Explorations in Economic History xxx (2010) xxx–xxx

Contents lists available at ScienceDirect

Explorations in Economic History

journal homepage: www.elsevier.com/locate/eeh

Evading the 'Taint of Usury': The usury prohibition as a barrier to entry ☆

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ARTICLE INFO

Article history:
Received 9 April 2009
Available online xxxx

JEL classification:
N23
G21

Keywords:
Usury
Transaction costs
Church
Regulatory capture

ABSTRACT

The development of capital markets in medieval Europe was shaped for centuries by the religious ban on lending money at interest. This paper examines how this prohibition developed as the outcome of strategic behavior by religious, commercial and political elites. A model is developed to analyze this hypothesis and to examine how the usury prohibition developed over time. It suggests that an important reason for the persistence of the ban was that it created a barrier to entry that enabled secular rulers, the Church, and a small number of merchant-bankers to earn monopoly rents.

1. Introduction

Recent work in economics and economic history emphasizes the importance of institutions in explaining economic growth over the long-run.[1] Economic and political institutions shape the incentives individuals face. Variations in the institutional environment can explain much of the disparity in comparative economic performance between countries and across time. There is, however, considerable uncertainty about how institutions evolve over time and no widely accepted explanation of why inefficient institutions persist.[2]

This paper contributes to the literature on endogenous institutional change by examining the Roman Catholic Church's prohibition on lending money at interest.[3] The medieval usury prohibition was an important part of the institutional fabric of the European economy throughout the Middle Ages and influenced the development of capital markets for centuries.[4] This paper provides a model that accounts for the persistence of the usury prohibition by showing why merchant–bankers may have had an interest in supporting it.

1.1. The regulatory capture hypothesis

This paper argues that many aspects of the medieval usury prohibition can be understood as by-products of regulatory capture. Small and organized groups are better able to support regulations favoring their interests than are more dispersed

☆ This paper has benefited greatly from the comments of Knick Harley, Bob Allen, Jean-Philippe Platteau, Tim Leunig, Jean-Paul Carvalho, Andrea Patacconi, and Sarah Cochrane as well as from the advice of seminar audiences at Oxford, Western Ontario, LSE, Brown, and Warwick and the two anonymous referees.
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[1] Classic statements in economic history are North (1981, 1990). Recent institutional accounts include Aoki (2001), Acemoglu et al. (2005), Greif (2006). Clark (2007b) is skeptical of institutional accounts of economic change.

[2] This question is addressed by Acemoglu (2003), Greif (2006, 153–186), and Ogilvie (2007).

[3] Henceforth the Roman Catholic Church is referred to as the Church.

[4] This paper examines the functioning of the prohibition until 1517 and the Council of Trent which marked a significant relaxation in the law. The prohibition survived for several centuries. Riemersma (1952, 17) described the widespread and public condemnation of usury as 'one of the curiously stable elements in economic life during the medieval and early modern centuries'. The Church finally acknowledged the legality of interest only in 1828.

0014-4983/$ – see front matter
doi:10.1016/j.eeh.2009.08.007

groups because they are better able to overcome collective action problems (Olsen, 1965). As a result, regulations that have the declared aim of improving social welfare often have the effect of creating monopoly rents for well organized interest groups. Stigler (1971) suggested that the regulatory capture hypothesis can explain many features of economic regulations.

This paper develops a claim first made by de Roover (1967, 1974) that some merchants were in a better position to evade the laws against usury than others.[5] This argument suggests that the usury prohibition was liable to regulatory capture. Certain merchants had an interest in supporting the prohibition on interest, even though it imposed additional costs on themselves, because the prohibition imposed still higher costs on their competitors.[6]

Using a theoretical model, the paper argues that the prohibition restricted lending to a small group of merchants who were able to write contracts sufficiently complex to evade the Church's laws. The prohibition had a number of effects: firstly it resulted in higher implicit rates of interest than would otherwise have obtained; secondly, it conferred monopoly power and profits on an elite subgroup of merchant–bankers who dominated mercantile lending; and, thirdly, a tightening of the prohibition led to the emergence of pawnbrokers who openly lent at interest. The rents generated by the usury prohibition were captured by medieval rulers, elite merchant–bankers and the Church.[7]

2. The prohibition

The usury prohibition was both a religious and a legal prohibition. Medieval Europe inherited two distinct legal traditions from antiquity: canon law and Roman law. The jurisdiction of canon law extended across Latin Christendom. In addition to governing the behavior of the clergy, canon law regulated social and commercial mores and norms (Wood, 2002, 2). Church courts operated alongside, and independently of, local and national courts. Merchants, traders, moneylenders, and shopkeepers had to obey canon law: ‘Church courts exercised jurisdiction, for example, over marriage and the termination of marriage, the legitimacy of children, all types of sexual conduct, commercial and financial behavior, the legitimate times and conditions of labor, poor relief, wills and testaments, and the burial of the dead’ (Brundage, 1995, 71).

In canon law any return on a loan (*mutuum*) beyond the principal was forbidden as usury (de Roover, 1967, 258).[8] Charging interest was not condemned on instrumental grounds but because it was viewed as intrinsically sinful. The canonists did not distinguish licit from illicit practices according to the purpose of the loan or the rate of interest. The usury doctrine viewed ‘usury as a sin independent of the borrower's circumstances and his allocation of credit’ (Melitz, 1971, 476).[9] It was a sin against justice, separate from, and worse than, the sin of avarice or lack of charity. In part, this was because it directly violated Luke's injunction to lend freely hoping for nothing in return.[10] In part, it was because one gained something for nothing. Since it could be theoretically distinguished from profit, on the grounds that it entailed no risk, it was a form of theft.[11] Furthermore, in an argument made famous by Thomas Aquinas, since charging interest involved stealing time, which belongs only to God, ‘[c]harging for the loan of money is unjust as such, for you are selling something that doesn't exist’ (Aquinas, 1989, 396).

Canon law was universal in application, and secular authorities enforced the canonic prohibition against usury, taking their definition of usury from the Church (Brundage, 1995, 3).[12] Usury prosecutions took place in royal, civic, and manorial courts, as well as in Church courts. In some respects, secular authorities adopted a less rigorous approach to the suppression of usury than that demanded by canon law.[13] Roman law, derived from the Codex Justinianus, which had been recovered in the eleventh century, and was taught by jurists at Bologna and Paris, had permitted rates of interest below 12%. Wood observes ‘[t]here was

[5] These ideas can be found in de Roover (1963, 1967, 1974). De Roover argued that the canonical prohibition on usury shaped business methods, organization and attitudes throughout the medieval period because it affected the types of contracts merchants employed by merchants (de Roover, 1974, 185). A number of other economic historians have emphasized the significance of the usury prohibition. Important recent references include Ekelund et al. (1989, 1996), Munro (1994, 2008), Glaeser and Scheinkman (1998), Reed and Bekar (2003), and Rubin (2009, 2010).

[6] This is akin to the phenomenon of ‘cost-predation’ in which the imposition of a regulation hurts some producers disproportionately more than others and thereby creates Ricardian (inframarginal) rents for some producers (see McChesney, 1987).

[7] The paper closest in theme to this one is Ekelund et al. (1989) which claims that the Church used usury laws to systematically change the prices it faced as a net borrower and that the Church used the prohibition to extract bequests and gifts from guilty merchants. This paper makes use of the latter argument in Section 3.3. However, Tan (2005) argues that the former claim is incorrect by examining how the papacy in the twelfth century came to use bankers to transfer to Rome the specie collected in taxation. She shows that it was these bankers rather than the Church who benefited from papal lending.

[8] Usury was exclusively associated with *mutuum* contracts because these were loans of fungible goods where it was possible for the borrower to return the principal to the lender in full. In contrast, a *commodatum* contract or a loan involving non-fungibles like a house could involve a return in excess of the principal because it was a loan for use, and thus could be viewed as a lease (Armstrong, 2003).

[9] The position of the canonists is at odds with the claims of historians since Ashley (1888, 1893) who have interpreted the usury prohibition as a public spirited attempt to help borrowers. Ashley argued that the ‘Church, caring for the masses of the people, for the weak and the stupid, might think it well to maintain a prohibition which imposed no restriction on the activity of the traders in the towns, who were well enough able to take care of themselves’ (Ashley, 1893, 438).

[10] ‘*Mutuum date, nihil inde sperantes*’ in the Latin Vulgate (Luke 6.35). This is the only place in the New Testament where usury is condemned. This passage was given particular prominence by canon lawyers during the twelfth and thirteenth centuries (Langholm, 1992, 46–56). References to usury in the Old Testament include Psalm 15:5, Exodus 22: 25, Leviticus 25: 35–38, Deuteronomy 15: 7–10, Deuteronomy 23: 19–21, and Ezekiel 18: 8–9.

[11] For the twelfth century theologian Peter the Chanter, the usurer effectively stole from, and exploited, the laborer because ‘he profited without labor, making a livelihood even while sleeping’ (Baldwin, 1970, 271).

[12] Canon law determined what usury was but allowed secular courts to enforce the laws prohibiting it (Helmholz, 1986, 365–366).

[13] See Rubin (2010) for an argument based on the tensions between secular and religious attitudes to usury.

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some confusion about whether Roman Law permitted usury, in the sense of receiving back more than was given. The consensus of the medieval Roman lawyers seemed to be that while technically it did, the permission had no force because it was contrary to the divine law and the law of the Church' (Wood, 2002, 185).[14] In most instances, secular rulers followed the strictures of the Church.[15]

2.1. Enforcing the prohibition

Usury trials occur regularly in the records of civil and religious courts throughout medieval Europe. Helmholz (1986) found that 'usury cases formed a regular part of ecclesiastical jurisdiction throughout England,' although they were never a large part of 'routine business' of the courts (Helmholz, 1986, 367–378). A similar picture can be obtained by studying the records of the manorial courts. Briggs (2009) finds instances of individuals being punished for usury in the manorial court but notes that such examples appear relatively rarely. He considers one case of a lender using a relatively simple ploy to 'hide' interest in the form of other goods. A Balsham court session records that in 1317 'John Crane lent Thomas Pictor *10s*' and that 'for the aforesaid *10s* the same John had bread, ale, and money to the value of *8d* for three weeks'. The court decided that this payment constituted interest and found John Crane guilty of usury.[16]

Usury was a more important issue in the urban and commercial centers of Europe and merchant–usurers were more likely to be prosecuted either in the royal courts or in the civic courts of cities like London. The kings of England launched investigations into merchant usury on a number of occasions. For example in 1274, Edward I issued the following order:

> 'to enquire cautiously whether any merchant–usurers are found in the city of London or elsewhere in the realm, and to cause the bodies and goods and chattels of any such to be arrested and kept safely until otherwise ordered' (Calendar of the Close Rolls, preserved in the Public Record Office, and Edward, 1272–1279, 1900, 144).

Parliament was also on occasion responsible for requesting action against merchant or Lombard usurers. Ormrod (1990, 26–27) details a parliamentary program 'on the subject of "those Christians who are usurers in various ways, some secret and some open, causing great suffering to the people" demanding that an "inquiry is to be made"' (translated by Seabourne, 2003, 190). In 1375 and 1377, parliament 'asked that the London civic ordinance against usury should be enacted across the whole realm. The commons were concerned that the prevalence of "the horrible vice of usury" in the realm was diminishing the virtue of charity, and that many gentlemen had been ruined because of usury' (Seabourne, 2003, 65–66).

In Bruges, de Roover notes that 'laymen who violated the usury prohibition were punishable by the civil authorities': 21 usurers were fined in 1304, 19 in 1310, and 24 in 1311 (de Roover, 1948b, 160).Clearly usury prosecutions were a relatively common occurrence in fourteenth century Bruges.[17] Lombard usurers were liable to prosecution for usury across northern Europe.[18] One Florentine resident in France, Scaglia Tiffi, was condemned for usury after his death and as a result his property was confiscated (Stephens, 1972, 34). In Florence itself during the 1320s and 1330s, the inquisition actively prosecuted usury alongside heresy.[19] Marshall observes that in fourteenth century Prato, the 'almost complete absence of any reference to [interest] in the tradesmen's books was due to the fear of prosecution for usury' (Marshall, 1999, 83). Venice began to enforce secular laws prohibiting usury from 1254 onwards. Further laws were passed in 1270, 1281, and 1333, which not only outlawed Venetians lending at interest, but also prohibited Tuscans on the mainland from doing so (Pullan, 1971, 435–437).[20]

2.2. Evading the prohibition

The prohibition against usury was, at least in theory, an absolute one: any return beyond the principal was prohibited, but it applied only to loan contracts. This opened up the possibility of evading the prohibition by disguising loans through the use of more complicated contracts.

[14] On this point Menning notes, `[s]ome canonists later argued that in fact no disagreement existed between civil and canon codes on usury because Justinian had called for adherence to the decrees of the general councils, which had condemned the practice. Others however, argued that civil law permitted usury in order to avoid a worse evil, even though usury itself was spiritually dangerous' (Menning, 1993, 18).

[15] According to Seabourne (2003), royal action against usury in England was guided by Church rules and `[t]he church and its teachings were referred to more often in royal action against usury than in price regulation' (Seabourne, 2003, 67–68).

[16] Other cases were still more straightforward; 'an isolated presentmentof 1325 in the rolls of Meldreth (Cambridgeshire) simply notes that "Agnes Bateman is a common usurer"' (Briggs, 2009, 75).

[17] Occasionally usurers from Bruges were taken before the Chambre des Comptes of Lille where the fines were much larger (de Roover, 1948b, 160–161).

[18] Gelpi and Julien-Labruyère (2000) note that across continental Europe, during the fourteenth century 'uncovering usurers was one of the major preoccupations of the ecclesiastical police' (Gelpi and Julien-Labruyère, 2000, 39).

[19] An inquisitor Pietro da l'Aquilia was accused of using usury prosecutions as an excuse to extort money (Stephens, 1972, 34). After the 1340s, the number of prosecutions for usury fell because '[a]gainst a background of rising anticlericalism,' Florentine citizens were granted immunity from Church courts (Becker, 1957, 446). At the same time, civic legislation against usury increased (Parkes, 1976, 291). Menning notes that '[b]y the fourteenth century, guild statutes and civic legislation began to reveal the city's determination to enforce the canonical ban on usury' (Menning, 1993, 14).

[20] There was one important exception to the secular prohibition of Christian usury and this involved the payment of interest on public debt. Church doctrine suggested that the payment of interest made all bondholders usurers but, in the debates over the debts acquired by the *monte commune* in Florence, this assessment was ultimately overturned (Armstrong, 2003; Kirshner, 2006; Munro, 2007). In 1378 Giannozzo Sacchetti repaid 300 florins interest because he felt guilty about receiving it (Armstrong, 2003, 56). In the early fifteenth century, lawyers like Lorenzo Ridolfi were successful in arguing that receiving interest on a forced loan could not be usurious because the creditor had not voluntarily lent out the money in the first place.

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Economic historians have long known that it was possible to evade the usury prohibition in practice. But, in general, this fact has been used to argue that the prohibition cannot have imposed a substantial burden on the medieval economy. Clark (2007a) claims that the ban on usury 'had very little cost to preindustrial Christian society' (Clark, 2007a, 216–17).[21] However, many of the 'exceptions' Clark lists, which he considers to have been 'well accepted in Christian Europe,' were in fact regarded as highly dubious by the authorities. In a letter from Pope Alexander II to the Archbishop of Genoa concerning time-dated contracts, the Pope answers that although 'arrangements of that kind and of that form could not strictly be called usury, sellers are nevertheless exposed to being considered as guilty, unless they could really doubt the plus or minus values of the commodities at the time of payment' (quoted in Lapidus, 1991, 33–34). While genuine late charges were permissible, the use of late charges simply to extract interest was condemned by Johannes Calderinus (d. 1365), Antonius de Butrio (d. 1406), and Peter of Ancharano (d. 1416) as illegitimate gain (Armstrong, 2003).

The difficulty the Church faced in enforcing the usury prohibition created incentives for some merchants to attempt to get around it. Some lenders openly flouted the ban on interest and operated as pawnbrokers. They were called manifest usurers.[22] In contrast to these open usurers, other merchants attempted to evade the prohibition. To do this they could not employ straightforward loans. Instead, each loan had to be written as a different type of contract, and the interest payment had to be disguised as a legitimate form of return. These merchants were called 'hidden' or 'occult'usurers (Nelson, 1947).

2.3. Complex contracts

A credit contract can exhibit varying levels of complexity. The simplest form is a loan contract specifying a principal and a rate of interest. Since such contracts were unenforceable, the predominant response was to write more specific and detailed exchange contracts that disguised the payment of interest.[23]

Damages or late payments and discretionary deposit charges were well established and notorious means of charging interest (Unwin, 1918).[24] In fourteenth century Prato, small-scale lenders often just left the interest payment off the books, noting it instead as memoriali (Marshall, 1999). The rates of interest charged typically varied between 20 and 30%. 'In one memoriali, dated June 6, 1385, the tailor Domenico di Jacopo recorded a loan of f.70 to Marco di Pino from Figline but added that Marco had given him written receipt for a loan of f.90, not the f.70 he actually received—a device often employed to camouflage interest' (Marshall, 1999, 98).[25]

The records of a Genoese notary Giovanni di Guidiberto indicate several relatively simple methods merchants used to conceal usurious practices.[26] Di Guidiberto worked in the Volta Fornariorum and his account book contains records of loans and business transactions made between 1200 and 1203. No openly usurious contracts are recorded but a number of the transactions conducted appear to involve disguised interest. Merchants sometimes got around the problem of interest by simply not stating the value of the principal in the records and only recording the total amount paid back. Enrico Nepitella acknowledged a debt he owed Ogerio Boleto of £47 for unrecorded services—a sum that probably includes both the principal and the interest and fees that have accumulated on top of the principal.

Because these relatively unsophisticated devices could be easily spotted by the authorities, over time merchants developed more sophisticated and complex contracts. This meant that usury became harder to prosecute.[27] Table 1 details a number of techniques commonly used to evade the ban on interest payments. A few of the techniques listed, such as the sea loan, were subsequently deemed usurious when – in response to widespread evasion – the usury law became increasingly sophisticated in the thirteenth century.

[21] Similarly McCloskey and Nash (1984) argue that the 'prohibition of usury was irrelevant: that the sin of taking interest should be committed frequently is no more surprising than that the sin of adultery was' (McCloskey and Nash, 1984, 183).

[22] Manifest usurers are not excessive usurers as Goff (1988) claims, but open usurers. In legal terms, a manifest usurer was an individual moneylender who had been found guilty of charging interest in court. Innocent III declared that manifest usurers were public usurers who had become "notorious by fact" for lending at profit (Noonan, 1957, 34).

[23] As Oliver Williamson writes, 'complex contracts can often be devised that are responsive to the needs of the parties' (Williamson, 1985, 327). However, there is a downside to increased complexity. Such contracts are more costly to write, agree to, monitor and enforce. How is quality to be measured? Who supervises the method of delivery? etc. Exchanging rights over goods is costly (Barzel, 1997, 1989). Complexity increases the cost of transacting. It creates problems of haggling and hold-up and this begs the question: 'can the requisite complex contract be described, negotiated, and enforced in a low-cost manner?'(Williamson, 1985, 220). The increased cost of complexity means that contracts are necessarily incomplete; it is impossible to account for every possible contingency (Hart, 1995). One implication is that contractual complexity is a margin along which rational agents adjust according to circumstances.

[24] According to Rabinowitz (1944) these devices may first have been used in antiquity to enable Jews to borrow at interest from other Jews. He observes that in the medieval period 'the device of disguising interest payments under the form of damages and expenses was used extensively by Jews and non-Jews alike' (Rabinowitz, 1944, 52).

[25] In thirteenth century Lucca, money-changers were engaged in short-term lending at interest. Blomquist (1971) notes that the 'money-changers were, however, properly circumspect concerning references to interest charges. Nowhere in the Lucchese materials is there mention of interest, and each mutuum contract explicitly stated that the borrower was obligated to return only the principal sum'. Interest was probably extracted 'by the add-on and discount type lending whereby the borrower acknowledged a debt larger than the sum actually received' (Blomquist, 1971, 469).

[26] Agostino Inguscio has made a data set that contains 756 entries from Giovanni di Guidiberto's records available to me.

[27] One measure of this can be gauged from the fact that by the fifteenth century, in England, lay juries were no longer expected to understand the issue at hand and civic tribunals consisting of the other merchants were often required in order to successfully hear cases of commercial usury (Seabourne, 1998).

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Table 1
Techniques used to disguise interest-bearing loans. Sources Hoover (1926), Pryor (1977, 1984), Bell et al. (2007).

Technique	
Partnerships	*Commenda* or *societas* used to fund investment.
Mortgages	Credit collateralized on the value of land.
The sea loan	Insured against 'the risk of the sea'. Dry sea loans were used to supply credit on land.
Discretionary deposits	A secret interest payment (*a discrezione*) to depositors.
The loan on exchange	Bill of exchanges used to convert foreign exchange transfers into credit.
Dry exchange	A loan on exchange with the exchanges fixed in advance.
Forward contracts	Contracts specifying the purchase of a fixed amount of a commodity in the future could be used a loan containing an implicit interest rate.

Partnerships

Partnerships could take the form of the *commenda* or sedentary partnership or of the *societas*.[28] The legitimacy of the partnership hinged on the burden of risk. If both partners shared equally in the risk of the venture then both were entailed to the resulting gain.[29] More problematic were partnerships in which one partner bore a greater share of the risk since this resembled a loan. It was on these grounds that passive partnerships were deemed usurious.

Mortgages and rents

The Church had a similarly nuanced attitude to intertemporal agreements involving land. Pope Eugene III (1145–1153) outlawed mortgages in which 'the lender enjoyed the fruits of a pledge without counting them towards the principal' (Homer, 1977, 70).[30] Rent charges were legitimized in the thirteenth century, though some scholastic writers such as Henry of Ghent continued to suspect them.

Sea loans

The *foenus nauticum* or sea loan dates from antiquity (Hoover, 1926). It insured against 'the risk of the sea'. The borrower was advanced a sum repayable upon the arrival of the ship. If the ship was lost at sea, the debt did not have to be repaid. It enabled the lender to earn back more than the principal because of the unique risks associated with sea voyages. In the twelfth and thirteenth centuries, merchants began advancing funds to each other on the basis of such sea loans. 'By means of the clever way in which the sea loan was inverted, it was possible to evade the laws against usury, not only for loans for sea commerce but likewise for trading upon the land' (Hoover, 1926, 511).[31]

Merchants used so-called dry sea loans – loans linked to arbitrary sea voyages – as a subterfuge to disguise usurious loans. Lopez and Raymond note that 'such a contract had much the same advantages as ordinary exchange contracts. Any objection which ecclesiastical authorities might raise was circumvented by the fact that no interest or premium was openly mentioned but rather a rate of exchange which could not be condemned even if it were set in advance to insure a suitable reward for the lender' (Lopez and Raymond, 2001, 1955, 169).

Discretionary deposits

Many Italian bankers including the Bardi and Peruzzi bankers typically received compensation for loans in the form of financial 'gifts' (Russell, 1918, 114–117).[32] Bankers also kept deposits which earned the depositor a discretionary amount of interest.[33] For example, a contract from Genoa dated 7th November 1200 states that 'I, Oberto, banker, of Pollanexi, acknowledge that I have received from you, Maria, wife of Rolando Generificio, £50 Genoese in *accomendacio* …I am to keep them in the bank and to

[28] Wilhelm Endemann had argued that the *commenda* was developed in response to the prohibition on usury (see Kaelber, 2007, 64). This was not the case as the use of partnerships preceded the medieval prohibition on usury as Weber (2003, 137–139) noted. Nevertheless, the usury prohibition may have been partly responsible for the popularity of *commenda* contracts. Many credit instruments had Islamic origins.

[29] Needless to say, the fact that full partnerships were approved by the Church does not imply that the usury doctrine imposed only trivial restrictions on contractual form. As Frederick Lane noted, '[f]ull partnership had the disadvantage, however, that it involved the investor in liabilities that were theoretically unlimited and of which the practical range was difficult to foresee' (Lane, 1966, 57).

[30] The tern mort-gage derives from the gage over land that could be employed as a surety for a loan. Mortgages were outlawed because the lender was entitled to the fruits of the land placed as surety as a form of interest. The vif-gage was permitted, however, because the value that the lender obtained from the land was, in theory at least, deducted from the principal. After the condemnation of mortgages, rent contracts and vif-gages gradually became popular, especially in northern France, as a meaning of evading the usury prohibition. Berman's study of the Berdoues cartulary does, however, suggest that in parts of rural southern France mortgages continued to be employed (with the interest thinly disguised) for some time after they were condemned by the papacy (Berman, 1982, 265–266).

[31] For more details on how the sea loan was employed as a form of maritime insurance see De Lara (2001, 2002).

[32] Also see Fryde (1955). As Bell et al. (2008) demonstrate, Edward III often paid high rates of interest on his loans (annualized rates of between 40 and 60 percent).

[33] These deposits were typically time deposits (chosen in preference to demand deposits because they provided greater security to the merchant–banker) (see Blomquist, 1979, 63).

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employ [them] in trade in Genoa as long as it shall be your pleasure; and I promise to give you the profit according to what seems to me ought to come to you' (quoted in Kirschner and Morrison, 1986, 315).

Forward commodities contracts

Forward contracts became common in the late thirteenth century. They were employed frequently by Italian merchants and financiers active in the English wool trade (Bell et al., 2007).[34] Forward contracts enabled sellers to smooth the fluctuating demand they faced for wool. They could also be used as *mutuum* contracts in disguise. A number of those contracts in which money exchanged hands at the time of the initial contract may have been credit transactions. For example, in 1274, 'the prior of Thornholme in Lincolnshire admitted that he had agreed to sell 75 sacks [of wool] to Master William of Louth in 1269–70 and had received 900 marks "as a loan"' (Bell et al., 2007, 127). Under such an arrangement an implicit rate of interest could be easily charged if the price of wool specified in the contract was undervalued or if additional sacks of wool were provided to the buyer as gifts (Bell et al., 2007, 127–130).[35]

Bills of exchange, the loan on exchange and dry exchange

A principal clerical objection to interest was the notion that it was "certain" and without risk.[36] The usury prohibition could therefore be evaded by using contracts that turned this certain gain into something uncertain. One way to do this was the loan on exchange. This was made possible by the invention of bills of exchange—promissory notes which enabled merchants to promise to pay one another in another city at some future date.[37]

To see in more detail how bills of exchange enabled merchants to evade the usury prohibition, consider the following example of a loan on exchange. The loan involved four parties. On one side of the transaction are the deliverer or lender and his agent or payee who resides in another city. On the other side of the transaction are the taker or borrower and his agent, the payer. In Florence, the deliverer gives the taker a certain amount of Florentine Florins at date t. In return, he gets a bill of exchange which is an order to pay him a specific amount of Venetian Ducats in Venice some future date $t+1$. This is called the exchange. The deliverer then sends the bill of exchange to his payee in Venice. The payee takes the bill of exchange to the payer who is an agent of the taker and receives the amount of Venetian Ducats promised in the bill of exchange. The second part of the process is called the re-exchange.

Had exchange rates been fixed, the bill of exchange would simply have become a time-dated contract. For a merchant looking to sell a bill of exchange promising x Florins in exchange for y Ducats in time $t+1$, the bill served the same purpose as a *mutuum*, and the sale was analogous to borrowing money from a lender with an implicitinterest rate or premium (*agio*) built into the contract. In reality, exchange rates fluctuated and this introduced an additional element of risk for the lender. However, the difference between the exchange rates depended on the balance of trade and the flow of specie between the two locations, which in turn hinged upon predictable matters such as the seasons and the pattern of shipping. Therefore the terms of a loan could be calibrated in such a way as to ensure that the lender was likely to make a return. For this reason Benedetto Cotrugli, author of a treatise on accounting, described the loan on exchange as a subtle and delicate invention (Mueller, 1997, 288). It relied on the fact that merchants were typically able to predict the direction (if not the magnitude) of exchange rate fluctuations. 'The success of a *cambista*, a lender on exchange, lay in his ability to foresee the movement of various curves of exchange rates, in his own city and in other commercial and financial centers. He had to plan his credit supply in such a way as to exploit the moment of widest divergence between two different rates of exchange, which corresponded to the moment of highest demand for credit' (Mueller, 1997, 302).[38]

A loan on exchange was known as a dry exchange if it was, in effect, a straight loan. de Roover (1944) provides a series of examples taken from the account book of Antonio del Conte, a member of the Medici bank in Bruges in 1441. First the Venetian branch of the Medici bank lent Antonio x amounts in Venetian Ducats. He drew this money from the bank in Bruges and instructed the Bruges branch to write a bill of exchange credited to the Venetian branch's account in Bruges. The bill promised to pay back x Ducats in Groats at a fixed exchange rate a. The re-exchange occurred when the Bruges branch drew a bill of exchange from Antonio del Conte payable at usance at exchange rate b plus a fee of commission c. This exchange is called 'dry' because money itself never needs to move between the two locations in question.[39] The implicit interest rate is nevertheless uncertain. Dry exchange remained speculation and there were (rare) occasions where the borrower would end up paying back less than the principal.[40] A fictitious

[34] Of 215 forward contracts examined, Bell et al. (2007, 19–21) found that 150 were drawn up for Italian bankers, notably the Riccardi, the Bellardi, the Gotele and the Gualteri, all of whom were from Lucca.

[35] Bell et al. (2007) assess statistically the implicit interest rate charged on a number of loans. They find that the implied interest rate varied between 10 and 40% and that the median interest was between 18 and 22% depending on how it was calculated.

[36] Usury was distinct from other forms of unjust profiteering which were termed *turpe lucrum*—filthy gain. Taeusch (1952, 298) notes that 'Shylock's behavior was reprehensible, not merely because the "bond" he demanded was a pound of flesh, but also because it was forfeit at a certain time regardless of the fact that Antonio's vessels lay "wrecked on the narrow seas"'.

[37] The bill of exchange could be used as a credit instrument because an individual bill could not be drawn until a fixed length of time had expired after it had been issued. This fixed length of time before a bill could be redeemed was known as usance. The amount of time that had to pass depended on where the bill was issued and where it could be drawn exceeded average postal times. From Florence to Bruges, the usance was 2 months (see Hall, 1935; de Roover, 1944; de Roover, 1963; Kohn, 1999).

[38] At Venice, the market peaked in the summer months of June and July because this was when merchant galleys sailed East and consequently when merchants needed funds most promptly. In September the rate of interest collapsed, typically falling below the rate obtaining in March or April. 'This calendar meant that supply and demand for credit and for specie were largely foreseeable, and Florentine merchant–bankers could plan ahead so as to have all possible assets on hand in Venice when demand was highest—that is, when exchange rates and thus interest rates peaked' (Mueller, 1997, 306).

[39] A number of letters showing instances of dry exchange dating from a later period can be found in Richards (1932, 252–258).

[40] In one example de Roover gives $a=b$ which meant that the only interest Antonio del Conti paid was the commission c.

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Table 2
The parameters of the model.

e_i = cost of writing complex contracts	r = rate of interest
θ_i = contract complexity	π = profit
ϕ_i = merchant ability	q_i = quantity lent
L = legal sophistication	Q = total quantity of loans
γ = social stigma	c = cost of lending

exchange occurred when no bills of exchange were written at all: 'Bills were simply made out pro forma, often under fictitious names. Interest, however, was still computed on the basis of the exchange rates reported by business connections abroad' (de Roover, 1944, 264–265).

The historical evidence presented in this section shows that the usury prohibition was actively enforced. Nevertheless the extent of enforcement was inevitably imperfect: it was possible to evade the law, and merchants showed considerable ingenuity in this respect, disguising loans as commodity transactions and using increasingly complex types of contracts. These observations provide initial support for the hypothesis that the usury prohibition *could* have been subject to regulatory capture. Once a merchant had the ability to use a bill of exchange in order to write a loan contract, he could theoretically have benefited from a tightening in the usury prohibition, if his rivals lacked the ability to write bills of exchange.

3. A model

The model has two components: an oligopolistic credit market and a legal system. The credit market comprises a large number of lenders facing a linear demand curve. The more lenders there are, the lower is the interest rate and the lower are the profits of individual lenders. The legal system consists of a non-strategic player called the court that assesses probabilistically whether a randomly selected lender is guilty of lending money at interest or not. This probability depends on the type of contract used by the lender and on the sophistication of the legal system, i.e. its ability to tell whether or not a given contract is usurious. The Church controls the sophistication of the legal system.

By disguising interest payments, lenders are able to reduce the probability that they will be convicted as usurers if they are brought to trial. If the law is relatively unsophisticated, then lenders only need to write relatively simple contracts to evade the law. A more complex law reduces the total amount of profits that can be made from lending because it increases the risk each lender faces from lending money at interest. Since this cost is higher for some than it is for others, this effect is not felt proportionally by all lenders. Furthermore, the costs of being convicted for usury vary between merchants. This means that some merchants lend at interest without attempting to evade the prohibition. As the usury prohibition becomes more sophisticated, lenders who have high costs of being convicted, and find it difficult to evade the prohibition, exit the market, whereas the remainder of the merchant population become either manifest or hidden usurers.

3.1. Setup

There are n merchants or lenders denoted by $i \in N$ where $|N| = n$ and a single provider of the law L called the Church. Usury prosecutions were undertaken by canon courts, royal courts and merchant courts but the overall legal framework was determined by the Church, so in the model the Church chooses a level of legal scope and sophistication L. The courts are assumed to investigate a small proportion of all loan contracts. Every merchant lending money at interest therefore faces some probability of being convicted for usury. This probability depends on the sophistication of the law L and the type of contract used by the merchant in question. The more sophisticated the contract that a merchant uses, the lower the probability of being convicted of usury. The sophistication or complexity of a contract is measured by $\theta \in (0, \bar{\theta})$. The more extensive the law (the greater is L), the greater the probability P_i that the court with find a merchant involved in providing credit guilty of usury. The courts therefore assess a merchant i according to

$$P_i(\theta_i | L), \tag{1}$$

where $P_i(\cdot|\cdot)$ is twice continuously differentiable, and $P \in (0, 1)$. P_i is increasing in L and decreasing in θ_i. The punishment for being convicted of usury is equal to $\gamma_i \in (0, \bar{\gamma})$. In practice the legal punishment for conviction of usury was not particularly severe, but the social stigma associated with being found to be a manifest usurer was considerable.[41] Merchants vary according to their ability ϕ. Ability is distributed uniformly on support $(0, \phi^H)$.[42] Ability determines the cost of writing complex contracts $e(\theta_i, \phi_i)$ where $e(\cdot)$ is twice continuously differentiable. This term plays an important role in the model as it acts as a fixed cost that lenders can choose to pay when they enter the credit market.[43] The parameters of the model are listed in Table 2.

[41] Episcopal courts could force convicted usurers to pay full restitution but it was also often accompanied by penance and the threat of excommunication with all that that entailed (Wood, 2002, 167).
[42] The assumptions of uniformity could be easily dropped, but they make it easy to interpret the comparative static results of the model.
[43] There is no need to specify whether the term 'high ability merchants' refers to merchants who are more literate or numerate, or who simply have better connections, and as a consequence of this, find it easier to use devices such as the loan on exchange, in order to disguise their usurious loans, than do 'low ability merchants'.

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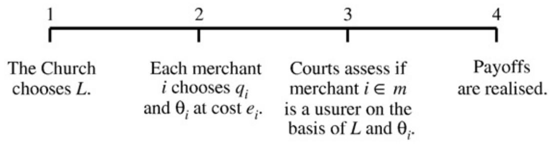

Fig. 1. The sequence of the game.

3.2. The credit market

The total quantity of loans in the credit market is $Q = \sum_{i=0}^{n} q_i$ where q_i is the quantity of loans supplied by each individual merchant i. A merchant is active in the credit market if q_i is strictly positive. Using this information, the utility maximization problem facing each merchant can be written as follows:

$$\max_{q_i,\theta_i} u_i = \begin{cases} \pi(q_i) - \gamma_i P_i(\theta_i|L) - e(\theta_i, \phi_i) & \text{if } q_i > 0, \\ 0 & \text{otherwise.} \end{cases} \tag{2}$$

The credit market is characterized by oligopolistic competition. Lenders decide how much to lend out and the resulting market rate of interest is determined by Cournot competition in the credit market. The demand for credit is linear and the market rate of interest is given by $r = \alpha - \beta Q$ with $\beta \in (0,1)$. The number of merchants i for whom $q_i > 0$ is given by $m \in N$. The Cournot–Nash equilibrium is given by $q_i^* = BR_i[q_{-i}^*]$ which is equal to

$$q^* = \frac{\alpha - c}{\beta(m+1)}, \tag{3}$$

for all $i \in m$. The total quantity of loans is given by $mq^* = Q^* = m(\alpha - c)/(m+1)\beta$ and the equilibrium interest rate is $r^* = \alpha - \beta Q^*$. Equilibrium profit per lender is given by:

$$\frac{1}{\beta}\frac{(\alpha - c)^2}{(m+1)^2}. \tag{4}$$

The decision whether or not to lend a positive quantity is consequently given by the following dichotomous choice:

$$q_i = \begin{cases} q^* \text{ if } & \dfrac{(\alpha - c)^2}{\beta(m+1)^2} - \gamma_i P_i(\theta_i|L) - e(\theta_i, \phi_i) > 0, \\ 0 & \text{otherwise.} \end{cases} \tag{5}$$

Equilibrium in the credit market implies that each active merchant produces the Cournot quantity q^*.[44]

3.3. The sorting equilibrium

The sequence of the game is described in Fig. 1. Each merchant has complete information about the sophistication of the law L.[45] Therefore we proceed by solving the decision problem facing merchant i for a given value of L.

Merchants who lend at interest and attempt to evade the usury prohibition are called ‘merchant–bankers’ or ‘hidden usurers’. Which individuals become merchant–bankers? The decision whether to become a merchant–banker depends upon (i) a merchant's ability and (ii) the social stigma they face if they are found guilty of usury, as well as the sophistication of the law, and we can show that there exists a function $\phi^*(\gamma_i, L)$ such that all merchants i with ability $\phi_i \geq \phi^*(\gamma_i, L)$ lend at interest and use complex contracts.

Merchants who do not enter the credit market do not learn how to write complex contracts. Conditional on entering the market, merchant i chooses θ_i in order to minimize the risk of being prosecuted and the cost of writing complex contracts: $\gamma_i P_i(\theta_i|L) - e(\theta_i, \phi_i)$. Therefore the optimal value of θ for each i, θ_i^* is given by

$$\min_{\theta_i^*} \left(\gamma_i P_i(\theta_i|L) + e\left(\theta_i^*, \phi_i\right) \right). \tag{6}$$

[44] The main effect of relaxing the symmetric marginal cost assumption is on the market share of each merchant–banker. Merchants with low marginal costs of lending will have a larger market share conditional on lending at all.

[45] The game is one of complete information. Therefore it can be solved through backwards induction. The Church cannot tell perfectly whether or not a merchant has committed usury, but both types of players have complete information about the strategies chosen by everyone else.

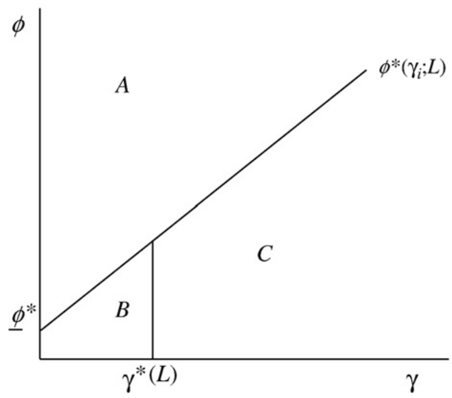

Fig. 2. The sorting equilibrium. The population of merchant–bankers is given by *A*; *B* represents pawnbrokers; *C* merchants who exit the credit market because of the prohibition.

The value of θ_i chosen by each merchant *i* depends both on *i*'s ability ϕ_i and on the strength of the social cost associated with being convicted as a usurer γ_i. Ability ϕ_i and stigma γ_i are uniformly distributed. Using this, we know that there exists a cut-off value of $\theta_i^*(\gamma_i, L)$ such that $\theta_i^*>0$ for all $\phi_i \geq \phi^*(\gamma_i, L)$ and $\theta_i^*=0$ for all $\phi_i<\phi^*(\gamma_i, L)$. This statement means that for a given level of legal sophistication L and for a given cost γ_i, the cut-off point at which an individual invests in writing complex contracts is determined by ability ϕ. Under the assumption that γ and ϕ are uniformly distributed, the function $\phi^*(\gamma_i, L)$ is linear in $\phi-\gamma$ space. This is depicted by the upwards-sloping line in Fig. 2. All merchants above this line become merchant–bankers and are denoted by *A*.

In order to examine $\phi^*(\gamma_i, L)$ in more detail, we need to look more closely at the entry decision of a merchant–banker. Merchant *i* enters the market and attempts to evade the usury prohibition if and only if the following condition holds: $\pi(q^*)\geq\gamma_i P(L|\theta_i^*)+e(\theta_i^*, \phi)$ for $\theta_i^*>0$, which can be written as $\pi(q^*)\geq P(L|\theta_i^*)+e(\theta_i^*, \phi(\gamma_i))$ $\theta_i^*>0$.This is satisfied with equality when $\phi_i=\phi^*(\gamma_i, L)$, where $\phi^*(\gamma_i, L)$ is defined by:

$$\pi\left(q^*\right) = P\left(L|\theta_i^*\right) + e\left(\theta_i, \phi^*(\gamma_i,L)\right). \tag{7}$$

Therefore for every level of *L*, and for each γ_i, there exists a value of $\phi(\gamma_i, L)$ such that for all $\phi_i\geq\phi^*(\gamma_i, L)$, merchant *i* enters the market and uses a level of contract determined by Eq. (6).[46]

Now let us examine the situation facing a merchant who is unable to evade the usury prohibition. A merchant who lends openly at interest faces probability $P(L|0)$ of being successfully prosecuted for usury. If merchant *i* has a low value of γ_i, he may find it worthwhile to enter the market and risk the probability of being declared a manifest usurer. Eq. (7) defines a cut-off point such that for a fixed value of $\pi(q^*)$, it is worthwhile for a merchant to enter the market and openly lend money at interest without attempting to evade the usury prohibition:

$$\gamma^*(\phi, L)\geq\frac{\pi\left(q^*\right)}{P(L|0)}. \tag{8}$$

All merchants *i* such that $\gamma_i\leq\gamma^*$ and $\phi_i<\phi^*(\gamma_i, L)$ enter the market without attempting to evade the prohibition. They are pawnbrokers or manifest usurers. In Fig. 2 they belong to group *B*. Conversely all merchants *i* such that $\phi_i\geq\phi^*(\gamma_i, L)$ enter the credit market and attempt to evade the usury prohibition. Finally we can consider the remainder of the population, those merchants with ability $\phi_i<\phi^*(\gamma_i, L)$ and $\gamma_i>\gamma^*(L)$. These merchants do lend money at interest either as merchant–bankers or as manifest usurers. In Fig. 2, they belong to segment *C*.

An examination of Eqs. (7) and (8) enables us to state the following proposition.

Proposition 1. *An increase in the sophistication of the law L from L_0 to L_1:*

1. *Increases the cut-off level of ability $\phi^*(\gamma_i)$ at which merchants attempt to evade the prohibition and increases the average sophistication of the contracts they use from $\hat{\theta}_0$ to $\hat{\theta}_1$;*
2. *Reduces competition between merchant–bankers and increases the profits of the remaining merchant–bankers;*
3. *Increases the number of pawnbrokers or manifest usurers who enter the market without acquiring the ability to write sophisticated contracts.*

[46] The level of contractual complexity used by each merchant–bankers ϕ_i^* varies between $\underline{\theta}$ and $\bar{\theta}$ where $\underline{\theta}$ is implicitly defined as the value of θ corresponding to that chosen by the lowest ability merchant–banker who has ability $\underline{\phi}^*$. The average value of θ can be denoted $\hat{\theta}$, and because merchant ability is uniformly distributed, it is equal to $(\underline{\theta}+\bar{\theta})/2$.

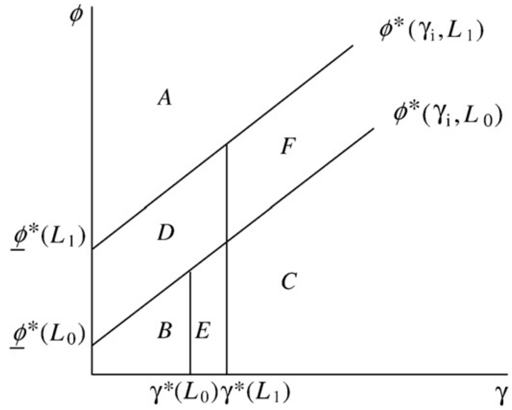

Fig. 3. Proposition **1**. An increase in *L*. *D* represents the proportion of merchant–bankers who become pawnbrokers; *F* is the proportion who exit the market; *E* represents the additional increase in the number of pawnbrokers.

Proof of Proposition 1 is provided in the Appendix A. The intuition behind the proposition is depicted in Fig. 3. An increase in the sophistication of the laws against usury from L_0 to L_1 shifts $\phi^*(\gamma_i, L_0)$ upward to $\phi^*(\gamma_i, L_1)$. As a result, a number of individuals who had been merchant–bankers previously cease to be so. Ex-merchant–bankers with low values of γ become pawnbrokers (D). Ex-merchant–bankers with higher values of γ exit the market completely (F). The fall in the number of lenders increases the profits available for those merchants who remain in the market. As a result, the cut-off level of social stigma γ below which individuals are willing to risk becoming manifest usurers increases from $\gamma^*(L_0)$ to $\gamma^*(L_1)$.

Proposition 1 has three predictions. The first is that the increasing sophistication of the canonical prohibition against usury reduced the number of merchant–bankers. The implication that the usury prohibition reduced competition between lenders follows directly from economic theory and it is consistent with the available evidence. Historians suggest that Italian merchant–bankers did not appear to compete directly with one another. Goldthwaite (1987) observes that the 'vast correspondence of Datini and of the Medici themselves yields hardly a hint of competition' (Goldthwaite, 1987, 23–24).[47] Preliminary quantitative evidence supports this view. McLean and Padgett (1997) test and reject the hypothesis that Florentine financial markets were competitive on the basis of tax data from the 1427 *catasto*. They find that the nine Medici banks represented 30.5% of the sector as a whole (McLean and Padgett, 1997, 226).

The second component of Proposition 1 is the distinction between manifest usurers who do not attempt to evade the usury prohibition and merchant–bankers who do. Furthermore, it predicts that this distinction would have become sharper as the usury prohibition became more sophisticated. Nelson (1947) observed precisely this phenomenon, noting that '[t]he merchant–usurer of the early middle ages had broken down to yield two disparate figures who stood at opposite poles: the degraded manifest usurer–pawnbrokers, often as not a Jew; and the city father, arbiter of elegance, patron of the arts, devout philanthropist, the merchant prince' (Nelson, 1947, 120–121).[48] The model outlined here generates such a distinction endogenously. Furthermore, it generates a positive relationship between the sophistication of the prohibition, and the definiteness of the distinction between manifest and hidden usury.

The third prediction is that because in equilibrium merchants who have low costs of writing complex contracts can benefit from an increase in *L*. Evidence for this is provided in the next section.

3.4. Evidence of regulatory capture

Given the kind of written material that has survived, it is impossible to test the regulatory capture hypothesis *directly*. Nevertheless there is a considerable amount of *indirect* evidence supporting the hypothesis. Firstly, we show that a coalition of interests could benefit from the usury prohibition. Medieval monarchs used the prohibition both as a means of indirect taxation and as an excuse to seize the assets of prominent merchants. Secondly, we consider evidence from the fourteenth and fifteenth century London, where domestic merchants used the usury prohibition to suppress competition from foreign merchants. Finally, we look briefly at how *political* changes in Florence affected the enforcement of the usury prohibition.

The main intuition behind the model is that by imposing costs on entrants, the usury prohibition was a source of economic rents. These rents accrued both to elite merchant–bankers, who were able to evade the prohibition, and to pawnbrokers and other manifest usurers, who were often granted local monopolies on lending at interest. For this to be relevant, it must be the case that the costs of evading the usury prohibition were both significant and asymmetrically distributed across merchant types.

[47] Following Weber (1930) historians have debated whether or not the merchant–bankers of late medieval and Renaissance Italy were true capitalists. The argument developed here suggests another reason why their behavior deviated from that associated with entrepreneurs operating in competitive markets.

[48] This divide was in fact tripartite between pawnbrokers, local bankers and international merchant–bankers. But both local bankers and merchant–bankers succeeded in evading charges of manifest usury (Goldthwaite, 1985, 1995).

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In fact, there is considerable evidence that the costs of using the more sophisticated contracts such as the loan on exchange were high. According to de Roover 'the business of exchange was an art'. Moreover, it was an art which was only 'practiced by the merchant–bankers who delivered money on the exchange …because they were thus able to lend at a profit without violating the ban of the Church against usury' (de Roover, 1948b, 66).[49] Using sophisticated credit instruments such as the bill of exchange was costly, and not all merchants had the knowledge, connections or experience to employ them. Braudel noted that 'one should not underestimate the competence that had to be acquired: the young merchant had to be able to establish buying and selling prices, to calculate costs and exchange rates, to convert weights and measures, to work out simple and compound interest, to be able to cast up a 'simulated balance sheet' for an operation, and to handle the various instruments of credit. This was not an easy task for an untrained merchant. Sometimes even experienced merchants felt the need to "retrain"' (Braudel, 1979, 1982, 409). Merchant–bankers acquired the institutionally specific human capital required to use instruments like bills of exchange from a young age: 'they familiarized themselves with the business, learning to handle the cash box and eventually to keep accounts' (Goldthwaite, 1972, 418). Benedetto Cotrugli (1416–1469), in his handbook for merchants, observed 'many gentlemen entrust to their [fellow] citizens their own sons, [to be] trained and placed in some good position, so that from childhood they could learn their art' (quoted in Lopez and Raymond, 2001, 1955, 415–416).[50]

The next question raised by regulatory capture hypothesis is: who obtained the rents? Stigler's (1971) theory suggested that a single producer or group of producers would be able to capture the entire regulatory apparatus of a given industry. Peltzman (1976) recognized that many parties might potentially have an interest in obtaining or preventing a particular piece of regulation. In recognition of this, he treated the capture process as a multiparty auction. A similar process may have taken place in medieval Europe where a number of different coalitions representing different interests could have benefited from the usury prohibition.

These interests included elite merchant–bankers, secular rulers, as well as the Church. Which particular groups benefited the most varied between different countries and across time. The model is most applicable in polities where elite-merchant–bankers had political influence. Where the power of merchants remained subordinate, much of this rent was captured by the nascent medieval state. The model is consequently more relevant for the smaller states of Italy and the Low Countries than it is for the monarchies of England or France. Kings faced a dilemma in which they had to trade-off the benefits from tolerating usury against the rents that they could earn by enforcing canon law. The kings of England benefited directly from suppressing usury because they could lay claim to properties and chattels of an unrepentant usurer on his deathbed. An entry of the Plea Rolls for September 4, 1272, during the reign of Henry III records the '[a]ppointment of William de Weyland to enquire by oath, of good men of the county of Lincoln whether William son of the parson of Lue, lately deceased, was a usurer in his lifetime, so that his goods and debts should belong to the king on that account' (Calendar of Plea and Memoranda Rolls, Preserved among the archives of the Corporation of the City of London at Guildhall, 1323–1364, 1906, 675).[51]

In Bruges from the 1280s onwards, Lombard moneylenders operated as manifest usurers within the city; they 'needed a special license because they publicly lent money at interest, or usury. Such an activity was illegal, and a license was required to engage in it' (de Roover, 1948b, 17).[52] The existence of a small number of licensed pawnbrokers in some jurisdictions is compatible with the model, as from the perspective of the capture hypothesis, the licensing of pawnbrokers can be seen as an attempt by secular authorities to capture some of the rents that the usury prohibition generated. Licenses to lend at interest were a source of revenue and moneylenders were often subjected to arbitrary taxation. The rulers of England and France licensed and taxed Jewish moneylenders throughout the thirteenth century.[53]

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[49] Though bills of exchange also played an important role in reducing transaction costs, the usury prohibition helps to explain the proclivity of medieval merchants to employ contracts that had the effect of 'reducing financial transactions to commodity transactions' (Riemersma, 1952, 20). For as de Roover noted: 'If it had not been for the usury doctrine, why would merchants have adopted a cumbersome procedure when simpler methods were available?' (de Roover, 1963, 13).

[50] Marco Datini served such an apprenticeship in Florence from the age of thirteen (Jouanique, 1996, 264). 'This meant fairly intimate contact and demanded of the neophyte eligibility by birth, temperament, and ability for trust and for companionship with his seniors. The best entree was to be born into the senior's family or to be one of that restricted circle of those eligible as sons-in-law' (Reynolds, 1952, 351).

[51] Usury charges were frequently used by the monarchs of England and France to expropriate rich merchants. Philip IV of France and his successors used the charge of usury to seize the property of Florentine lenders. Fryde observes that 'on at least five occasions between 1277 and 1349, Italian merchants were seized by the king on the pretext that they were guilty of usurious practices and they were released each time only after paying very substantial fines' (Postan et al., 1963, 479–480). Similarly, the French financier Jacques Coeur was accused of usury amongst other crimes by Charles VII in 1451, and as a result his fortune was seized (Reyerson, 2004).

[52] In Italy during the fourteenth and fifteenth centuries, outside major urban centers such as Florence and Milan, these pawnbrokers were mostly Jews (see Poliakov, 1955, 1977, 1965; Calimani, 1988; Gow and Griffiths, 1994; Botticini, 2000; Foa, 2000; Pullan, 1971, 2001). Elsewhere in Europe, pawnshops were run by Lombards or cahorsians (de Roover, 1948b; Noonan, 1957). This did not amount to a legalization of usury since pawnbrokers were 'not allowed to follow their calling peacefully without a license or special permit to do so. Even thus provided, their position remained precarious and was in many way comparable to that of the Jews. The Lombards in Flanders as elsewhere lived in constant fear of a sudden reversion to repressive methods and under permanent threat of expulsion and of spoliation' (de Roover, 1948b, 99–100). De Roover suggests that 'the situation was not unlike that which prevails in certain countries where licensed houses are tolerated as a means of protection against uncontrolled prostitution' (de Roover, 1948b, 103).

[53] In a letter, written in 1208, to the count of Nevers, Pope Innocent III specifically condemned secular princes for convening and profiting from Jewish usury. He stated that though princes, 'themselves are ashamed to exact usury, they receive Jews into their hamlets [*villis*] and towns and appoint them their agents for the collection of usury; and they are not afraid to afflict the churches of God and oppress the poor of God' (Grazel, 1966, 127). Article 67 of the Fourth Lateran Council signed in November 1215 also explicitly condemned Jewish moneylending (Tanner, 1990). Parallel developments occurred in jurisdictions where pawnbroking was in the hands of Christians rather than Jews. The first licensed pawnbrokers in Bruges were the Lombards Jakemon de Calochs and Centurin de Montfaucon in 1281, and they paid yearly fees to the city. The amount they paid varied: 'it was £133 *5s 8d* in 1308 but it rose to as high as £400 in some years. After 1360, it was increased to £216 per year and stayed at this level for many years' (de Roover, 1948b, 102).

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The model sheds insight on how elite merchant–bankers could benefit from the prohibition and retain a large portion of the rents it generated, particularly in city states such as Florence where they controlled the levers of political power. The usury prohibition was used to restrict competition. The distinction between manifest and hidden usurers was increasingly formalized; bankers in Florence were organized into a guild – the *Arte de Cambio* – which barred pawnbrokers and other manifest usurers (de Roover, 1948a; Goldthwaite, 1985, 1995). This conferred legitimacy on local and international bankers who were able to successfully evade the usury prohibition by disguising their loans, whilst heaping opprobrium on those who chose not to do so. From 1367 onwards, any guild members found guilty of usury could be fined one hundred lire (Menning, 1993, 15). This limited entry and thereby kept profits high. Lenders who were not members of the guild could be subject to extraordinary taxation and had no political representation.

Another manifestation of regulatory capture can be seen in the way in which the campaigns against usury that took place in London during the fourteenth and fifteenth centuries were used for protectionist purposes. In 1422, '[a] petition to the Commons protested against the alien brokers who used subtlety and deceit to exact usurious "grievous, horrible and dishonest" bargains and raised the price of merchandise they imported while reducing that of English goods, to the impoverishment of the realm' (Nightingale, 1995, 392).[54] This English case provides perhaps the strongest evidence of regulatory capture as prominent London merchants were able to act as judges on the committees investigating usury. For example, a panel established by the City of London in 1370 to investigate usury cases was chaired by prominent members of the mercers' guild, including Adam Carlisle, William Essex and John Fifhide. According to Nightingale, '[t]here can be little doubt that the usurers the City had in mind were chiefly of Italian origin' (Nightingale, 1995, 233).[55]

An implication of Proposition 1 is that elite merchant–bankers had an interest in the usury prohibition being sufficiently strict so as to restrict the competition they faced, but not so strict that it prevented them from earning positive returns on their own loans. It predicts that there was an optimal value of L for merchant–bankers such as the Bardi or the Medici, and that this value was positive.

It is impossible to test this, but the broader argument that political considerations helped to determine how the usury prohibition was enforced is supported by an examination of a brief period between 1429 and 1435, when the loan on exchange was actually prohibited as usurious by the Florentine government. In 1429, the Albizzi family forced through a law that banned the *cambium sine litteris* or exchange of bills, deeming it openly usurious. The official reason given for the prohibition was to protect borrowers from ruin. But the timing of the bill suggests that it could have been an attempt to reduce the financial power of the Medici.[56] The Medici were adept at evading the canonical restrictions on usury and a large proportion of their profits came from foreign exchange transactions.[57] As de Roover put it, the Medici 'vigorously denied that they were manifest usurers,' yet they made the vast majority of their profits from credit and their account books contain 'several clear cases of dry exchange' (de Roover (1948b, 81) and de Roover (1946, 154)).

The laws of 1429 criminalized the main commercial activity of Medici and they can be seen as part of a more general attempt to reduce the power of the family after the death of Giovanni de' Medici (1360–1429). This was initially successful, and Giovanni's son, Cosimo de' Medici, was forced into exile in 1433. Nevertheless the attempt to reduce the power of the family ultimately failed, and in 1434 Cosimo returned from exile. The law was revoked in 1435. The *cambium sine litteris* was again permissible. The Medici, once in power, did not sanction lending at interest or usury. Rather they simply reverted to the *status quo ante*. This policy decision is consistent with the hypothesis that the usury prohibition as it stood suited their interests; certainly it was compatible with a small subset of usurers making supernormal profits.[58] Even if Cosimo had been able to sanction or legalize interest payments, the theory suggests that it would have been against his interests to do so. This insight helps to account for the stability of the usury prohibition.

4. The Church and the development of the usury prohibition

The period examined in this paper covers more than three centuries, and over this period the society and economy of medieval Europe changed, as did the prohibition on usury. The Commercial Revolution of the twelfth and thirteenth centuries was accompanied by a sustained 'campaign against usury' waged by the Church.[59] This tightening of the usury prohibition is described in Table 3. At the height of the commercial revolution, the Church sought to *tighten* the usury prohibition. It updated canon law and accommodated the financial innovations of the twelfth and thirteenth centuries in a way that maintained a distinction between licit and illicit exchange.

[54] The parliamentary measures of 1375 and 1375 were also directed against 'Lombard usurers' (Seabourne, 2003, 65).

[55] Similarly the election of John Ward as mayor of London in 1375 meant a renewal of the campaign against Lombard usurers and 'was followed by the persecutions of aliens for acting as brokers for usurious loans' (Nightingale, 1995, 243).

[56] In the 1420s, prior to the political accession of the Medici, Florentine politics was dominated by their rivals, the Albizzi family. Cosimo's biographer Curt Gutkind notes that the 'years 1426–1428 were indeed a severe test for the Medici' because their opponents in the Signoria 'knew full well that unless energetic measures were taken by them they could no longer retain power' (Gutkind, 1938, 56).

[57] The Europe-wide foreign exchange market also served as a capital market since the most important way in which the usury prohibition was circumvented was by transforming credit transactions into foreign exchange transactions via a bill of exchange (de Roover, 1963, 108–141).

[58] It is also consistent with the alternative view that Cosimo showed genuine concern about usury. However, this has to be squared with de Roover's finding that the Medici did use bills of exchange in a way that was 'censored by most theologians and jurists' (de Roover, 1948b, 82).

[59] The term 'campaign against usury' comes from Chapter XV of Baldwin (1970, 296–311) and was originally used to describe the period 1195–1215. Munro (2003, 2008) extends it to include a period from the late twelfth century until the mid fourteenth century, and this is the sense in which it is used here.

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Table 3
Sources Tanner (1990), Gilchrist (1969). Numbers in brackets refer to the relevant canons, constitutions and degrees of the council in question.

1139	Second Lateran Council	Usury prohibited to laymen as well as to the clergy (13).
1179	Third Lateran Council	Manifest usurers to be excommunicated and denied Christian burial (25).
1215	Fourth Lateran Council	Jewish usurers to be ostracized (67).
1245	Council of Lyon I	Churches forbidden from contracting usurious debts (1).
1274	Council of Lyon II	Usurers to be expelled (26). Bishops who fail to excommunicate usurers to be suspended (26). Wills of usurers invalided. Judges who upheld the wills of usurers are to be treated as usurers (27).
1311	Council of Vienne	Inquisition to investigate rulers who tolerate usury (29). Lenders compelled to handover their account books.

Part of the tightening of the usury prohibition involved increasing the severity of the punishment associated with usury (γ in the model). Goff (1979, 28) noted a marked increase in the severity of the vitriol directed against usury in the twelfth century. In 1139, usury had simply been "ignominious," but by the turn of the century it had become equated to heresy—an evil that the Church had to devote itself to stamping out.[60] The punishment meted out to usurers involved penance, restitution or the denial of spiritual services. At the Third Lateran Council in 1179, it was deemed necessary to use the threat of excommunication to deter manifest usurers, although it is unclear how often this final threat was carried out.

More significantly for the purposes of our argument, canon lawyers devoted considerable effort to investigating whether or not particular contractual forms were usurious. In the decretal *Naviganti*, published in 1234, Gregory IX declared passive partnerships to be usurious because the burden of risk was shared unequally. This reflects a broader tendency and the legislation of the thirteenth century as a whole attests 'to the proliferation of usurious contracts and to the development of a more precise vocabulary to describe it' (Armstrong, 2003, 59).[61] From the thirteenth century onwards 'usury was soundly condemned, and in ever more sophisticated ways, by the scholastics' (Little, 1978, 180).

The views of the scholastics were not merely cheap talk. The Church granted the courts greater powers to investigate usury. Whereas previously an alleged usurer had to be accused by an unhappy borrower, in 1207 a change in legislation meant that it became possible to bring a case against a suspected usurer in the absence of a plaintiff. This was an important development because it reduced the likelihood of the lender and borrower collusively agreeing to honor interest-bearing contracts. In 1215, the auricular confession became compulsory, thus tightening the grip the Church had on morality.[62] At around the same time, the new mendicant orders, particularly the Franciscans, began to actively preach against usury (Little, 1978, 211).[63] After the Fourth Lateran Council 'steps were continually taken to bring the decrees of the Councils of the Lateran and of Lyons before the general Christian public. They were ordered to be read and expounded from every pulpit. In some dioceses they were to be publicly affixed. The people were to be reminded every Sunday that the penalty for usury was excommunication' (Parkes, 1976, 287).[64]

The London usury trials of 1421 provide an example of how the courts responded to merchants disguising interest payments. One reason why a civic court was given responsibility for investigating usury in this instance was that 'there was felt to be a need for the civic authorities to act because other tribunals might not have been able to deal with certain matters which were important in the prosecution of usury in London, such as how brokers of usurious deals should be punished, and how sophisticated versions of usury should be defined and treated' (Seabourne, 1998, 117).

The Church's campaign culminated in 1311–12 with the Council of Vienne. Hidden usury was equated with heresy and sexual perversion, and rulers who tolerated, or profited from the practice, were threatened with excommunication. The inquisition was given the authority to investigate usury cases. Those who associated with usurers, including their wives and children, their business associates, lawyers and notaries, were also smeared with the crime. Decree 29 explicitly states that 'since moneylenders frequently conclude loan contracts in an occult or fraudulent manner, which makes it difficult to convict them on a charge of usury, we decree that they should be forced by ecclesiastical censure to produce their books on such occasions' (Kirschner and Morrison,

[60] By the thirteenth century, usury was equated with theft and murder. According to William of Auxerre usury, was worse than murder because 'there is no exception to the law against usury, whereas it is on occasion even meritorious to kill' (quoted in Nelson, 1969, 1949, 13).

[61] 'What Gratian condemned as mere avarice was now the *crimen usurarum* (crime of usury), a form of theft and a sin against justice or charity that could be rectified only by complete restitution. It was expressed not only in loans, but in a variety of transactions that had the same effect as loans, such as simulated sale contracts, credit sales in which payment or delivery was postponed, partnerships in which the risk was unevenly shared, bills of exchange and sea loans'(Armstrong, 2003, 59).

[62] As Smith (1913) observed, the auricular confession 'gave a much greater efficacy to excommunication, which was now backed up by a real executive officer, the confessor' (Smith, 1913, 52).

[63] As Bonfil (1994) and Poliakov (1977, 1965) document, they often preached against Jewish pawnshops and moneylenders.

[64] During the thirteenth century, usury 'was dealt with in France in councils at Avignon in 1209, Paris in 1212, Montpellier in 1214, Narbonne in 1227, Château Gontier in 1231, Béziers in 1246, Le Mans in 1247, Albi in 1254, and Sens in 1269. From the British Isles canons survive of a Scottish Council of 1225, and of a council at Worcester in 1240; German prelates dealt with it at Trier in 1227 and 1238, and at Vienna in 1267. Though such a list is in no way complete, it is enough to indicate both the seriousness of the effort put forth by the Church and the extent of the practice which she was attempting to suppress' (Parkes, 1976, 283).

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1986, 317).[65] The Council of Vienne 'declared all secular legislation in favor of usury null and void, and branded as heresy the belief that usury was not sinful' (O'Brien, 1920, 175).[66]

4.1. The aims of the Church

Why did the Church tighten the prohibition? What was the objective function of the Church? In this section we extend the model by considering what the Church's aims were and how they may have changed over time? The medieval Church was an organization and as such it can be viewed as a 'religious firm' providing certain services (Ekelund et al., 2006, 17).[67] These services were both material and non-material. It not only provided 'temporal bliss' and the promise of eternal salvation, but also regulated social behavior, helped to enforce social norms, and provided social insurance and education. To do this the Church required revenue. It could tax agricultural production effectively for it owned vast swathes of land, and was able to collect tithes on the land that it did not own.[68] But it was less adept at taxing trade. As the urban economy grew during the twelfth and thirteenth centuries, the relative wealth of the Church was likely to decline unless it found a way to tax trade, commerce and finance. Given the Church's economic interests, it was not surprising that the Church 'faced the development of a commercial economy with initial hostility' and that the 'initial impact of the revival of the cities was to cause ecclesiastical authorities to sharpen these condemnations of merchandise and usury' (Morris, 1989, 333).

4.2. The Church

The sophistication of the law is given by L. It is chosen by the Church. The Church is concerned with two objectives: revenue R and saving souls S via the elimination of usury. The objective function of the Church embeds a potential trade-off between revenue and the suppression of usury. The Church chooses $L = L^*$ so as to maximize:

$$\max_{L} U^C = (1-\eta)R(Q,X) + \eta\, S(m), \tag{9}$$

where η weighs the relative importance of either objective.[69] Revenue R is an increasing function of the total amount of lending in the economy Q and a set of unspecified exogenous variables X. S is a decreasing function of the number of usurers m. This function is sufficiently general to nest a number of interpretations of the actual objectives pursued by Church leaders during the period.

More generally it is possible to think of the Church and the state bargaining over the level of L. Where secular states were powerful they were able to influence the level of L in such a way so as to benefit themselves. As we have seen, the medieval English state was able to do this in many instances. However, the English monarchy was uniquely centralized and powerful in the middle ages. In general, the assumption that it was the Church that was able to set L is the appropriate one for most of Europe (see Brundage, 1995).

This trade-off between the Church's financial and spiritual ambitions was widely acknowledged by contemporary observers. It was publicly justified, in part, by the papacy's aim of funding crusades (see Ryan, 2008).[70] Contemporaries noted that this trade-off inevitably colored the Church's attitude to usury. William of Auxerre (d. 1231) condemned usury as theft whilst recognizing that it was socially useful, stating that 'a certain worldly good to the community may arise from this kind of theft'.[71] Even popes realized that there was a potential trade-off between prosperity and the elimination of usury. Thus in 1208, Innocent III advised the bishop of Arras to 'proceed cautiously in enforcing the decrees of the Lateran Council [against usury] because usurers are so numerous that if all were punished many churches would have to be shut down' (Clapham, 1929, 491).

[65] According to Marshall, tradesmen and merchants in fourteenth century Prato 'never used notarial documents to secure their loan' (Marshall, 1999, 93). The risk of prosecution was non-contractible. A notary drawing up a usurious contract was an accessory to the crime. Decree 29 of the Council of Vienne meant that notaries involved in drawing up documents used for usurious purposes would have been liable to prosecution. In Marseilles in the first half of the fourteenth century, '[c]reditors were not allowed carelessness in playing this game. The wise course was never to admit usury—not even orally' (Shatzmiller, 1990, 23). Notaries could not solve the problems thirteenth and fourteenth century merchants faced.

[66] In fourteenth century Pistoia, a usurer was branded twice with a cross as a heretic (Origo, 1957, 153). Later in the fourteenth century, 'the Constitutions of Aquileia of 1339 not only ordained that the Bishop, or a special deputy appointed for the purpose, should alone be entitled to judge of the sincerity of a confession of usury, but also, in despair at the wiles of their opponents, declared forthright that *any* contract made with *any* member of a group, family or company believed to be occupied with usury, was to be deemed to be usurious, however innocent it appeared' (Parkes, 1976, 290).

[67] Ekelund et al. (1989) is one of several papers to apply the theory of the firm to the medieval Church. See Hull and Bold (1989), Hull (1989), Clegg and Reed (1994), Hull and Bold (1994), Davidson (1995), Davidson and Ekelund (1997), Ekelund et al. (2006). Schmidtchen and Mayer (1997) analyze the Church as a franchise monopoly. They argue that the mendicant orders were founded in the thirteenth century in order to maximize the profits from the sale of indulgences. Bercea et al. (2005) examine how cathedral building in the twelfth and thirteenth centuries can be understood as a device used by a monopolistic organization—the Roman Catholic Church—to prevent entry from rival faiths and heresies.

[68] The Church accumulated much of this land in the eighth andninth centuries. By the end of the Carolingian period around 30 percent of the land in continental Western Europe was owned by the Church. Though this proportion declined overall in the tenth century, ecclesiastical authorities still held 32 percent of cultivated land in northern France in the twelfth century (Herlihy, 1961, 86).

[69] By setting η close to zero we recover a model of the Church as a profit-maximizing organization outlined by (Ekelund et al., 1996). The less cynical can place a higher value on η. A realistic value of η will never approach one since even a purely benevolent Church needed revenue in order to survive. As Hull and Bold (1989, 7) note: 'organizations that survive over time are necessarily those that have been able to maintain non-negative net revenue.'

[70] 'It was to re-establish the hapless Christian states of the East and to reconquer the Holy Land that the thirteenth century popes had taken control of the Church and begun to tax in a way which affected every holder of a benefice' (Renouard, 1970, 1954, 116). Of course the Church needed liquid capital for other reasons as well.

[71] *Summa aurea in quattuor libros Senteniarum*. III. 48, 1, 2, pp. 913-14 (quoted in Langholm, 1992, 85).

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The results of the model hinge on the Church adjusting L in response to the amount of moneylending. How plausible is it to think of the Church adjusting the sophistication of the law? There is evidence that this is exactly what happened. The use of complex contracts to evade the usury prohibition was a matter of concern to churchmen. In the *Mirror of the True Penitence*, Fra Jacopo Passavanti (1302–1357) wrote that:

> ‘There are certain cases about which even wise and learned men are in doubt …such as usurious contracts, which are so many that one can hardly understand them. And some men conceal and excuse them under the name of exchange or interest and others with those of deposits or savings. Some call them purchase and sale, or profits of hazards or deferred payments and yet others say they are investments, companies, associations, and other abominable profits’ (quoted in Origo, 1957, 150).

In his first *quodlibet*, Henry of Ghent (d. 1293) subjected rent contracts to the suspicion of usury.[72] Bernardino of Siena (1380–1444) argued that exchange by bills was usurious, and Santi Ruccellai (1437–1497) concurred with this denouncement. The fact that the Church did not go so far as to outlaw bills of exchange supports the existence of the trade-off identified by Eq. (9). In the second half of the thirteenth century, a number of scholastic thinkers attempted to close some of the loopholes that had been opened up by innovative merchants. The sea loan – commonly used in order to write loan contracts – was prohibited in the *Naviganti*. Though it was not intrinsically usurious (i.e. it could be used legitimately), the sea loan was deemed illegitimate precisely because it was believed that it was regularly subverted for illicit purposes (Noonan, 1957; Wood, 2002).[73] This corresponds to an increase in L in the model.

4.3. Did the aims of the Church change over time?

Historians argue that the attitude and ambitions of the Church changed in the fourteenth and fifteenth centuries. This is often explained in terms of what Leff (1961) termed the ‘institutional’ decline of the Church (Leff, 1961, 36). In the eleventh and twelfth centuries, popes had successfully established the Church's right to govern itself and imposed an ambitious program of reform across Europe. As a consequence, the moral and spiritual authority of the papacy rose so that by ‘the thirteenth century the bond that held Europe together was a common faith, one that in all its essentials was one fixed by the papacy’ (Ullmann, 1972, 251). But, in achieving this, the Church had become as powerful and as rich as any monarch (Morris, 1989, 582). It ‘grew in wealth and privilege: endowment, the establishment of a system of taxation ordinary and extraordinary, its comprehensive tariff of fees extending from birth to death …Inequitably, quite apart from the effects on its way of life, it meant a change in outlook; it became a major preoccupation to safeguard its rights and dues as a corporation’ (Leff, 1961, 46). The late medieval Church ‘became a monarchy, exceptional in its international nature but in some ways very like other contemporary national monarchies’ (Renouard, 1970, 1954, 116).[74] The following kinds of taxation were ‘enforced by threat of excommunication’: a ‘direct income tax of 10% on all clergy; fees for dispensing the laity, especially the political power, from canonical prohibitions of marriage within certain forbidden degrees of kinship; fees for removing canonical barriers to the acquisition of benefices for which a cleric was not qualified …and, finally, fees for absolution from the sin of usury’ (Ozment, 1980, 196).[75]

This section considers whether or not these institutional developments within the Church can illuminate the development of the prohibition on usury. A more ‘worldly’ Church might be expected to prioritize revenue considerations and therefore weaken the prohibition on interest—in the language of the model η would be expected to fall. In order to investigate this, we need to make the assumptions underlying the Church's objective function more explicit. By differentiating U^C (Eq. (9)) with respect to L we can obtain the optimal value of L^*. It implicitly solves the following equation describing the effect L has on the amount of usury m and the Church's revenue X:

$$\underbrace{(1-\eta)\frac{\partial R(Q,X)}{\partial Q}\frac{\partial Q}{\partial L^*}}_{-}+\underbrace{(1-\eta)\frac{\partial R(Q,X)}{\partial X}\frac{\partial X}{\partial L^*}}_{?}+\underbrace{\eta\frac{\partial S(m)}{\partial m}\frac{\partial m}{\partial L^*}}_{+}=0. \tag{10}$$

The Church's ordinary revenue is likely to have been negatively affected by an increase in the sophistication of the usury legislation, indicating that the first part of the equation can be negatively signed. Increasing L will result in fewer individuals engaging in moneylending and thus have a positive effect on S. Therefore the last term can be positively signed. Evaluating

[72] Perhaps under pressure from the authorities he later changed his position on this (see Langholm, 1992, 273). Gervais of Mont-Saint-Éloi also opposed fixed period rent contracts.

[73] The text reads ‘[i]f anyone who lends a certain amount of money to someone sailing or traveling to market is expected to get back more than the principal, because he has taken on the risk, he must be considered a usurer’ (Kirschner and Morrison, 1986, 316–317).

[74] The second Avignon Pope, John XXII (1316–1334) has been described as ‘the great financial administrator who, in his determination to restore the papacy to its former independence of secular monarchs, concentrated above all on increasing its wealth’ (Cohen, 1975, 62).

[75] The history of papal indulgences reveals a similar development. Initially indulgences were only granted by popes for exceptional acts of service but over time they was exploited for financial gain and the currency of salvation debased: ‘There were remissions at the hour of death; remissions for a single danger of death; remissions for a multiplicity of dangers of death; remissions for pilgrims to Rome or other churches; remissions without any condition whatever, except the universal one of repentance and confession. Once the bottomless treasure had been opened up there could be no restraining its distribution’ (Southern, 1970, 139).

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the middle term requires further assumptions to be made concerning our assessment of how strongly Church policy was influenced by pecuniary motives. There are three possibilities to consider: (I) the Church benefits financially from the development of credit markets; (II) the Church does not profit from credit markets; and (III) the Church can, in fact, benefit financially from the suppression of credit markets.

I. Enforcing the usury prohibition reduces the Church's revenues: $\partial X/\partial L<0$. In this case, so long as the weight the Church places on eliminating usury η is less than 1, it is in the Church's interest to moderate the sophistication of the law. For low values of η it may be optimal for $L^*=0$. More generally, let the value of L associated with this scenario be denoted L_I.
II. The Church's revenue stream is unconnected to the amount of credit in the economy. If this is the case or if the Church only cares about eliminating usury ($\eta=1$), Eq. (10) can be written as:

$$\frac{\partial S(m)}{\partial m}\frac{\partial m}{\partial L^*}=0, \tag{11}$$

which implies $L^*>0$ since $S(m)$ is falling in m and m is falling in L. It also implies that $L^*_{II}>L^*_I$.
III. The Church can benefit financially from repressing usury. This is the case if the following condition holds:

$$\frac{\partial R(Q,X)}{\partial Q}\frac{\partial Q}{\partial L^*}\leq\frac{\partial R(Q,X)}{\partial X}\frac{\partial X}{\partial L^*}. \tag{12}$$

This condition states that the amount of revenue the Church loses from less lending is less than, or equal to, the amount of revenue in terms of bequests, restitution payments and gifts, that it gains from a higher value of L. In this case L^* will be higher than under II: $L^*_{III}>L^*_{II}$.

The following proposition summarizes this.

Proposition 2. *The law L is more sophisticated when the Church benefits financially from prohibiting usury.*

This follows from Eqs. (10)–(12) which establish that $L^*_{III}>L^*_{II}>L^*_I$. The corollary of this proposition is that the intensification of the usury laws during the thirteenth and early fourteenth centuries can be partly explained by the argument that the Church discovered a means of profiting from the suppression of usury. This is compatible with the view that the Church initially suppressed usury even when doing so involved imposing a cost on itself. It is only from the late thirteenth century onwards that there is evidence that the Church had been benefiting from enforcing the usury prohibition. The benefits were not obtained by the Church as a lender, charging shadow prices which allowed for the market rate of interest as Ekelund et al. (1989, 1996) claimed. Rather, the benefits of the prohibition were indirect. By 1300, the Church had found a way to profit from suppressing usury via the confessional, via posthumous payments of restitution and via bequests.

In principle, the concept of restitution meant that, if the usury was *certa*, that is to say, there was a known borrower or 'victim,' recompense was to be made to that borrower.[76] If the borrowers who had paid interest could not be identified or traced, or if there were simply too many of them to find, then the usury was *incerta*, and restitution had to be made to the Church or to the poor. Amongst scholastic thinkers, restitution to the Church was controversial, and permissible only under certain conditions, such as supervision by a prelate. In practice, 'the system of penance and restitution could be abused in favor of the material interests of the Church' (Wood, 2002, 171). The 'Church gained greatly from the restitution of "incerta" …Such prizes were supposed to be given to "the poor", but this became a cover for any ecclesiastical institution or pious use' (Wood, 2002, 170).[77]

In 86 of 112 bequests made by Sienese merchants in the late thirteenth and early fourteenth centuries, Cohn (1988) found that no attempt was made to identify or track down the injured parties. This meant that 'these pious merchants and shopkeepers, after admitting their guilt, assuaged their consciences spotted by avarice and the normal affairs of late medieval urban life through donations to pious institutions' (Cohn, 1988, 53). Segre found 'several papal briefs of pardon to Christian bankers and merchants known as *usuarii*' in which Bartolomeo Borgognono and Johannino de Solario, *domicelli* of Asti, bankers in Turin received Papal absolution for usury on 8 May 1435 (Segre, 1986, xi). According to the biographer Vespasiano, when Cosimo de' Medici 'had prickings of his conscience that certain portions of his wealth …had not been righteously gained' he turned to Pope Eugenius, who replied that 'if he was bent on unburdening his soul, he might build a monastery' and this induced Cosimo to endow the monastery of San Marco at the cost of more than forty thousand florins (Vespasiano, 1963, 219).[78]

[76] An example of restitution being made directly to the borrowers is the story of Aldebrandinus, a thirteenth century moneylender who 'met with his Franciscan monk, brother Augustinus, to whom in a rather dramatic fashion he vowed that while on his impending sojourn to France he would return 50 *livre tournois* gouged usurious from former clients' (Blomquist, 1985, 528).
[77] Jenkins (1970) observes that '[c]ontemporary sources frequently give the impression that money given to charities was an atonement for usury' (Jenkins, 1970, 162). Nelson notes that '[h]undreds of stories of the later Middle Ages accuse clergy, both secular and monastic of being more intent on gathering tainted moneys for the sake of financing church construction than upon expediting a genuine return of illicit goods to the actual victims of usury' (Nelson, 1947, 111).
[78] Another celebrated instance of moneylenders providing patronage for the Church is the Strozzi Chapel in the Church of Santa Maria Novella in Florence (Arthur, 1983). This is consistent with the finding that in twelfth century Genoa, pious bequests amongst merchants were positively correlated with mercantile activity (Galassi, 1992).

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By increasing the sophistication of the usury laws, the Church not only reduced the amount of usury, but also squeezed additional monies from merchants and moneylenders. In terms of the model, this suggests that, by the fourteenth century at least, the objective function of the Church was best described by Case III.[79] Proposition 2 provides the final part of the regulatory capture hypothesis. Initially the usury prohibition may have arisen out of a desire to conform to scripture or to help borrowers as Reed and Bekar (2003) and Rubin (2009) argue, but it had the unintended consequence of creating monopoly rents for those merchants who were best placed to evade it. These merchants were able to influence Church policy because they were generous supporters of the Church and prominent donors to religious establishments.[80] The usury prohibition also suited the interests of secular authorities who sold licenses to pawnbrokers and levied taxes on manifest usurers. Finally, restitution payments enabled the Church to claw back a proportion of the monopoly profits that the usury prohibition enabled successful merchant–bankers to earn, and provided an incentive for the prohibition to be maintained over time.

During the thirteenth and fourteenth centuries, the usury prohibition tightened. Proposition 2 indicates that this phenomenon can be understood in terms of the Church's increased ability to benefit materially from the prohibition. This development peaked in the late middle ages. By the fifteenth century, however, the coalition of interests supporting the prohibition was beginning to fracture. The next section examines this process.

5. The decline of the usury prohibition

A theoretical account of the usury prohibition has to give some account of its eventual demise. Historians date the weakening of the usury prohibition to the sixteenth century, when both Catholic and Protestant authorities softened their attitude to lending at moderate rates of interest. A gradual moderation of attitudes towards usury in the Italian city states can be traced back to the late fourteenth century. By the beginning of the fifteenth century, the debate on whether or not interest should be payable on forced loans demanded by the state, had settled on the view that receiving a return over and above the principal was not usury. Rent contracts were legitimized in two stages by Martin V in 1425 and by Calixtus III in 1455 (Nelson, 1969, 1949, 24). In 1515 Leo X acknowledged that *monti di pietà* – loan-banks for the poor – could lend at interest, and while the Church continued to condemn usury, this date marks a convenient endpoint for our discussion of the medieval prohibition. Finally, the Reformation broke the Church's moral authority across northern Europe and led the way to the secular legalization of moderate interest in many states.[81]

Historians attribute the decline of the usury prohibition to a variety of factors, including increasing levels of commercialization, the price inflation of the sixteenth century, and the Reformation.[82] The model indicates that one reason why the usury prohibition persisted was because it conferred monopoly rents to merchants who were able to evade it. It suggests that once this source of rents began to decline that coalition of interests that benefited from enforcing the prohibition would fracture. The theoretical framework outlined in this paper also suggests that we should look at the costs of evading and enforcing the usury prohibition. Together these two factors meant that the usury prohibition was a stable source of rents to the secular authorities, elite merchant–bankers and the Church. During the fifteenth and sixteenth centuries, the costs of evading the prohibition fell, while the costs of enforcing it rose—together these factors can help to account for the gradual decline of the prohibition.

Over time, the techniques pioneered by Italian merchant–bankers became widely available. Usage of bills of exchange became common across Europe, and the techniques associated with Italian banking families began to be employed by English and German merchants (see Tawney, 1925, 1571, 60–86).[83] In terms of the model, these developments correspond to a compression of the distribution of the ability to write complex contracts θ. As a result the size of the rents associated with the prohibition shrank.

A second factor contributing to the decline of the prohibition was the rising costs of enforcement. New financial innovations made it easier to evade the charge of usury. The most important innovation was the triple contract, which involved three contracts: an initial partnership; an insurance contract in which the active partner gave the passive partner some guarantees in return for him accepting a smaller share of profit; and a debt contract in which the active partner promised to pay the passive partner a fixed rate of return. This enabled the 'borrower' to access a large amount of working capital while it gave the 'creditor' a steady return (Homer and Sylla, 2005, 73).

Scholastic thinkers tried to close a number of loopholes in the usury prohibition in the fourteenth century. In *De usuris*, Giles of Lessines attempted to sever the link between bearing risk and earning a legitimate profit over and above the principal, on the basis

[79] The way in which the Church profited from restitution payments made by moneylenders was not uncontroversial: 'the practice of making restitution serve to gain merit was attacked by St. Antoninus, Archbishop of Florence, and San Bernardino' (Jenkins, 1970, 162–163). Bernardino criticized the Florentines' 'apparent goodness (*la apparente bontà*): "what seems good to you is not." Their many good deeds, generous almsgiving and many hospitals were external and not intrinsic, masking their illgotten gains (*male guadagnata*)' (Howard, 2008, 358–359).

[80] During the fourteenth century, the Church came to rely on Italian banking families to transport the Church's revenues to Rome. By the end of the fourteenth century, the Papacy was dependent on the group of Florentine banking families such as the Spinelli, the Cambini, the Pazzi, the Olivieri families (Bruscoli, 2007). This facilitated the emergence of a potentially collusive relatioship between the bankers and the Church.

[81] Luther's position on usury was very close to that of the Catholic Church (Baker, 1974, 50–52). Bullinger and Calvin, however, contested both the Church's interpretation of the Deuteronomic prohibition on charging interest between Christians and Aristotelian view of the sterility of money (Frierson, 1969; Baker, 1974). Even though the Protestant reformers remained in general opposed to usury, in rejecting canon law and by contesting the Church's interpretation of scripture, they provided the conceptual space in which the prohibition could be rethought.

[82] See Tawney (1925, 1571), Frierson (1969), Jones (1989), Kerridge (2002).

[83] De Roover contends that the backwardness of English merchants in this respect was so great that as late as 1559, 'there was not a single Englishman except Gresham who had any extensive knowledge of the intricacies of the exchange business or who had enough prestige to deal successfully with the continental bankers' (de Roover, 1949, 17). However, subsequent work suggests that this view may be an exaggerated one (see Munro, 1994).

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that what mattered was whether or not the contract was usurious in intention. Langholm summarizes these new views as follows: 'if money of a certain currency is entrusted to a merchant on the condition that a debt in that currency be repaid on the lender's behalf at a future date, and in a location, when and where the rate of exchange is expected to be less favorable, this is usury because the purpose is profit' (Langholm, 1992, 315). However, these attempts to tighten the usury prohibition did not make it easier for courts to determine which contracts were legitimate and which were usurious. Attempts to increase the value of L^* hit an upper bound. As a result, it became more costly to enforce the laws against charging interest.

To see how the usury prohibition was eroded in practice, we can consider two case studies: England and Italy. In England, the secular authorities attempted to maintain the prohibition against usury for much of the sixteenth century. The prohibition broke down once the religious sanctions provided by the Church disappeared. During the fifteenth century, the prohibition against usury continued to be maintained although Church courts in England appear to have concentrated on punishing cases of gross or extortionate usury (Helmholz, 1986, 378). Henry VII issued a royal prohibition on all lending at interest in 1487, and again in 1495. However, the Reformation meant that from the 1530s onwards, the Church's prohibition on usury no longer had to be adhered to, and the secular prohibition was repealed in 1540. In 1552, usury was again forbidden. This new prohibition against usury was a secular one. It appears to have been ineffective, in part, because, unlike canon law, Tudor law courts depended on informants, and individuals were wary about informing on their neighbors for infractions that they considered minor or harmless, while would-be borrowers had little incentive to testify against individuals who might be able to lend money to them in the future (Jones, 1989). Without the Church actively enforcing the social norms against usury and applying social sanctions to those who violated the prohibition gradually became toothless as charging low rates of interest was increasingly tolerated. In recognition of this, the law was changed again in 1571. According to this statute, loans at under 10% were only punishable by forfeiture of the principal. Lenders found guilty of lending at rates higher than 10% were fined three times the value of the loan. The law was interpreted as effectively permitting interest charges of 10% or less, and within a generation the old definition of usury had disappeared. Finally, when the law was revised in 1624, economic rather than ethical arguments were cited in the debate over the appropriate interest rate ceiling.[84]

During the late fifteenth century, and for most of the sixteenth, both the king and the mercantile classes in London had an interest in maintaining the usury prohibition. This account for the repeated attempts to outlaw usury in secular law. It was the break with Rome that undermined the prohibition because, by weakening the forces of the religious and social condemnation of usury, it raised the costs of enforcing the ban.

In Italy the usury prohibition was undermined in a different way. Secular authorities first began licensing pawnbroking. The Church responded by sponsoring Jewish loan-banks, in an attempt to limit Christian usury, and then by recognizing the establishment of *monti di pietà*. The first indication of a relaxation of the prohibition was a change in the attitude of the Church toward Jewish moneylending. This was an attempt by the Church to control, and profit from, the moneylending took place despite the prohibition. A number of Jewish loan-banks were established during the fourteenth and fifteenth centuries across Italy with the support of the Church. Poliakov writes that 'papal authorization …became an indispensable condition for the conclusion of an agreement in the fifteenth century' (Poliakov, 1977, 1965, 58). The papacy was able to extract some of the rents associated with Jewish lending through the fees it charged the owners of the loan-banks. These fees became an 'important new source of revenue for the papacy' (Gow and Griffiths, 1994, 294). In the twelfth and thirteenth centuries, the Church had opposed Jewish lending, but by the fourteenth century, it had come to see Jewish lending as the lesser of two evils. As Sisto Medici phrased the matter in mid-sixteenth century Venice, if 'the worst crime of the Jews is their infidelity and perfidy, which offends God, since our mother Church tolerates these why not tolerate their usurers when the latter are not contrary to the public good?' (quoted in Calimani, 1988, 21).

The introduction of Jewish moneylenders was unsurprisingly opposed by Christian usurers. In the context of the decision to permit Jewish lending in sixteenth century Venice, Marino Sanuto wrote that 'others did not want to allow the Jews to stay in this land on any account, some out of pious righteousness and others because they themselves wanted to lend at interest, not at 20%, but at 40, 50 or more, as goes on at the Rialto' (quoted in Poliakov, 1977, 1965, 201).[85] Where the Jews could be kept out – as they were in the cities of Turin until 1424, Florence until 1437 and Milan, throughout the period – interest rates could be kept high (Roth, 1950). In Bologna, Christian bankers succeeded in excluding Jews until the second half of the fourteenth century (Foa, 2000, 116). In Venice, Jewish lenders had been encouraged to lend at interest in the city itself in 1366 and to settle at Mestre, but they were barred from settling in the city itself.

In contrast to the English experience, in Italy it was the secular authorities who first moved to liberalize the usury prohibition, and this liberalization led to the Church changing its attitude, first to Jewish lending, and then eventually to the idea of a loan bank that lent to the poor at low rates of interest. The proliferation of Jewish lending during the fifteenth century led to a movement in favor of establishing *monti di pietà*.[86] The *monti* had to cover their costs, and to do so they charged small amounts of interest. For

[84] Francis Bacon concluded that '[f]or since there must be borrowing and lending (and men are so hard of heart as they will not lend freely) usury must be permitted.' (quoted in Jones, 1989, 183). This clearly parallels Rubin's (2010) argument that it was the 'double illegality' of usury in the Islamic world that maintained the usury prohibition.

[85] Elsewhere the threat of Jewish settlement was used to encourage local lenders to reduce their interest rates. For example in Florence in 1396 'the commune instructed the priors to invite the Jews and to authorize them to lend at 15 per cent. According to Davidshon, this was merely a threat intended to impress local lenders. This unusually low rate lays the seriousness of the intention open to doubt; in any case it did not happen again, and the Christians retained their monopoly' (Poliakov, 1977, 1965, 59).

[86] The first *monte* was set up by Franciscans in Perugia in 1462. The founding of *monti di pietà* by Franciscans in numerous cities across Italy 'went hand in hand with the expulsion of the Jews' (Menning, 1993, 28).

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this reason they were attacked by theologians like Thomas da Vito as usurious.[87] The recognition of the *monte*'s right to charge interest in 1515 marks the effective end of the medieval usury prohibition.

5.1. The consequences of the usury prohibition

In additional to restricting competition in credit markets, the usury prohibition imposed a number of other costs on the economy. New Institutional economics emphasizes the importance of the role transaction costs have played in shaping the course of economic development.[88] This paper has shown that the usury prohibition shaped economic development in Europe as it increased transaction costs in medieval capital markets.

The usury prohibition imposed substantial costs on the medieval economy that have been neglected by historians. The opportunity costs of the prohibition consisted of, not only all of the transactions that would otherwise have taken place had it not existed, but also the resources invested in evading it. It resulted in contracts and documents that were 'deliberately couched in obscure and ambiguous language that became a fertile breeding ground for expensive litigation' (de Roover, 1948a, 57). It created hold-up problems of the kind discussed by Williamson (1985) and Barzel (1997, 1989). De Roover provides the example of Tommaso Soderini, who sued Tommaso Portinari in 1487 for 'the restitution of a sum of 4204 1/2 ducats, which he had received in deposit and which was repayable after four months' advanced notice' (de Roover, 1948a, 57–58). Portinari refused to pay on the grounds that the contract was a partnership and not a deposit, i.e. a profit-sharing agreement and not a loan. Cases like this illustrate how the acts taken in evading the usury prohibition made contract enforcement more costly than it would otherwise have been.

Another consequence of the prohibition was to transform credit transactions into commodity transactions, and to divert funds into long distance trade, where it was easier to disguise the return on capital. Medieval historians have long stressed the 'prominence of international trade relative to domestic trade' (Postan, 1973, 14). One reason for this was that the poor state of the roads often made international trade cheaper than domestic trade because water transport was so much more efficient than land transport. The usury prohibition provides an additional explanation. Lane (1966) speculated that this might have been beneficial, since capital was diverted from funding consumption to investment. But it seems equally likely that funds that otherwise might have been invested in domestic industry were instead sent abroad, since it was always easier to raise funds for an overseas venture than it was for a domestic one, if only because the credit instruments available were largely based upon foreign exchange. In capital starved economies, the effects of this incentive on the allocation of capital could have been substantial.[89]

More generally, regulations that increase transaction costs retard economic development, not only because they reduce the total volume of trade, but also because they reduce the proportion of trade conducted in the impersonal sphere relative to the proportion of trade that was personalized.[90] The transition from informal credit arrangements to a system of formal or impersonal credit was distorted by the usury prohibition. In small-scale or close-knit societies, bilateral credit agreements can exist informally and, to the extent that credit relations are reciprocal, there may be sufficient incentives for individuals to lend without charging interest.[91] But in larger-scale or more fluid societies, contracts are necessary, since creditor–debtor relations require third-party enforcement; furthermore, since in such societies, credit relations are unlikely to be reciprocal or repeated over time, such contracts will invariably be interest-bearing. A final implication of this is that the prohibition on interest was likely to impose the highest costs in the most commercially developed parts of Europe. We would predict that that it was in the Italian city states that the most resources would have be devoted to evading the prohibition, and this is consistent with what historians have found.

5.2. Concluding comments

Greif (2001) observed that 'to understand the operation of an economy …we need to study its microlevel institutions' and that 'such analysis is inherently historical. Institutions embody, reflect, and shape a society's economic, political, social, and cultural aspects and these aspects have an inertia of their own; they are societal features that transcend the conditions that led to their emergence' (Greif, 2001, 338–339). This paper has provided a microanalytic framework within which the usury prohibition can be analyzed. It has attempted to delineate the economic forces that gave rise to it, and that explain its persistence, as well as many aspects of the prohibition that are otherwise inexplicable.

[87] For different reasons, the Medici opposed the establishment of a *monte di pietà* and the establishment of the Florentine *montedi* was only possible after they had fallen from power (Menning, 1993, 31).

[88] See for example North and Thomas (1973), North (1981, 1990), Williamson (1985) and the essays contained in Drobak and Nye (1997).

[89] The analysis provided here suggests that a similar model may be applicable to the Islamic experience. The prohibition on *ribba* appears to have promoted the development of a number of techniques of evasion similar to those detailed in this paper. Udovitch argued that the various forms of partnerships that proliferated during this period 'adequately, flexibly and licitly fulfilled the economic function of an interest-bearing loan' (Udovitch, 1975, 10). The main difference is that as Rubin (2010) suggests the Islamic prohibition was evidently more stable than the Christian ban.

[90] This is costly because, though personal and impersonal credit markets are substitutable, they are far from perfect substitutes. Reciprocal arrangements based on internal or multilateral sanctions can effectively support a *certain* level of trade, but they cannot support an *efficient* level of trade because such arrangements are based upon excluding strangers, with whom it would otherwise be possible to engage in mutually beneficial trade. Formal contracts enable traders to economize on personal exchange, and thus allow the volume of trade to expand and, with it, the division of labor to increase.

[91] Kimball (1988), Coate and Ravallion (1993), Kocherlakota (1996) provide theoretical expositions of the circumstances under which such practices are incentive compatible.

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Historians have supposed that increased levels of commercialization and market activity *must* have eroded the atavistic norm against interest.[92] They supposed that economic incentives would undermine inefficient cultural or social norms. This view is similar to the 'efficient institution' hypothesis advanced by Clark that 'institutions destructive of output will be reformed' (Clark, 2007a, 212). The analysis provided here suggests that this framework is flawed. The usury prohibition transferred resources from borrowers to elite merchant–bankers, rulers, and the Church. It did so by distorting capital markets. Direct transfers would have been less inefficient, but direct taxation was difficult to justify, while the costs imposed by the usury prohibition were indirect and largely invisible. This example shows how institutions can persist, not because they are efficient, but because they are consonant with existing power relations in society.

The contention that economic incentives undermined the usury prohibition over the very long-run is essentially empty unless the long-run is carefully defined. Certainly this proposition sheds little light on the development of the usury prohibition in the middle ages. The immediate response of the Church to the growth of capital markets in the twelfth and thirteenth centuries was an attempt to suppress them (Morris, 1989, 332–334). The following centuries saw a sustained effort to demarcate licit from illicit forms of commerce. As a result, the usury prohibition became more complex and sophisticated. Particular types of contractual form were legitimated. The loan on exchange was permissible because it involved genuine risk. But canon lawyers permitted certain types of contract only because this enabled them to suppress other types of exchange more effectively. The usury prohibition created monopoly rents which made it possible for the Church, the state and international merchant–bankers to benefit from the suppression of usury. It was this shared interest that made the usury prohibition a *self enforcing* institution. It cemented a partnership between the leading merchant–bankers, secular rulers, and the Church, and because it shaped the beliefs and expectations of medieval society as a whole, it generated behavior that reinforced and perpetuated its own existence.

Appendix A

Proof of proposition 1. Proof in order to prove the first proposition of the paper, totally differentiate Eq. (7) with respect to L to obtain:

$$\frac{\partial \boldsymbol{\pi}\left(q^*\right)}{\partial q_i}\frac{dq}{dL} = \frac{\partial P(L|\boldsymbol{\theta}_i)}{\partial L} + \frac{\partial P(L|\boldsymbol{\theta}_i)}{\partial \boldsymbol{\theta}_i}\frac{d\boldsymbol{\theta}_i}{dL} + \frac{\partial e\left(\boldsymbol{\theta}_i,\boldsymbol{\phi}^*(\boldsymbol{\gamma}_i)\right)}{\partial \boldsymbol{\theta}_i}\frac{d\boldsymbol{\theta}_i}{dL} + \frac{\partial e\left(\boldsymbol{\theta}_i,\boldsymbol{\phi}^*(\boldsymbol{\gamma}_i)\right)}{\partial \boldsymbol{\phi}^*}\frac{d\boldsymbol{\phi}^*(\boldsymbol{\gamma}_i)}{dL}. \tag{13}$$

Since both $P_i(\theta_i|L)$ and $e(\cdot)$ are twice continuously differentiable, the first order conditions of Eq. (2) are given by

$$\frac{\partial P_i(\boldsymbol{\theta}_i|L)}{\partial \boldsymbol{\theta}_i} = -\frac{\partial e\left(\boldsymbol{\theta}_i^*,\boldsymbol{\phi}_i\right)(\boldsymbol{\gamma}_i)}{\partial \boldsymbol{\theta}_i}. \tag{14}$$

This implies that the middle two terms of the RHS of Eq. (13) cancel. Then by rearranging Eq. (13), we can show that the derivative of ϕ^* with respect to L is given by:

$$\frac{d\boldsymbol{\phi}^*}{dL} = \frac{\frac{\partial \boldsymbol{\pi}\left(q^*\right)}{\partial q}\frac{dq^*}{dL} - \frac{\partial P(\boldsymbol{\theta}_i|L)}{\partial L}}{\frac{\partial e\left(\boldsymbol{\theta}_i,\boldsymbol{\phi}^*(\boldsymbol{\gamma}_i)\right)}{\partial \boldsymbol{\phi}}}. \tag{15}$$

Both the numerator and the denominator of this expression are always negative, therefore the overall effect is positive. For a fixed γ_i, an increase in L leads to a corresponding increase in the minimum level of ability of a merchant who is active in the credit market $\phi^*(\gamma_i)$.

The second part of the proposition follows. Formally, the number of active merchant–bankers m is given by

$$m = 1 - F\left(\boldsymbol{\phi}^*(\boldsymbol{\gamma})\right) \tag{16}$$

where F is the cumulative distribution function (cdf) of lenders' types. This statement enables us to establish the following corollary of Proposition 1. The level of competition can be measured using the Herfindahl index of market concentration: $H = \sum_i s_i^2$ where $s_i = q_i/Q$ is the market share of each active lender i. Note that since in equilibrium all $q_i = q^*$ we can use the identity $Q = mq^*$ to write $s = s_i$ as $s = 1/m$. An increase in L leads to an increase in the threshold level of ability a merchant requires before it is optimal for him to lend money ϕ^* and therefore by Eq. (16), to a fall in m. Equilibrium profits per lender $\pi(q^*)$ are given by Eq. (4) and are decreasing in m. The third part of the proposition follows from this. Simply inspecting Eq. (8) establishes that γ^* is increasing in $\pi(q^*)$.

[92] Braudel argued that economic growth and 'the gathering speed of the money economy' made it '*inevitable* that one day "vituperable" usury would be admitted in the open light of day' (Braudel, 1979, 1982, 562).

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Please cite this article as: Koyama, M., Evading the 'Taint of Usury': The usury prohibition as a barrier to entry, Explorations in Economic History (2010), doi:10.1016/j.eeh.2009.08.007

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Please cite this article as: Koyama, M., Evading the 'Taint of Usury': The usury prohibition as a barrier to entry, Explorations in Economic History (2010), doi:10.1016/j.eeh.2009.08.007

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Please cite this article as: Koyama, M., Evading the 'Taint of Usury': The usury prohibition as a barrier to entry, Explorations in Economic History (2010), doi:10.1016/j.eeh.2009.08.007