},
\end{cases}
\]

where \( \hat{r} \) satisfies the following first-order condition:

\[
\frac{f}{(1-F)(\tau^*(\hat{r}))} = \frac{\lambda_C(1 - \delta F(\tau^*(\hat{r})))}{\lambda_R(1 - \delta)} \left( \frac{1}{\lambda_C(\hat{r} - q) + (1 - \lambda_C)y} \right).
\]

Putting these results together, we have the following.

Proposition 1 There exists a stationary equilibrium of the game, \( (\tau^*(\cdot), r^*) \). In such an equilibrium, the Church proposes \( r^* \) as defined in the statement of Lemma 3 in every period. The Ruler accepts the bishop-nominee in any period in which \( \epsilon_t > \tau^*(r_t) \) and rejects in any period in which \( \epsilon_t < \tau^*(r_t) \).

Proof. Follows immediately from Lemmas 2 and 3, which establish that stationary strategies are mutual best responses for the players and the form they take.

2.3 Empirical Implications

The model yields comparative statics with respect to a variety of parameters. But, for both conceptual and empirical reasons, we are focused on one: diocesan income \( (y) \). Here, we ask how this parameter affects the expected alignment of bishops \( (r^*) \) and the frequency and length of interregna—i.e., periods in which no bishop is in office.

As diocesan income \( (y) \) increases, the Church’s costs and Ruler’s benefits from having a nominee rejected increase. As a consequence, the Church nominates a bishop more aligned with the Ruler, as recorded in the next result.

Proposition 2 In a stationary equilibrium, if \( r^* \) is interior, it is strictly decreasing in \( y \).

There is an interregnum if a nominee is rejected. In any given period, this occurs with probability:

\[
\Pr(\text{interregnum}) = F(\tau^*(r^*)).
\]
Similarly, the expected length of an interregnum, conditional on one occurring, is

\[
\text{Expected Length of Interregnum} = \frac{1}{1 - F(r^*(r^*))}.
\]

The comparative statics of these two quantities are the same.

At an interior \( r^* \), increasing the income of a diocese has competing effects. On the one hand, as income increases, the Ruler becomes less inclined to accept nominees. On the other hand, the Church becomes keener to have its nominee accepted and, as such, offers nominees who are more favorable to the Ruler. Whether the probability and length of an interregnum increases or decreases as a function of the income of the diocese thus depends on whether the Ruler’s demands or the Church’s willingness to accommodate change more. As the next result shows, this depends on the relative weights that the Ruler and Church put on economic gain versus political alignment of the bishop.

**Proposition 3** In a stationary equilibrium, if \( r^* \) is interior, then the probability and expected length of an interregnum is strictly increasing in \( y \) if \( \lambda_R < \lambda_C \), strictly decreasing in \( y \) if \( \lambda_R > \lambda_C \), and constant in \( y \) if \( \lambda_R = \lambda_C \).

If \( r^* \) is a corner solution, the probability and expected length of an interregnum is strictly increasing in \( y \).

Proposition 3 shows that, according to theory, the relationship between diocesan income and the occurrence or length of interregna could go either way. Without a measure of \( \lambda_R - \lambda_C \), we don’t know whether they should be positively or negatively associated.

It is, perhaps, worth pausing to note that it is not ex ante obvious which should be larger, \( \lambda_R \) or \( \lambda_C \). One might be tempted to think the Church must care more than secular rulers about religious policy. But recall from Section 1 that bishops were important local political figures with considerable sway over a broad range of issues in a secular ruler’s domain. Thus, it is entirely possible that a secular ruler, with a more limited domain to secure political control, might care more about the alignment of local bishops than the central Church whose potential political power extended across all of Europe. Moreover, there might be heterogeneity among secular rulers and Church leaders regarding the relative importance of income and political control.

### 2.4 Welfare

Finally, it is important to know how a diocese’s wealth affects the players’ overall welfare from the game, since this will elucidate the wedge the Concordats drove between the
economic policy interests of secular rulers and Church leaders.

The Ruler always benefits from an increase in the diocese’s wealth because any such increase improves both the Ruler’s outside option and the alignment of bishop-nominees.

For the Church, there are trade-offs from increased income for the diocese. On the one hand, when an agreement is reached, the Church controls the diocese’s income and so would like it to be large. On the other hand, the greater the diocese’s income, the less willing the Ruler is to accept a bishop-nominee and, thus, the less bargaining power the Church has. As a consequence, the Church’s welfare is non-monotone in diocesan wealth.

To get a more detailed intuition for this non-monotonicity, start by considering a diocese with wealth \( y \in (\underline{y}, \overline{y}) \), so that the bishop-nominee is neither totally aligned with the Ruler nor the Church, i.e., \( r^* \in (\underline{r}, \overline{r}) \). As \( y \) goes up, Proposition 2 shows that \( r^* \) goes down—the Church makes a better offer to the Ruler. Proposition 3 shows that, if the Ruler cares more about income than the Church (\( \lambda_R < \lambda_C \)), then, despite this improved offer, the Ruler rejects the offer more often. Because the Church is therefore getting the increased income less frequently and getting a bishop-nominee who is less aligned with its interests, its welfare is decreasing. By contrast, if the Ruler cares less about income than the Church (\( \lambda_R > \lambda_C \)), then Proposition 3 shows that the Ruler accepts the Church’s more generous offer more often. Hence, the Church gets to consume the increased income more often and, despite getting a bishop who is less aligned with it, the Church’s welfare is increasing. Thus, the Church’s welfare can be increasing or decreasing in \( y \), depending on \( \lambda_R \) vs. \( \lambda_C \).

Now consider situations in which the diocese is either very rich or very poor, so that the alignment of the bishop-nominee is at a corner. If the diocese is sufficiently poor, then the Ruler accepts the bishop-nominee almost with certainty. Thus, as \( y \) increases, the Church benefits because it gets to consume a larger amount of income with virtual certainty. Hence, in sufficiently poor dioceses, the Church’s welfare is increasing in income, even if \( \lambda_R < \lambda_C \). Similarly, if the diocese is sufficiently rich, then the bishop-nominee is rejected with virtual certainty, even though he is perfectly aligned with the Ruler. As \( y \) increases, the Ruler becomes even less willing to accept the bishop-nominee, which makes the Church less likely to get the income. Hence, in sufficiently rich dioceses, the Church’s welfare is decreasing in income, even if \( \lambda_R > \lambda_C \).

Figure 2.1 illustrates the non-monotonicity and Proposition 4 states the results formally.

**Proposition 4** In a stationary equilibrium:

- The Ruler’s ex ante expected payoff from the game is strictly increasing in \( y \).
Figure 2.1: Church’s welfare from the game as a function of $y$.

- There is a unique $\hat{y}$ such that the Church’s ex ante expected payoff from the game is increasing in $y$ for $y < \hat{y}$ and decreasing for $y > \hat{y}$. Moreover,
  - if $\lambda_R < \lambda_C$, then $\hat{y} < \bar{y}$ and
  - if $\lambda_R \geq \lambda_C$, then $\hat{y} > \bar{y}$.

Proposition 4 suggests that the incentives created by the Concordats drove a wedge between the interests of secular authorities and the Church. Secular rulers had unequivocal incentives to support policies that increased local economic development because such policies increased the power of secular political authorities relative to the Church. The Church, by contrast, had at best mixed incentives. In sufficiently poor dioceses, secular rulers had little enough bargaining power that the Church benefitted from the increase in income it consumed when a bishop was in place. But as Europe became wealthier, the Church’s loss of bargaining power from increased local income, and the associated loss in political authority, more than off-set the benefits. Moreover, thinking dynamically (slightly outside the model), the Church could anticipate this loss of bargaining power and, thus, had incentives to limit economic development even in dioceses with wealth $y < \hat{y}$.

2.5 Summing Up

To sum up, our theoretical analysis provides several implications which we take to the quantitative and qualitative evidence. These are as follows:

(i) In dioceses where the Concordats were in effect, secular rulers had greater bargaining power the wealthier the diocese, so that, conditional on a bishop being in office, the
wealthier the diocese, the more likely the bishop was to be aligned with the secular ruler.

(ii) The relationship between a diocese’s wealth and the frequency and length of interregna is expected to be positive (resp. negative) if, on average, policy is less (resp. more) important to secular rulers relative to income than it is to Church leaders.

(iii) The Concordats drove a wedge between secular rulers and Church leaders with respect to economic development. Secular rulers had unambiguous incentives to foster local economic development. By contrast, Church leaders had incentives to limit economic development to curtail the loss of political power.

3 The Data

Our data consist of information on as complete a set of Roman Catholic dioceses and their bishops as could be assembled for the years from the fourth century through the Protestant Reformation.

Each diocese in our data had many bishops over our time period. Dioceses are recorded as long as they had their own bishop. Over the centuries some dioceses merged, some split, some ceased to exist, and new ones were created. Observations are at the diocese-year level, though for analysis these are collapsed to the diocese-bishop level. The data include 555 unique dioceses of which 274 are covered by the Concordats of Worms, Paris or London and 281 are not. There are 11,834 diocese-bishop pairs. Of these, approximately 70 percent are from dioceses covered by the Concordats.

3.1 Bishop Alignment

The main outcome variable is the secular versus religious alignment of each bishop. Unfortunately, because of missing information on the years in which bishops entered and exited office, we are unable to reliably measure the frequency or length of interregna.

Data about the alignment of bishops and their consecration and departure dates are derived by scraping Catholic Church websites and Wikipedia in English, German, and in a few cases, French, Spanish or Swedish.\(^4\) We classified the alignment of bishop-nominees into two categories: religious or secular. Bishops are coded as religious (i.e., aligned with the Pope/Church) if their position prior to becoming bishop for the first time (as many held

\(^4\)Cross-checking showed that there was very little information available in French, Spanish or Swedish beyond what was available in German.
several bishoprics sequentially and a few held more than one simultaneously) was a religious post such as abbot, monk, deacon, archdeacon, or priest. Bishops are classified as secular if their prior post was as an agent of the secular authorities, such as court ambassador, chancellor, and the like or if the biographical information indicates they were specifically linked to the secular ruler. We summarize the classification process in Appendix B.

Our data collection yielded biographies for 2642 bishops that were sufficiently detailed to allow us to code their alignment. Of these bishops, 1974 (75%) are from dioceses covered by the Concordats and 666 are from uncovered dioceses; 2015 (76%) are classified as religious and 627 as secular.\(^5\) Figure 3.1 shows the number of bishops for whom we observe alignment by half-century for both covered and uncovered dioceses.

The useful biographies span the years between 325 and 1517. Of course there are some missing dioceses and some missing bishops simply because records could not be found. There is, however, no reason to believe that missing data reflect any more than information lost through fires, disasters, wars, and other destructive forces over the very large number of years investigated here. We discuss the implications of missingness due to lack of biographical data (for any reason) in greater detail in Section 4 below and in Tables 5 and 6 in Appendix C.

\(^5\)Recall that following the advent of the Avignon papacy, the pope had become the agent of the French king in non-religious matters at least through the Council of Constance in 1417 and so even when a bishop with a “religious” background was chosen he was likely to be expected to be loyal to the secular authority who largely controlled the papacy and chose the pope.
3.2 Diocese Wealth

Unfortunately, detailed, systematic diocese-level income data is difficult to find prior to the Protestant Reformation. Other studies have measured diocese-level wealth using proxies such as population, urbanization, or construction (e.g., Cantoni, 2015; Cantoni, Dittmar and Yuchtman, 2018). Those studies, however, focus on later time periods, around the Protestant Reformation. Data such as these are not widely available for the much earlier time period required for our purposes. For instance, revenue data for England do not begin until around 1270 and are not readily disaggregated to the diocese level. Historical data on the location of large cities have been coded back to pre-Christian times by Chandler (1987) and from the year 800 by Bairoch, Batou and Ch`evre (1988) and Bairoch (1991), but only once per century or once per half-century at best for more recent years. Hence, we cannot be confident from year to year when a city came to be significant or when it ceased to be so. Even after interpolating these data annually, simple cross-tabs of Chandler’s data with our measure of a bishop’s alignment between 325 and 1309 indicate that the presence of a city is only reported about 8 percent of the time. Using Bairoch’s data, that percentage drops below 2 percent. This does not provide enough statistical power to detect meaningful effects.

As such, we employ two different indicators of diocesan income. First, we use data on the location and years of operation for major trade routes from the Old World Trade Routes Project, detailed maps of 11th and 12th century trade routes, and numerous economic histories.\(^6\) The data cover all of Europe and designate trade routes, pilgrimage routes, ports and other movement corridors (e.g., navigable rivers) as well as some of the goods produced and exported from the location.\(^7\) Using these data we code a dummy variable, \( \text{trade}_{dt} \), for each diocese year. A diocese \((d)\) in year \((t)\) is coded as having \( \text{trade}_{dt} \) equal to 1 if the diocese in the observed year satisfied any of the following: the seat was within 25 km of a major trade or pilgrimage route, it had a port or river route, or it produced and exported goods such as textiles and so forth. Of the 555 unique dioceses in our data for which we observe trade data, \(427\ (77\%)\) are never on a trade route, \(76\ (14\%)\) switch at least once during the sample period and \(55\ (10\%)\) are always on a trade route. As already mentioned, for the analysis we collapse our data to diocese-bishop pairs. We will label by \( \text{trade}_{db} \), the value of the \( \text{trade}_{dt} \) variable in the year bishop \(b\) was consecrated.

\(^6\)See http://www.ciolek.com/owtrad.html and https://easyzoom.com/imageaccess/ec482e04c2b240d4969c14155bb6836f

\(^7\)For studies using these data, see (among others), Pella (2014), Yue, Lee and Wu (2017), and Harrower and Dumitru (2017).
Second, we use a measure of pre-Columbian agricultural caloric potential per hectare, as estimated by the Food and Agriculture Organization (FAO) of the United Nations (Galor and Özak, 2016). Because caloric potential is estimated by the FAO on a very small land-scale, it is readily mapped to the diocese-level.\(^8\) For each diocese we code a variable \(\text{calorie}_d\) which takes a value of 1 if that diocese (measured at the seat) has caloric potential above the median and a value of 0 if that diocese has caloric potential below the median. (The mean and median are virtually identical.)

### 3.3 Where and When the Concordats Apply

As we have already mentioned, different Catholic dioceses were bound by the Concordats at different times. To capture this, we create a dummy variable \(\text{Concordats}_{db}\) that takes a value of 1 if a Concordat was in effect in diocese \(d\) in the year that bishop \(b\) entered office and a value of 0 otherwise. For dioceses in England and France (other than Burgundy), the Concordats variable is 1 for the years 1107–1309 and 0 otherwise. For dioceses in Ireland, it takes a value of 1 for 1171–1309 and 0 otherwise because Ireland became subject to the Concordat of London after the invasion of Ireland by Henry II of England. For dioceses in the Holy Roman Empire, Concordats is 1 from 1122–1309 and 0 otherwise. For dioceses in places that were never subject to the Concordats—including Spain, Portugal, the southern parts of Italy, Venice, and much of Eastern and Northern Europe—the Concordats variable is always coded as 0. We sometimes refer to these as the uncovered dioceses. Footnote 2 provides a breakdown of the covered and uncovered dioceses.

We drop the Papal States from our analysis, since in those locales the secular and religious authority was one and the same person.

### 3.4 Other Variables

We also collect data on several other relevant variables. Using GIS data from the Digital Atlas of Roman and Medieval Civilizations, we assign each diocese to a European kingdom for three snapshots in history—1000, 1200, and 1450.\(^9\) We treat the 1000 assignment as reflective of the years 800–1100, the 1200 assignment as reflective of the years 1100–1325, and the 1450 assignment as reflective of the years 1350–1517.

We collected data on the monarchs of these kingdoms from Wikipedia, which provides comprehensive lists of historical monarchs. Of the 2642 bishops whose religious affiliation

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\(^8\)For a thorough discussion of the use of the FAO data on caloric potential production see Galor and Özak (2016).

\(^9\)See https://ags.cga.harvard.edu/arcgis/rest/services/darmc/roman/MapServer/126
we are able to code, we know the monarch in power at the time of their nomination for 2253 (85%) of them. For the remaining 15%, it is typically the case that no kingdom-level monarch was in power and it is historically ambiguous who the relevant secular authority was.

We use GIS data to code which dioceses were on the route for each of the four crusades.\footnote{Crusade routes available here http://www.arcgis.com/home/item.html?id=962cb96725354ce5aade45acd82982f5.} We create four dummy variables which take a value of 1 in any year after the start of the relevant crusade for dioceses whose seat is within 25 km of the crusade route and 0 otherwise.

Finally, we also use GIS to lay a grid with cells that are roughly 400 km by 400 km over the map of Europe, assign each diocese to its grid cell, and create dummy variables for each cell. This will give us a way to control for geographic characteristics in a way that is not endogenous to political boundaries.

Figure 3.2 plots the data on a map. There are four maps, showing the geographic distribution of four key pieces of data:

(i) Dioceses that were or were not covered by one of the Concordats;

(ii) Dioceses that always had a secular-aligned bishop, always had a Church-aligned bishop, or had both kinds of bishop.

(iii) Dioceses that were always on trade routes, never on trade routes, or sometimes on trade routes;

(iv) Dioceses whose caloric potential is above or below the median;

One key feature that jumps out from the map is that, in addition to there being over time variation, there is considerably more geographic variation in the trade measure than in the caloric capacity measure.

4 Testing Secularization

The key empirical implication of our model that can be tested in our data concerns the relationship between bishop alignment and diocesan wealth (measured through exposure to trade or caloric potential). We expect that, when the Concordats were in effect in a diocese, the probability of having a bishop aligned with the Church should have been lower the higher the diocesan wealth.
Figure 3.2: Map of the data showing variation in covered vs. uncovered dioceses, religious vs. secular, trade routes, and caloric potential.
A comparison of the alignment of bishops in dioceses that are more or less wealthy is, of course, subject to the concern that there may be persistent differences between wealthier and poorer dioceses that have nothing to do with the incentives created by the Concordats. To partially address such concerns, we do two things: (1) compare the period during which a Concordat was in effect to periods in which it was not and (2) compare dioceses that were and were not subject to the Concordats during a given time period.

To implement these ideas, we estimate linear probability models of the following form:

\[ Y_{db} = \beta_0 + \beta_1 \cdot \text{Wealth}_{db} + \beta_2 \cdot \text{Concordats}_{db} + \beta_3 \cdot \text{Concordats}_{db} \cdot \text{Wealth}_{db} + \gamma \cdot X_{db} + \psi \cdot \text{Diocese} + \xi \cdot \text{Half-Century} + \epsilon_{db}. \] (2)

\( \text{Wealth}_{db} \) is a measure of diocese \( d \)'s wealth in the year bishop \( b \) took office—in different specifications, this will be based on our trade measure or our caloric potential measure. The variable \( X_{db} \) represents time varying co-variates, such as whether a crusades route had passed through the diocese prior to the year bishop \( b \) was consecrated.

We first run this regression restricted to the sample of covered diocese. This is a difference-in-differences in which, for almost all years (other than between 1107–1122), all observations in a given year are either subject to the Concordats or not. So we are asking whether the difference in bishop alignment between wealthy versus poor dioceses differed during the Concordats period or not. We then expand the sample to include not just covered, but uncovered dioceses that never change whether or not they are subject to the Concordats. This allows us to use the dioceses that never change status to estimate the “untreated” trend. In the appendix (Tables 15 and 16), we also report the results when we run our regressions just on the uncovered dioceses, using a “Concordats Period” dummy that takes a value of 1 from 1122–1309. Doing so shows that the patterns we observe in the covered dioceses are not evident in the uncovered dioceses.

For each of these models, we consider various fixed effect structures. In Equation 2 we show the basic specification, with diocese and half-century fixed effects. For each regression, we consider four varieties of fixed effects.

(i) Diocese and half-century fixed effects.

(ii) Diocese, half century, and monarch fixed effects.

(iii) Diocese and kingdom-by-half century fixed effects.

(iv) Diocese and grid cell-by-half century fixed effects.
The last three specifications are all trying to get at the same basic strategy beyond the basic difference-in-differences—to compare dioceses at similar times in similar places facing similar political circumstances. Specification (2) does this by directly controlling for the identity of the monarch. Unfortunately, there is a non-trivial amount of missing data on monarchs. So specification (3) does something similar by comparing within kingdom-half centuries, without relying directly on knowing the actual identity of the monarch. And specification (4) does the same, but avoids the endogeneity of kingdom borders, instead looking within arbitrary grid cell-half centuries.

Notice, our trade measure varies over time for some dioceses. However, caloric potential is a fixed diocese characteristic. So the main effect of the wealth variable is absorbed in the diocese fixed effect when we measure wealth using caloric potential.

In all cases, we report results for two sample periods. Our preferred specification includes only the years prior to and during the Concordats period, so the sample years run from the beginning of our sample through the beginning of the Avignon Papacy (i.e., 325–1309 when not using the kingdoms data and 800–1309 when using the kingdoms data). But we also consider a longer time period, going all the way to 1517, including years before and after the Concordats period. As already discussed, the exact meaning of bishop alignment is more difficult to parse after the advent of the Avignon papacy. With that caveat in mind, the analysis that goes through 1517 separates the sample into three periods—before the Concordats (takes a value of 1 up to 1107/1122/1171 and 0 otherwise), during the Concordats (takes a value of 1 from 1107/1122/1171–1309 and 0 otherwise), and Avignon (takes a value of 1 from 1309–1517 and 0 otherwise). The period prior to the Concordats is the omitted category. In this specification we interact both the Avignon and Concordats indicator with Wealth, so that the estimating equation (up to fixed effects) is:

\[
Y_{db} = \beta_0 + \beta_1 \cdot \text{Wealth}_{db} + \beta_2 \cdot \text{Concordats}_{db} + \beta_3 \cdot \text{Concordats}_{db} \cdot \text{Wealth}_{db} \\
+ \beta_4 \cdot \text{Avignon}_{db} + \beta_5 \cdot \text{Avignon}_{db} \cdot \text{Wealth}_{db} \\
+ \gamma \cdot X_{db} + \psi \cdot \text{Diocese} + \xi \cdot \text{Half-Century} + \epsilon_{db}.
\]

In each specification, our prediction with respect to alignment is that the coefficient on the interaction between the Wealth and the Concordats variable (above, \( \beta_3 \)) is expected to be negative. That is, we expect secular rules to have greater bargaining power in wealthier dioceses compared to poorer dioceses during the Concordats period relative to the periods before and after.
4.1 Some Identification Concerns

While we do not make strong causal claims about our estimates, it is worth discussing several noteworthy identification concerns before turning to the analysis.

One concern involves panel imbalance resulting from the spread of Catholicism across Europe over the course of our sample period. The addition of new, geographically and politically different dioceses over the course of time raises the possibility that our results are due to compositional changes. Our first line of defense against such concerns, of course, is the inclusion of diocese fixed effects in all of our models. But to further address these issues, we also construct a panel consisting exclusively of dioceses that existed in the year 800 and continued to exist through the year 1309 (or 1517, depending on the analysis). We report results for this “balanced panel” in Appendix C.

Second, as we have already noted, because of the age and nature of our data, there are many bishop-diocese pairs for which we observe the date of consecration and our wealth measure, but cannot classify the bishop as religious or secular. This missingness is of greatest concern if it is correlated with the interaction of wealth and Concordats; that is, if wealth is differentially correlated with missingness during the Concordats period. To explore this possibility, Tables 5 and 6 in Appendix C report the results of regressions akin to Equation 2, using missingness of the alignment measure as the dependent variable. Table 5 shows no evidence of a systematic relationship between missingness and the interaction of trade and the Concordats period. Table 6 by and large also shows no correlation, though there is some evidence of a negative relationship, which should make us somewhat cautious in interpreting these results.

A third concern involves other major events that happened around the same time as the Concordats. Most notably, Crusades took place from 1096–1099, 1145–1149 and 1189–1192, and 12012–1204. The latter three Crusades, therefore, coincide with the Concordats period. Because large armies moved across Europe to the Middle East, it is possible that those that went overland both affected local politics and caused the creation of new trade routes, as goods and services would have been needed to support these armies. For this reason, we control for whether a crusade passed near a diocese.

Finally, it is important to note that our key empirical findings have to do with comparing the number of bishops with previous appointments in secular versus religious bureaucracies in wealthier versus poorer dioceses that were and were not subject to the Concordats. If the secular bureaucracies in wealthier dioceses grew more robustly moving from the pre-Concordats period to the Concordats period, relative to poorer dioceses, perhaps because of
their thriving economies, then our results could mechanically reflect the greater availability of such candidates, rather than a shift in bargaining power. We certainly cannot entirely rule out this possibility. We attempt to address this concern through the variety of fixed effect specifications we consider. In particular, for such correlations to confound our estimates, this pattern of correlations between the wealth of a dioceses and the change in opportunities in the secular bureaucracy before and during the Concordats period, would have to hold within kingdom-half-century or grid-cell-half-century.

4.2 Alignment of Bishops

Before turning to the regression analysis, Figure 4.1 illustrates our empirical strategy, focusing only on dioceses that were covered by the Concordats. Each data point measures the percentage of bishops consecrated in that year who were classified as aligned with the Church. Over that, we plot a moving average (running plus and minus 20 years). The dark points and curve show the share of bishops who were aligned with the Church in poorer dioceses and the light points and curve shows the share of bishops who were aligned with the Church in wealthier dioceses. Of course, these plots of the raw data do not take account of diocese and time-period fixed effects, rulers, kingdoms, or the crusades. Nonetheless, they reveal the basic pattern of interest. During the Concordats period the bishops in wealthier covered dioceses became systematically less aligned with the Church compared to poorer covered dioceses.

Table 1 reports results for a regression corresponding to Equation 2 (in columns 1–4)
and Equation 3 (in columns 5–8), considering only covered dioceses, and using trade as
the measure of wealth. And Table 2 does likewise, using caloric potential as the measure
of wealth. Tables 3 and 4 show the analogous results using both covered and uncovered
dioceses.

Across specifications, the findings are as predicted by the model. Wealthier dioceses
have bishops less aligned with the Church than do poorer dioceses in the Concordats period
relative to the period prior to the Concordats (although, as can be seen in columns 5–8 of the
tables, this difference is not distinguishable from the Avignon period). This holds whether
we measure wealth with trade or with caloric potential, whether or not we include uncovered
dioceses, and across different fixed effects specifications. Tables 7–10 in the appendix show
that these same results hold for a panel of dioceses that exist all the way through the sample
period. Tables 11–14 in the appendix cluster the standard errors by monarch, rather than
diocese, which substantially increases the estimated uncertainty. And Tables 15–16 show
that we do not observe similar systematic patterns in uncovered dioceses if we create a
dummy variable called Concordats Period\(_{db}\) that takes a value of 1 from 1122–1309 and
0 otherwise. (It is also worth noting that this final analysis reveals that the data for the
uncovered dioceses is sparse and noisy.)

Table 1: Correlates of bishop alignment with pope, only covered diocese. Wealth measured as trade.

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Standard errors clustered by diocese.

* p < 0.1 ** p < 0.05 *** p < 0.01
Table 2: Correlates of bishop alignment with pope, only covered diocese. Wealth measured as caloric potential.

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Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01

Table 3: Correlates of bishop alignment with pope, covered and uncovered dioceses. Wealth measured as trade.

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Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01
Table 4: Correlates of bishop alignment with pope, covered and uncovered dioceses. Wealth measured as caloric potential.

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Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01

Timing  We have argued that the institutional incentives created by the Concordats are key for understanding the secularization of politics in wealthier dioceses. As such, it is worth probing the data to assess whether the timing of the divergence between wealthier and poorer dioceses is in fact consistent with the claim that the Concordats were critical. Of course, given the nature of our data and the process of bishop turnover, we cannot pin down the timing precisely. But we can offer some evidence.

Figure 4.2 reports the results of a series of placebo regressions using a moving window for the treatment period. The true Concordats period runs for either the 202 years from 1107–1309 (in England and parts of France), 187 years from 1122–1309 (in the Holy Roman Empire), or 138 years from 1171–1309 (in Ireland). So, in each of our placebo regressions we estimate a regression analogous to Equation 3, but with a different treatment window of the same length. We do so for each possible 202/187/138-year window from 800–1517. That is, for each placebo regression, we estimate the following linear probability model:

\[ Y_{db} = \beta_0 + \beta_1 \cdot \text{Wealth}_{db} + \beta_2 \cdot \text{Window}_{db} + \beta_3 \cdot \text{Window}_{db} \cdot \text{Wealth}_{db} + \beta_4 \cdot \text{Avignon}_{db} + \beta_5 \cdot \text{Avignon}_{db} \cdot \text{Wealth}_{db} + \psi \cdot \text{Diocese} + \xi \cdot \text{Half-Century} \cdot \text{Kingdom}_{db} + \nu \cdot \text{Crusades}_{db} + \epsilon_{db} \]
In our first placebo regressions, the window is 800–1002 for England and non-Burgundian France, 815–1002 for the Holy Roman Empire, and 864–1002 for Ireland. In the second placebo regressions, the window is 801/816/865–1003. This continues all the way through our final placebo regressions, where the window is 1315/1330/1379–1517. (The placebo regressions with a treatment period of 1107/1122/1171–1309 corresponds to our actual regression.) The left-hand plot of Figure 4.2 shows our estimate of $\beta_3$ for each placebo period, along with its 95% confidence interval, using trade as the measure of wealth. The right-hand plot does the same, using caloric potential.

Each of these plots suggests that the timing of the divergence of the alignment of bishops between wealthier and poorer dioceses is consistent with the Concordats having been a key event. The estimated effect, in both cases, is minimized right around the true treatment window.

5 The Concordats and Incentives for Development

In the previous section, we saw quantitative evidence that the Investiture Controversy and its resolution in the Concordats created a linkage between local wealth and secular political power. In this section, we explore further features of the argument represented by the model. Most importantly, the Concordats drove a wedge between the incentives of Church and secular leaders with respect to economic development. Secular leaders benefited from local economic prosperity, while, as localities became wealthier in ways that affected diocesan revenue, the Church was harmed by the resulting loss of political control. Thus, Church leaders had incentives to limit economic development or to find ways to shift the
locus of resources away from local bishops and towards the center.

Of course, many factors contributed to the behavior of both secular and religious leaders in this period. We do not mean to suggest that the incentives we identify are all that was going on, only that understanding these incentives helps to make sense of some important patterns of historical behavior.

The Church sought to curtail economic development in various ways during the Lateran Councils (1123, 1139, 1179 and 1215). Perhaps most importantly, the Council issued a crucial ruling regarding usury:

> we condemn that practice accounted despicable and blameworthy by divine and human laws, . . . namely the ferocious greed of usurers; and we sever them from every comfort of the church, forbidding any archbishop or bishop, or an abbot of any order whatever or any one in clerical orders, to dare to receive usurers, unless they do so with extreme caution; but let them be held infamous . . . and, unless they repent, be deprived of a Christian burial.

The fourth Lateran Council (1215) further strengthened the usury ban by improving its enforcement. In particular, Lateran IV made annual oral confession mandatory for all Catholics, providing priests with the opportunity to uncover usurers. This period saw the spread of confessors’ manuals with specific instructions for dealing with merchants and others likely to have engaged in usury (Le Goff, 1982). The risks and costs for usurers had been raised and so, naturally, the expected rate of return had to rise commensurately (De Roover, 1948, 1974). The upshot was to make loans scarcer and costlier, thereby slowing economic development (and the rise of secular political power) relative to what it otherwise would have been. And, indeed, Brown (2015) argues that it wasn’t until the 14th century (notably, after the end of the Concordats period) that the Church began to soften its views on merchants and usury.

Ekelund, Hébert and Tollison (1989, p. 320), noting that the usury ban was bad for economic development, write that “[p]aradoxically, the most outwardly economic directive of the medieval church, the doctrine of usury, has proven most resistant to purely economic explanations.” Our account of the incentives created by the Concordarts provides an explanation: a ban on usury was a way for the Church to use religious policy to pursue its political interests relative to secular leaders by curtailing economic development outside of monasteries and other ecclesiastical institutions.

While economic agents used creative contracting to attempt to avoid the ban, evidence suggests the ban did have a real effect on access to capital, and more so for secular borrowers
than church borrowers (Ekelund, Hébert and Tollison, 1989). As such, we can get some sense of how the usury ban might have affected secular economic development by comparing castle construction to church and cathedral construction during the 50 years just before the ban to the 50 years after the ban. Castles were built primarily by secular authorities. These were expensive projects that involved massive amounts of labor and movement of materials. As the architect/builder of the Beaumaris castle, Master James of St. George, noted regarding the construction he was overseeing in 1282:

In case you should wonder where so much money could go in a week, we would have you know that we have needed and shall continue to need 400 masons, both cutters and layers, together with 2,000 less skilled workmen, 100 carts, 60 wagons and 30 boats bringing stone and sea coal; 200 quarriers; 30 smiths; and carpenters for putting in the joists and floor boards and other necessary jobs. All this takes no account of the garrison...nor of purchases of material. Of which there will have to be a great quantity...The men’s pay has been and still is very much in arrears, and we are having the greatest difficulty in keeping them because they have simply nothing to live on. (McNeil, 1992, p. 43)

Thus, we would expect that reduced access to financing would affect the feasibility of castle construction. Church and cathedral construction were also major projects. But the church was better able to continue to borrow, even after the ban on usury (Ekelund, Hébert and Tollison, 1989). And it was also less dependent on financing for construction because cathedrals were often built with free labor, acquired by granting indulgences for sins in return for good works or through the in-kind payment of tithes (Gimpel, 1983; Swanson, 2006). For instance, Swanson (2006, p. 72), notes that, “indulgences played a role in the construction, alteration or rebuilding of a number, if not most,...important church buildings.”

Interpreted cautiously, given potential data missingness, the available evidence suggests that there was a large reduction in secular castle-starts coincident with the ban on usury—there were 221 starts in the 50 years prior to 1215 as compared to the 92 in the 50 years after.11 By contrast, Buringh et al.’s (2020) data show unabated growth in church construction, with approximately 76 million square meters built in the half-century prior to the usury ban and approximately 95 million square meters built in the half-century after the usury ban.12

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11 The data on castle construction are from https://en.wikipedia.org/wiki/List_of_castles_in_Europe.
12 We thank the authors for sharing their data.
The Church also used religious policy to limit economic development and the attendant rise of secular authority in other ways. For instance, during the twelfth century, the Church began to revise its views on (menial) labor in order to limit the spread of efficiency-enhancing machines, such as mills (Le Goff, 1982). Relying on Proverbs 16:27–29, it promoted the view that idle hands are the work of the devil. Moreover, the Church viewed more productive economic activity as a base activity until well into the Middle Ages. Le Goff (1982, p. 111) summarizes the Church’s attitude toward productive economic activity through trades and crafts in the Middle Ages as follows: “how often the Middle Ages must have witnessed the inner drama of men anxiously wondering whether they were really hastening toward damnation because they were engaging in a trade suspect in the eyes of the Church. The merchant comes naturally to mind.” By opposing both the spread of machines and increased labor productivity, the Church seems to have been trying to reduce a key driver of economic development.

The Church had another strategy, besides curtailing economic development, for minimizing its loss of bargaining power in wealthy dioceses following the Concordats. It could shift Church revenues away from dependence on local, diocesan money that was paid to the administrators in each bishopric, altering the revenue flow so that more of it was paid directly to the pope’s administrators. By diverting funds away from bishops, the pope reduced the revenues he would lose in the event of an interregnum and, thus, weakened the secular leaders’ bargaining position.

This realization helps explain a potentially puzzling move by the Church, in light of our earlier argument about the incentives to curtail economic growth. During the same period that the Church was banning usury and resisting mechanization, it endorsed and granted special papal privileges to new, entrepreneurial monastic orders which in fact contributed substantially to economic development. Why would the pope be willing to do this, given the incentives we have highlighted?

As long as the wealth these orders created flowed directly to the pope, rather than through the local bishops, they did not exacerbate the loss of bargaining power associated with the Concordats. And, indeed, this is precisely the arrangement the pope reached with the entrepreneurial monastic orders. The Cistercians, for instance, created in the late 11th century and centered in Burgundy, secured favors and privileges from the papacy that isolated them from the local demands of bishops and lay leaders by the start of the French Concordat. The Knights Templar, created in 1118, were recognized by the pope in 1129 and exempted from local taxation in 1139. The Knights Hospitaler were recognized by Pope Pashchal II in 1113, just after he was compelled to back down on a potential resolution
of the Investiture Controversy in 1111 that culminated in his facing the political wrath of both the Holy Roman Emperor and his own bishops. Here were new orders—military and money-making—that were unlike most of their predecessors among monastic orders both in their entrepreneurial mission and in their unusually direct financial ties to the papacy.

Secular rulers, the model suggests, had the opposite incentives from the Church. And they were no less innovative than the pope in erecting institutions to wrest political control and to increase wealth. The decades immediately after the Concordats, for instance, saw a dramatic flowering of secular institutions in England and France that were designed to encourage development. Consider, for instance, the series of legal reforms introduced by Henry II (1133-1189) in England during the mid-twelfth century. Henry II countered papal economic strategies with an expanded curia regis (loosely, the central government administration) and four important writs. The first two provided an improvement in a tenant farmer’s commitment to the land he farmed and contributed to improving its productivity, helping tenant farmers secure the property rights that are essential to economic development while also enhancing the king’s unique credibility as the person who would protect the common man’s interests (Taylor, 1889; Van Caeneghem, 1988; Barzel, 1989). The third and fourth writs restricted ecclesiastical rights.

Further, the kings of England and France sought new ways to raise revenue, often at the expense of the very resources the Church was trying to move away from localities and towards the center. Richard the Lionhearted greatly increased his tax take, including from Church property. His successor, John, went so far as to seize Church lands. Philip IV followed a similar path in France, prompting a backlash from Pope Boniface VIII that led to war.

6 Europe’s Medieval Economic, Political, and Religious Development

Europe’s economic, political, and religious development in the years roughly between 1000 and the end of the Thirty Years War in 1648 has been the subject of enormous scholarly debate by economists, historians, political scientists, and others. In this concluding section, we link our argument to a few strands of this literature, necessarily in a somewhat speculative way. We start by discussing our relationship to other arguments about the connection between economic and political development in Europe. We then turn to discussions of religious development and the rise of Protestantism.

We have argued that the Investiture Controversy and its resolution in several closely re-
lated Concordats marked the beginning of the end of Church political dominance in wealthier parts of Europe and the concomitant rise of secular authority. In an important sense, this political process reached its apex in the Avignon Papacy, where the political leadership of France (which was quite wealthy relative to much of the rest of Europe) asserted secular control over the Church.

Other scholars highlight entirely different economic, social, and political factors to help understand European development. Tabellini (2010), Stark (2014), and Mead (2015) attribute Europe’s economic or political development to special elements of European culture or people. Others reflect more on the political circumstances in different parts of Europe that may help explain why the Church was more successful in some places than in others. Some report, for instance, that Europe’s profile of competitive state-based political systems resulted from its feudal approach to military commitments, the domestic interdependencies imposed by taxation and borrowing, the use of warfare to create states, or patterns of dynastic marriage alignments (Blaydes and Chaney, 2013; North and Weingast, 2012; Tilly, 1992; Sharma, 2005). Kokkonen and Sundell (2014), building on Tullock (1987), contend that Europe’s shift to primogeniture contributed to its politically distinctive evolution. The evidence shows that there is substantial truth in each of these analyses. Finally, some economic analyses focus on access to revenue and its associated transaction costs (e.g., North and Thomas, 1973; Levi, 1988; Ertman, 1997). These accounts place economic considerations in the causal role and political outcomes as their consequences.

Our account is in some ways related to Spruyt’s (1994) argument regarding the rise of governments with secular control over defined territory. Like us, Spruyt (1994, p. 50) argues that, “[t]he Investiture Conflict in a sense necessitated rulers to invent ‘secular’ rule”. However, his reasoning follows a different path from ours. He contends that the Investiture struggle weakened both Church and state, whereas we argue that the incentives created by the Concordats strengthened secular leaders in wealthy areas. Spruyt also views European economic development as largely independent of the emergence of secular governments, whereas we argue that the ability to secularize politics and the incentives to stimulate or stifle economic development endogenously affected one another. In support of our contention, we show that during the Concordats period, differential outcomes in secularization across Roman Catholic Europe were associated with variation in access to trade.

Our argument also relates to Rubin’s (2017) comparative account of the differences

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13 Since the focus here does not encompass Spruyt’s thesis about the post-secularization spread of a sovereign state system, we draw attention only to the portions of his arguments that are pertinent to secularization and to economic development.
in economic and political development between the Middle East and Europe. Like us, Rubin sees bargaining power as central—for him the key difference between the Middle East and Europe is the greater bargaining power of Islamic leaders in the Middle East compared to Catholic clergy in Europe. That bargaining leverage, he contends, translated into the Islamic clergy being better positioned to legitimize rulers and to impose Islam’s religious values and objectives than was true for the Christian clergy. The Christian clergy, initially essential to help secular rulers sustain their time in office, lost influence relative to entrepreneurs as the commercial revolution swept across Europe, propagating more pro-business and pro-growth institutions and policies in its wake. We diverge from Rubin both by focusing on comparative questions within Europe, as opposed to between Europe and the Middle East, and for those within-Europe questions, in our specific focus on the role that the Concordats played in the shift in bargaining power and the rise of pro-growth interests within secular power circles.

Of course, much of the interest in European development revolves around the claims by Smith (1904) and Weber (1930) that the rise of Protestantism explains variation in European post-Reformation economic performance. Weber’s account has come under criticism by scholarship showing that capitalism, contrary to Weber, was invented well before the Protestant Reformation (Tawney, 1926), that Europe experienced rapid economic growth starting perhaps as early as the global warming trend and longer growing seasons that began around 900 (Ladurie, 1988), and that ideas akin to the Protestant ethic existed well before the Reformation (Andersen et al., 2017). That said, recent work in economic history has re-ignited the debate over Protestantism’s causal importance. Becker and Woessmann (2009) present evidence that Protestantism’s requirement that people attain literacy so they could study the Gospels led to greater human capital accumulation and economic growth in Protestant countries. However, using within-country variation, Cantoni (2012) finds no difference between Catholic and Protestant areas of Germany. Cantoni, Dittmar and Yuchtman (2018) show evidence that the adoption of Protestantism in Germany led to a shift in resource investment away from the religious and toward the secular.

The most relevant strand of this literature for us is the argument, made by some, that Protestantism might not only be a cause of economic development, but a consequence of it. Dimont (2004), for instance, argues that Protestantism was adopted by economically motivated leaders. As he observes, “[t]hough Protestantism had begun as a strictly religious reform movement, the people behind the new economic forces seized the Reformation and bent it to their own economic needs” (quoted in Becker, Pfaff and Rubin, 2016, first page decoration). In a closely associated thesis, Cantoni (2015, p. 15) notes that, “territories
which were already more inclined to commercial activity saw the growth-promoting potential of the Protestant Reformation and therefore chose to adopt it.” In these explanations, Protestantism, a religious movement, offered an opportunity for greater economic control that resulted in subsequent, rapid growth.

Although speculative, our argument offers another possible twist on these reverse-causality type stories. In particular, on our account, during the period that the Concordats were in force, local economic development was associated with the rise of secular control over politics. It seems plausible that this secular control set the stage for the emergence of Protestantism. As we have seen, the wealthy French were already prepared to substantially break with Church authorities in 1309, resulting in the Avignon Papacy. The Church’s monopoly on salvation meant that a complete break was inconceivable at that time. This possibility had to wait for Luther’s theological innovations to break the Church’s monopoly. But once that happened, perhaps leaders of wealthier dioceses, who had achieved greater secular, political control thanks to the incentives created by the Concordats, were freer to in fact break with the Church. On this account, polities that were economically successful might have adopted Protestantism not only because Protestant ideas were conducive to their economic path, but because their economic path had created the political pre-conditions for an assertion of secular control. In this sense, both economic and political factors that preceded the Protestant Reformation by two-hundred years may have played a role in its variable adoption.

Testing such a thesis rigorously is well beyond the scope of this paper. Many major events (e.g., the Great Famine and the Black Death) had dramatic effects on European economics, politics, and religion in the two-hundred years between the Avignon Papacy and the Reformation. Nonetheless, as scholars continue to attempt to understand patterns of economic, political, and religious development in Europe, our account suggests that it is worthwhile to consider the role played by institutional incentives, like those created by the Concordats of London, Paris, and Worms, that affected the interplay of these domains well before the dramatic events surrounding the Protestant Reformation that have occupied much of the literature.
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A Proofs of Numbered Results

Proof of Lemma 2. Suppose the Pope uses a strategy that calls for proposing \( r \) in each period. Slightly abuse notation by writing the Church’s strategy as simply \( r \).

From Equation 1, if a bishop of type \( r_t \) is proposed in period \( t \), the Ruler accepts if:

\[
e_t \geq \lambda_R \left( \frac{r_t}{1 - \delta} - q \right) + (1 - \lambda_R)y - c + \delta \max_{s_R} V_R(s_R, r).
\]

Notice, since the Churchs’ strategy is stationary, this condition is the same in all periods \( t \). The one-shot-deviation principle thus establishes that the Ruler’s strategy is stationary.

Proof of Lemma 3. Using the argument in the proof of Lemma 2, if the Ruler’s strategy is a best response to a stationary strategy, \( r \), by the Church, then it is an \( \tilde{\tau}^*(\cdot) \) satisfying:

\[
\tilde{\tau}^*(r_t) = \lambda_R \left( \frac{r_t}{1 - \delta} - q \right) + (1 - \lambda_R)y - c + \delta \max_{s_R} V_R(\tilde{\tau}^*(\cdot), r), \tag{4}
\]

for each \( r_t \). If the Church conjectures that the Ruler is using such a strategy, the Church’s expected utility from proposing \( r_t \) in period \( t \) and using a stationary strategy in which he proposes \( \hat{r} \) in all other periods is:

\[
(1 - F(\tilde{\tau}^*(r_t))) \left( \frac{\lambda_C r_t + (1 - \lambda_C)y}{1 - \delta} \right) + F(\tilde{\tau}^*(r_t)) \left( \lambda_C q + \delta V_C(\tilde{\tau}^*(\cdot), \hat{r}) \right).
\]

The one-shot-deviation principle implies that his best response in period \( t \) must maximize this expected utility. Moreover, since this problem is the same in every period, the Church’s strategy must be stationary as long as the optimum is unique.

To see that the optimum is unique, first suppose it is interior. Then it satisfies the following first-order condition:

\[
f \frac{\tilde{\tau}^*(r_t^*)}{1 - F(\tilde{\tau}^*(r_t^*))} \frac{d\tilde{\tau}^*(r_t^*)}{dr_t} = \frac{1 - \delta}{\lambda_C} \left( \frac{\lambda_C r_t^* + (1 - \lambda_C)y}{1 - \delta} - (\lambda_C q + \delta V_C(\tilde{\tau}^*(\cdot), \hat{r})) \right)^{-1}.
\]

From Equation 4, we have

\[
\frac{d\tilde{\tau}^*(r_t^*)}{dr_t} = \frac{\lambda_C}{1 - \delta}.
\]
We can, thus, rewrite the first-order condition as:

\[
\frac{f}{1 - F(\tilde{\epsilon}^*(r^*_\ell))} = \left(1 - \frac{\delta}{\lambda_C}\right)^2 \left(\frac{\lambda_C r^*_\ell + (1 - \lambda_C)y}{1 - \delta} - (\lambda_C q + \delta V_C(\tilde{\epsilon}^*(\cdot), \hat{r}))\right)^{-1}.
\]  

(5)

The right-hand side of Equation 5 is strictly decreasing in \(r^*_\ell\) and the log-concavity of \(f\) implies that the left-hand side is strictly increasing, so there is a unique solution to the first-order condition.

For this to be a stationary best response, we need \(r^*_\ell = \hat{r}\). Hence, there will be a unique, stationary, interior best response if there is a unique \(r^* \in [\underline{r}, \overline{r}]\) that satisfies:

\[
\frac{f}{1 - F(\tilde{\epsilon}^*(r^*))} = \left(1 - \frac{\delta}{\lambda_C}\right)^2 \left(\frac{\lambda_C r^* + (1 - \lambda_C)y}{1 - \delta} - (\lambda_C q + \delta V_C(\tilde{\epsilon}^*(\cdot), r^*))\right)^{-1}.
\]  

(6)

Using the standard recursive approach, if the Church uses a stationary strategy, \(r\), his continuation value for the game is implicitly defined by:

\[
V_C(\tilde{\epsilon}^*(\cdot), r) = (1 - F(\tilde{\epsilon}^*(r))) \left(\frac{\lambda_C r + (1 - \lambda_C)y}{1 - \delta} - (\lambda_C q + \delta V_C(\tilde{\epsilon}^*(\cdot), r))\right).
\]

Rearranging, this yields:

\[
V_C(\tilde{\epsilon}^*(\cdot), r) = \frac{(1 - F(\tilde{\epsilon}^*(r))) \left(\frac{\lambda_C r + (1 - \lambda_C)y}{1 - \delta} + F(\tilde{\epsilon}^*(r)) (\lambda_C q + \delta V_C(\tilde{\epsilon}^*(\cdot), r))\right)}{1 - \delta F(\tilde{\epsilon}^*(r))}.
\]  

(7)

Substituting this into Equation 6, a stationary, interior best response exists if there is an \(r^* \in [\underline{r}, \overline{r}]\) satisfying:

\[
\frac{f}{(1 - F)(\tilde{\epsilon}^*(r^*))} = \frac{\lambda_C (1 - \delta F(\tilde{\epsilon}^*(r^*)))}{\lambda_r(1 - \delta)} \left(\frac{1}{\lambda_C (r^* - q) + (1 - \lambda_C)y}\right),
\]  

as required in the statement of the Lemma. The left-hand side of Equation 8 is increasing and the right-hand side is decreasing, so \(r^*\) is unique if it exists.

It is straightforward from the first-order condition that if \(y\) is sufficiently large or small, then there is not an \(r^*\) satisfying Equation 8. Define \(\overline{y}\) such that

\[
\frac{f}{(1 - F)(\tilde{\epsilon}^*(\underline{r}))} = \frac{\lambda_C (1 - \delta F(\tilde{\epsilon}^*(\underline{r})))}{\lambda_r(1 - \delta)} \left(\frac{1}{\lambda_C (\underline{r} - q) + (1 - \lambda_C)\overline{y}}\right).
\]
And define \( y \) such that
\[
\frac{f}{(1 - F)(\bar{v}(\bar{r}))} = \frac{\lambda_C(1 - \delta F(\bar{v}(\bar{r})))}{\lambda_R(1 - \delta)} \left( \frac{1}{\lambda_C(\bar{r} - q) + (1 - \lambda_C)\bar{y}} \right).
\]

Then \( r^* \) exists for any \( y \in [y, \bar{y}] \) and does not otherwise.

Now consider \( y \notin [y, \bar{y}] \). Precisely the argument given above implies that \( r \) is a stationary best response if \( y < \bar{y} \) and \( \bar{r} \) is a stationary best response if \( y > \bar{y} \).

\[\blacksquare\]

The following Lemma will be useful throughout:

**Lemma 4**

\[
\frac{\partial \bar{v}(r^*)}{\partial r^*} = \frac{\lambda_R}{1 - \delta F(\bar{v}(r^*))}.
\]

\[
\frac{\partial \bar{v}(r^*)}{\partial y} = \frac{1 - \lambda_R}{1 - \delta F(\bar{v}(r^*))}.
\]

\[
\frac{\partial \bar{v}(r^*)}{\partial c} = \frac{-1}{1 - \delta F(\bar{v}(r^*))}.
\]

**Proof.** From Lemma 2, the cutoff rule that the Ruler uses in response to a nomination \( r^* \) is implicitly defined by:
\[
\bar{v}(r^*) = \lambda_R \left( \frac{r^*}{1 - \delta} - q \right) + (1 - \lambda_R)\bar{y} + \delta V_R(\bar{v}(\cdot), r^*).
\]

Now, use the standard recursive approach to calculate \( V_R(\bar{v}(\cdot), r^*) \). First, write:
\[
V_R(\bar{v}(\cdot), r^*) = (1 - F(\bar{v}(r^*))) \left( \frac{-\lambda_R r^*}{1 - \delta} + \mathbb{E}[\epsilon | \epsilon \geq \bar{v}(r^*)] \right) + F(\bar{v}(r^*)) (\bar{r} - \lambda_R q + (1 - \lambda_R)\bar{y} + \delta(\bar{v}(\cdot), r^*)).
\]

Now rearrange to get:
\[
V_R(\bar{v}(\cdot), r) = \frac{(1 - F(\bar{v}(r))) \left( \frac{-\lambda_R r}{1 - \delta} + \mathbb{E}[\epsilon | \epsilon \geq \bar{v}(r)] \right) + F(\bar{v}(r)) (\bar{r} - \lambda_R q + (1 - \lambda_R)\bar{y})}{1 - \delta F(\bar{v}(r))}.
\]
Substituting for $V_R(\bar{\epsilon}^*(\cdot), r^*)$ from Equation 9, noting that we can write

$$\mathbb{E}[\epsilon \mid \epsilon \geq \bar{\epsilon}^*(r^*)] = \int_{\bar{\epsilon}^*(r^*)}^{\infty} \frac{f(\bar{\epsilon})}{1 - F(\bar{\epsilon}^*(r^*))} \, d\bar{\epsilon},$$

and simplifying, $\bar{\epsilon}^*(r^*)$ is given by:

$$(1 - \delta F(\bar{\epsilon}^*(r^*)))\bar{\epsilon}^*(r^*) - \delta \int_{\bar{\epsilon}^*(r^*)}^{\infty} \bar{\epsilon} f(\bar{\epsilon}) \, d\bar{\epsilon} = \lambda_R(r^* - q) + (1 - \lambda_R)y. \quad (10)$$

Now the result follows immediately by implicitly differentiating Equation 10. ■

**Proof of Proposition 2.** Implicitly differentiating Equation 8, we have that at an interior solution:

$$\frac{d r^*}{dy} = \left( \frac{f}{1 - F} \right)'(\bar{\epsilon}^*(r^*)) \frac{d \bar{\epsilon}^*(r^*)}{dy} + \frac{2\delta \lambda_C (1 - \delta F(\bar{\epsilon}^*(r^*))) f(\bar{\epsilon}^*(r^*))}{(1 - \delta) \lambda_R (\lambda_C (r^* - q) + (1 - \delta) \lambda_C) y} + \frac{\lambda_C^2 (1 - \delta F(\bar{\epsilon}^*(r^*)))^2}{(1 - \delta) \lambda_R (\lambda_C (r^* - q) + (1 - \delta) \lambda_C) y^2} < 0,$$

where the inequality follows two facts. First, log-concavity of $f$ implies that $\left( \frac{f}{1 - F} \right)'(\bar{\epsilon}^*(r^*)) > 0$. Second, Lemma 4 shows that $\frac{d \bar{\epsilon}^*(r^*)}{dy} > 0$. ■

**Proof of Proposition 3.** Differentiating:

$$\frac{d \Pr(\text{interregnum})}{dy} = f(\bar{\epsilon}^*(r^*)) \left( \frac{\partial \bar{\epsilon}^*(r^*)}{\partial y} + \frac{\partial \bar{\epsilon}^*(r^*)}{\partial y} \frac{\partial r^*}{\partial y} \right).$$

At a corner solution, this has the same sign as $\frac{\partial \bar{\epsilon}^*(r^*)}{\partial y}$, which is positive, by Lemma 4.

At an interior solution, we can substitute for $\frac{\partial \bar{\epsilon}^*(r^*)}{\partial y}$ from Equation 11. Doing so, this derivative has the same sign as:

$$\frac{\partial \bar{\epsilon}^*(r^*)}{\partial y} \left( \left( \frac{f}{1 - F} \right)'(\bar{\epsilon}^*(r^*)) \frac{d \bar{\epsilon}^*(r^*)}{dy} + \frac{2\delta \lambda_C (1 - \delta F(\bar{\epsilon}^*(r^*))) f(\bar{\epsilon}^*(r^*))}{(1 - \delta) \lambda_R (\lambda_C (r^* - q) + (1 - \delta) \lambda_C) y} + \frac{\lambda_C^2 (1 - \delta F(\bar{\epsilon}^*(r^*)))^2}{(1 - \delta) \lambda_R (\lambda_C (r^* - q) + (1 - \delta) \lambda_C) y^2} \right).$$

Cross multiplying and rearranging this has the same sign as:

$$\frac{\partial \bar{\epsilon}^*(r^*)}{\partial y} \lambda_C^2 - \frac{\partial \bar{\epsilon}^*(r^*)}{\partial r} \lambda_C (1 - \lambda_R).$$
Substituting for $\frac{\partial \bar{\epsilon}^*(r^*)}{\partial y}$ and $\frac{\partial \bar{\epsilon}^*(r^*)}{\partial r}$ from Lemma 4, this has the same sign as:

$$(1 - \lambda_R)\lambda_C - \lambda_R(1 - \lambda_C),$$

as required. The argument for expected length is analogous. ■

**Proof of Proposition 4.** The Ruler’s ex ante expected welfare is:

$$V_R(\bar{\epsilon}^*(r^*), r^*) = \frac{(1 - F(\bar{\epsilon}^*(r^*))) \left( \frac{-\lambda_R r^*}{1 - \delta} + \mathbb{E}[\epsilon | \epsilon > \bar{\epsilon}^*(r^*)] \right) + F(\bar{\epsilon}^*(r^*)) (-\lambda_R q + (1 - \lambda_R) y)}{1 - \delta F(\bar{\epsilon}^*(r^*))}.$$

Differentiating, we have:

$$\frac{dV_R(\bar{\epsilon}^*(r^*), r^*)}{dy} = \frac{1}{(1 - \delta F(\bar{\epsilon}^*(r^*)))^2} \left[ \left( f(\bar{\epsilon}^*(r^*)) \left( \frac{\partial \bar{\epsilon}^*(r^*)}{\partial y} + \frac{\partial \bar{\epsilon}^*(r^*)}{\partial r} \frac{dr^*}{dy} \right) (1 - \delta F(\bar{\epsilon}^*(r^*))) \right) \right.\left. \times \left( \lambda_R \left( \frac{r^2}{1 - \delta} - q \right) + (1 - \lambda_R) y - \bar{\epsilon}^*(r^*) - (1 - F(\bar{\epsilon}^*(r^*))) \frac{\lambda_R}{1 - \delta} \frac{dr^*}{dy} + F(\bar{\epsilon}^*(r^*)) (1 - \lambda_R) \right) \right.\left. + \delta f(\bar{\epsilon}^*(r^*)) \frac{\partial \bar{\epsilon}^*(r^*)}{dy} \left( 1 - F(\bar{\epsilon}^*(r^*))) \left( \frac{-\lambda_R r^*}{1 - \delta} + \mathbb{E}[\epsilon | \epsilon > \bar{\epsilon}^*(r^*)] \right) + F(\bar{\epsilon}^*(r^*)) (-\lambda_R q + (1 - \lambda_R) y) \right) \right].$$

From Equation 10, we can write:

$$\bar{\epsilon}^*(r^*) = \frac{\lambda_R (r^* - q) + (1 - \lambda_R) y + \delta \int_{\bar{\epsilon}^*(r^*)}^{\infty} \epsilon f(\epsilon) d\epsilon}{1 - \delta F(\bar{\epsilon}^*(r^*))}.$$

Making this substitution and canceling like terms, the derivative reduces to:

$$\frac{dV_R(\bar{\epsilon}^*(r^*), r^*)}{dy} = \frac{F(\bar{\epsilon}^*(r^*)) (1 - \lambda_R) - (1 - F(\bar{\epsilon}^*(r^*))) \frac{\lambda_R}{1 - \delta} \frac{dr^*}{dy}}{1 - \delta F(\bar{\epsilon}^*(r^*))}.$$

The derivative has the same sign as its numerator. The result now follows from the fact that, as shown in Proposition 2, $\frac{dr^*}{dy} \leq 0$.

The Church’s ex ante expected welfare is:

$$V_C(\bar{\epsilon}^*(r^*), r^*) = \frac{(1 - F(\bar{\epsilon}^*(r^*))) \left( \frac{\lambda_C r^* + (1 - \lambda_C) y}{1 - \delta} \right) + F(\bar{\epsilon}^*(r^*)) \lambda_C q}{1 - \delta F(\bar{\epsilon}^*(r^*))}.$$
Differentiating, we have
\[
\frac{dV_C(\bar{\tau}(r^*), r^*)}{dy} = \frac{1}{(1 - \delta F(\bar{\tau}(r^*))^2} \left[(1 - \delta F(\bar{\tau}(r^*)) (1 - F(\bar{\tau}(r^*)))(1 - \lambda_C) \\
\times \left( - f(\bar{\tau}(r^*)) \left( \frac{\partial \bar{\tau}(r^*)}{\partial y} + \frac{\partial \bar{\tau}(r^*)}{\partial r} \frac{\partial r^*}{\partial y} \right) \left( \lambda_C (r^* - q) + (1 - \lambda_C) \frac{y}{1 - \delta} \right) + (1 - F(\bar{\tau}(r^*))) \left( \frac{\lambda_C \partial r^*}{\partial y} + (1 - \lambda_C) \right) \right) \right] + \frac{\partial r^*}{\partial y} \left( (1 - \delta F(\bar{\tau}(r^*)) (1 - F(\bar{\tau}(r^*)) \frac{\partial \bar{\tau}(r^*)}{\partial r} - f(\bar{\tau}(r^*)) \left( \lambda_C (r^* - q) + (1 - \lambda_C) y \right) \right) \right].
\]

This derivative has the same sign as the term in square brackets.

To see this, note that in the event that \(r^*\) is a corner solution, \(\frac{\partial r^*}{\partial y} = 0\). In the event that \(r^*\) is interior, the first-order condition implies that the term in parentheses is 0.

Thus, the derivative has the same sign as:
\[
\frac{(1 - \delta F(\bar{\tau}(r^*)) (1 - F(\bar{\tau}(r^*)))(1 - \lambda_C) - f(\bar{\tau}(r^*)) \frac{\partial \bar{\tau}(r^*)}{\partial y} \left( \lambda_C (r^* - q) + (1 - \lambda_C)y \right)}{1 - \delta}.
\]

Substituting for \(\frac{\partial \bar{\tau}(r^*)}{\partial y}\), the derivative has the same sign as:
\[
\frac{(1 - \delta F(\bar{\tau}(r^*)) (1 - F(\bar{\tau}(r^*)))(1 - \lambda_C) - f(\bar{\tau}(r^*)) \left( \lambda_C (r^* - q) + (1 - \lambda_C)y \right)(1 - \lambda_R)}{1 - \delta F(\bar{\tau}(r^*))}.
\] (12)

Now we divide the analysis into several lemmas. First, focus on the case of an interior \(r^*\).

**Lemma 5** For any \(y \in (\bar{y}, \bar{y})\), the Church’s welfare is strictly increasing in \(y\) if \(\lambda_R > \lambda_Y\), strictly decreasing in \(y\) if \(\lambda_R < \lambda_Y\) and constant in \(y\) if \(\lambda_R = \lambda_Y\).
Proof of Lemma 5.

From the first-order condition, we have that:

\[ f(\epsilon^*(r^*)) \left( \lambda_C(r^* - q) + (1 - \lambda_C)y \right) = \frac{(1 - F(\epsilon^*(r^*)))(1 - \delta F(\epsilon^*(r^*))\lambda_C}{\lambda_R(1 - \delta)}. \]

Substituting this in to Equation 12, at an interior \( r^* \), \( \frac{dV_C(\epsilon^*(r^*), r^*)}{dy} \) has the same sign as:

\[ \frac{(1 - \delta F(\epsilon^*(r^*))) (1 - F(\epsilon^*(r^*))(1 - \lambda_C)}{1 - \delta} - \frac{(1 - \delta F(\epsilon^*(r^*))) (1 - F(\epsilon^*(r^*)))(1 - \lambda_R)\lambda_C}{(1 - \delta)\lambda_R}. \]

Rearranging shows that at an interior \( r^* \), \( \frac{dV_C(\epsilon^*(r^*), r^*)}{dy} \) has the same sign as:

\[ \lambda_R - \lambda_C, \]

as required. \( \blacksquare \)

Now consider when \( r^* \) is a corner solution. We will establish the result in two steps. First, we show that, when \( r \) is fixed, the Church’s welfare is decreasing in \( y \) if and only if \( y \) is sufficiently large.

Lemma 6  Fix an \( r \). Then there exists a \( \hat{y} \) such that \( V(\epsilon^*(r), r) \) is strictly decreasing in \( y \) if \( y > \hat{y} \) and strictly increasing in \( y \) if \( y < \hat{y} \).

Proof of Lemma 6.  Rearranging Equation 12, \( V(\epsilon^*(r), r) \) is increasing if

\[
\frac{1 - \lambda_C}{(1 - \delta)(1 - \lambda_R)} \frac{(1 - \delta F(\epsilon^*(r))) (1 - F(\epsilon^*(r)))}{f(\epsilon^*(r))} > \lambda_C(r - q) + (1 - \lambda_C)y,
\]

decreasing if the sign is reversed, and constant at equality. It is straightforward that the right-hand side is increasing and going to infinity in \( y \). Hence, it suffices to show that the left-hand side is decreasing in \( y \).

To see this, first note that log-concavity of \( f \) implies log-concavity of \( 1 - F \). Thus, for any \( x \), we have:

\[-f'(x)(1 - F(x)) < f(x)^2. \tag{13}\]

Differentiating, the left-hand side is decreasing in \( y \) if:

\[
\frac{\partial \epsilon^*(r)}{\partial y} \left( \frac{-\delta f(\epsilon^*(r))^2 (1 - F(\epsilon^*(r))) - f(\epsilon^*(r))^2 (1 - \delta F(\epsilon^*(r))) - f'(\epsilon^*(r)) (1 - F(\epsilon^*(r)))(1 - \delta F(\epsilon^*(r)))}{f(\epsilon^*(r))^2} \right) < 0.
\]

49
From Lemma 4, \( \frac{\partial \bar{\epsilon}^*(r)}{\partial y} > 0 \), so this inequality holds if and only if the fraction in parentheses is negative. Rearranging, this is equivalent to:

\[
-f'(\bar{\epsilon}^*(r)) (1 - F(\bar{\epsilon}^*(r))) < f(\bar{\epsilon}^*(r))^2 \left( 1 + \frac{\delta (1 - F(\bar{\epsilon}^*(r)))}{1 - \delta F(\bar{\epsilon}^*(r))} \right),
\]

which follows from Condition 13. ■

Finally, we show that the location of \( \hat{y} \) is as in the statement of the proposition.

**Lemma 7** At any \( y \in \{y, \bar{y}\} \), the Church’s welfare is strictly increasing in \( y \) if \( \lambda_R > \lambda_Y \), strictly decreasing in \( y \) if \( \lambda_R < \lambda_Y \), and constant in \( y \) if \( \lambda_R = \lambda_Y \).

**Proof of Lemma 7.** Rearranging Equation 12, for a fixed \( r \), \( \frac{dV(\bar{\epsilon}^*(r), r)}{dy} \) has the same sign as

\[
\frac{1 - \lambda_C}{(1 - \delta)(1 - \lambda_R)} (1 - \delta F((\bar{\epsilon}^*(r))) (1 - F((\bar{\epsilon}^*(r))) - f((\bar{\epsilon}^*(r))) (\lambda_C(r - q) + (1 - \lambda_C)y)).
\]

Using the definitions of \( \bar{y} \) and \( y \), at either of these values, the second term of Condition 14 is equal to

\[
\frac{\lambda C}{\lambda_R(1 - \delta)} (1 - \delta F((\bar{\epsilon}^*(r))))(1 - F((\bar{\epsilon}^*(r))),
\]

where either \( r = \bar{r} \) and \( y = \bar{y} \), or \( r = \bar{r} \) and \( y = y \). Substituting this in to Condition 14, we have that at either of these values of \( y \), \( \frac{dV(\bar{\epsilon}^*(r), r)}{dy} \) has the same sign as

\[
\frac{1 - \lambda C}{(1 - \delta)(1 - \lambda_R)} (1 - \delta F((\bar{\epsilon}^*(r))) (1 - F((\bar{\epsilon}^*(r))) - \frac{\lambda C}{\lambda_R(1 - \delta)} (1 - \delta F((\bar{\epsilon}^*(r))))(1 - F((\bar{\epsilon}^*(r))))).
\]

Rearranging one more time, \( \frac{dV(\bar{\epsilon}^*(r), r)}{dy} \) has the same sign as

\[
\lambda_R - \lambda_C,
\]

as required. ■

From Lemma 6, when \( r \) is fixed, there is a \( \hat{y}(r) \) such that \( V(\bar{\epsilon}^*(r), r) \) is strictly increasing in \( y \) up to \( \hat{y}(r) \) and then strictly decreasing. From Lemma 7, if \( \lambda_R > \lambda_Y \), then \( V(\bar{\epsilon}^*(\bar{r}), \bar{r}) \) is increasing at \( y = \bar{y} \). Hence, \( \hat{y}(\bar{r}) > \bar{y} \), so the Church’s welfare is increasing for all \( y \leq \bar{y} \). Moreover, by Lemma 5, \( V(\bar{\epsilon}^*(r^*), r^*) \) is increasing for \( y \in (\bar{y}, \bar{y}) \). Finally, by Lemma 7,
$V(\tau^*(r), r)$ is increasing at $y = \bar{y}$. Hence $\dot{y}(r)\bar{y}$. Thus, $V(\tau^*(r^*), r^*)$ is strictly increasing in $y$ up to $\dot{y}(r) > \bar{y}$ and then strictly decreasing.

From Lemma 7, if $\lambda_R < \lambda_Y$, then $V(\tau^*(\bar{r}), \bar{r})$ is strictly decreasing at $y = \bar{y}$. Hence, $\dot{y}(\bar{r}) < \bar{y}$. Moreover, by Lemma 5, $V(\tau^*(r^*), r^*)$ is strictly decreasing for $y \in (\bar{y}, \bar{y})$. Finally, by Lemma 7, $V(\tau^*(r), r)$ is decreasing at $y = \bar{y}$. Thus, $V(\tau^*(r^*), r^*)$ is increasing in $y$ up to $\dot{y}(\bar{r}) < \bar{y}$ and then decreasing.

From Lemma 7, if $\lambda_R = \lambda_Y$, then $V(\tau^*(\bar{r}), \bar{r})$ is constant at $y = \bar{y}$. Hence, $\dot{y}(\bar{r}) = \bar{y}$. Moreover, by Lemma 5, $V(\tau^*(r^*), r^*)$ is constant in $y$, for $y \in (\bar{y}, \bar{y})$. Finally, by Lemma 7, $V(\tau^*(r), r)$ is constant at $y = \bar{y}$. Hence, $\dot{y}(r) = \bar{y}$. Thus, $V(\tau^*(r^*), r^*)$ is strictly increasing in $y$ up to $\bar{y}$, constant for $y \in [\bar{y}, \bar{y}]$, and strictly decreasing for $y > \bar{y}$. ■

B Data Sources

Here we briefly describe the data collection and sources. The replication data and do-file can be accessed on the authors’ webpage.

B.1 Bishop types

To evaluate whether bishops were religious, secular or of unknown type, we scraped web sites for each European diocese. The data regarding bishops can be found by searching Wikipedia for European Roman Catholic bishops. Such a search will lead to https://en.wikipedia.org/wiki/Category:Roman_Catholic_bishops_in_Europe from which one can then choose each country in turn and each bishop in turn. Bishops coded in black font have no biographical information. Those coded in blue do have biographical information. Those coded in red may have biographies forthcoming in the future. In addition to Wikipedia, we also scraped information on individual bishops from http://www.catholic-hierarchy.org/bishop/ or, equivalently, the Catholic hierarchy site by country. In ambiguous cases additional websites relevant to the individual bishop were also searched although they rarely turned up information not already covered by Catholic Hierarchy or Wikipedia.

To create a preliminary coding of each bishop’s type, biographical texts were scanned as follows:

A bishop was given a preliminary coding of Religious if the biographical text included any of the following terms (with the appearance of multiple terms coded as well and with checks both for uppercase and lowercase entries):
Archbishop, Benedictine, monk, Bishop, Bishop-elect, Cantor, deacon, Dom-scholaster, abbey, abbot, abott, arch-deacon, archdeacon, canon, car-
dinal, cathedral, champlain, chaplain, choirmaster, church, clergy, cleric, deacon,
dean, elected, friar, hermit, cathedral, missionary, monastery, monk, monk/silversmith,
papal, Pope, pope, preacher, prebend, prebendary, precenter, precentor, priest,
priests, prior, proctor, rector, religious, sacrist, sub-dean, theologian, vicar, bish-
oprics, hermit.

A bishop was given a preliminary coding as Secular if the biographical text included
any of the following terms (with the appearance of multiple terms coded as well and with
checks both for uppercase and lowercase entries):

Governor, academic, ambassador, archchancellor, archduke, architect, artist,
scholar, auditor, chancellor, chancery, coadjutor, diplomat, composer, count,
diplomacy, doctor, duke, prince, exchequer, goldsmith, judge, government, keeper,
king, kings, secretary, knight, law, writer, vice-chancellor, vice, lawyer, trea-
surer, privy, master, military, military/chancellor, noble, office, poet, politician,
professor, advisor, council, councillor, justice, notary, official, physician, stew-
ard, scholar, secretary, secular, statesman, teacher, treasurer, prince-bishop,
 imperial.

After this preliminary coding, multiple coders hand read the individual text in cases
for which the criteria yielded ambiguous or no coding. For instance, while law could imply
secular and canon religious, canon law as a phrase would indicate the individual was more
likely in the religious domain whereas Roman law or just “law” would more likely have
indicated a secular occupation. About 90 percent of the codings from the list of words were
unambiguous (random checks were performed) so about 10 percent of the codings required
close individual readings.

B.2 Trade Data

Trade data were downloaded from http://www.ciolek.com/owtrad.html with all routes
designated as major and involving a European starting or ending point coded for the inclu-
sive years specified on the website.
C Additional Tables

C.1 Missing Data

Table 5 and 6 report our standard regressions, but using missingness of bishop alignment data as the dependent variable.

Table 5: Correlates of missingness of bishop alignment data. Wealth measured as trade.

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<tr>
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N 5303 3096 4193 5267 8312 5759 7197 8263
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diocese fixed effects yes yes no no yes yes no no
crusades no yes yes yes no yes yes yes
monarch no yes no no no yes no no
kingdom * half-century no no yes no no no yes no
grid * half-century no no yes no no yes no yes
sample years 325-1309 800-1309 800-1309 325-1309 325-1517 800-1517 800-1517 325-1517

Wealth measured as trade. Standard errors clustered by diocese.
* p < 0.1 ** p < 0.05 *** p < 0.01

C.2 Balanced Panel

Tables 7 and 8 show that qualitatively similar results to Tables 1 and 2 hold for the balanced panel. Tables 9 and 10 shows the same for Tables 3 and 4.

C.3 Clustering by Monarch

Tables 11–14 cluster the standard errors by monarch, rather than diocese.
Table 6: Correlates of missingness of bishop alignment data. Wealth measured as caloric potential.

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</table>

Standard errors clustered by diocese.

* $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$

C.4 Uncovered Dioceses

Tables 15–16 show that we do not observe similar systematic patterns among uncovered dioceses, if we create a dummy variable called $Concordats_{Period_{db}}$ that takes a value of 1 from 1122–1309 and 0 otherwise.

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Table 7: Correlates of bishop alignment with pope, only covered diocese. Wealth measured as trade. Balanced panel.

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Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01

Table 8: Correlates of bishop alignment with pope, only covered diocese. Wealth measured as caloric potential. Balanced panel.

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Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01
Table 9: Correlates of bishop alignment with pope, covered and uncovered dioceses. Wealth measured as trade. Balanced panel.

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Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01

Table 10: Correlates of bishop alignment with pope, covered and uncovered dioceses. Wealth measured as caloric potential. Balanced panel.

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Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01
Table 11: Correlates of bishop alignment with pope, only covered diocese. Wealth measured as trade.

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monarch: no yes no no no yes no no
kingdom * half-century: no no yes no no no yes no
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Standard errors clustered by monarch.
* p < 0.1  ** p < 0.05  *** p < 0.01

Table 12: Correlates of bishop alignment with pope, only covered diocese. Wealth measured as caloric potential.

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kingdom * half-century: no no yes no no no yes no
grid * half-century: no no no yes no no no yes
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Standard errors clustered by monarch.
* p < 0.1  ** p < 0.05  *** p < 0.01
Table 13: Correlates of bishop alignment with pope, covered versus uncovered dioceses. Wealth measured as trade.

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Standard errors clustered by monarch.
* p < 0.1  ** p < 0.05  *** p < 0.01

Table 14: Correlates of bishop alignment with pope, covered versus uncovered dioceses. Wealth measured as caloric potential.

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Standard errors clustered by monarch.
* p < 0.1  ** p < 0.05  *** p < 0.01
Table 15: Correlates of bishop alignment with pope, only uncovered diocese. Wealth measured as trade.

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diocese fixed effects: yes yes yes yes yes yes yes yes
crusades: no yes yes yes no yes yes yes
monarch: no yes no no no yes no no
kingdom * half-century: no no yes no no yes no no
grid * half-century: no no no yes no no no yes
sample years: 325-1309 800-1309 800-1309 325-1309 325-1517 800-1517 800-1517 325-1517

Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01

Table 16: Correlates of bishop alignment with pope, only uncovered diocese. Wealth measured as caloric potential.

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monarch: no yes no no no yes no no
kingdom * half-century: no no yes no no yes no no
grid * half-century: no no no yes no no no yes
sample years: 325-1309 800-1309 800-1309 325-1309 325-1517 800-1517 800-1517 325-1517

Standard errors clustered by diocese.
* p < 0.1  ** p < 0.05  *** p < 0.01