

PRINTING AND INTEREST RESTRICTIONS IN ISLAM & CHRISTIANITY:
AN ECONOMIC THEORY OF INHIBITIVE LAW PERSISTENCE*

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Abstract

Until recently, many scholars attributed the divergence in Middle Eastern and Western European economic development to the "conservative nature" of Islam. This paper departs from such scholarship, suggesting that institutions supporting economically inhibitive laws are more likely to be self-enforcing in the Muslim world – providing an *appearance* of conservatism. A theoretical model inspired and substantiated by the history of interest and printing restrictions in Islam and Christianity suggests that this outcome emanates from the greater degree to which Islamic political authorities derive legitimacy from the dictates of religious authorities.

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1. Introduction

Over the past few decades, a significant amount of research has been conducted in search of the causes underlying the “rise of the West” (North and Thomas 1973; Jones 1981; Diamond 1997; Landes 1998; Pomeranz 2000; Acemoglu, Johnson, and Robinson 2005; Greif 2006). In relation to the Middle East, such research takes on a special significance. By almost any account, the Middle East was far more advanced economically and scientifically than Western Europe as late as the thirteenth century, yet Middle Eastern economies did not develop nearly as rapidly as Western European ones did in the ensuing centuries and were far surpassed economically after the Industrial Revolution (Ibn Khaldun 1379/1958; Kuran 1997; Lewis 2002).¹ Perhaps instead of searching for the factors underlying the rise of the West, the correct question to pose is the converse one Bernard Lewis (2002) suggests: "What went wrong?"

Until recently, popular explanations for the economic divergence suggested that the "conservative" or "mystical" nature of Islam discouraged curiosity (to learn non-Muslim languages or European cartography, take foreign expeditions, adopt foreign methods and techniques, and so forth) and prevented risk-taking, innovation, and mechanization (Cromer 1908; von Grunebaum 1966; Weber 1978; Lewis 1982, 2002). In this view, Islam is seen as inherently hostile to commerce and finance.² Indeed, there are numerous historical phenomena which, on the surface, encouraged this line of analysis. In particular, both religions advocated several laws which inhibited economic development – such as prohibitions on taking interest and

¹ Throughout this paper, I use the terms "Christian world" and "Western Europe" to denote the pre-Reformation Christianized regions under the Church of Rome. I also use the term "Islamic/Muslim world" somewhat broadly, comprising North Africa and the "Middle East" (that is, the entire Arab world, Iran, Turkey, the Balkan peninsula, and Spain up to the Reconquista). Muslim regions of Central Asia, the Indian subcontinent, and the Malay Peninsula are not the direct focus of this paper, though the results are applicable to these regions.

² For an overview of this literature, see Kuran (1997, p. 49-53). Said (1978) gives a fascinating historical account of Western views towards the "Orient", and in particular, the Middle East. Lerner (1958, p. 405) argues that the top policy problem (of the 1950s) for Middle Eastern leaders was the choice between "Mecca or mechanization". Also see Mokyr (1990).

printing, suppression of women, and laws against mass education. Although such laws were equilibrium outcomes in the pre-modern settings in which they emerged, they generally persisted for longer in Islam than in Christianity despite changing circumstances under which they inhibited economic activity.

This paper suggests that the differential persistence of economically inhibitive laws in Islam and Christianity resulted not from the “conservative nature” of the former but from the greater degree to which Islamic political authorities depended on conforming to the dictates of religious authorities for legitimacy – an exogenous remnant of the circumstances surrounding each religion’s birth. The unintended consequences of this difference on equilibrium actions and outcomes are thus amenable to a theoretical analysis which falls into a broader literature seeking exogenous roots of institutional and economic differences (Diamond 1997; Kuran 2001, 2003, 2005; Acemoglu, Johnson, and Robinson 2001, 2005; Engerman and Sokoloff 2002).

In order to shed light on these unintended consequences, I construct a theoretical model containing two salient features: 1) the existence of a productive action (such as lending at interest or printing) which is initially banned by political and religious authorities, and 2) political authorities are dependent on religious authorities for legitimacy. The model analyzes how an exogenous increase in the returns to production (such as the emergence of capitalistic markets allowing for investment lending or the invention of the printing press permitting the mass replication of words and images) affects the interactions between political authorities, religious authorities, and the laity under varying degrees of “dependence”. The basic tension examined is the one between the political and religious authorities’ relationship with the laity, whose productivity they have incentive to maximize, and their sources of legitimacy. The political

authority derives legitimacy by conforming to the dictates of the religious authority, while the religious authority derives legitimacy by upholding its “eternal” doctrine.

I show that when “dependence” is sufficiently large, institutions which support economically inhibitive laws are more likely to be self-enforcing – that is, the outcomes emanating from players’ actions motivate others to behave in a manner consistent with the institutional rules.³ The logic underlying this result is as follows. When “dependence” is large, it is costly for political authorities to permit religiously-prohibited actions, so they are unlikely to do so. In turn, only a small portion of the laity transgresses the prohibition, since this entails worldly costs (contract non-enforcement) *and* other-worldly costs (hell). With few individuals breaking its dictates, the religious authority has little incentive to enact a costly reinterpretation. Thus, the players’ interactions entail that no player has incentive to “push the envelope”, and the institutions upholding the law are self-enforcing. However, when the level of dependence is small, the institutional structure supports such incentives, and the institutions undermine the related laws. This encourages endogenous institutional change – the outcomes emanating from players’ actions entail that the set of institutions constraining their behavior changes over time.⁴

I substantiate the model’s claims by analyzing, in the context of the model, the histories of two of the most ubiquitous economically inhibitive laws in Islam and Christianity – interest (usury)⁵ and printing restrictions. These laws are conducive to shedding light on the general

³ For more on self-enforcing institutions, see Greif (1993, 2006).

⁴ For more on the theory of endogenous institutional change, see North (1990, ch. 9-11), Greif and Laitin (2004), and Greif (2006, ch. 5-6).

⁵ Though the terms interest and usury have different meanings in their modern context, in pre-modern times they were largely synonymous, and will thus be used interchangeably throughout the paper (Divine 1959; Persky 2007). Several other economic models have recently been advanced to explain interest bans. A common theme in many of these models is that interest bans are socially optimal given the conditions of the pre-modern economy (Posner 1980; Brenner 1983; Glaeser and Scheinkman 1998). However, these models have difficulty accounting for some of the historical phenomena analyzed in this paper, such as the divergence in interest theory in Islam and Christianity and the persistence of interest restrictions despite the feasibility of investment lending.

forces at work, as laws forbidding interest and the replication of words and images were equilibrium outcomes under certain economic conditions (before the commercial revolution and the invention of the printing press), yet they persisted in spite of changing circumstances under which they were inhibitive to economic development. I show that the interactions predicted by the model under differing institutional circumstances are salient features of these histories, and they can account for a wide variety of disparate (and sometimes counter-intuitive) historical phenomena.

The paper is organized as follows. Section 2 presents stylized facts of printing and interest histories, employing these facts to dismiss hypotheses which are not consistent with the historical record. Section 3 sheds light on the one hypothesis not dismissed – the divergence in economically inhibitive laws stems from the greater degree to which political authorities depend on religious authorities for legitimacy in Islam – formulating a model which highlights the economic consequences of this difference. Section 4 revisits the histories of interest and printing restrictions in the context of the model. Section 5 considers the broader ramifications of the discussion, and Section 6 concludes.

2. Stylized Facts and Potential Hypotheses

2.1. Stylized Facts: Interest and Printing Restrictions in Islam and Christianity

This paper employs a methodology championed by Greif (1993, 2006), utilizing a theoretical model aimed at facilitating an understanding of an economic relationship in a specific historical setting. As in Greif, the approach taken here is that the model should be based as much as possible on assumptions justified by historical evidence, and in turn, the model should account for phenomena under consideration while employing the fewest possible additional assumptions.

To this end, this section summarizes nine stylized facts (SF) of interest restrictions and seven stylized facts of printing restrictions in Islam and Christianity.⁶ These facts are employed to test the scope of a variety of potential hypotheses related to the differential persistence of economically inhibitive religious laws. The history thereby tames the theory, pointing our focus away from hypotheses not consistent with the historical evidence.

SF #1: Christian interest restrictions were strengthened in the twelfth century (most famously through Lateran II and III, which proscribed excommunication for usurers, refused usurers burial in Christian grounds, and interdicted usurers' offerings) (Le Goff 1979).

SF #2: The Church commenced a series of relaxations of the ban beginning in 1270. Early alternatives to open lending at interest included partnerships (*societas* or *commenda*) and the *census*, an annuity on a fruitful good. These contracts had features implicit in interest-bearing loans, yet in the thirteenth through fifteenth centuries were justified by Church authorities – after becoming deeply embedded in commercial relations – as legitimate within the context of Christian thought. In subsequent centuries, Church leaders allowed other open, circumventive practices that were similar in spirit to lending at interest, such as the triple contract,⁷ bills of exchange, mortgages, and fictitious sales. By the nineteenth century taking moderate interest was permitted (Noonan 1957, 1969; Divine 1959).

SF #3: Secular interest caps – which effectively legalized moderate interest – became ubiquitous throughout Europe in the middle of the thirteenth century (Rubin 2008a).

⁶ For a more detailed account on interest history, see Noonan (1957), Divine (1959), Homer and Sylla (1990), and Rubin (2007). For printing history, see Febvre and Martin (1958), Eisenstein (1979), and Robinson (1993).

⁷ The triple contract was made up of three different types of transactions: a contract of partnership (*societas*), insurance on the principal of the partnership, and a contract where an uncertain future gain is sold for a lesser certain gain. Each individual contract was valid, but when combined, simulated a risk-free loan.

SF #4: Many of the later Christian relaxations of the interest ban came from outside the papacy and were espoused by disparate theologians at the Universities. Papal bulls were decreed in opposition to many of the transactions permitted by the theologians, including bills of exchange and the triple contract (Noonan 1957, 1966).

SF #5: Christian usurers were considered amongst the worst types of evil-doers in the medieval period, often compared with murderers and rapists, and were subject to legal and ecclesiastical prosecution (Le Goff 1979, 1988; Helmholz 1986). On the other hand, there is little evidence that Muslim usurers faced temporal penalties beyond not having their contracts enforced (Gerber 1999).

SF #6: Muslim lenders employed ruses (*hiyal*) in order to circumvent the ban as early as the first Islamic century. An example of *hiyal* is the double sale (*mukhātara*), in which the prospective debtor sells to a creditor some commodity for cash, then immediately buys it back for a greater sum payable at a later date (essentially amounting to a loan at interest, with the interest being the difference between the two prices). *Hiyal* were allowed (and created) by religious authorities, but merchants rarely conducted (and political authorities rarely allowed) interest-bearing transactions beyond those allowed by the religious authorities (Khan 1929; Schacht 1964, 2006; Coulson 1969; Grice-Hutchinson 1978).

SF #7: Interest was de facto legalized in much of the Ottoman Empire in the mid-fifteenth century, as most interest-based transactions were permitted as long as sufficient lip service was paid to Islamic law (*sharī'a*) (Gerber 1988, ch. 7; Imber 1997). For example, the Ottoman *mufī* Ebu's-su'ud permitted lending at moderate interest (though charging greater than 15 percent was considered a criminal offense) under the euphemistic designations "transaction"

or “legal transaction” (Imber 1997, p. 146). The interest ban remains part of Islamic doctrine today (de jure).

SF #8: Muslim religious authorities allowed one major reinterpretation of interest theory – the permission of *hiyal*. Christian religious authorities did not employ a “catch-all” theory like *hiyal*, but instead reinterpreted frequently on the margin, justifying specific practices within the context of Christian thought (often by resolving them into other, lawful contracts).

SF #9: The Christian interpretation of interest was less permissive than the Muslim one for much of their shared history. Early Islamic *hiyal* were closer to open lending at interest than any type of transaction allowed by the Church until the fifteenth century (when, for example, bills of exchange and the triple contract were permitted).

SF #10: The printing press spread rapidly throughout a cross-section of important Western European cities and the Church was amongst its greatest supporters (Febvre and Martin 1958).

SF #11: The Church lost its monopoly on educational and intellectual institutions in the late-thirteenth century – which it previously held through the book-producing efforts of the monasteries – when the Universities commenced major religious and secular book-publishing programmes (Haskins 1957; Schachner 1962; Christ 1984).

SF #12: The secular wings of the Universities grew in the late-thirteenth century largely through the support that they received from lay rulers (Schachner 1962).

SF #13: Although the printing press was known in the Ottoman Empire as early as 1493, there were no Muslim presses in the Ottoman Empire until 1727, and outside the Ottoman Empire the press spread even slower (Göçek 1987; Savage-Smith 2003).

SF #14: Muslim religious authorities claimed that the press diminished the importance of the oral transmission of the Qur'an (Robinson 1993). This system of transmission was the backbone of Muslim education, but it also entailed that the mass production of books threatened the religious authority's control of the educational and legal systems (Göçek 1987; Savage-Smith 2003).

SF #15: Until the eighteenth century, Ottoman *sultāns* explicitly forbade Muslims from printing in Arabic script (although books printed in Arabic were available in Europe since 1514), but non-Muslim printing presses were permitted. The *sultāns* permitted such presses only if they printed "only in either Hebrew or Latin characters, thus offering no threat to either prejudice or interest" (Göçek 1987; Savage-Smith 2003).

SF #16: The printing press was not widespread in the Muslim world until the nineteenth century. The press flourished with greater rapidity in regions where Muslims were under some form of colonial rule and the threat of the West to Islam was more apparent, and it was delayed longer – although eventually accepted – in regions that were threatened by Europe, but were not under direct Western control (Robinson 1993).

2.2. Potential Hypotheses

In this section, I consider seven hypotheses – representing the most frequently analyzed differences in culture and institutional structures in the Muslim and Christian worlds – which could explain the differential persistence of economically inhibitive laws in Islam and Christianity. Devoid of historical context, any of the following hypotheses could theoretically account for the differences. Yet, a convincing hypothesis should be able to account for the sixteen stylized facts presented in the previous section. In this section, I show that six of the seven hypotheses are contradicted by the historical facts presented in section 2.1 and are thus

untenable. Though I do not claim that a mono-causal explanation exists for such a complex phenomenon, and it is indeed likely that all seven of the potential hypotheses (PH) suggested in this section played some role in the divergence, only one – the divergence stems from the greater degree to which Islamic political authorities derive legitimacy from religious authorities (PH #7) – is consistent with all sixteen stylized facts.

PH #1: Social pressures provided incentive for individuals to falsify their preferences, which allowed economically inhibitive equilibria to persist (as in Kuran 1995, 1997).

This hypothesis cannot explain why preference falsification occurs in the Muslim economic setting but not the Christian one. Although social pressures exacerbate the effects of most of the potential hypotheses, they cannot be the ultimate cause.

PH #2: The divergence is cultural in nature – Christian "individualism" versus Islamic "collectivism" promoted different equilibrium outcomes (as in Greif 1994).

One testable prediction arising from this argument is that law-breakers should receive less social condemnation in individualistic (Christian) societies. Yet, medieval Christian usurers received harsher social penalties (being stigmatized in the same vein as murderers and rapists) than Muslim usurers (SF #5).

PH #3: The divergence stems from the hierarchical nature of the religious institutions in pre-Reformation Christianity relative to those of Sunni Islam.⁸

This hypothesis implies that the relaxation of inhibitive laws results from the centrality of authority. Therefore, this hypothesis cannot account for the fact that later relaxations of the Christian interest ban arose *outside* the papacy, being espoused by disparate theologians at the

⁸ Within Islam, it is commonly held that Shī'i Islam has a more hierarchical structure than Sunni Islam. Yet, these structures contain an incredible amount of heterogeneity over time, and the Shī'i hierarchy only began to emerge when the Safavid rulers made Shī'i the state religion of Iran in the early sixteenth century (Arjomand 1985). Hierarchical structures are not completely absent in Sunni Islam, where a highly developed sense of rank amongst *mufītīs* has had considerable influence on the validity of various *fatwās* (Stewart 1988).

Universities (SF #4). Indeed, papal bulls were decreed in *opposition* to many of the transactions permitted by the theologians. For example, it took over one hundred years after the introduction of the triple contract (and its acceptance by theologians) for the papacy to issue the bull *Detestabilis*, which denounced the contract (the bull, however, was not heeded in commercial relations, where the contract had become custom) (Noonan 1957).

PH #4: The religious homogeneity of pre-Reformation Europe relative to Islam, which is not only divided into Shī'i and Sunni, but the latter into four major schools of jurisprudence, played a defining role in the divergence.⁹

This hypothesis cannot simultaneously explain two historical facts: 1) Muslim authorities were *more* permissive than Christian ones until the fifteenth century (SF #9). If this hypothesis is correct, it indicates that religious homogeneity discourages the alleviation of inhibitive economic laws. On the other hand, 2) dramatic changes in Christian interest theory, which precipitated the eventual alleviation of the ban, occurred *prior* to the Reformation (SF #2). However, religious homogeneity in Europe was not greatly threatened until *after* the Reformation. Thus, the timing of events does not reconcile with these two facts – if religious heterogeneity encourages economies to “escape” inhibitive equilibria (as is suggested by the former fact, SF #9), then changes in Christian interest theory should have occurred after, not before, the Reformation.¹⁰

PH #5: The divergence emanated from the lower cost of coordination between Muslim political and religious authorities.

⁹ Culture is another source of heterogeneity in the Muslim world. Islam has a substantial number of followers in North Africa, the Arab world, Turkey, the Indian subcontinent, and the Malay peninsula.

¹⁰ On the other hand, Western Europe was much more *politically* heterogeneous than the Middle East throughout the medieval period. This phenomenon complements the hypothesis presented in this paper – Middle Eastern political homogeneity likely contributed to the dependence of the political authority on the religious authority – but a detailed analysis of its implications are outside the scope of this paper.

Indeed, Christian interest restrictions weakened after lay regents regained their coordinative ability in the thirteenth century (SF #2), and Ottoman interest restrictions were relaxed soon after the position of jurisconsultant (*muftī*) became an apparatus of the state (SF #7). Yet, these facts contradict the broader historical reality that coordination was *less* costly in the Muslim world. Most judges (*kādī*) – who were the primary enforcers of the law – were appointed by political leaders, who were able to extract favors in return for job security and power (Imber 1997). This entailed coordinative ability which was never present, at least to such an extent, in Europe after the early twelfth-century Investiture Controversy (which greatly limited lay involvement in clerical appointments). Thus, a theory based on coordinative ability cannot account for the ban's dissipation in Christianity but not Islam while also accounting for SF #2 and SF #7.

PH #6: Monetary incentives drove religious authority's actions and hence the divergence (as in Ekelund, Hébert, and Tollison 1989).

Although there were clear economic incentives for Muslim religious authorities to suppress the spread of printing (SF #14), this hypothesis cannot explain the Ottoman *sultāns* forbidding Muslim presses for centuries (SF #15). The *sultāns* permitted non-Muslim printing presses, indicating that it was in their economic interest to do so. Yet, they forbade Muslims from printing in Arabic script for centuries. Such complicity cannot be accounted for via the political or religious authority's monetary incentives. Moreover, Christian interest theory was heavily influenced after the fifteenth century by those outside of the papacy (SF #4), suggesting that (unlike the argument presented in Ekelund, Hébert, and Tollison [1989]) changes in interest theory were not a direct result of economic motivations of the Church and especially the pope.

PH #7: The divergence stems from the greater degree to which Islamic political authorities depend on the dictates of religious authorities for establishing legitimacy.

This is the only one of the potential hypotheses which is not contradicted by one of the stylized facts of interest and printing histories. Moreover, this differing institutional relationship stems from the birth of these religions and is thus *exogenous* to the specific doctrines in question, making it conducive to theoretical analysis. Indeed, early Christians were forced to live under Roman authority, where it was both unnecessary and infeasible to create a legal system based on religious principles, and early Church leaders advocated a separation between political and religious institutions.¹¹ On the other hand, Islam was formed at a time of weak centralized power and tribal feuding in the Middle East. Consequently, Islamic ideals quickly became those of the state, and there has never been a clear demarcation in the Muslim world between religious and legal authority.¹²

But can this hypothesis account for *all* of these facts? Although it is not contradicted by any of the facts, it does not obviously *account* for some of them, such as SF # 5, 8, 9, 10, 15, and 16. In order to explore this possibility, I build a theoretical model which captures the salient elements of both religions and analyzes how changes in these elements – particularly the level of institutional “dependence” – affect the equilibrium interactions between the relevant players and the sustainability of economically inhibitive religious laws.

3. Model: “Dependence” and Persistent Equilibria

3.1. Overview of the Model and Results

¹¹ The most famous support for this position is attributed to Jesus: “Render unto Caesar the things which are Caesar's, and unto God the things that are God's" (Matthew 22:21).

¹² For more on the exogeneity of this difference in institutional structures, see Lewis (1974, 1995) and Rubin (2007). For more on the intersection of the religious and the legal in Islam, see Lewis (1974, 1995, 2002) and Hassan (1981).

This section considers an economy consisting of three types of players – a political authority (PA), a religious authority (RA), and numerous laity (L). It contains two salient features: 1) the laity chooses whether or not to undertake some economically productive action (such as lending at interest or printing) whose legality is determined by the PA and RA, and 2) the PA incurs a cost from legalizing actions prohibited by the RA (in terms of Section 2, the PA is “dependent” on the RA for legitimacy). I model the interactions of the players in order to shed light on the relationship between these two features under a set of historically-motivated behavioral assumptions.

The model highlights the consequences of an exogenous "period 0" event that increases the economic returns to production. In the context of lending at interest or printing, this event could be the emergence of capitalistic markets allowing for investment lending or the invention of the printing press allowing for mass printing. Hence, this event entails that any law prohibiting the action is economically inhibitive. The event sparks interactions between the players, who are infinitely-lived and whose actions and objectives are described below.

Laity. The laity acts first, deriving utility from undertaking some action which is an input in a production function. In each period, they choose between undertaking the action, not undertaking the action, or undertaking the action while incurring a transaction cost (which helps them avoid detection, secure contract enforcement, or ease their conscience – such as transacting on the black market or with a ruse which violates the spirit, but not the letter, of the law). They incur a cost from choosing actions which the PA and/or RA prohibit (representing the worldly and otherworldly sanctions associated with the action, respectively).¹³

¹³ Otherworldly sanctions are widely seen as an important force in sustaining economic equilibria. See, for example, Azzi and Ehrenberg (1975), Richardson (2005), and Rubin (2008b).

Political and Religious Authorities. After the laity acts, the PA and RA, acting simultaneously, “interpret” the legality of the action. They choose to either prohibit the action (which they do in period 0), permit the action, or allow it as long as a sufficiently large transaction cost is undertaken. The PA and RA derive utility from L’s production.¹⁴ They observe L’s past actions but not their utility functions; hence, they employ L’s past actions as a (unmodeled) signal for L’s future response to interpretations (and thus their future productivity). That is, if L’s act openly despite incurring worldly or otherworldly costs, the RA and PA view this as a positive signal of the action’s economic returns. This specification allows for simplification to a repeated one-period game – although the RA and PA are forward-looking, they do not know the future effects of their interpretations with certainty and thus recalculate their optimal interpretation in each period.¹⁵

The PA and RA also derive utility from the “legitimacy” of their interpretations. The former loses legitimacy (and hence utility) when it permits actions prohibited by the latter, a phenomenon which is at the heart of this model. For reasons noted in Section 2 (PH #7), I assume that the degree to which the PA depends on the RA for legitimacy – modeled as a “dependence” parameter – is exogenous. The PA’s cost of diverging from the RA’s interpretation is increasing in the dependence parameter, and the model analyzes how changes in this parameter affect equilibrium outcomes.

¹⁴ Lay production can benefit the PA or RA in numerous (unmodeled) ways. It directly benefits them if they are benevolent, and even if they are self-interested, production provides a greater tax base and decreases the cost of social insurance provision. For examples of these motivations in history, see Duby (1980) and Ekelund et al. (1996).

¹⁵ This specification can also account for situations in which the RA has economic incentive to suppress the action. In this case, the less transaction cost incurred by L’s in the past, the greater the returns to permitting the action are *relative* to the costs, since L’s actions diminish the utility the RA receives by suppressing the action. For example, Muslim jurists had incentive to suppress printing in order to maintain their monopoly on educational and intellectual institutions. Yet, as the press spread, their monopolies were lost, in turn decreasing the relative cost of permitting printing.

The RA derives legitimacy from two sources. One source is its hold on “eternal truths” – when such truths are reinterpreted the very nature of its authority is threatened (Rodinson 1973; Noonan 1993, 2005; Ekelund et al. 1996; Hallaq 2001). Hence, in the model, the RA incurs a cost from changing its interpretation relative to the previous period. The other source of legitimacy is the degree to which its dictates are followed by the laity. Indeed, accommodating custom has historically been an open concern of Islamic and Christian religious authorities (Schacht 1964, p. 78-85; Noonan 1966, 1993, 2005; Rodinson 1973; Imber 1997; Libson 1997; Gerber 1999; Hallaq 2001; Zubaida 2003, ch. 1-3). Thus, in the model, the RA’s utility is increasing in the number of L’s complying with its interpretation.

Results. The primary result of the model is that the size of the parameter set over which an economically inhibitive law (defined as any interpretation which does not openly permit the action) persists is increasing in the “dependence” parameter. The logic underlying this result is as follows. The first order effect of an increase in dependence is that the PA's interpretation is less permissive. In turn, lay agents are discouraged from transgressing the law, as they face both spiritual and legal costs from doing so. With few agents openly breaking its dictates, the RA has little incentive to reinterpret, since doing so is costly and there is little to be gained on the margin. No player has incentive to change actions and the institutions upholding the laws are self-enforcing. However, when the level of dependence is small, the PA has greater incentive to legalize the action. In turn, more agents transgress the RA's law, as they only face otherworldly (and not worldly) costs from doing so. With more agents breaking its dictates, the RA has greater incentive to reinterpret its doctrine. The implications of the institutional structure thus undermine the related laws, encouraging endogenous institutional change.

3.2. Setup

Consider an economy in which all players are infinitely lived and actions are common knowledge. These players engage in a dynamic game with perfect information of previous actions. There are $N + 2$ players (for some large N): N members of the laity (L), a religious authority (RA), and a political authority (PA). N is large enough such that the actions of any one L do not affect the equilibrium action of the RA or PA (that is, no agent is pivotal).¹⁶

In each period (denoted with subscript t), L's act first, deriving utility from producing via some action, $a_t \in A$, which is an input in a production function $g(\cdot)$. $A = \{0, a^1, a^2, \dots, a^m, 1\}$, $0 < a^1 < a^2 < \dots < a^m < 1$, and A is interpreted as follows: $a_t = 1 \Rightarrow$ L undertakes the action without incurring a transaction cost; $a_t = 0 \Rightarrow$ L does not undertake the action; $a_t \in \{a^1, a^2, \dots, a^m\} \Rightarrow$ L undertakes the action, but incurs transaction cost $1 - a^j$ (for $j \in \{1, \dots, m\}$). All L's have different types, τ_i , distributed over a cdf $F(\cdot)$, where L's marginal product is increasing in type.

After L's act, the PA and the RA simultaneously choose an interpretation, $i_t^{PA} \in A$ and $i_t^{RA} \in A$, respectively. L's face a legal cost $\ell(\cdot)$ when its actions are greater than the PA's interpretation ($a_t > i_t^{PA}$). L's also face a spiritual cost $s(\cdot)$ for actions greater than the RA's interpretation ($a_t > i_t^{RA}$).¹⁷ Legal and spiritual costs are increasing in the degree of the chosen

¹⁶ Alternatively, the actions of the RA and PA could be modeled as “quasi-parameters”, as in Greif and Laitin (2004) and Greif (2006). That is, their actions are exogenous to the laity at any point in time but are endogenous to the game as a whole. Moreover, this specification entails that the results may be sensitive to large shifts in N . However, population change is not a concern of this model – such a concern is alleviated by placing the objective functions of the RA and PA in per capita terms.

¹⁷ These two types of costs are similar to those modeled in Kandell and Lazear (1992), who look at internal and external motivations in the context of peer pressure and partnerships.

action's deviation from i_{t-1}^{PA} and i_{t-1}^{RA} , respectively.¹⁸ Each L (denoted with subscript i) solves the following problem in each period t :¹⁹

$$\max_{a_{t,i}} g(a_{t,i}; \tau_i) - \ell(a_{t,i} - i_{t-1}^{PA}) - s(a_{t,i} - i_{t-1}^{RA}), \quad (1)$$

where $g_1 > 0$, $g_{11} < 0$, $g_{12} > 0$, $g(0; \cdot) = 0$, $\ell' > 0$, $\ell'' > 0$, $\ell(x) = 0$ if $x \leq 0$, $s' > 0$, $s'' > 0$, and $s(x) = 0$ if $x \leq 0$.

The primary parameter of concern in the model, $\gamma \in [0,1]$, denotes the degree to which the PA derives legitimacy/utility by conforming to the interpretation of the RA. This parameter enters the PA's utility through a cost function $c^{PA}(\cdot; \gamma)$, which measures the cost incurred by the PA for choosing an interpretation greater than i_{t-1}^{RA} . At $\gamma = 0$, there is no such cost, at $\gamma = 1$, there is an infinite cost (if $i_t^{PA} > i_{t-1}^{RA}$), and at $\gamma \in (0,1)$, there is a positive cost which is increasing in γ . The PA derives utility from L's production, and it derives more utility from a greater interpretation the greater L's actions are. The PA solves the following problem in each period t :

$$\max_{i_t^{PA}} K^{PA}(i_t^{PA}, \bar{a}_t) - c^{PA}(i_t^{PA} - i_{t-1}^{RA}; \gamma), \quad (2)$$

where \bar{a}_t is the vector of L's actions, $K^{PA}: \mathfrak{R}^{N+1} \rightarrow \mathfrak{R}$ has the properties $K_1^{PA} > 0$, $K_{11}^{PA} \rightarrow 0$, $K_{1j}^{PA} > 0 \forall j \in \{2, \dots, N+1\}$, and $c^{PA}(\cdot; \gamma)$ has the properties $c_1^{PA} \geq 0$, $c_2^{PA} > 0$, $c_{11}^{PA} > 0$, $c_{12}^{PA} > 0$, $c^{PA}(x; \cdot) = 0$ if $x \leq 0$, $c^{PA}(y; 0) = 0 \forall y$, and $\left\{ c^{PA}(z; 1) = \begin{cases} 0 & \text{if } z \leq 0 \\ \infty & \text{if } z > 0 \end{cases} \right.$.

The RA incurs a "reinterpretation" cost, $c^{RA}(\cdot)$, which is increasing in the distance between the new and old interpretations (that is, the degree to which "eternal" truths are

¹⁸ Similar assumptions are employed in Iannaccone (1988) and Kuran (1995).

¹⁹ Although L's are infinitely lived, their utility is not maximized over an infinite horizon. Their individual actions do not affect the PA, RA, or other laity, so a discount factor merely acts as a scalar. I am not concerned with changes in equilibria across different discount factors, so this consideration has been omitted.

reinterpreted). The RA derives utility from L's production, and it derives more utility from a greater interpretation the greater L's actions are. The RA also derives utility from L's following its dictates ($a_t \leq i_t^{RA}$). It solves the following problem in each period t :

$$\max_{i_t^{RA}} K^{RA}(i_t^{RA}, d, \bar{a}_t) - c^{RA}(i_t^{RA} - i_{t-1}^{RA}), \quad (3)$$

where $d = \sum_{k=1}^N 1(a_{t,k} \leq i_t^{RA})$, $1(x)$ is an indicator function equaling one if x is true, $K^{RA}: \mathfrak{R}^{N+2} \rightarrow \mathfrak{R}$ has the properties $K_1^{RA} > 0, K_{11}^{RA} \rightarrow 0, K_2^{RA} > 0, K_{1j}^{RA} > 0, K_{2j}^{RA} > 0 \forall j \in \{3, \dots, N+2\}$, and $c^{RA}(\cdot)$ has the properties $c^{RA'} > 0, c^{RA''} > 0$, and $c^{RA}(x) = 0$ if $x \leq 0$.²⁰ The RA and PA break indifference by not reinterpreting. The initial conditions are $\bar{a}_0 = i_0^{RA} = i_0^{PA} = 0$, and all functions are assumed to be smooth.

3.3. "Dependence" and Persistent Equilibria

In this section I study players' behavior in order to derive a link between the level of "dependence" (γ) and the RA's and PA's interpretation in equilibrium. The following definitions simplify the analysis:

DEFINITION 1. The institutional structure is **self-enforcing** in period t if $a_{t,k} = a_{t-1,k} \forall k$,

$$i_t^{RA} = i_{t-1}^{RA}, \text{ and } i_t^{PA} = i_{t-1}^{PA}.$$

DEFINITION 2. An equilibrium is **persistent** in period t if the institutional structure is self-enforcing in every period $\bar{t} \geq t$.

DEFINITION 3. A persistent equilibrium in which either $i^{PA} < 1$ or $i^{RA} < 1$ is **inhibitive**.

First, note that there exists a persistent equilibrium in *every* parameter set. To see this, assume that this is not true – that is, there is a parameter set in which a persistent equilibrium does not

²⁰ The assumptions $K_{11}^{PA} \rightarrow 0$ and $K_{11}^{RA} \rightarrow 0$ allow for clean results. Dropping them does not dramatically alter the qualitative results, but merely allows for the existence of special (and uninteresting) cases. They are actually much stronger assumptions than are necessary for the results to hold – as long as K_{11}^{PA} and K_{11}^{RA} are not *too* concave, all of the propositions hold.

exist. Then, in every period, either $a_{t,k} > a_{t-1,k}$ for some k , $i_t^{RA} > i_{t-1}^{RA}$, or $i_t^{PA} > i_{t-1}^{PA}$. Since A is finite and players are infinitely lived, these three inequalities cannot hold *ad infinitum*.

The persistent equilibrium is also unique. Uniqueness arises from the simplicity of the model – there is no randomness nor exogenous change, an explicit rule exists for breaking indifference, and persistent equilibria are a steady state.

Next, consider the relationship between γ and the existence of inhibitive equilibria. To begin, note that multiple equilibrium paths exist over the parameter space, largely driven by the shape of $F(\cdot)$. Thus, in order to shed light on salient outcomes, I confine attention to a specific subset of cases. Following a methodology advocated by Greif (1993, 2006) and Bates et al. (1998) in which historically relevant facts guide concentration to the appropriate equilibria, I employ arguments made by (amongst others) Noonan (1966, 1993, 2005), Rodinson (1973), Libson (1997), and Hallaq (2001), who suggest that Muslim and Christian authorities historically have "accepted" practices which became customary. In the present model, such acceptance occurs endogenously under some parameter specifications. For the remainder of the analysis, I confine attention to these parameter sets. The following definition is useful for this analysis.

DEFINITION 4. The interpretations in the unique persistent equilibrium are **accepted religiously** in

period t^* if and only if $i_{t^*}^{RA} = i_{t^*}^{PA}$.

Accepted religiously persistent equilibria (ARPE) have the property that religious interpretation is never lagging in the long run – that is, custom is “accepted”.²¹ Although concentrating on such equilibria diminishes some of the model's traction, history points to equilibria in which religious interpretation is malleable to economic and political exigencies.

²¹ Note, however, that \bar{a}_{t^*} does not necessarily equal $i_{t^*}^{PA}$ or $i_{t^*}^{RA}$ in ARPE. Indeed, it is likely that some L 's transgress the RA in any inhibitive ARPE. Yet, while it is possible that *both* authorities lag behind a “progressive” society (in which case custom is not accommodated), this phenomenon – akin to anarchy in that lawlessness is the norm – is outside the scope of this paper.

Concentrating on ARPE permits a more straight-forward analysis of the consequences of “dependence” (γ). The first-order effect of dependence is an inherent inflexibility arising from the PA’s cost function. Because of this inflexibility, high- γ PA’s differ less in their interpretation from the RA, *ceteris paribus*, and the incentive for the laity to “push the envelope” and break the religious and/or legal dictates are diminished. This in turn provides less incentive for the PA and RA to reinterpret. If γ is sufficiently large, a situation emerges in which no player has incentive to “push the envelope”, and the resulting inhibitive equilibrium is supported by self-enforcing institutions. Proposition 1 formalizes this intuition, providing the primary comparative static result of this paper. Proofs of all propositions are in Appendix A.

PROPOSITION 1. In the unique ARPE, the equilibrium actions i^{RA*} and i^{PA*} are weakly decreasing in γ .

Proposition 1 highlights the effect of dependence in persistent equilibria. Yet it provides no insight into periods before such equilibria are reached. The remaining analysis sheds light on these periods, in turn increasing the number of testable predictions arising from the model.

To this end, I conduct a qualitative analysis of i^{PA*} and i^{RA*} (for one parameter set with a large enough action set that the interpretations are close to smooth) over the first three periods, highlighting some of the consequences of dependence. I discuss the intuition underlying the interpretations in each period and relate these interpretations to more general outcomes. For illustrative purposes, I omit the interpretations of the laity in all figures.

Period 1: All RA’s face the same optimization problem regardless of γ , and thus all choose the same interpretation. The only difference in the PA’s optimization problem is γ . It thus follows that i_1^{PA} is weakly decreasing in γ . For sufficiently large γ it is too costly for the PA to differ from i_0^{RA} , so $i_1^{PA} = 0$.

[INSERT FIGURE 1 HERE]

Period 2: All L's actions are weakly greater than in period 1. L's actions are increasing in i_1^{PA} , so i_2^{PA} is decreasing in γ . All PA's choose $i_2^{PA} \geq i_1^{RA}$, since there is no cost associated with interpretations less than i_1^{RA} .

Note that $i_1^{PA} - i_1^{RA}$ is decreasing in γ . Thus, L's face lower legal costs from choosing greater actions in period 2 in low- γ economies and hence transgress i_1^{RA} to a greater extent. In order to permit such actions, the low- γ RA must undertake a dramatic reinterpretation. In the present example, the low- γ RA's marginal reinterpretation cost outweighs the marginal benefit of permitting such actions, and it only permits a portion of the laity's actions. Yet, at a sufficiently large γ (or sufficiently small i_1^{PA}), $i_1^{PA} - i_1^{RA}$ is not great enough to encourage L's to choose actions which significantly transgress i_1^{RA} . In turn, the RA is motivated to choose $i_2^{RA} \geq i_1^{PA}$, thus increasing the number of L's following its dictates (d) while not incurring a significant reinterpretation cost.

[INSERT FIGURE 2 HERE]

This intuition is generalizable and entails two testable predictions. The first is that a high- γ RA should reinterpret less frequently than a low- γ RA before "catching up with custom". The intuition underlying this result is described above: L's transgress high- γ RA's interpretations to a lesser extent, so a less radical – and less costly – reinterpretation is necessary for these RA's to accommodate custom. Meanwhile, low- γ RA's have greater incentive to take "smaller steps", avoiding dramatic reinterpretations before eventually accommodating custom. This result is formalized in Proposition 2.

PROPOSITION 2. For all equilibria in which interpretations are accepted religiously when $i_t^{RA} < 1$, the number of reinterpretations by the RA before $i_t^{RA*} \geq i_{t-1}^{PA*}$ in some period t^* is weakly decreasing in γ , *ceteris paribus*.

The other result is a counter-intuitive one. It stems from the intuition underlying Proposition 2, namely that under some parameter sets it is possible that L's actions encourage high- γ RA's to interpret at least to i^{PA} while low- γ RA's take smaller steps in order to catch up with custom. This entails a “kink” in Figure 2; at some large γ , the RA's return from accommodating a larger portion of L's actions (who cluster around i_1^{PA} in order to incur a small legal cost) is sufficient to encourage an “accepted religiously” interpretation, though it is not for lower- γ RA's. That is, L's evade the low- γ RA's dictates to a greater extent – the cluster around i_1^{PA} is a sufficient distance from i_1^{RA} – and thus interpreting to accommodate custom entails a larger reinterpretation cost. This intuition entails the counter-intuitive, testable prediction (which is formalized in Proposition 3) that a greater level of dependence can temporarily lead to a *more permissive* religious interpretation. In other words, a functioning black market or institutionalized set of ruses may arise more quickly in a high-dependence economy.

PROPOSITION 3. Consider two economies, A and B , with dependence parameters γ_A and γ_B , respectively, where $\gamma_A > \gamma_B$ and all other parameters are equal. In an ARPE, \exists some parameter sets in which i_t^{RA*} in economy A is greater than i_t^{RA*} in economy B in some period t° prior to the one in which both interpretations are accepted religiously.

Period 3: This period contains phenomena similar to those in Period 2, but over a larger part of the parameter set. L's actions are increasing in i_2^{RA} and i_2^{PA} , which in turn entails greater i_3^{RA} and i_3^{PA} . Propositions 2 and 3 hold over all values of γ – even more kinks arise, and there are values

of γ for which a higher- γ RA has a greater interpretation than a lower- γ RA (Proposition 3), and the number of interpretations before ARPE is reached is weakly decreasing in γ (Proposition 2).

[INSERT FIGURE 3 HERE]

*Period t^** : This period represents an ARPE. A portion of the interpretations are inhibitive, and the interpretations are weakly decreasing in γ , even at γ in which a “kink” arose in previous periods (Proposition 1). For such γ , there exists greater incentive for all players to “push the envelope” once the interpretations are accepted religiously, and hence interpretations in these economies are relaxed to a greater extent.

[INSERT FIGURE 4 HERE]

With these results, the theoretical exercise is complete. By focusing on ARPE, the following testable predictions are derived:

- It is more likely that an ARPE is inhibitive the greater the level of “dependence” (Proposition 1).
- The number of religious reinterpretations that occur before the RA “catches up with custom” is decreasing in dependence (Proposition 2).
- An economy with greater dependence may temporarily be *more* permissive than the one with less dependence, though this equilibrium will not persist (Proposition 3).

4. Stylized Facts in the Context of the Model

I now reconsider the stylized facts presented in Section 2 in the context of the salient interactions predicted by the model.

In the eleventh through thirteenth centuries, capitalistic markets materialized in Western Europe. In the context of the model, this phenomenon can be viewed as the “period zero” event which sparks interactions between the laity, political authorities, and religious authorities. Prior to this period, loans were primarily taken for consumption, and hence usury laws were not necessarily inhibitive.²² Yet, the emergence of capitalistic markets entailed that investment lending was feasible and that interest bans thereby inhibited economic activity.

Coinciding with this “period zero” event, the resolution of the Investiture Controversy at the Concordat of Worms (1122) permitted papal power to reach its zenith, with the popes establishing suzerainty over secular lands (that is, γ was relatively large). As proposition 1 predicts, interest restrictions were also strengthened in this period, with Lateran II and III (1139 and 1179) proscribing particularly harsh punishments for usury (SF #1). By the late thirteenth century, however, ecclesiastical leaders had lost much of their authority – a result of the growth of secular power into national kingdoms, new theories of the state based on Aristotelian foundations, and movements of criticisms within the Church (Tierney 1988) – and secular regents recaptured domain over much of their lands (that is, γ decreased in this period). As Proposition 1 predicts, interest restrictions were relaxed in this period. Indeed, the interactions analyzed in the model proved salient: the relaxation commenced with political authorities, who were less dependent on the Church than in previous centuries, allowing moderate interest (SF #3). Meanwhile, beginning in the late thirteenth century, the Church slowly caught up with custom by repeatedly relaxing the ban; by the fifteenth century, the Church permitted openly usurious practices such as bills of exchange and the triple contract (SF #2). This history thus accords with the model’s intuition – as secular dependence on the Church diminished in

²² Indeed, Rubin (2008b) shows that interest bans are an equilibrium outcome in economies where loans are primarily taken for consumption.

medieval Europe, the legal relaxation of interest restrictions encouraged lenders to “push the envelope”, and the institutions supporting the ban were undermined.²³

In the Islamic world, *mufit̄s* (the primary source of legal and religious reinterpretation in Islam) and other religious scholars gained considerable independence from the state in the first Islamic century (Masud, Messick, and Powers 1996; Berkey 2003; Hallaq 2005). In the face of a powerful legal class, the caliphate had little choice but to comply with Islamic law; otherwise, the philosophy underpinning their legitimacy, which was largely based on their blood lines connecting them to the Prophet, would have been undermined (that is, γ was very large). Thus, lenders incurred worldly *and* otherworldly costs from openly lending at interest, which was banned since the dawn of Islam. To avoid these costs, they circumvented the ban by employing ruses (*hiyal*), such as the double sale, which violated the spirit but not the letter of the law (SF #6). Yet, because these *hiyal* were arguably within the confines of the law, they were relatively inexpensive for Muslim religious (and political) authorities to permit – the “envelope” was not pushed too far. Moreover, because merchants were lending at small cost while facing significant sanctions for transgressing the ban, they had little incentive to further “push the envelope”. An absence of lay “push” provided no incentive for political or religious authorities to reinterpret, entailing an inhibitive equilibrium in which lending at interest *was* permitted, but only if a sufficient transaction cost (*hiyal*) was undertaken (in terms of the model, an inhibitive ARPE emerged in which $0 < i^{RA} < 1$).

This inhibitive equilibrium persisted until the early Ottoman period, when the religious authorities became a part of the state, a change which enabled a “limited but significant

²³ SF #4 (most Christian relaxations of interest theory came from outside the papacy) is not analyzed in this section. This is not because it contradicts the theory, however. Indeed, the theory implies that those with the most to lose from relaxing “eternal truths” – the papacy – should be the least responsive to economic pressures.

expansion in the ruler's prerogatives in relation to the *sharī'a*" (Berkey 2003, p. 264). In terms of the model, γ decreased in this period, though it was still large.²⁴ Concurrently, as Proposition 1 predicts, this decrease in "dependence" encouraged a relaxation of interest restrictions (although lip service paid to the *sharī'a* was still necessary to ensure the legality of the contract, SF #7). For example, Ronald Jennings (1973) shows convincing evidence, in a study of seventeenth-century judicial records in Anatolian Kayseri, that interest was regularly charged on credit in accordance with the Islamic law and "secular" law (*kanun*) and with the consent and approval of the judge's (*kādī*) court, the religious scholars (*'ulamā'*), and the *sultān*. These records indicate that 20% per annum was considered acceptable and in accordance with the *sharī'a*. However, almost all interest-bearing transactions Jennings observes involved some sort of ruse, the most popular of which was *istiğlal* (which involved the debtor giving his creditor a piece of real estate, supposedly as a sale, but actually as a pawn).²⁵

Moreover, the model clarifies some other aspects of interest history. For one, Proposition 2 helps explain why Muslim religious authorities undertook only one major reinterpretation of interest doctrine in the medieval period, whereas Christian authorities accommodated custom with a series of "small" reinterpretations (SF #8). The intuition underlying Proposition 2 is instructive: after European authorities permitted moderate interest in the mid-thirteenth centuries (a considerably different "interpretation" from the Church), lenders were encouraged to

²⁴ The major changes in the relationship between Muslim political and legal/religious authorities in the Ottoman period resulted from demographic heterogeneity (which limited the coordinative ability of the masses) and lack of external threats (Coşgel, Ahmed, and Miceli 2007) – phenomena outside the scope of the model's arguments. Similar institutional arrangements still exist in many modern Islamic polities; state *mufītīs* were appointed in the twentieth century in Egypt, Saudi Arabia, Lebanon, Malaysia, Yemen, and Indonesia, and twentieth century constitutions in Egypt, Syria, Kuwait, Morocco and Iran (to name a few) include provisions making the *sharī'a* the law of the land (Schacht 1964, p. 107-110; Masud, Messick, and Powers 1996).

²⁵ It is unlikely that most lenders actually resorted to such tricks, and the fact that *waqf* trustees required borrowers to deposit a pledge suggests that they lent at interest directly (Imber 1997). Other scholarly works indicate that lip-service paid to *sharī'a* was not relegated to Kayseri, but prevailed throughout the Ottoman Empire (see, for example, Gerber 1988, ch. 7).

transgress the Church's dictates to a significant extent. In turn, the Church was encouraged to take "small steps", avoiding dramatic (and hence costly) reinterpretations before accommodating custom. On the other hand, Islamic lenders employed *hiyal* as early as the first Islamic century. These actions, which abided by the letter of the law, did not "push the envelope" too far, and hence Muslim religious authorities incurred relatively little cost in permitting these transgressions, which had become customary.

Likewise, Proposition 3 sheds light on why the Church was less permissive than Muslim religious authorities for much of their shared history (SF #9) – and thus why Christian punishment for transgressing the ban was harsher (SF #5). Proposition 3 provides the counter-intuitive result that "high-dependence" religious authorities may be *more* permissive than "low-dependence" authorities during the period in which the latter is catching up with custom. Indeed, Islamic authorities accommodated custom relatively quickly, permitting *hiyal* soon after they were employed. On the other hand, Christian authorities reinterpreted interest law numerous times, slowly catching up with custom. As predicted in Proposition 3, Islamic authorities were more permissive during the period in which the Church took "small steps" to accommodate custom, allowing more openly usurious practices until the fifteenth century.

The model also sheds light on European printing history, although some of the model's formulae do not directly apply – most importantly, the relevant action set is "print" or "not print", with no intermediate action (that is, there is no black market or way of evading the ban). For one, there were numerous reasons why the Church would have wanted to control the spread of the press – most prominently, the success of the Reformation was dependent on the Reformers' ability to circulate vast amounts of literature. Yet, as noted in Section 2, the Church was amongst

its greatest supporters (SF #10). If the Church stood to lose so much by permitting the press, why did it – unlike its Muslim counterparts – support the spread of the press?

Proposition 1 sheds light on this phenomenon. After European rulers regained suzerainty over their lands in the mid-13th century (thus decreasing γ), they supported the economically productive actions of the Universities, particularly the writing and copying of non-religious (especially political) tracts which were not encouraged when the Church dominated the Universities (SF #11, 12). Indeed, this shift to secular rule over the Universities coincided with the emergence of interest rate caps – the exogenous macroeconomic forces changing the dependence parameter undermined the equilibrium state in both cases. The rise of the Universities provided a setting in which, after the invention of the printing press (another “period zero event”), there was widespread demand for books yet no Church-held monopoly on supply, allowing the press to spread without opposition from the Church (SF #10).²⁶

On the other hand, acceptance of printing was delayed for centuries in the Islamic world. The potential costs incurred by religious authorities for permitting the press were substantial – it entailed a significant reinterpretation of doctrine (which stressed the importance of the oral transmission of the Qur’an and a prohibition of the replication of images) and, more importantly, it diminished their monopoly power over the educational and legal systems (SF #14). In response to disapproval from religious authorities, the political authorities, dependent on the RAs for legitimacy, forbade the press despite its early arrival in the Ottoman Empire and its potential as a

²⁶ New theories on the state based on Aristotelian foundations were a crucial “exogenous” force behind the changing Church-State relations of the mid-thirteenth century. While it is possible that the rise of the Universities caused this change in “dependence” – it is indeed likely that causation runs both ways – it does not detract from two important points. The first is that the rise of the Universities, especially in their role as book producers, came about largely because there was a sphere outside and disassociated from the religious in which it gained financial and political support. Secondly, the rise of the Universities was merely the precursor to the episode in question – the rapid spread of the press. The rise of the Universities is not necessarily a phenomenon that can be explained by the model, yet their emergence had important unintended consequences as spelled out in this section.

source of revenue (SF #13, 15). The press' benefit to the state is evidenced by the fact that non-Muslim presses, which did not threaten the religious authority's monopoly, were permitted throughout this period (SF #15). It was only when printing became sufficiently profitable to political authorities (largely in combating Western advances) that the costs of diverging from religious dictates were not sufficient to obstruct its permission (SF #16). In terms of the model, an inhibitive equilibrium emerged and persisted for centuries; the "escape" from this equilibrium occurred only after Western aggression caused a dramatic change in the parameter set.

5. The Big Picture: Was the "Gate of *Ijtihād*" Really Closed?

This paper tackles an important route through which religion directly impacts economic outcomes: the perpetuation of laws inhibiting economically productive actions. By refraining from attributing anything inherent in religion as the force underlying the economic divergence, this framework encourages a reconsideration of traditional notions of conservatism in the Islamic world. The most influential of these ideas is that the "gate of independent reasoning (*ijtihād*)" was closed in the tenth century (C.E.). Until recently, historians generally agreed that in this period some informal consensus arose that independent reasoning, an important method of reinterpretation in the first three Islamic centuries, was no longer an acceptable means of finding truth and that henceforth jurists were only allowed to follow precedents (Schacht 1964, ch. 10; Coulson 1969; Weiss 1978; Rahman 1979; Watt 1988). Under this theory, juristic ingenuity was stifled in Sunni Islam after the founding of the four schools consolidated what had been widely dispersed judicial authority. Instead of exercising *ijtihād*, jurists were confined to accepting religious authority (Hallaq 2001, ch. 4).

Some recent scholarship disputes this notion. Gerber (1999, ch. 4-7) cites numerous cases throughout the medieval period where *ijtihād* was employed. In a study of rulings by the seventeenth-century Palestinian muftī Khayr al-Dīn al-Ramlī, Gerber notes that numerous disagreements which remained unresolved in the classical and post-classical periods arose in al-Ramlī's time, necessitating a relaxation of devotion to the ancient masters. Likewise, Hallaq (1984, 2001) notes in great historical detail that the gate of *ijtihād* did not close in theory or in practice, though its practice became increasingly rare in the medieval period.

If the gate of *ijtihād* was not closed, independent reasoning *was* less frequently practiced after the tenth and eleventh centuries. In fact, Gerber (1999, p. 138) admits that *ijtihād* was not freely permitted in every field, but only in those in which the law remained open. In this light, I propose an alternative metaphor: the "gate of *ijtihād*" may have been closed, but the gate was *not* locked. All that was necessary for the gate to be opened was a sufficient number of individuals attempt to push it open. But, due to the incentives supported by the prevailing institutions, few had incentive to "push the envelope" (the gate), and observed behavior led to the *appearance* that the gate was closed and locked. Indeed, if the gate were not really locked, we would expect to see *ijtihād* in aspects of law which fostered better economic outcomes, such as those studied by Gerber and Hallaq. However, the overwhelming cost of pushing the gate open when such pressures did not exist was the reason that the gate *seemed* locked. In turn, once inhibitive equilibria emerged in the tenth century, beliefs in the gate's closure were supported. This insight allows us to view Islamic legal and economic history through a different lens by looking beyond the scope of observed actions to understand the institutions, behaviors, and incentives underlying them.²⁷

²⁷ This analogy gains more weight when combined with Kuran's (1995) theory of preference falsification (PH #1), in which he argues that when ideas fall out of the mainstream, they can be forgotten or marginalized. If *ijtihād* fell into

6. Conclusion

This paper analyzes the role that religious, political, and legal institutions played in sustaining and undermining economically inhibitive religious laws in medieval Islam and Christianity. I suggest that a salient difference between the two religions' institutional structures is the greater degree to which political authorities are dependent on the dictates of the religious authorities for legitimacy in Islam. To shed light on the consequences of this difference, I identify the salient players involved in the reinterpretation of religious doctrine (religious authorities, political authorities, and the "laity") and construct a model to identify their interactions under varying institutional conditions. The model's primary result is that when the level of "dependence" is significant, the institutions supporting economically inhibitive laws are more likely to be self-enforcing – no player has incentive to "push the envelope", and the inhibitive law persists. On the other hand, when the level of "dependence" is small, political authorities have incentive to permit productivity-enhancing, religiously banned actions, which in turn encourages the laity to transgress the religious ban. This provides greater incentive for religious authorities to reinterpret doctrine, and the institutional structure is self-undermining – the players "push the envelope" to the point that the law is eradicated.

The logic underlying these interactions and outcomes helps account for the salient (and even counter-intuitive) features of interest and printing histories. Moreover, it should also help shed new light on a variety of historical phenomena in which the interactions between religious institutions and other institutions (political, economic, legal, and social) affected economic outcomes, such as the differing paths of Islamic and Christian laws concerning slavery,

disuse due to a paucity of individuals "pushing the envelope", then it is much more likely to become forgotten and not brought up in every day discourse.

insurance, the economic role of women, and education. While significant in their own right, especially given the role that unintended consequences can play in institutional development, studying such cases within the framework presented in this paper provides insight into a much broader economic reality. Contrary to the predilections of many previous scholars, it turns purely cultural explanations (based on the “conservative nature” of Islam) of the divergence between Western European and Middle Eastern economies on their head. That is, while we certainly see conservatism in the Islamic world, this phenomenon can be understood as a *result* of the institutional structures and not as a *cause* of economic stagnation.

Appendix A: Proofs

Proof of Proposition 1. I prove this proposition by contradiction. Assume that Proposition 1 is false, and imagine two economies, A and B , with corresponding parameters γ_A and γ_B , where $\gamma_A > \gamma_B$ and all other parameters are equal. Since $i_0^{PA,A} = i_0^{PA,B} = i_0^{RA,A} = i_0^{RA,B} = 0$, it must be that $i_1^{PA,A} \leq i_1^{PA,B}$ – the only difference between the two PA's optimization problem is γ . Thus, there must exist some period \bar{t} in which $i_{\bar{t}-1}^{PA,A} \leq i_{\bar{t}-1}^{PA,B}$, $i_{\bar{t}}^{PA,A} > i_{\bar{t}}^{PA,B}$, and $i_{t^*}^{PA,A} > i_{t^*}^{PA,B} \forall t^* \geq \bar{t}$.

The PA's first-order condition entails that $K_1^{PA} = c_1^{PA}$. From this, it follows that the equilibrium action i_t^{PA*} is increasing in i_{t-1}^{RA} and \bar{a}_t (which is also increasing in i_{t-1}^{RA} and i_{t-1}^{PA}) and is decreasing in γ . Thus, $i_{\bar{t}}^{PA,A} > i_{\bar{t}}^{PA,B}$ can only hold if $i_{\bar{t}-1}^{RA,A} > i_{\bar{t}-1}^{RA,B}$. Moreover, in ARPE, $i_t^{PA,A} > i_t^{PA,B}$ can only hold *ad infinitum* if $i_{\bar{t}-1}^{RA,A} > i_{\bar{t}-1}^{PA,B}$ (it must be that $i_{t^*}^{RA,B} \geq i_{\bar{t}-1}^{PA,B}$ in some period t^*), so confine attention to this case. However, $i_{\bar{t}-2}^{RA,A} \not\geq i_{\bar{t}-1}^{PA,B}$ (otherwise, $i_{\bar{t}-1}^{PA,A} > i_{\bar{t}-1}^{PA,B}$). Thus, for the first period $t^* \geq \bar{t} - 2$ in which $i_{t^*}^{RA,B} \geq i_{\bar{t}-2}^{RA,A}$, it must be that $i_{t^*+1}^{RA,B} \geq i_{\bar{t}-1}^{RA,A}$ (unless

$i_{t^*}^{PA,B} > i_{t-1}^{RA,A}$, in which case the proposition holds).²⁸ Hence, $i_{t^*+2}^{PA,B} \geq i_t^{PA,A}$, so $i_{t^\circ}^{PA,A} \not\geq i_{t^\circ}^{PA,B} \forall t^\circ \geq \bar{t}$: a contradiction.

Q.E.D.

Proof of Proposition 2. Consider two economies, A and B , with corresponding parameters γ_A and γ_B , respectively, where $\gamma_A > \gamma_B$ and all other parameters are equal. That is, $i_{t^\circ}^{RA,A} = i_{t^\circ}^{RA,B}$ and $i_{t^\circ}^{PA,A} = i_{t^\circ}^{PA,B}$ in some period t° . Assume that $i_{t^\circ}^{RA,A} < i_{t^\circ}^{PA,A}$, otherwise the results are trivial. Since L's actions are the same in both economies in period $t^\circ + 1$, $i_{t^\circ+1}^{PA,A} \leq i_{t^\circ+1}^{PA,B}$ and $i_{t^\circ+1}^{RA,A} = i_{t^\circ+1}^{RA,B}$.

Consider two cases. In the first, the RA in economy A reinterprets in period $t^\circ + 2$ such that $i_{t^\circ+2}^{RA,A} < i_{t^\circ+1}^{PA,A}$. Due to the concavity of L's optimization problem, the difference between any L's equilibrium actions (in period $t^\circ + 2$) in economies B and A *must* be less than or equal to $i_{t^\circ+1}^{PA,B} - i_{t^\circ+1}^{PA,A}$. Hence, $K_{11}^{RA} \rightarrow 0$ implies that $i_{t^\circ+2}^{RA,A}$ is closer to $i_{t^\circ+1}^{PA,A}$ than $i_{t^\circ+2}^{RA,B}$ is to $i_{t^\circ+1}^{PA,B}$.²⁹ This is exacerbated in the following period, as $K_{11}^{PA} \rightarrow 0$ entails that $i_{t^\circ+2}^{PA,B} - i_{t^\circ+1}^{PA,B} \geq i_{t^\circ+2}^{PA,A} - i_{t^\circ+1}^{PA,A}$, and thus L's evade the RA to a greater extent in economy B than they do in economy A . This case is repeated – with the RA's in the two economies making the same number of reinterpretations – until the second case is realized (and it must be realized, since the equilibrium is accepted religiously).

²⁸ There is one case in which this does not hold – when the RA in economy A interprets to accommodate the actions of a cluster of L's acting greater than $i_{t^*}^{PA,B}$ but the RA in economy B does not, as the marginal returns (K_{11}^{RA}) do not outweigh the marginal costs (c^{RA}). In this case, it is possible that $i_{t^*+1}^{RA,B} < i_{t-1}^{RA,A}$. Yet, this is where the assumption $K_{11}^{RA} \rightarrow 0$ has bite. Given this assumption, such a case cannot exist when the interpretation in economy B is accepted religiously (which it must be in some period). Here, the marginal returns cannot outweigh the marginal costs of reinterpreting to accommodate the cluster in A but not B .

²⁹ $K_{11}^{RA} \rightarrow 0$ is a stronger assumption than is necessary for this result to hold. A sufficient condition is: $K_{11j}^{RA} \leq 0 \forall j$ (or K_{11j}^{RA} is not sufficiently positive).

In the second case, the RA in economy A reinterprets in some period $t^* \geq t^\circ + 2$ such that $i_{t^*}^{RA,A} \geq i_{t^*-1}^{PA,A}$. In this case, not only is it *not* necessarily true that $i_{t^*}^{RA,B} \geq i_{t^*-1}^{PA,B}$, but it may be such that $i_{t^*}^{RA,B} < i_{t^*-1}^{PA,A}$. d is (weakly) smaller at all interpretations for the RA in B than it is for the RA in A , and thus on the margin the former may have less to gain from such an interpretation. Hence, it must be true that the number of reinterpretations by the RA in economy A before it “reaches” a period t^* in which $i_{t^*}^{RA,A} \geq i_{t^*-1}^{PA,A}$ is weakly less than the number of reinterpretations by the RA in economy B before it “reaches” a period t^* in which $i_{t^*}^{RA,B} \geq i_{t^*-1}^{PA,B}$, *ceteris paribus*.

Q.E.D.

Proof of Proposition 3. This result follows directly from the proof of Proposition 2. In that proof, it was shown (in the “second case”) that in the first period t^* in which $i_{t^*}^{RA,A} \geq i_{t^*-1}^{PA,A}$, it is *possible* that $i_{t^*}^{RA,B} < i_{t^*-1}^{PA,A}$. It follows that if such a period t^* exists, then $i_{t^*}^{RA,A} > i_{t^*}^{RA,B}$.

Q.E.D.

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Figures

Figure 1: Qualitative Representation of i^{PA*} and i^{RA*} , Period 1

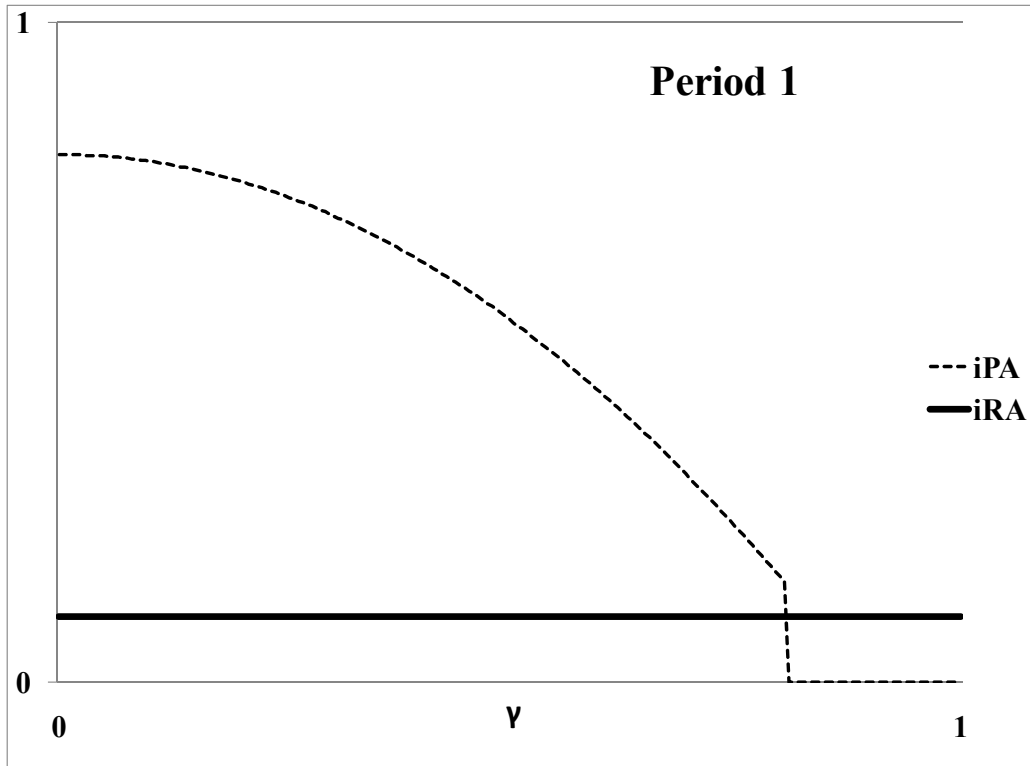


Figure 2: Qualitative Representation of i^{PA*} and i^{RA*} , Period 2

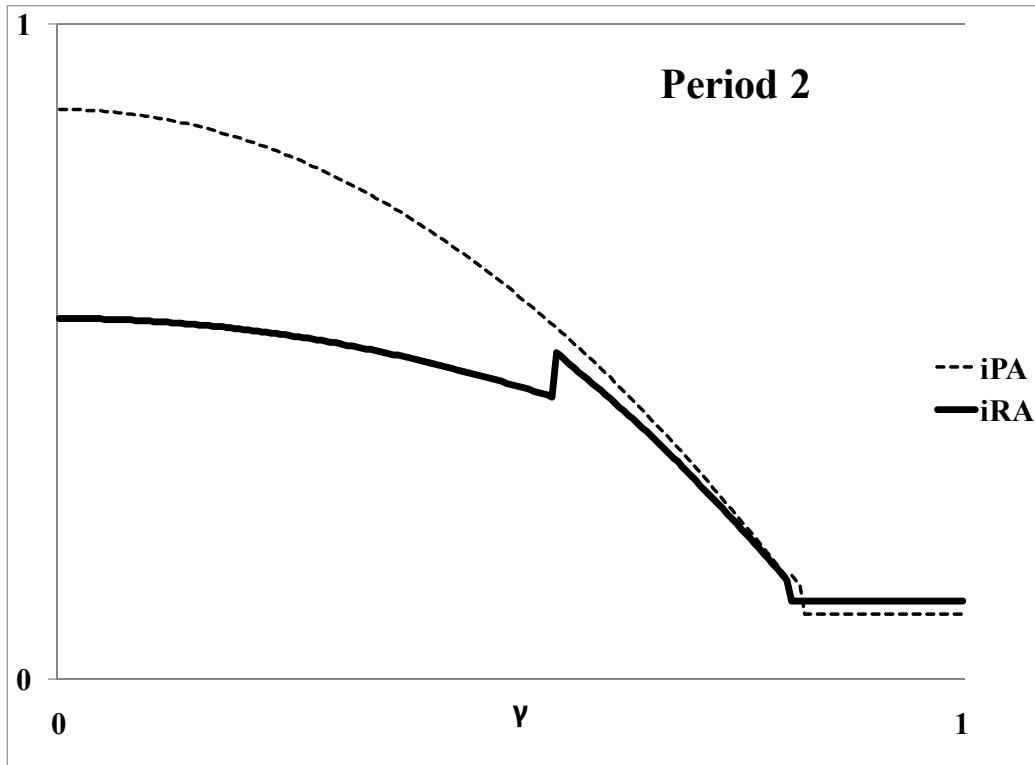


Figure 3: Qualitative Representation of i^{PA*} and i^{RA*} , Period 3

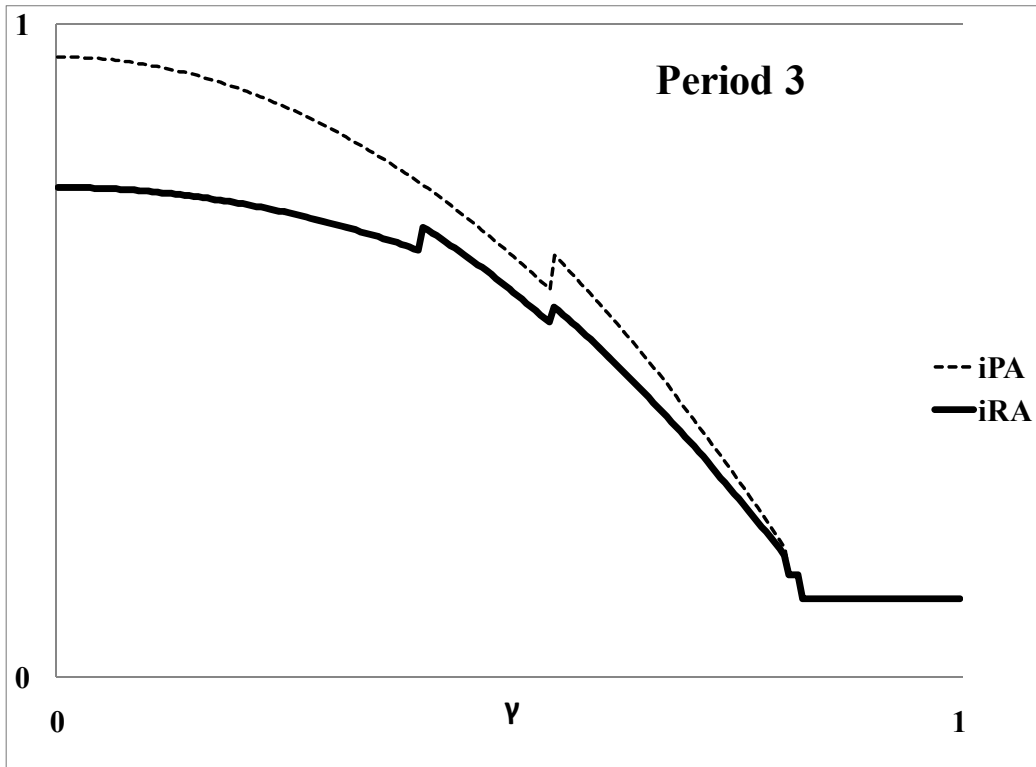


Figure 4: Qualitative Representation of i^{PA*} and i^{RA*} , Period t^*

