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RELIGION, AFTERLIFE, AND PROPERTY RIGHTS IN THE HIGH MIDDLE AGES

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Economic historians have a rich literature applying economic theory to topics like unemployment, income, trade, and development. These are appealing subjects since they allow the usual statistical analysis of historical data. Researchers are less willing to explore, and journals are less willing to publish, application of economic theory to the history of changes in social institutions. This hesitance is understandable. Social institutions more often must be analyzed without using statistical tools, relying instead on "casual" empirical evidence, examples, and stylized facts.

A few researchers do choose as a subject the history of social institutions. As an example, Olson (1982) models several historical trends including the emergence of India's caste system. Posner (1980) uses economic theory to explain the role of the extended family in primitive society.

One result of the work by authors like Posner and Olson is to extend the boundaries of what is considered an appropriate subject for economics research. Indeed, a compelling characteristic of this new research in particular and of economic theory in general is its ability to explain a wide variety of human behavior.

In this spirit, the following essay reviews an economic theory of religion and uses the theory to explain changes in attitudes toward hell, heaven, and divine retribution in Western

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Europe during the Middle Ages. The hypothesis is straightforward. Religion serves a number of important functions, one of which is to provide an alternative to the state and to the local community in enforcing particular social behavior. As the nature of the state's power, of the influence of the local community, and of economic activity change, religious doctrine changes in a predictable manner. The behavior and doctrine of the Medieval knights and of the mendicant orders are used as examples. Although applied to a particular period and culture, the theory is perfectly general and has implications for behavior in other cultures and other periods in history.

Before proceeding, two caveats are in order. First, the theory presented here neither promotes nor criticizes religion itself. Nothing in the theory proves or disproves any particular church's doctrine. Second, the material presented here in no way explains all of the important events during the thousand years of the Middle Ages, nor does it refute views held by those outside economics. Doubtless historians will find counter examples and omissions. Economic theory cannot explain everything and in this case attempts only to provide some interesting insight into an important period in western history.

The High Middle Ages

The Middle Ages in western history encompasses a period from the fall of the Roman Empire in the fifth century to the beginning of the Reformation in the fifteenth century. The middle three hundred years, from the eleventh through the thirteenth centuries, are often designated the High Middle Ages since they represent a period of relative prosperity and progress.

Two institutions dominated the High Middle Ages: the feudal system and the Catholic Church. The feudal system was characterized by relatively small self-sufficient manors controlled by a hereditary lord who provided local government services and security to peasant serfs.¹ Serfs in turn supported the lord with

labor services and agricultural products. The manorial lord was loosely tied by bonds of vassalage, kinship, and tradition to regional and "national" royal families. These higher royalty provided some security and additional services and taxed the manorial lord in money and in kind.

After the Roman Empire dissolved, the feudal system emerged because it offered relative security at the local level. As North (1981) shows, military technology in the form of the mounted knight and the relatively invulnerable castle in large part dictated the scale of local social and economic organization. The subsequent invention of gun powder, the requirement for large standing armies, and improvements in transportation and technology in turn insured that nation states would replace the feudal system.

The second important force in the High Middle Ages was the Catholic Church. By the beginning of the eleventh century, most of Europe had converted to Christianity and most of the Near East and Africa to Islam.² The Pope, at first simply the Bishop of Rome, became the autocratic head of a complex hierarchy extending down through regional bishops and local parish priests.

Coincident with the emergence of its centralized organization and particularly beginning in the eleventh century, the Catholic Church's temporal power increased significantly. Pope Leo III had recognized the power of an existing king as early as 800 A.D. by crowning Emperor Charlemagne. But by the beginning of the eleventh century, the church began extending this notion and asserting increased papal authority over heads of temporal kingdoms.

An important Papal assertion of temporal authority came in 1076 A.D. when Pope Gregory VII excommunicated the German King Henry IV. At issue was Henry's attempt to invest a bishop, the papacy having recently begun claiming the sole right to do so. Henry withdrew the bishop's nomination and bowed to papal authority, even crossing the Alps alone in the middle of winter to submit to Gregory. Despite Henry's later victory in the dispute, the

mere fact that the Pope could seriously threaten temporal authority made this a critical event in the evolution of church power.

Papal temporal authority continued increasing in the twelfth century. Two crusades were launched. Gothic art and architecture, much of it religiously inspired, highlighted the middle of the century.

The early thirteenth century marked the height of Roman Catholic Church power in the Middle Ages. Best representing this power, Pope Innocent III first crowned the German King Otto and then removed him by excommunication the next year. Innocent then dictated the election of Otto's replacement two years later in 1212 A.D. In the same year Otto was crowned, Innocent's interdiction of England and excommunication of its King John forced the sovereign to accept Stephen Langton as archbishop of Canterbury.

Under Innocent's leadership, Church influence extended through every level of society. No less than crowned heads, common peasants bowed to Papal authority. The Inquisition used coercion and fear to enforce religious purity. The proverb about death and taxes was carried to its logical end as the church collected death taxes. Construction of the great cathedrals began.

Rezoning Hell

One of the less dramatic but more curious trends in the High Middle Ages is the change during the period in church doctrine and in popular attitude toward death and divine retribution. In his extensive research on historical trends in attitudes toward death, Aries (1981) shows how the Middle Ages marked a period when Christians came to believe in hell and in divine judgment at the moment of death.

Both before and in the first years after Europe's conversion to Christianity, people viewed death simply as sleep followed by one or another version of ascension to heaven for everyone at "the end of time". By the beginning of the twelfth century, Christian

attitudes toward death changed in an important way. Now the dead faced the Last Judgment. A period of sleep still followed death, but the faithful were separated from sinners and non-believers at the end of time. The former ascended to heaven, the latter two groups faced eternal damnation in hell.

A second important but gradual change in church doctrine accelerated in the twelfth century. As LeGoff (1984) explains in his history of the Christian concept, a period of testing and trial called purgatory now followed death. In the early twelfth century, the church asserted that this period of trial was identical for everyone and preceded the Last Judgment.

By the beginning of the thirteenth century, divine retribution took on its most immediate and dramatic form. Now the forces of evil and good surrounded a person before death. At the moment of death, the sum of the person's actions through life were judged. Those of sufficient faith and having lives of sufficient goodness ascended to heaven. Those without faith and with sinful lives descended to hell. Questionable cases went to purgatory, where they stayed until the living acted to save them through prayer and intercession.

Notice the change in the church's view of death and divine retribution. In the early period, heaven was granted to all. Later, the dead were judged and sent to heaven or hell at the end of time. Finally, judgment was immediate, although in some cases not final.

What explains this change? Aries sees it as another element in the overall transition from the attitude that people are defined mainly as members of a community, with little personal identity, to a time when individual identity is acknowledged. This seems a reasonable hypothesis. Aries shows how a variety of death and burial practices, including the use of grave markers, reflects an increasing recognition of individual identity.

There is an alternative, although not a competing hypothesis. An economic theory of religion explains this change and explains other church activities during the High Middle Ages.

Economic Theory of Religion

The economic theory of religion and the church is treated in detail elsewhere (Bold and Hull, 1985) and so is only reviewed here. A church is modeled as a profit maximizing firm. Although a church might be defined legally as a non-profit organization, the assumption of profit maximization is still appropriate. In addition, the church need not make a conscious decision to maximize profit, and for that matter, need not be conscious of all of the products it provides.

Several forces compel churches to maximize profit. Churches need resources to promote religious goals and churches gain revenue to the extent they manage their resources in an efficient manner. Churches also compete with profit-maximizing firms for resources in many markets so church success again requires efficient behavior. Finally, the long-run survival of a church in part depends on its ability to maintain non-negative wealth.

Like ordinary firms, a church offers the set of products which exploits economies of scope, gains from tied sales, comparative advantage, the cost of information, and other economies. The church-provided products of interest to this essay are social insurance, the promise of an appealing afterlife, and encouragement of particular social behavior.

A church offers social insurance by encouraging members to help those less fortunate or, perhaps more commonly, to encourage member donations to church sponsored charitable activities. The church promotes itself as the preferred agent to individuals with altruistic motives. These altruistic individuals wish to give money to the less fortunate and are willing to pay the church to reduce information and transfer costs. The church uses its reputation to assure individuals of its integrity and efficiency in this activity.

Even some individuals without altruistic motives donate voluntarily to the church. The church provides insurance against

unforeseen misfortune like disease and local crop failure and, to some extent, foreseen events like old age. For example, medieval monasteries often accepted substantial donations from elderly men in exchange for care until death. To the extent that they are risk averse, individuals are willing to pay the church to provide these forms of insurance. An individual without altruistic motives might also give to the poor to the extent doing so reduces property crime rates.

In addition, the church uses techniques mentioned below to encourage donations by those who would otherwise not give to the less fortunate. In so doing, the church reduces potential free rider problems and deals with issues of moral hazard and adverse selection in insurance markets.

Heaven, an appealing afterlife, is a product offered by most of the world's religions. The price of heaven typically includes prayer, faith, and donations. The last directly increases church revenue. In addition, the price of heaven commonly includes requirements for particular behavior, for Christian churches these include adherence to the Ten Commandments, the Golden Rule, and similar standards.

Of all of the imaginable methods of earning heaven, churches encourage these particular behavior standards because they define and protect property rights and reduce other transactions costs. These are valuable products, provision of which the church can have a significant comparative advantage.

Property rights enforcement and particular social behavior are public goods. They produce benefits freely available to everyone. Ordinary firms find public goods production difficult because non-payers get a free ride. In centralized states, public goods like property rights enforcement and enforcement of particular social behavior are typically produced by the state itself. The state possesses a developed and relatively efficient police and court system for detecting and punishing misbehavior.

On the other end of the spectrum of social structures are primitive societies. Even here enforcement of property rights and good social behavior is important. However, as Posner (1980)

shows, the small cohesive groups which characterize primitive societies rely on kinship bonds and on the fact that members of small groups are more sensitive to the fortunes of others than are members of large groups.

When they provide or encourage provision of public goods, governments solve the problem of being unable to exclude non-payers by using coercion and involuntary taxation. Churches occasionally employ these methods as well. However, the church also possesses an important tool not available to the state. The church can exclude miscreants from heaven. Even more frightening, the church can promise those who misbehave eternal damnation in hell. Thus heaven and hell can be viewed as innovations in property rights enforcement uniquely available to the church. The church employs heaven and hell to encourage production of valuable public goods.

The foregoing suggests that the church is most important in providing property rights enforcement and particular behavior in societies with weak central governments and in cases where communities are large enough that common interest is an insufficient motive. For example, robbery is less likely to occur in small communities where enforcement and detection is relatively easy. In modern states, government enforcement is relatively more effective than the church. The church has an advantage in the intermediate case where local control and state enforcement are relatively weak.

Church provision of these valuable public goods is consistent with the assumption of profit-maximization. When it has a comparative advantage at producing these public goods, the church enhances its own wealth by doing so. Further, these activities promote the wealth and assure the survival of the society. In so doing, the church indirectly promotes its own survival and prosperity. This is simply another version of Stigler's (1958) survivorship principle and Alchian's (1950) notion of natural selection and profit maximization.

The idea that church doctrine is encouraged by natural selection to increase social welfare is necessarily simplistic and

overlooks several important issues. In his important analysis of social structure and economic development, North (1981) shows how welfare maximization is one of two important forces motivating governments. Those who control a government prosper when they increase a society's wealth, but also prosper by using taxes for personal gain or to appease other powerful groups. This taxation makes the rulers better off, but weakens the economy. Although he never makes the extension, North's analysis of government behavior applies as well to the church. The church obviously gains by encouraging economic prosperity but just as obviously gains by exploiting the economy.

Also not addressed here is the potential desire by a church to maximize its own size and influence, rather than simple profit. For governments this theme is pursued by Niskanen (1971). Size and influence maximization seems consistent with the desire by religions to increase membership but does not explain why churches would include any demanding behavior as a condition of membership. This alternative assumption also implies behavior not dissimilar to that of profit maximization. In this same vein, the bureaucracy implied by a large church organization necessarily faces enormous agency problems. These agency problems are an important issue, surely playing a role in the eventual decline in Catholic Church power in the fourteenth century.

Why Was Hell Rezoned?

After the [Roman] Empire's collapse, the medieval society that emerged was a set of disjointed and clashing parts subject to no central or effective secular authority. Only the Church offered an organizing principle, which was the reason for its success, for society cannot bear anarchy.
(Tuchman, 1978, p. 5)

As discussed, the Catholic Church in the High Middle Ages introduced and promoted heaven, hell, and judgment at death. What purpose did such a change in doctrine serve? Simply, these were effective tools in enforcing particular social behavior and property rights in locations where state authority and local community enforcement were relatively ineffective.

The feudal system, where local control of social behavior was possible, became relatively weaker as independent towns and cities emerged. The fragmented and weak central governments were unable to exercise control of either feudal lords or the independent cities and towns. The church possessed a comparative advantage in enforcing particular behavior and provided this as a joint product of its revenue earning activities.

Miskimin (1969, p. 3) reviews the writings of the thirteenth century Christian theologian and philosopher St. Thomas Aquinas, noting the importance of church property rights enforcement:

. . . Aquinas offered a defense of private property. Private ownership was the best form of property division, since it prevented possible disruption of the social order, by providing clearly delineated rules of possession and since it contributed motivation for care in the use of property for energetic devotion to labor.

When these political ideas, theoretical though they may be, were sustained by an institution with such power and prestige as the thirteenth-century Catholic Church possessed, they constituted a significant force in the organization, structure, and contemporary conceptions of economic activity and fiscal policy.

Did Lords Misbehave?

Church influence on medieval society acted through any number of agents. Two are examined in this essay: the feudal

lords and the mendicant orders. For the first, the question is the degree to which lords chose to exploit their power.

That the feudal lord possessed nearly absolute political and economic power is not disputed. In addition, since the feudal system enforced the exclusive and absolute power of local lords, competition from other potential lords for a given lord's monopoly power was limited.

Three forces acted to prevent lords from fully exploiting their monopoly position, however. First, following one of this paper's important themes, the long run prosperity and survival of the lord depended in large part on his ability to assure the support of his serfs. An excessively exploitive lord would lose wealth and power relative to nearby lords and so would face possible loss of territory. The lord was compelled to provide efficient incentives to serfs. Second, the High Middle Ages were a period of relative labor scarcity. Serfs could and did move among manors or move to undeveloped land (North 1981; Bloch, 1961).

A third force encouraging proper behavior by the lord was the Catholic Church, directly through its own doctrine and persuasion and indirectly through knightly codes of behavior. Although little direct evidence exists to show that lords treated serfs better because of church doctrine and pressure, other lordly behavior provides an indirect clue. In particular, lords provided significant financial support to local churches (Aries, 1981). Lords donated the money to assure themselves a good afterlife. Church doctrine encouraged these financial contributions, but church doctrine also required of individuals good social behavior to achieve a desirable afterlife. Because we observe the money contributions, we can reasonably infer their good behavior. The work of authors like Ladorie (1978) who documents the daily lives of villagers in France and Homans (1960) who does the same for Great Britain also confirms that the relationship between lord and serfs was generally positive.

As further evidence, knights, and lords were usually knights, gradually came to adopt a code of Christian behavior. Although often only implied, at least one formal set of guidelines

was compiled. Sonizo of Sutri wrote the *Liber de Vita Christiana* (c. 1090). The code promoted loyalty, bravery, and justice. It enjoined knights to protect the poor, widows, and orphans, and to eschew plunder. The guidelines clearly encouraged the sort of social behavior theorized here.

More dramatic examples of knightly commitment to Christian behavior are the knightly orders organized in the High Middle Ages. The Knights Hospitalers or Knights of St. John formed from a group who cared for pilgrims to Jerusalem. Pope Paschall II recognized the order in 1113 A.D. The Knights Templars formed during the Crusades and were recognized in 1128 A.D. by Pope Honorius III. The Teutonic Knights formed during the siege of Acre in 1190 A.D.

Members of the knightly orders took vows of poverty, chastity, and obedience. They adopted high standards of moral behavior, enforced in part through papal authority. Interestingly, the moral standards and military ability of the Knights Templar encouraged the French crown to use them to manage the government's treasury and to transport gold.

The orders eventually fell victim to their own military power and to their ability to attract members and wealth. The resulting corruption doomed the orders. Importantly, their early success—which created the temptation for corruption—derived directly from the high ideals established and enforced by the orders. This is consistent with the economic theory of religion. Their failure emphasizes the difficulty of enforcing particular behavior even with tools available to churches.

The Independent Cities and the Mendicant Orders

That the feudal system endured for so long is evidence of its ability to provide for its members. However, the feudal system was poorly adapted to encourage economic growth and development. The system discouraged the interregional trade that allows specialization and industrialization, in turn promoting the

exploitation of economies of scale. These functions were gradually provided by cities and towns independent of feudal authority.

Feudal lords usually granted the status of independent "communes" to cities and towns in exchange for tax payments from the citizens and from craft guilds. Lords made the grants because of financial, political, or social pressure (Tuchman, 1978, p. 5; Braudel, 1979, p. 510). Grants were made throughout the Middle Ages, but the pace increased significantly in the beginning of the twelfth century. These towns became true productive units and not just administrative centers (Miskimin, 1969). The most successful independent cities were international trading centers like Venice, Genoa, and Lubeck.

Because feudal authority did not extend into the independent communities and because central governments were too immature to exercise control, other means evolved to produce valuable social goods. Craft guilds provided some social services to members (Tuchman, 1978). More interesting are the activities and doctrine of the mendicant religious orders.

From the earliest years of the Church, dedicated Christians expressed their commitment by forming monastic orders. Commonly these holy orders withdrew into relative isolation to pursue lives of contemplation and prayer. The Cistercian Order, for example, cleared farmland from the wilderness to support their activities (Lyon, 1964).

A distinctly different form of holy order emerged in the first years of the thirteenth century, the nature and doctrine of which is consistent with the economic theory of religion. Pope Honorius III recognized the prototype of these Mendicant Orders in 1209 A.D. shortly after its formation by St. Francis. Honorius formally confirmed the Rule of the Franciscan Order in 1223 A.D. Only six years after first recognizing the Franciscan Order, Honorius approved another of the mendicant orders, the Dominicans. The third important mendicant order originally was formed in the middle of the twelfth century by hermits on Mount Carmel in Palestine. Importantly, St. Simon transformed

Carmelite doctrine in 1264 A.D., making it similar to that of the other mendicant orders (Esser, 1970; Iriarte 1982).

Why are the mendicant orders of interest here? Because they spread Catholic doctrine to independent cities and towns and because the orders adopted predictable techniques to make their doctrine convincing. An explicit part of mendicant doctrine was itinerant preaching to cities and towns (Esser, 1970). The emerging cities and towns had limited central authority to enforce behavior (Iriarte, 1982).

The mendicant orders shared a number of important characteristics, particularly their fundamental doctrine. The ideal was *Imitatio Christi*—to live the life of Christ. Loyalty to the orders and then to the Pope was paramount. The orders required of their members poverty, chastity, and obedience.

The strict and sacrificial nature of mendicant behavior standards served the important function of assuring product quality to potential converts. Monks without wealth or family have no incentive to misrepresent doctrine and embezzle donations. In its early years, the Franciscan Order in particular discouraged members from owning or using permanent dwellings, preventing that form of wealth accumulation as well. The humble and unique clothing adopted by the orders serves the same function. Not surprisingly, the Catholic Church forbade others from wearing the clothing of the orders (Esser, 1970). Other practices consistent with quality assurance include the apprenticeship periods required of new members and the requirement that members remain in the orders for life.³

What did the mendicants preach? The mendicants wanted to persuade urban dwellers to convert to a version of the Catholic doctrine, a version that required particular and valuable social behavior. The mendicants wanted converts to behave properly, but the orders could not rely on secular authority to enforce good behavior. The state was not powerful and a priest could not draw on the power of the lord to enforce good behavior in the independent communities. To solve this enforcement problem, the

mendicants invented or at least exploited the inventions of hell and judgment at death.

Hell and judgment at death increase the cost of misbehavior. Hell increases both the expected cost and variance in payoffs after death of improper behavior. To the extent that individuals are risk averse, an increase in variance also effectively increases expected cost. Judgment at death is more costly in present value terms than judgment at the end of time to the extent that individuals possess a positive discount rate.⁴

What about the role of purgatory, also promoted by the mendicants? Since purgatory allowed the dead a second chance, it encouraged donations of money after death to the church for prayer and good works. Perhaps more importantly, purgatory prevented individuals from intentionally or accidentally defaulting on money debts at death. Relatives, heirs, or provisions in wills were used to redeem a debtor who would otherwise be condemned to eternal damnation.

Protecting property rights in financial instruments was an important function in which the medieval church had a comparative advantage. Towns and cities were beginning to use money-based trade, including debt instruments. Absent, however, were some of the methods available in modern economies to protect lenders. The corporation had not yet formed so asset ownership was limited to one lifetime and one individual. The absence of life insurance on borrowers increased the risk born by a lender. Finally, secular courts and other feudal authority were absent or weak in the independent communities. The church as an enforcer of financial property rights was the obvious alternative.

From what evidence has survived, the promise of heaven and threat of hell did influence individual behavior in the predicted way: "... concern for their own salvation, especially acute as death drew near, disposed people to pay heed to the voice of the church, ..." (Bloch, 1961, p. 258.).

In addition to providing for repayment of debt, individual wills show that substantial resources were redistributed to the poor and other deserving groups, exactly the sort of redistribution that

otherwise was provided by feudal lords or is provided by modern central governments. Wills commonly set aside money and detailed the desired burial ceremony. Much of the money for the ceremony went to hire the poor as mourners and attendants.

[Priests and Monks] were followed by a group, whose size varied according to the wealth and generosity of the deceased, made up of poor people and children from foundling homes. They carried candles and torches, and, in addition to the robes, they were given alms in exchange for their attendance.
(Aries, 1981, p. 165).

Wills also allocated money for activities after the burial. Some portion paid for prayers for the dead, an activity that hardly improves temporal social welfare. However, even these donations went to the church which in turn used it to support charitable activities. By far the largest proportion of bequests, however, went to fund charitable endowments, a conclusion in unpublished research by Elaine Clark and consistent with material Aries presents.

Besides these endowments for Masses . . . there were also charitable endowments: a contribution to a hospital for a bed, or the living expenses or dowry of a poor girl. Donations to abbeys, monasteries, and schools were common and generous in the twelfth and thirteenth centuries. (Aries, 1981, p. 181)

Another characteristic of medieval wills was that they encouraged accumulation of temporal wealth. The traditional Christian ideal was of lifetime poverty and humbleness. If it allowed a wealthy individual to purchase heaven at death, the will encouraged wealth accumulation. With a will, both temporal and heavenly riches were possible. "The will . . . legitimized and authorized the enjoyment—otherwise suspect—of property

acquired during a lifetime" (Aries, 1981, p. 191). This opportunity provided incentive for economic growth and development. It created incentive to maximize wealth and assured that the wealth was redistributed. Again the church encouraged useful social behavior.

Conclusion

This application of the economic theory of religion and the church is obviously very limited in scope, explaining only one change in church doctrine during a period of significant change in all aspects of culture and society. This application also offers no explanation for the eventual decline (and near collapse) of the church in the fourteenth century. Certainly the plagues, which struck urban areas in particular, played a role. The prolonged warfare and the emergence of national identities likely also eroded the power of a "universal" international church.

The church itself also contributed to its own decline. As discussed earlier, the church enhances its own wealth first by promoting overall economic growth and second by exploiting an economy. Perhaps the latter of the two church motives became more important than the former.

Despite its limitations, this work breaks important ground in applying economic theory to a new area of society. This research shows that economic theory can explain changes in religious behavior and such an extension has potential application to other periods of human history.

1. This simple treatment of the feudal system ignores the considerable local variation in its structure. Even the use of the term "feudal" to encompass the variety of institutions is disputed. For two important treatments of the feudal system and the High Middle Ages see Bloch (1961) and Lyon (1964).
2. That Christianity and Islam emerged at the same time is not coincidental, nor is the similarity of their doctrine. Both filled a vacuum left by the Roman Empire's collapse. Both extended beyond regional and national boundaries. Both promoted religious conquest and active conversion of non-believers. Both supported the particular social behavior and property rights protection discussed later, for reasons also discussed later.
3. Bold and Hull (1985) discuss in more detail activities which assure honesty on the part of priests and the church. As an aside, both the Carmelites and Franciscans became important educators in the early and largely religiously supported universities. Education is another public good provided first by churches and then by the state as its role became more important.
4. Consistent with the idea of promoting heaven, hell, and judgment at death, the Catholic Church also discouraged, to a greater or lesser degree, charging positive interest on loans (usury). For a complete treatment, see Benjamin Nelson (1969). If the church is able to use this rule to reduce individual discount rates, the present value of heaven and present cost of hell increase. Interestingly, the strongest church statement against usury was issued by the Second Lateran Council in A.D. 1139, exactly the period of interest.

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