

MEDIEVAL MICROCREDIT?

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ABSTRACT

How do credit markets function in societies where legal contract enforcement is weak? This paper uses a theoretical model to examine how the institution of personal pledging aided the development of credit markets in medieval England. It demonstrates how the practice of pledging improved repayment rates by lowering enforcement costs and mitigating the problems associated with adverse selection. By combining the model with historical evidence, it can be shown that pledging helped to enable illiterate peasants to gain access to capital markets.

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I INTRODUCTION

How did credit markets emerge in medieval England? This is the puzzle addressed in this paper. It is a puzzle because credit markets developed in England in the absence of institutions like notary credit or widespread access to debt registries, which played important roles in the development of credit in continental Europe. Moreover, the legal institutions responsible for enforcing contracts were weak. Most peasants were illiterate and rural credit was typically based on oral contracts. For this reason the study of rural credit was neglected by historians until recently comparatively.¹ They emphasized the importance of a non-market economy based on the manor in which money was not the dominant medium of exchange and land was held by customary tenure and was rarely permanently alienated.² Research in the past few years, however, suggests that rural credit markets did exist in medieval England and that they were comparatively effective enabling a broad swathe of the population to access capital (Clark, 1981; Schofield, 1997; Richardson, 2005; Briggs, 2009).

How was this possible? Is it possible to identify the economic mechanisms that enabled medieval peasants to use credit markets? To answer these questions, this paper builds on insights drawn from recent work in development economics and economic history. Studies of microcredit institutions in the developing world suggest that practices like group insurance can be effective in overcoming many of the problems that affect credit markets in weakly institutionalized economies (see Morduch, 1999; Aghion and Morduch, 2005). Furthermore, Greif (2002, 2006*b,a*) documents how a system of community responsibility helped to enforce inter-regional trade in the medieval period. Community

¹Michael Postan pioneered the study of medieval credit (Postan, 1928, 1951, 1973). But his concern was with mercantile credit rather than with rural lending. The extent to which earlier works on English villages neglect credit is remarkable. The first volume of the Cambridge Economic History of Europe, which focuses on the agrarian conditions of the Middle Ages does not include an entry in the index for credit (Postan, 1966). Homans (1960) another major text on medieval peasant society does not mention formal or informal credit relationships. Postan (1972) however does speculate briefly on the role of informal credit and pledging. Campbell (2009) notes '[o]nly a handful of historians have attempted to grapple with the greater complexities of the capital market' (Campbell, 2009, 83).

²Cf. Coulton (1949), Hilton (1966, 1975), and Duby (1968, 1962). Hilton (1975, 51) described the medieval village as 'pre-capitalistic' and though acknowledging that it 'would be ridiculous to think of a village idyll of organically related groups,' his analysis stressed the unitary interests of the peasantry. This was also the view of early modernists like Hill (1964); Laslett (1965); Thomas (1971) (see Smith, 1984). This scepticism, concerning the ability of peasants to access any form of credit, led McCloskey (1976) to argue that a number of otherwise inexplicable practices in medieval agriculture, such as scattered plots, arose from the need to spread risk in the absence of storage technologies or access to functioning capital markets (McCloskey, 1976; McCloskey and Nash, 1984; McCloskey, 1989, 1991; Townsend, 1993).

responsibility meant that individual merchants were held responsible for the behaviour of their peers. Under this system of vicarious liability, the goods of a merchant could be seized simply because another merchant from the same town had refused to repay a loan or had cheated another merchant. As a consequence, the cost of an individual merchant's cheating was bourn by the entire community, and this meant that internal community enforcement could be relied upon to effectively deter domestic merchants from cheating foreigners. In a similar vein Banerjee et al. (1994), Guinnane (2001), and Hollis and Sweetman (1998) examine how credit cooperatives functioned in nineteenth century Germany and Ireland. These cooperatives applied social sanctions to borrowers who defaulted and screened prospective borrowers according to their credit risk.³

This paper demonstrates that similar institutional mechanisms were at work in medieval England. It describes how an institution based on an practice known as pledging facilitated the growth of credit markets. Pledges were personal sureties who witnessed the initial debt contract, and could be liable in court if the borrower defaulted. Credit institutions based upon the practice of pledging enabled illiterate peasants without collateral to borrow money. The aim of this paper is to find out how these rural credit markets functioned.

The evidence that survives are the records of a number of local courts from the thirteenth through to the fifteenth centuries. These records only record debts that have not been repaid. Since it is possible to estimate the proportion of total loans that ended up in court, statistical techniques cannot be used to evaluate the performance of these rural credit markets. Instead, I develop a theoretical model which uncovers three separate mechanisms through which pledging could have improved the efficiency of rural credit markets. The first mechanism was that pledging enabled courts to 'outsource' contract enforcement to local villagers who had a comparative advantage in enforcement. Second, pledging lessen the problem of adverse selection because borrowers could acquire pledges in order to signal their trustworthiness. Thirdly, reciprocal pledging enabled households to mutually insure one another against idiosyncratic shocks.

³This paper is also related to the work of Leeson (2007, 2008, 2009) who demonstrates how trade could take place in a number of historical environments where third-party contract enforcement was entirely absent.

II THE INSTITUTION OF PLEDGING

How can a borrower make a credible commitment to repay a loan? If the loan is from a close neighbour or friend, then perhaps a promise to repay will be believed. The carrot of future cooperation and the stick of social ostracism can ensure that repayment may be the best action *ex post*, even if there is no well-functioning system of external contractual enforcement. This mechanism, however, only enables credit to be extended within a closely-knit community, where the gains from doing so are slight; extending credit further is problematic since, in the absence of external enforcement, a stranger has little reason to repay.⁴

A further reason why individuals find it difficult to access extensive credit markets is that if lenders know little about the individuals asking them for loans, they will be reluctant to lend. Within a closely-knit community, information on the character and quality of the borrower will be common knowledge, but the benefits of harnessing this information for the purpose of mobilizing credit will be limited. Larger gains are possible from more extensive credit networks, but such credit markets may not exist in the absence of external contract enforcement. This trade-off has been a major barrier to the emergence of effective capital markets both historically, and in contemporary developing countries.⁵ Overcoming it was central to the development of credit markets in Western Europe, but we know relatively little about the institutional mechanisms responsible for this achievement.

As a benchmark, it is informative to look at how formal credit markets function. Some notation can be introduced to help clarify the role played by the court in enforcing credit relationships. The lender must decide whether or not to lend and the borrower must decide whether or not to repay. The game is a one-sided prisoner's dilemma. The lender has an endowment of value l which he can lend to the borrower. The loan is assumed to be of greater value to the borrower than it is to the lender, either because the borrower has a productive investment that he wishes to make, or because he needs it to offset a negative income shock. This is reflected in the assumption that the amount is multiplied,

⁴Details of the theory of repeated games with the specific application to credit without commitment can be found in Telser (1980); Kimball (1988); Coate and Ravallion (1993); Campos and Root (1995); Kocherlakota (1996); Attanasio and Rios-Rull (2000); Ligon et al. (2002).

⁵See Bottomley (1963, 1975); Bell (1988); Besley (1988) for accounts of the problems that have beset credit markets in the developing world.

by a factor $x > 1$, so that the borrower receives xl . Subsequently, the borrower can decide whether or not to repay the debt (with or without interest $r \in (l, xl)$). If the borrower fails to repay the loan then the lender can take him to court at a cost c . The courts are able to convict the borrower with probability α_b and, in the event that their suit is successful, they can award the lender damages equal to d .

Every efficient strategy profile involves the lender lending l to the borrower. If the threat to take a defaulting borrower to court *ex post* is credible *ex ante*, then it can ensure that lending and repayment take place along the equilibrium path. If the threat to go to court is not credible, a lender will not lend anything since there is no reason to expect the borrower to repay. To be credible the cost of going to court and successfully obtaining a verdict has to be less than the benefit that the lender gets from the credit relationship: i.e. $c \leq \alpha_b(r + d) - l$. If the courts are unreliable or costly to use, then the threat of taking a borrower to court, especially for small loans, will not deter borrowers from defaulting, and therefore lenders will not lend out small amounts of money to individuals who are outside their close kinship or village network.

Informal systems of mutual insurance play an important role in supplying credit to peasants in contemporary developing countries.⁶ However, such mechanisms do not appear to have been at work in late medieval England. Briggs contends that ‘little weight should be placed on the idea of an informal village credit market that is invisible to historians because its participants never bothered to use the manor court to settle their disputes’ (Briggs, 2009, 16). In her study of late medieval Havering, McIntosh concludes that ‘[t]here is no sign of what has been described as a ‘moral economy’ within a Southeast Asian village setting, in which the values of the community are directed toward assuring the survival of all its members’ (McIntosh, 1986, 176-177).⁷ This raises questions as to how peasants were able to access capital markets.

⁶Cf. Platteau (1987), Fafchamps (1992), and Macfarlane (2003). Mutual insurance mechanisms are embedded in a communal “safety-first” principle which is *internalized* until it becomes a social norm (Wolf, 1957; Scott, 1976; Platteau, 1997). They can function effectively only in societies that are closely-knit and cohesive, where communities are bound together through kinship or marriage ties (Bramoullé and Kranton, 2007), or where the village community is very small and the population is stable, or when inter-generational ties are especially strong (Ferrara, 2003).

⁷Briggs provides examples of very poor individuals being taken to court such as ‘John de Upstone, who in 1311 at Balsham, after admitting owing to Geoffry le Cuppere just 8d., had the consequent amercement payable to court waived because of his poverty’. He notes that ‘[e]vidence of such debtors serves to question the notion of a hidden network of quasi-charitable lending in which debt recovery from the very poor was achieved without recourse to the manor court’ (Briggs, 2009, 16).

During this period, there were improvements in the institutional framework. In the aftermath of the attempt to prohibit Jewish moneylending, Edward I established the Acton Burnell registry. This provided an optional debt registry which enabled special authorized sealed bonds to be drawn up and left in the possession of the creditor. Failure to repay a loan resulted in the seizure of the debtors possession or in imprisonment (McNall, 2002).⁸ By registering a debt a lender incurs an initial upfront cost. Once the debt was registered, however, it became comparatively straightforward to recover it in the case of default. If a lender does not anticipate the borrower ever refusing to repay a loan, then he has no incentive to register the transaction. But if informal mechanisms of enforcement are insufficient to ensure repayment, then by registering the debt a lender makes his threat to pursue a defaulting borrower in court credible, and in equilibrium this threat can be sufficient to induce the borrower to repay. Since an upfront cost was incurred for all loans registered (including loans that were repaid), this system spread out the costs incurred by going to court in the event a borrower defaulted across all loans, good and bad.

Describing these measures, Greif (2001*a*) suggested that the ‘procedures established in England between 1283 and 1285 provided the basis for a contract enforcement mechanism that enabled impersonal exchange based on a central legal system and individual responsibility’ (Greif, 2001*b*, 34–35).⁹ However, the importance of the Acton Burnell registry did not extend to rural credit. The mean debt recognized on the London Merchants registry between 1285 and 1307 was £26, 10*s* (McNall, 2002, 76).¹⁰ Many of the loans registered were smaller but, as Table 1 shows, the sums involved were, on average, still much larger than those found in rural credit markets. The disparity between the average size of the loans made in rural credit markets and those registered in towns like London, Bristol and York can be accounted for by the fact that using formal credit entailed a high fixed cost, and this prevented lenders from extending small-scale loans. It also accounts for the particular inadequacy of rural credit as professional moneylenders were based in the towns and, while they were able to extend credit into the countryside,

⁸Prior to this, Bowers observes that ‘English law had favored the debtor over the lender. Not only had debts been easily repudiated, but there had also been no satisfactory legal remedy by which a creditor could compel a debtor to pay a delinquent obligation’ (Bowers, 1983, 62).

⁹As Mundill (1998) notes the Statute of the Acton Burnell was based on the Exchequer of the Jewry and it was designed to allow Christian creditors to lend securely (Mundill, 1998, 121–122).

¹⁰Huge sums such as the £648, 16*s*, 6*d* that Sir Peter de Bermengham owed the Riccardi of Lucca were also registered (McNall, 2002, 71).

	Size of debts	
	Less than 5s	Greater than 20s
Oakington, Cottenham, and Dry Drayton, 1291–1400	74.7 %	3.9 %
Great Horwood, 1302–1460	66.2 %	1.6 %
Willingham, 1377–1400	72 %	4 %
Writtle, Essex, 1382–1490	57 %	11 %
	Mean debt	Median debt
London Registry 1285–1307	£26 10s	£12
Bristol Registry 1283–1307	£21 13s	£11
York Registry 1283–1307	£14 16s	£6 13s 4d

Table 1: Rural and mercantile credit. Rural credit data from Briggs (2009, 59). Mercantile credit data from McNall (2002, 76–80). A pound sterling £ was made up of 20 shillings (s) or 240 pence (d)

doing so was costly. This indicates that the development of formal legal mechanisms for debt enforcement cannot account for the growth of rural credit in the late middle ages and early modern period. Since it was not worthwhile lending small amounts of credit to peasants, peasants had to develop their own credit institutions.¹¹

Evidence for rural credit comes from a number of micro-studies of debt litigation dating from the late thirteenth and through to the fifteenth century in England. The first work on rural credit based on manorial records was undertaken by Elaine Clark (1981), who studied the village of Writtle, and found widespread participation in rural credit markets. These credit markets did not involve professional moneylenders: “[f]or cash loans neighbor relied on neighbor’ (Clark, 1981, 262). Nor was credit based on collateral, since many peasants lacked well specified property rights over their only asset, their land.¹² Creditors lent money to people like themselves, and one third of all creditors were debtors at other times. The loans could be in the form of deferred payment, in-kind, or in cash (Clark, 1981, 253–255). Only the very poor appear to have been denied access to capital. Loans contracts were oral and they only survive in the records in cases where either lender or borrower subsequently took the case to the local manor court. Given

¹¹Urban-based moneylenders lent primarily to the rural gentry. See Hilton (1966, 50–51) and Titow (1969, 47).

¹²In his subsequent study Briggs found that ‘[no] mortgages of land have been traced’ (Briggs, 2009, 83). Short-term leases were more common but it does not seem to have been an important part of the credit market (see Briggs, 2009, 91).

the limitations of the court system this appears to be a major puzzle. How did illiterate peasants, lacking collateral, gain access to capital markets?

Subsequent work by Philip Schofield and Chris Briggs has confirmed many of Clark's findings.¹³ Villagers contracted loans with peasants from other villagers. Outside periods of crisis, credit markets appear to have performed relatively well.¹⁴ In his study of Oakington, Briggs (2003) found that peasants who possessed at least 10 but less than 18 acres of land were heavily involved in rural credit markets. While not the poorest segment of rural society, these 'middle' peasant households needed access to credit markets because they were vulnerable to shocks such as harvest failure. Briggs finds that 46 percent of these households appear in manor courts for debt cases during the first part of the fourteenth century. Since only a small proportion of credit relationships would have gone to court—to suggest otherwise would be 'to underestimate fourteenth-century rural lenders' judgement and knowledge of their clients'—this figure provides a floor on the percentage of households that used credit (Briggs, 2003, 239).

The first element to consider is the role played by pledges. Pledges were used to witness all kinds of transactions. They played a prominent part in debt case which were decided on the basis of testimony by their testimony.¹⁵ In criminal cases, courts occasionally assigned pledges to the accused, but in debt cases 'the choice of pledge, as well as the agreement to act as a pledge, was the result of a personal agreement between the villagers' (Razi, 1981a, 12). In debt cases, pledges performed two roles: (i) they witnessed the initial contract; and (ii) the pledge of the borrower could be sued by the lenders in the event of the borrower defaulting or absconding. This second feature meant that there was conditional joint liability between the borrower and his pledge. The pledge was liable for the debt if it was not feasible for the court to make the borrower repay. This system of joint liability was the rural analog to the system of community responsibility

¹³This work is based on research on the village of Hinderclay in Suffolk (Schofield, 1997), the Bedfordshire county court (Schofield, 2002), the Cambridgeshire villages of Oakington, Cottenham, Dry Drayton (Briggs, 2002, 2009) and Willingham (Briggs, 2006, 2009), and Great Horwood in northern Buckinghamshire (Briggs, 2004, 2009). There were regional differences in how rural credit functioned. Schofield (1997, 2008) examines how rural credit responded to crises which leads to a difference of emphasis in comparison with Clark's study.

¹⁴As McCloskey (1976) observed outside periods of crisis such as 1315-1322 peasants in medieval England rarely faced starvation.

¹⁵Pledges were mostly male. In Brigstock '[o]f the thousands of pledges recorded in the rolls of the court, only 46 were women, and most of these were widows pledging for their dependent children (Bennett, 1987, 25).

that was used to regulate interregional commerce during this period (Greif, 2006a).

The second part of the system was the manor court.¹⁶ The local manorial courts were a third-party which could ultimately enforce contracts. The manor courts were a legal forum which peasants had access to. One reason for this was that the manor courts employed oral rather than written contracts. Since most peasants were illiterate this lowered the costs associated with using the courts. Relative to other courts, such as the royal courts, the cost of using the local manor court was relatively low.¹⁷ However, the power of the manorial court was limited: each individual court only possessed the power to formally distrain villagers who lived within the manor and had no power of coercion vis-à-vis borrowers from villages outside its fee. Briggs observes that '[m]anorial lawsuits brought against persons living a substantial distance away were probably quite rare, since the limits to a lord's power to distrain outside his fee made it hard to secure the court appearance of such debtors' (Briggs, 2009, 127–128).

This discussion suggests how the limited power of the law could have been strengthened by the personal ties that existed through the practice of pledging. Borrowers from outside could have secured loans from local lenders by getting someone from within the creditor's home village to pledge for them. Pledges could bridge the gap that existed between borrowers and lenders who were strangers, and whose contracts could not be credibly enforced by the courts. In this way, pledging enabled credit relationships to exist across legal jurisdictions. If the lender was unable to pursue the borrower then he might at least be able sue the borrower's pledge. The pledge in turn could then obtained repayment from the borrower privately or in court. This improved the ability of the court system to enforce debt contracts. Pledging harnessed social sanctions in order to improve the effectiveness of the court system. On their own these social norms were of little significance, but, when combined with the legal system, they could be of decisive importance in ensuring that debts were repaid.

¹⁶The manor courts were established in part because they increased the efficiency with which lords could run their estates: '[l]ords of manors ecclesiastical and lay alike, were interested in efficient operation of courts on their estates primarily for reasons of economic and social control' (Beckerman, 1992, 199). Once these courts were established, peasants used them to pursue civil cases like debt pleas.

¹⁷From the mid-thirteenth century onwards, debts below 40s could be pursued in manor courts, in church courts or in the courts of hundred and country. Larger debts could be pursued in the royal courts which did not usually deal with debt cases since they were since according to Glanvill they were viewed as private agreements (Ibbetson, 1999, 17–18). If a plaintiff was successful in his case in the manor court, he was not charged legal fees by the court.

III A MODEL OF PLEDGING

The historical evidence suggests a number of channels through which pledging could have increased the efficiency and effectiveness of credit markets. A theoretical model is needed to disentangle these channels so that the mechanisms underpinning the practice can be understood. Three different specifications of the model can be considered. In the first specification of the model (Game 1) pledging enables lenders to ‘outsource’ the business of enforcing the contract to a pledge. By lowering the costs of ensuring that a debt is repaid, this allows lenders to extend credit to individuals they would not otherwise lend to.

The second specification (Game 2) considers the problem of adverse selection. It shows that so long as the pledge knows something about the character of the borrower, then acquiring a pledge can be a way for ‘safe’ borrowers to signal their type to lenders. Finally, Game 3 considers the possibility that borrowers reciprocally pledging for one another. Before introducing these three different specifications, we first outline the structure of the relationship between the lender, the borrower, and the pledge.

I THE REPAYMENT GAME

Consider the extensive form game depicted in figure 1. This depicts the relationship between a lender, a borrower, and a pledge on the assumption that the borrower has already acquired a pledge. It can be interpreted as a subgame within a wider set of strategic interactions. There are three players: the lender L , the borrower B , and the pledge P . The lender first decides whether or not to lend to the borrower an amount l . The loan is a short-term loan hence there is no discounting. The borrower then decides whether or not to repay an amount r , which may or may not include a discretionary amount of interest.¹⁸ If the borrower fails to repay the debt then his pledge can pay the loan. Finally if the pledge fails to pay the debt then the lender has to the option of taking either the original borrower or his pledge to court. The game is a one of complete

¹⁸It is impossible to ascertain the rate of interest r because of the prohibition on interest. Nightingale (2002) and Briggs (2009) argue that a return over and above the principle would have been usual, but that it was set by custom and precedent, and not a variable that lenders were able to manipulate. This view is supported by Helmholtz’s 1986 study of usury cases in canon courts. It is possible that some loans were interest free. For instance in his contemporary study of fishermen in Kerala, Platteau (1987) did find zero interest loans being employed. Udry (1994) in his study of lending in Nigeria found positive implicit rates of interest were typical and this seems more typical. Certainly the historical evidence suggests that a customary amount of interest was common in rural credit.

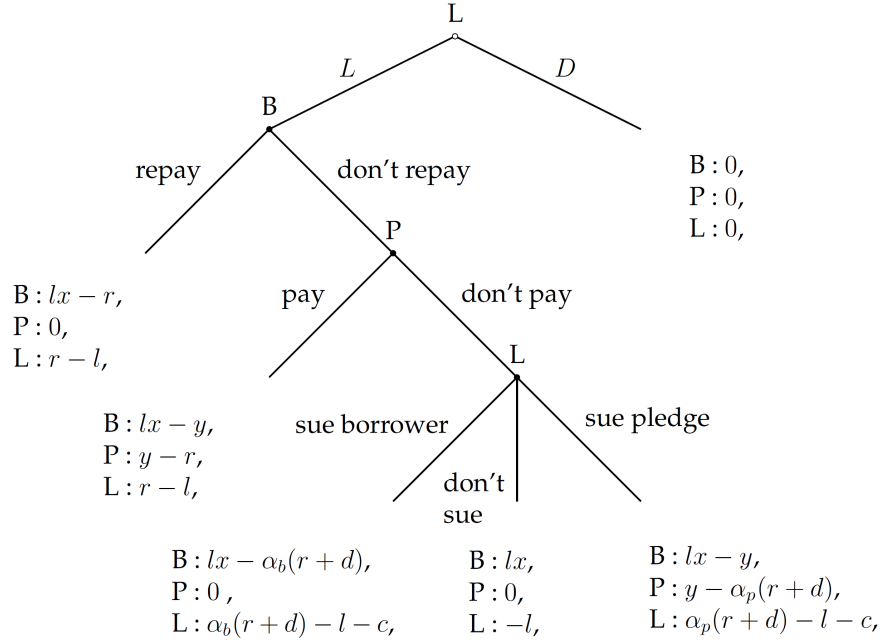


Figure 1: The repayment game with pledging

information.

If the pledge pays on behalf of the borrower or is sued by the lender then he is able to exact an amount equal to y from the defaulting borrower. A lender who decides to go to court has to pay a cost c to do so. Once in court, α_b measures the probability that a lender will obtain a favourable decision obtain repayment from the borrower directly, while α_p measures the probability of obtaining payment from his pledge. A borrower or pledge who is successfully sued pays damages d in addition to the amount he owes r . The payoffs associated with each terminal node for the borrower (B), pledge (P), and lender (L) that are depicted in figure 1.

The game can be solved via backwards induction. At the final node of the game, the lender can either sue the borrower, sue the pledge, or not sue at all. This provides three cases to consider. In the first case, once the final move of the game is reached it is optimal for the lender not to sue. In the second, the lender sues the borrower in the final node. In the third case, the lender sues the pledge. This allows us to solve for the decisions of the borrower and the pledge at the previous stages of the game in each of the three cases.

Case 1: The lender does not sue (*DS*) if $\max[\alpha_p, \alpha_b] < c/(r + d)$. The lender cannot credibly threaten to take either a borrower or a pledge to court because the cost of going to court is high relative to the probability of successfully winning. As a result, neither the borrower or the pledge will repay. Consequently the lender does not lend in any equilibrium strategy profile.

Case 2: The lender sues the borrower (*SB*) in the final node if $\alpha_b \geq \max[\alpha_p, c/(r + d)]$. If, at the final node, the lender will sue the borrower, the pledge has no incentive to pay the loan on behalf of the borrower. Therefore the pledge plays *DP*. Given this, the borrower can either decide to repay the loan or to go to court:

- i The borrower repays (*R*) if $\alpha_b[r + d] \geq r$.
- ii The borrower does not repay (*DR*) if $\alpha_b[r + d] < r$.

In situation (i), the threat of being sued directly motivates a borrower to repay. Alternatively if (ii) holds then the borrower prefers to be sued rather than repaying the loan. Now it is possible to examine the parameters under which the lender lends in the first place. Under (i) the lender lends so long as $r > l$. Under (ii) the lender only lends if $\alpha_b(r + d) > l + c$ which is only likely to be satisfied for small values of c . Therefore for some parameter values two different strategy profiles: $\sigma^* = \{L, R, D, SB\}$ (lend, repay, don't pay, sue borrower) and $\sigma^* = \{L, DR, D, SB\}$ (lend, don't repay, don't pay, sue borrower) can be subgame perfect Nash equilibria.

Case 3: The final case to consider is where at the final node the lender sues the pledge (*SP*): $\alpha_p \geq \max[\alpha_b, c/(r + d)]$. There are two actions that the pledge can take at the penultimate node:

- i The pledge pays (*P*) if $r < \alpha_p[r + d]$.
- ii The pledge does not pay (*DP*) if $r \geq \alpha_p[r + d]$.

The pledge chooses action *P* if the costs of being sued are greater than the costs of paying the borrower's debt directly. Now we can examine the borrower's decision at the second node of the game. The borrower's decision whether or not to repay the loan is influenced by the threat that if she does not repay then the pledge can exact private repayment equal to y .

Under both (i) and (ii) if $y \geq r$, then the borrower prefers to repay the loan (R) rather than incur punishment from the pledge. There are four candidate equilibria under Case 3. There are two possible equilibrium strategy profiles in which the presence of a pledge can directly motivate repayment: (1) $\sigma^* = \{L, R, P, SP\}$ (lend, repay, pay, sue pledge) and (2) $\sigma^* = \{L, R, DP, SP\}$ (lend, repay, don't pay, sue pledge). There is a further candidate equilibrium of the repayment game (3) in which the pledge pays the loan but the borrower does not play repay: $\sigma^* = \{L, DR, P, SP\}$. There is also fourth possible equilibrium (4) where the lender sues the pledge at the final node and neither the pledge nor the borrower pay the loan: $\sigma^* = \{L, DR, DP, SP\}$.

Case 1 is not of economic or historical interest because no lending takes place. In Case 2 the only role played by the pledge is that of a witness.¹⁹ For this reason the remainder of the chapter is concerned with situations where pledging played a strategic role in motivating repayment, i.e. Case 3, where $\alpha_p > \alpha_b$. In order to examine Case 3 in more detail, three different specifications of the model can be considered:

Game 1 Pledging is an institutional mechanism that enables the enforcement of debt contracts to be 'outsourced' to an individual with a comparative advantage in enforcing the contract. Pledging in this model is not reciprocal.

Game 2 Pledging can provide information on the borrower's 'type' under conditions of asymmetric information.

Game 3 Reciprocal pledging between two parties enables both individuals to access a wider credit network, and to provide mutual insurance.

II GAME 1: OUTSOURCING ENFORCEMENT

The first game to consider is one in which pledging is a one-off occurrence. Why would a pledge agree to become a pledge in this scenario? To answer this the outside option of the pledge can be set to 0. Then it is possible to write out the pledge's participation

¹⁹This was undoubtedly historically important: the manor court records indicates that both the lender and the borrower used pledges to validate and bear witness to the initial loan. In these cases—which probably corresponded to the bulk of actual credit transactions in medieval England—witnesses lowered the costs of using the court c , and increased the probability that a borrower who had defaulted would be forced to repay his loan α_b . However in these cases pledging did not play a strategic role in improving repayment rates or in lowering the costs of enforcing contracts pledging.

constraint as

$$\max[y - r, y - \alpha_p(r + d)] \geq 0. \quad (1)$$

This states that if the pledge is faced with either paying back a loan on behalf of the borrower or being taken to court, the payoffs associated with the best of these options have to exceed zero. Using this it is possible to examine potential equilibrium configurations of the repayment game to which are consistent with equation 1. Case 3 establishes that there are four candidate equilibria: (1) $\sigma^* = \{L, R, P, SP\}$ (lend, repay, pay, sue pledge); (2) $\sigma^* = \{L, R, DP, SP\}$ (lend, repay, don't pay, sue pledge); (3) $\sigma^* = \{L, DR, P, SP\}$ (lend, don't repay, pay, sue pledge); and (4) $\sigma^* = \{L, DR, DP, SP\}$ (lend, don't repay, don't pay, sue pledge). Equation 1 enables us to state the following proposition.

PROPOSITION 1: Two equilibria in which pledging enforces debt repayment are consistent with equation 1: (1) $\sigma^* = \{L, R, P, SP\}$ (lend, repay, pay, sue pledge); and (2) $\sigma^* = \{L, R, DP, SP\}$ (lend, repay, don't pay, sue pledge).

Strategy profile (3) $\sigma^* = \{L, DR, P, SP\}$ is inconsistent with the pledge's participation constraint. It involves the pledge paying the debt on behalf of the borrower. This can be consistent with the pledge's participation constraint if $y > r$. But if $y > r$, then the borrower will prefer to pay back the initial loan in the first place, rather than have the pledge extract y from him. Similarly strategy profile (4) $\sigma^* = \{L, DR, DP, SP\}$ also violates the pledge's participation constraint unless $y > r$.

The only remaining potential equilibria are (1) $\sigma^* = \{L, R, P, SB\}$ and (2) $\sigma^* = \{L, R, DP, SB\}$. Both configurations are consistent with equation 1 because the pledge's threat to take y from a borrower who defects is credible so long as $y > r$. Both equilibria illustrate how pledging could have helped to improve repayment when either the lender or the courts may have found it too costly to force a defaulting borrower to repay.

EVIDENCE FOR GAME 1

Before examining who pledged, we need to show that pledges did in fact play a strategic role in enforcing debt contracts. Briggs observes that '[b]ecause the system of pledges operated in a world of largely oral credit, evidence of it surfaces only occasionally in the written record' (Briggs, 2009, 92). Nevertheless, there are a sufficient number of cases in which a pledge, who stood as surety for the borrower, was himself sued in court, for the model examined to be relevant. Out of nearly 2,500 debt cases Briggs (2009) examined,

around 100 feature pledges being sued or, more rarely, suing borrowers whose debts they had paid. Schofield observes that many pleas at Hinderclay in the early fourteenth century feature creditors pursuing ‘not the debtor but the pledge’ (Schofield, 2008, 57). Sometimes this was because debtor had died, but in some cases it was because the debtor had ‘fled’. For example, ‘Walter Hare, who clearly fled at some time during the Great Famine, left his pledge John Noble to pay his debts of two shillings and two pence owed to Henry Trussehare (Schofield, 2008, 57). Furthermore, he notes that ‘[o]n other occasions it is clear that the creditor simply decided to proceed against the pledge rather than, or as well as, the original debtor. For example, there are numerous pleas against Alice Wodeward for unjust detention of grain in the famine years; but there are also claims against her pledges’ (Schofield, 2008, 57).

The next question raised by Game 1 is: “Who pledged?”. There is evidence that pledges were individuals who had a comparative advantage in enforcement as suggested by Proposition 1. Pledges were often reputable village members. Martin Pimsler (1977) argued that most of the pledging in the village in Elton was done by a small number of men in authority such as the reeves, the bailiff and the ale-tasters.²⁰ This is consistent with Game 1 as individuals in positions of authority may have been able to act in the manner specified by either equilibria (1) or (2) because they were able to impose private sanctions on a borrower in the event of default.

Game 1 also provides an explanation for why in some villages the same names appear over and over again in the court records as pledges. Razi and Smith (1996) document the existence of individuals like Walter Clericus of Redgrave who owed at least 12 acres of land and between 1260 and 1279 acted ‘as a pledge sixteen times’ whereas he ‘received that privilege from others only for the fines he paid when purchasing land and never as a defendant in a plaint or as a result of being amerced in the court’ (Razi and Smith, 1996, 62). They suggest that this reflected deep and long-lasting patterns of hierarchy and dominance within the village, noting that individuals with the name ‘Clericus’ were prominent as pledgers in Redgrave throughout the late thirteenth century. In a similar fashion Olson (1991) describes ‘the pledge system of suretyship’ as ‘one vivid example of’ the ‘informal authority vested in village offices . . . whose operations were buttressed

²⁰In partial support of Pimsler, Bennett found that the ‘people who most actively served as pledges in Brigstock were, as in most medieval villages, among the wealthiest and most influential members of the community’ (Bennett, 1987, 24). Hilton (1996) similarly finds prominent villagers acting as pledges frequently.

by familial networks' (Olson, 1991, 242). A number of studies, including Windt (1972), Razi and Smith (1996) and Olson (1991, 1996), found that prominent villagers and village officials were recorded as having acted as pledges far more frequently than their share of the village population would have suggested had their selection been a matter of chance.

Pimsler (1977) suggests that pledges may have been paid for their services by borrowers. There is no direct evidence of this. Nevertheless, the idea that pledge were recompensed, with money or perhaps with goods or favours, is consistent with the equilibria outlined here.²¹ Prominent villagers had a considerable non-financial incentive to pledge for other members of the village:

'The potential costs [of pledging] may have been low, but the corresponding benefits to the peasant elite were considerable—foremost among them social control. It was in the interests of the peasant elite, as well as of lords, to preserve harmony in the community by controlling the margins of society' (Postles, 1996, 422).

This supports the main prediction of Game 1. Pledging appears to have been outsourced to individuals who had the means to 'cheaply' punished borrowers who default opportunistically on the loans. Another finding consistent with this prediction is that high correlation between acting as a juror and as a pledge. The position of juror was typically reserved from prominent villages who either held other offices or came from long-established families. Olson (1991) finds that almost seventy percent of individuals who are recorded as acting a pledges in the village of Ellington, in Huntingshire, between 1280 and 1350, were also jurors.

Game 1 offers a simple explanation of why certain individuals were prominent as pledges: they were individuals with high values of α_p or y . An important local villager like an aletaster or a reeve had many opportunities to privately punish a borrower [or the relatives of the borrower] who defaulted. This punishment could involve physical violence, or it could involve denying the defaulter access to public goods within the village. The point is that the system of pledging enabled punishment strategies of this

²¹In many cases direct payment was unnecessary since as the model indicates, in both equilibria, along the equilibrium path the borrower repays the loan and the pledge pays nothing; thus although 'uncertainty remained, reasonable expectation prevailed that pledges would not be out of pocket' (Postles, 1996, 422).

kind to be outsourced to individuals who could punish ‘cheaply’, and who, perhaps stood to gain from their position as village strongmen.²² Individuals with capital were not necessarily able to credibly punish defaulters either because the borrower lived in a separate jurisdiction or because they lacked access to extra-legal means of enforcement. The pledging system enabled separate individuals to perform the two tasks of extending the loan and ensuring repayment, thereby economizing the limited resources of the manor courts.

III GAME 2: OVERCOMING ADVERSE SELECTION

Pledging reduced enforcement costs. It made it possible for lenders to lend to individuals they would otherwise find it impossible to lend to. But pledging appears to have added something else to medieval credit markets, and that is information. The ability to access information on the characteristics of the borrower *may* have played an important additional role in reducing the costs of lending. To examine what this entails let us analyze an extension of the model that allows for a degree of asymmetric information.

Consider a situation where whether or not a borrower defaults is determined by some exogenous event or probability λ . For example a hail storm could have damaged their crops, their livestock could have been afflicted by cattle blight, or a family member may have become sick. The total population of society $|n| = N$ is made up of two types of borrower: safe borrowers, who default with probability λ_s , and risky borrowers, who default with probability λ_r , where $\lambda_r > \lambda_s$.

Let L_s represent the return a lender obtains by extending credit to a safe borrower, while L_r can stand for the return a lender receives from lending to a risky borrower. Assume that λ_s and λ_r are such that lenders have an incentive to lend to good credit risks, but not to lend to bad risks:

$$\begin{aligned} L_s &= [1 - \lambda_s]r + \lambda_s \alpha_b[r + d] - l \geq 0, \\ L_r &= [1 - \lambda_r]r + \lambda_r \alpha_b[r + d] - l < 0. \end{aligned} \tag{2}$$

²²The main alternative explanations for why prominent villagers and village officials feature so frequently as pledges that I am aware of is the suggestion that prominent villagers were used as pledges for cases that involved the interests of the lord of the manor since ‘one would expect to find this most authoritative pledging variety most frequently marshalled in his service’ (Olson, 1996, 72). Olson notes however that ‘such a model of singleness of purpose and coercion fails to explain the data ... In Ellington as Upwood, official pledging was not primarily attached to maintaining seigneurial interests’ (Olson, 1996, 72-73).

As in Stiglitz and Weiss (1981) suppose the lender is uninformed about the quality of the borrower, and that ν proportion of the population are good credit risks and proportion $1 - \nu$ of the population are bad credit risks, where $\nu \in (0, 1)$. Since r was set by custom, medieval moneylenders were not able to easily adjust it in order to maximize their profits without incurring the risk of being prosecuted for usury. In the absence of a system of pledging, a lender lends if and only if:

$$\nu L_s + (1 - \nu) L_r \geq 0. \quad (3)$$

Good credit risks subsidizes bad, and if the proportion of bad credit risks in the population is sufficiently large (a low value of ν) then no lender lends, and the credit market dries up. Precisely, the credit market unravels if the proportion of safe credit risks in the population is small, and if the costs associated with lending to a risky borrower are high:

$$\nu < \frac{[l - [1 - \lambda_r] + \lambda_s \alpha_b [r + d]]}{[r(\lambda_r - \lambda_s) + \alpha_b [r + d](\lambda_r + \lambda_s)]}. \quad (4)$$

This adverse selection problem can be ameliorated if pledges have access to information about each borrower's type. Bad credit risks are deterred from borrowing if $[1 - \lambda_r]r + \lambda_r y > lx$. Good credit risks are deterred from borrowing if $[1 - \lambda_s]r + \lambda_s y > lx$. Since both types of individuals benefit equally from being able to borrow, this condition is tighter for bad credit risks than it is for good credit risks. There exist values of $l, x, y, r, d, \nu, \lambda_s, \lambda_r$ such that it is possible to construct a perfect Bayesian equilibrium where lenders lend to borrowers with pledges, and acquiring a pledge is a costly signal that indicates that one is a good credit risk. For this equilibrium to obtain, the value a borrower gets from a loan has to be bounded by the following condition:

$$lx \in \{[1 - \lambda_s]r + \lambda_s y, [1 - \lambda_r]r + \lambda_r y\}. \quad (5)$$

Using this it is possible to establish the following proposition.

PROPOSITION 2: There exists a separating Perfect Bayesian equilibrium (PBE) in which (i) lenders lend to all borrowers who are vouched for by pledges, (ii) only safe types borrow, and (iii) lenders believe that a borrower is safe if and only if he has a pledge.

Formally, a borrower $i \in n$ chooses a strategy q_i where $q_i \in \{\text{repay, default}\}$ as well as whether or not to acquire a pledge. The lender chooses whether or not to lend to the borrower $L = 1$ or $L = 0$. The borrower's type is hidden but his choice of q_i is observed

by the lender. The beliefs of the lender over the borrower i 's type can be denoted by $\mu_i(\lambda_i|q_i)$, which is the probability a lender assigns to the borrower being type λ_i given q_i . A PBE is a set of strategy profiles and posterior beliefs such that: (i) both safe and risky borrowers choose strategies that are mutual best responses to the actions of the lender; (ii) the lender plays a best response given his beliefs about the borrower's type; (iii) the lender updates his beliefs about the borrower's type according to Bayes' rule.

The beliefs that comprise this equilibrium are as follows. If the lender observes that the borrower i has a pledge (i.e. $q_i = 1$), his beliefs are $\mu_i(\lambda_s|q_i = 1) = 1$, i.e. he believes with probability 1 that i is a good credit risk. If the lender observes $q_i = 0$, then he believes that he is a good credit risk with probability $\mu_i = 0$. Next, it can be shown that these beliefs are compatible with the equilibrium strategies of the players, so long equation 5 is satisfied.

To establish this, we first show that safe types have an incentive to acquire a pledge. This follows from condition 5, since by assumption $lx > [1 - \lambda_s]r + \lambda_s$. Second, it has to be the case that the bad credit risk does not have an incentive to mimic the behaviour of good credit risk. It has to be more costly for bad credit risks to acquire a pledge than it is for good credit risks to do so. This requires the following incentive compatibility condition to be satisfied:

$$u_i(q_i = 1; \lambda_r; 1) \leq u_i(q_i = 0, \lambda_r; 0). \quad (6)$$

Checking this is straightforward as $u_i(q_i = 1; \lambda_r; 1) = lx - [1 - \lambda_r]r - \lambda_r y$ and $u_i(q_i = 0, \lambda_r; 0) = 0$. Therefore, as long as equation 5 holds, the incentive compatibility condition is trivially satisfied. Given this, the lender's posterior beliefs that no borrower with a pledge is risky are consistent with the strategies chosen, and the strategy profile described in Proposition 2 is a PBE.

Acquiring a pledge is costly signal that enables safe borrowers to borrow from lenders who they would not otherwise be able to borrow from. Game 2 predicts that only safe borrowers acquire pledges. The corollary of proposition 2 is that if $lx > [1 - \lambda_r]r + \lambda_r y$ then no separating equilibrium exists and both types of borrower acquire pledges. In this pooling equilibrium lending can only take place if the proportion of risky types ν is low enough.

Ghatak (1999, 2000) examines how group lending can induce borrowers to behave in a

way that mitigates the problem of adverse selection. Under group liability, safe credit risks have an incentive to self-select one-another because they gain comparatively more by being grouped with other safe risks than do less safe borrowers. Game 2 identifies a mechanism that is similar to this ‘peer selection’ effect. Both group lending and pledging enable lenders to distinguish between safe and risky borrowers.²³

EVIDENCE FOR GAME 2

There is considerable historical support for the second game. Pledging enabled lenders to lend to individuals, who they did not necessarily personally know or trust, so long as that individual could find a pledge, whom the lender did know. Briggs observes that ‘simply by being able to produce the required pledges, a borrower could demonstrate that he was a person of good credit, known as someone who usually repaid his debts’. A ‘crucial consequence of this was that a creditor did not necessarily need to know a borrower, or his circumstances, in order to be confident about extending credit to him’ (Briggs, 2009, 94).

Pledging enabled social capital to substitute for physical capital. This is how pledging appears to have been perceived at the time by contemporaries. When John Mautrauers in Yarcombe in 1287 was ‘unable to find pledges in a case of debt,’ he ‘was distrained (that is, his chattels were seized) until his creditors were satisfied’ (Postles, 1996, 422). In other words, individuals who were unable to provide the required credentials or social collateral, had to provide physical collateral. This evidence indicates that the signalling aspects of pledging augmented the role that the institution played in reducing enforcement costs. The final variation on the model to consider is one where pledging was embedded in a richer social environment in which there were opportunities for individuals to take turns to pledge for one another.

IV GAME 3: PROVIDING MUTUAL INSURANCE

In addition to two functions that we have considered in many villages there is evidence of mutual and reciprocal pledging in which villagers would pledge on behalf of their neighbours rather than relying upon prominent village officials. The role of reciprocal pledging can be best understood in the context of a repeated game in which individuals

²³For more details on the peer selection mechanism consult Aghion and Gollier (2000), Wydick (2001) and Ahlin and Townsend (2007).

receive negatively correlated income shocks. Game 3 examines the how individuals could have used the system of pledging to help to insure each other against idiosyncratic shocks. By acting as a pledge to a neighbour, an individual, not only enabled his neighbour to gain access to credit, he also secured his own access to credit because his neighbour could, in turn, act as surety for him when he wanted to borrow. Reciprocal pledging, in this sense, was effectively a form of group lending.

THE ENVIRONMENT

Consider an environment in which every period $t = \{1, \dots, \infty\}$, individual i receives a negative income shock \underline{q} with probability γ_i , and a positive income shock \bar{q} with probability $1 - \gamma_i$, where $\bar{q} > \underline{q}$. Individuals consume their output as there is no possibility of storage.²⁴ Per-period utility is therefore $u_i(q_i)$ where $u'_i > 0$ and $u''_i < 0$. Life-time utility is given by $U_i = \sum_{t=1}^{\infty} (1 - \delta) u_i^t$.

Suppose a pair of individual i and j are exogenously matched together. Suppressing time subscripts, each period $\gamma_i[1 - \gamma_j]$ is the probability that i receives a bad income realization and j receives a positive income realization. Similarly the probability that i gets a good shock, and j a bad shock is $\gamma_j[1 - \gamma_i]$. The probability that both i and j receive negative shocks is $\gamma_i\gamma_j$.

STRATEGIES

Individual i pledges for individual j when j receives a low income endowment \underline{q} and when i receives a high endowment \bar{q} . Individual i is unable to pledge for j when they both receive low endowments. Initially, suppose in period 1 that individual i receives \bar{q} while individual j obtains \underline{q} . Under a system of reciprocal credit individual j would ask his neighbour i for a loan. Instead i can act as a pledge for j .

The cost of pledging is the risk that either the pledge will be left liable for repayment of the debt contracted by the borrower and end up paying $y - r$, or that he will end up being take to court: $y - \alpha_p(r + d)$. These costs are equal to $\kappa = \max[y - r, y - \alpha_p(r + d)]$. The benefits of pledging are based on the understanding that i will be able to call upon j to act as pledge of his behalf when he attempts to get a loan in the future.²⁵ Since

²⁴The assumption of no storage is consistent with McCloskey and Nash (1984) who find that peasants consumed each year's harvest because of the high costs associated with storage.

²⁵Loans were typically short term while the period between loans was much longer. Therefore we can

individuals discount future benefits at rate $(1 - \delta)$, the value of these benefits can be written as: $\gamma_i(1 - \gamma_j)(1 - \delta)(xl - r + \underline{q})$.

THE RECIPROCAL PLEDGING EQUILIBRIUM

Since an individual i is asked to pledge when he receives a positive income shock, the discounted future utility individual i obtains in period t if he agrees to pledge is given by U_i^p which is equal to:

$$\begin{aligned}
& u(\bar{q} - \kappa) + \underbrace{\gamma_i[1 - \gamma_j](1 - \delta)u(xl - r + \underline{q})}_{\text{future if payoffs } j \text{ pledges for } i} \\
& + \underbrace{\gamma_j[1 - \gamma_i](1 - \delta)u(\bar{q} - \kappa)}_{\text{future payoffs if } i \text{ pledges for } j} \\
& + \underbrace{\gamma_i\gamma_j(1 - \delta)u(\underline{q})}_{\text{future payoffs if there is a correlated shock}}
\end{aligned} \tag{7}$$

An individual who deviates receives an autarchy payoff given by U_i^d , which is equal to:

$$u(\bar{q}) + [1 - \gamma_i](1 - \delta)u(\bar{q}) + \gamma_i(1 - \delta)u(\underline{q}). \tag{8}$$

Therefore even in cases where the pledge has to pay for the loan on behalf of the borrower i will act as a pledge for j so long as the following condition holds:

$$U_i^p \geq U_i^d.$$

This can be written as follows:

$$\frac{u(\bar{q}) - u(\bar{q} - \kappa)}{\varphi + \chi - \phi} \leq 1 - \delta. \tag{9}$$

where $\varphi = \gamma_i(1 - \gamma_j)u(xl - r + \underline{q})$ is the difference in discounted utility between receiving a negative income shock and not having access to credit, and receiving a negative shock and having access to credit; $\chi = (\gamma_i - \gamma_i\gamma_j)u(\underline{q})$ measures the relative likelihood of receiving a low income realization in autarchy, and under the pledging system; and $\phi = (1 - \gamma_i)(u(\bar{q}) - \gamma_j u(\bar{q} - \kappa))$ is the difference, in discounted utility terms, between having a positive shock in autarchy, and receiving the same shock under the pledging

surmise that each loan was contracted and paid back within the same 'period'.

system. Reciprocal pledging is easier to sustain when individuals are patient, when the costs of pledging κ are low, and when $\varphi + \chi - \phi$ is large.

Recall that in Game 1 a number of possible equilibrium configurations had to be discarded because they were incompatible with the pledge's participation constraint. Under reciprocal pledging this constraint is relaxed, and there are two possible equilibria of the repayment game that can be supported: (3) $\sigma^* = \{L, DR, P, SP\}$ (lend, don't repay, pay, sue pledge), and (4) $\sigma^* = \{L, DR, DP, SP\}$ (lend, don't repay, don't pay, sue pledge).

The strategy profile (3) $\{L, DR, P, SP\}$ can be supported as an equilibrium of the repeated game when equation 9 holds and $r > \alpha_p(r + d)$. If equation 9 is satisfied individual j is willing to act as a pledge for i even if this means bearing the burden of repaying the loan i contracted. The second condition states that j prefers to pay i 's debt rather than risk going to court. Conversely, when equation 9 holds and $\alpha_p(r + d) > r$, the strategy profile (4) $\sigma^* = \{L, DR, DP, SP\}$ can be a potential equilibrium. In this case, j prefers to go to court rather than pay off the debt directly. These results can be summarized by the following proposition.

PROPOSITION 3: When $U_i^p \geq U_i^d$ two potential equilibria exist in which reciprocal pledging supports lending: $\sigma^* = \{L, DR, P, SP\}$, and $\sigma^* = \{L, DR, DP, SP\}$.

This establishes the claim that reciprocal pledging enlarged the scope of the formal credit system. It enabled loans to be made even in instances where the borrower could be expected not to repay the loan on time.

Besley and Coate (1995) show how group lending can overcome problems of moral hazard and raise overall repayment rates. By providing incentives for successful borrowers to repay loans on behalf of unsuccessful borrowers, the practice of group lending can raise overall repayment rates.²⁶ Proposition 3 establishes that reciprocal pledging resembled group lending because it allowed both the borrower and the pledge to provide insurance to one another, and this reduced the probability of either defaulting. Reciprocal pledging, like group lending, functioned, in part, because it bundled mutual

²⁶Besley and Coate (1995) also show that shared liability can reduce repayment in the case of a borrower who would be willing to repay his own loan, but is unwilling to also repay the loan of the other borrower. When group lending is combined with social penalties that can be enforced by the borrowers on one another then, if the social sanctions are sufficiently severe, group lending results in higher repayment rates than does lending to individuals. The remainder of the chapter focuses on problems of enforcement and adverse selection rather than moral hazard.

insurance with the provision of market credit.

EVIDENCE FOR GAME 3

While some village studies emphasize the importance of pledging by prominent villagers, a different picture emerges from other studies. Bennett writes that in Brigstock most pledges pledged 'for ties of friendship and mutuality' (Bennett, 1987, 24). Postles (1996) and Briggs (2009) find plenty of historical evidence establishing the importance of reciprocal equilibria. Razi (1981*a*) argued that the 'great majority of the villagers in the pre-plague period needed sureties so frequently that it is reasonable to assume that they were prepared to take a risk and to pledge for their neighbours free of charge because they knew that there was a very high chance that they themselves would need their neighbours to stand surety for them' (Razi, 1981*a*, 12).

Reciprocal pledging did not only occur amongst kin. Kinship structures in late medieval England were weak (Macfarlane, 1978; Cressy, 1986). Smith (1979) found widespread pledging in the village of Redgrave in the late thirteenth century.²⁷ The commitment to pledge 'involved various aspirations on the part of the persons concerned, from neighborly friendship or a kin-based bond to a desire for a profitable investment when the pledge was a guarantor in a financial agreement involving, for instance, a land transaction or credit for a debt repayment' (Smith, 1979, 223). Pledging was not restricted on the basis of kinship, rather neighbours were 'in many cases were more important than kin,' and 'played a significant role through the giving of pledging support, and aid in agricultural tasks' (Smith, 1979, 247). This neighbourliness was a form of social capital that capital markets were able to access, and build upon, though the practice of pledging.

IMPLICATIONS OF THE MODEL

Credit markets can function even if third-party contract enforcement is weak. We have shown how pledging could have augmented contract enforcement and improved the effectiveness of credit markets. Games 1, 2, and 3 cast light on different historical aspects of pledging as an institution. Game 1 demonstrated how pledging lowered the costs of enforcing debt repayment by enabling the threat of enforcement to be outsourced to the individual with the lowest costs of extracting repayment. Game 2 established that the

²⁷He found 6160 cases where pledging was involved [many of these were not debt cases].

practice of using pledges could alleviate problems of adverse selection by giving lenders access to an additional source of information on borrowers. Borrowers unable to obtain pledges could be identified as bad credit risks and obligated to provide physical collateral to borrow against. Game 3 shows that pledging also enabled borrowers and lenders to insure one another against idiosyncratic shocks and to access formal credit markets. It is this aspect of pledging as an institution that most closely resembles the group loans that feature prominently in modern microcredit.

All three mechanisms cast light upon the development of credit markets in medieval England. Reciprocal pledging as outlined in Game 3 is not necessarily inconsistent with the equilibria described in Games 1 and 2. Pledging was a polymorphous institution and it could perform different roles. In different parts of the country and at different times pledging may have taken different forms, with one-off or reciprocal pledging more common in some places than in others. Olson (1996) notes examples of both reciprocal and one-off pledging in thirteenth and fourteenth century Ellington and Upwood. Razi (1981a) obtained various pieces of evidence supportive of both one-off and reciprocal pledging. First, he observed that pledging was frequent. In Halesowen between 1270 and 1349, Razi found 25,314 acts of pledging ‘which meant that on average each of the 1533 males identified in these records acted 16.3 times as a pledge’ (Razi, 1981a, 12). Second, he found that pledging was often reciprocal: ‘80 per cent of the population both pledged their neighbours and were pledged by them at least a few times during their adult lives,’ but that ‘the wealthier [an individual] was the more he served as a pledge’ (Razi, 1981a, 12). In Halesowen, between 1310 and 1325, he found that 82 out of 260 cases or 31.5 percent of pledges in debt cases were relatives, whereas as 52 or 20 percent were close neighbours. In the other cases, it seems as though villagers went to prominent village officials. This suggests that the mechanisms highlighted in Games 1 and 2 were relevant even in villages where most pledging was reciprocal. Pledging performed multiple roles in supporting medieval credit.

V THE DEMISE OF PLEDGING

Having demonstrated how a credit system based on reciprocal credit could enable lenders to extend loans to borrowers, they would otherwise be unable to lend to, we can now look at how this system could have emerged. In the model, there is a cost associated with going to court c . If this cost is too high, then a lender cannot credibly

threaten to sue a borrower who defaults, and the court system will not be used. If this cost falls sufficiently, then eventually individuals will, of course, begin to use formal credit systems. It is important to note, however, that there may be intermediate systems like pledging that mediate the switch-over from reliance of purely informal means of consumption smoothing to dependence on the market.

Let $c^{**} = \max[\alpha_p(r + d), \alpha_b(r + d)]$. In practice this value of c would be different for different lenders, and it would differ from court to court, and according to the identity of the borrower and the pledge but allow us to the case where there is only a single lender, borrower, and pledge. In this case, if $c \geq c^{**}$ no lending will take place, since the threat to sue either a borrower or his pledge is not credible. For the practice of pledging to emerge in the first place c had to fall below a critical threshold c^{**} . Equally, if the cost of going to court is sufficiently low and the probability of successfully suing a borrow who has defaulted is higher than than is the probability of suing his pledge, then pledges will not be used to enforcement contracts (Case 1 of the repayment game).

This permits us to speculate about the reasons why pledging gradually disappeared during the fifteenth century. One possibility suggested by the model is that the probability of successfully suing a borrower who had defaulted α_b increased, and that this eventually made pledging unnecessary. This is possible: Mukherjee (2009) examines how the legal system improved in early modern England. However, in this case, the historical evidence suggests that another mechanism was responsible for the eventual demise of pledging as an institution, and this was a fall in the number of individuals who were willing or able to act as pledges.²⁸

Postles argues that one 'pragmatic cause of change was the demographic decline after the plague, which severely reduced the number of male pledgers, especially since one case, prosecuted to its conclusion, required at least four pledges for each party' (Postles, 1996, 423). The population of England fell by about a half between 1300 and 1450.²⁹ However, it is more likely that it was the increased mobility of labour, rather than fall in

²⁸Improvements in the legal system had taken place in the thirteenth century with the establishment of the Acton Burnell registry which enabled lenders to formally record their loans (Bowers, 1983). The Acton Burnell registry did not significantly affect small-scale rural credit however. The mean debt recognized on the London Merchants registry between 1285 and 1307 was £26, 10s (McNall, 2002, 76).

²⁹The population of England and Wales may have been as high as between 5 and 6 million in 1300. It fell to little more than 2 million by the middle of the fifteenth century. See Hatcher and Bailey (2001, 27–38) for a range of estimates.

population itself, that eroded the value of pledging. Razi (1981*b*) observes that ‘it is very probable that the rural population became more mobile’ in the later middle ages. Dyer (2005) notes that a ‘high rate of migration meant that few families remained in the same village for more than three generations ... These tendencies undermined the former tenurial structure of the village [as a result] The village’s communal discipline and agrarian economy was under threat’ (Dyer, 2005, 75).³⁰ This argument is supported by Olsen’s (1991) description of how the pledge system gradually fell apart as ‘community bonds were weaker in the fifteenth century, at least to the extent that they centered on the family and its radiating systems of interpersonal associations’ (Olson, 1991, 255). In terms of the model, this weakening of community bonds at first appears most relevant to Game 3. The increased mobility of labour can be interpreted in terms of a bigger discount factor δ .³¹ A rise in the discount factor reduces the range of parameters over which the equilibria outlined in Proposition 3 can be supported. Greater labour mobility also undermined the equilibria detailed in Games 1 and 2. Traditional structures of authority within the village weakened and, as a result, the authority of local officials diminished. This can be interpreted as lessening the value of y and as reducing the incentive, or even the ability, to act as a pledge. This was part of a set of broader developments. According to Dyer (2002) traditional forms of community enforcement went into terminal decline after around 1400 as the demographic crisis of the plague years encouraged migration between villages and towns and led to a shift towards pastoral cultivation. As a consequence the social capital that had upheld the institution

³⁰One way to track the extent of migration in the middle ages is to examine the number of individual surnames that contain place names denoting different localities. Based on this evidence, McClure (1979) found that London in the fourteenth century attracted migrants from up to 40 miles away. Other towns like Norwich could draw in migrants from up to 20 miles away. Postles (2000) examined Leicester Abbey in the fourteenth century and found that of 120 unfree tenants listed in the records, 23 bore surnames indicating that their or ancestors came from other parts of the country, whereas as more than half of the free tenants had names indicating other places of origin. DeWindt (1987) showed that peasants seeking specialised employment as brewers or tanners migrated quite widely.

³¹Following Mailath and Samuelson (2006), a more precise way of examining this would be to add a separate discount factor μ to capture the further uncertainty that an individual might move away from the community, in addition to the standard constant discount factor: δ :

$$\prod_{\tau=0}^{t-1} \mu_{\tau} (1 - \delta),$$

where $\lim_{\tau \rightarrow \infty} \mu_{\tau} = 0$. This has the effect of weakening the inter-temporal incentives to cooperate since each individual effectively discounts future payoffs twice. He discounts future payoffs *constantly* because he prefers current consumption to future consumption. But he also discounts the future at an increasing rate: $1/1 - \mu_{\tau}$ because, as the game continues, the chances of it ending next period, increase.

of pledging was dissipated.

IV THE HISTORICAL SIGNIFICANCE OF PLEDGING

The emergence of comparatively thick and deep capital markets played a vital part in the economic success of North-Western Europe in the late medieval and early modern periods (van Zanden, 2009). Pledging can be placed in a broader historical and economic context if we consider why capital market development was important, and if the comparatively early development of relatively broad and deep credit markets in late medieval England can help to explain the economic performance of England in the period before the industrial revolution.

Economic historians argue that low interest rates and widespread access to capital played an important role in stimulating economic development in Western Europe (see van Zanden, 2008, 2009; Allen, 2009). This raises the question of how to account for the improvement in capital markets and credit market institutions. Can this improvement be attributed to better third-party contract enforcement? If this is the case, then the institution of pledging can be dismissed as an interesting, but ultimately inconsequential, institutional innovation. If, however, improvements in credit market access cannot be fully accounted for by improvements in formal institutions, then this means that economic historians must reconsider how intermediate forms of credit like those that are based on practices like pledging in medieval England, could have led to better access to capital.

Capital markets in medieval Europe were hindered in a number of ways. In particular the usury prohibition stymied the development of credit markets. Nevertheless, improvements in formal institutions did play an important role in many parts of Europe.³² In the Netherlands, widespread participation in credit markets similarly drove down the costs of capital in the late medieval period (see van Zanden et al., 2009). Unlike England,

³²In early modern France notarized credit played an important role in enabling a broad-based credit market to emerge. A previous generation of historians had largely dismissed the significance of rural credit markets in France before the Revolution (Duby, 1968, 1962). Research in the past twenty years, however, has uncovered the existence of widespread capital markets across France (Rosenthal, 1993, 1994; Hoffman et al., 1995, 2000; Fontaine, 2001; Brennan, 2006). Credit in Paris, and in rural areas like Burgundy, and Champagne, was based on notarial contracts. It financed long-term investment, as well as the short-term, and immediate need, to smooth income and consumption from shocks to production. Notaries acted as informational intermediaries, matching suitable lenders and borrowers, and thereby ameliorating many of the problems of asymmetric information that can trouble credit markets.

this development was based on improvements in formal lending institutions. In Holland, debt recognizance emerged in the second half of the thirteenth century. According to Dijkman (2007), '[f]ormal recognizance offered material advantages: it was considered to be absolute proof of the existence of the debt. A creditor who possessed a document issued by the proper authorities stating a debt had been incurred and was to be repaid at a certain date, could, if payment was not forthcoming, demand summary execution: immediate distraint of the debtor' (Dijkman, 2007, 12). In both the Netherlands and France, improvements in formal credit market enforcement technologies were important in widening access to credit and lowering interest rates.

Unlike continental Europe, In England the growth of rural credit markets cannot be attributed to improvements in the formal legal or institutional framework. Debt registries and other formal institutions were involved in providing loans to merchants and noblemen but not to peasants. The growth of rural credit was largely due to the development of credit markets that operated on the basis of oral rather than written contracts and were dependent on the institution of pledging. This largely self-ordering and emergent social phenomenon could overcome many of the problems associated with informal credit. It enabled peasants to access more extensive credit networks. Lenders and borrowers did not have to know each other well before entering into a credit agreement; they could come from different villages and might be strangers to one another so long as the lender knew the borrower's pledge. Compared to reciprocal credit, this system of oral credit based on personal sureties and third party enforcement could generate a comparatively extensive credit system. This is because a borrower did not need to know the lender so long as the borrower's pledge could credibly vouch for the security of the loan.

CONCLUDING COMMENTS

Pledging provided a mechanism capable of reducing enforcement costs and overcoming adverse selection in rural credit markets. Three further conclusions can be drawn from this analysis. Firstly, it establishes the existence and significance of a historical institution that occupied the grey area between informal or community based enforcement and third-party enforcement (Greif, 2006a). Recognition of the importance of this grey area means that we are less likely to impose binary distinctions on institutions, like credit markets in developing countries today, that rely on both informal and formal

enforcement.

Pledging can be contrasted with both informal systems of mutual insurance, on the one hand, and with formal, market-based credit, on the other. Informal credit does not require a functioning legal system to exist, nor does it demand financial literacy or sophistication on behalf of borrowers in order to participate, but it does entail a large social commitment to one's neighbours. A credit market enforced solely by the courts is at the opposite end of the spectrum. It imposes no social obligations, but it cannot function in the absence of a functioning legal system, and requires comparatively high levels of financial literacy. In comparison with reciprocal credit, pledging involved less onerous social obligations. Instead of having to extend a loan to a neighbour, the individual in question merely had to stand in for them as a pledge. At the same time, in relation to a formal credit market, a credit system based on pledging can function even when legal enforcement of contracts is weak.

Secondly, the example of pledging shows that informal and formal enforcements mechanisms can support, rather than undermine, one another. Pledging enabled individuals to access financial markets at a lower cost because it effectively 'piggy-backed' on the existence of relatively close knit relations between peasant households. Pledging broken down once these community ties weakened in the aftermath of the Black Death. This support what is an emerging consensus amongst scholars that markets and community need not be viewed as substitutes but can in fact complement one another.

Thirdly, this sheds light upon the problem of institutional change. The transition from an equilibrium based upon personal and informal credit to one based upon impersonal credit is difficult to negotiate for a number of reasons. It is well known that the emergence of formal credit markets can undermine informal social insurance systems because formal markets offer a potentially attractive outside option for individuals who choose to defect from the village based insurance (Kranton, 1996). Furthermore, informal credit systems entails redistribution from lucky or successful villagers to unlucky or unsuccessful villagers. The existence of an outside option can induce 'lucky' individuals to exit, thereby reducing the value of informal insurance to everyone else, and possibly causing it to unravel entirely. The analysis in this paper suggests that pledging could have acted as a mediating institution easing the transition from informal to formal credit. Because it enabled market lenders to harness some of the social capital upon which

informal insurance schemes rely, it appears to have eased the slow and gradual transition towards a system of formal credit markets.

LIST OF REFERENCES

- Aghion, Beatriz Armendáriz de and Christian Gollier (2000), 'Peer group formation in an adverse selection model', *The Economic Journal* **110**(465), 632–643.
- Aghion, Beatriz Armendáriz de and Jonathan Morduch (2005), *The Economics of Microfinance*, MIT Press, Cambridge, MA.
- Ahlin, Christian and Robert M. Townsend (2007), 'Using repayment data to test across models of joint liability lending', *Economic Journal* **117**(517), F11–F51.
- Allen, Robert C. (2009), *The British Industrial Revolution in a Global Perspective*, Oxford University Press, Oxford.
- Attanasio, Orazio and Jose-Victor Rios-Rull (2000), 'Consumption smoothing in island economies: Can public insurance reduce welfare?', *European Economic Review* **44**(7), 1225–1258.
- Banerjee, Abhijit V, Timothy Besley and Timothy W Guinnane (1994), 'Thy neighbor's keeper: The design of a credit cooperative with theory and a test', *The Quarterly Journal of Economics* **109**(2), 491–515.
- Beckerman, John S. (1992), 'Procedural innovation and institutional change in medieval English manorial courts', *Law and History Review* **10**(2), 197–252.
- Bell, Clive (1988), Credit market and interlinked transactions, in H.Chenery and T.Srinivasan, eds, 'The Handbook of Development Economics Volume 1', Elsevier Science Publishers, Amsterdam, North-Holland.
- Bennett, Judith M. (1987), *Women in the Medieval English Countryside: Gender and Household in Brigstock Before the Plague*, Oxford University Press, Oxford.
- Besley, Tim (1988), Savings, credit and insurance, in H.Chenery and T.Srinivasan, eds, 'The Handbook of Development Economics Volume 1', Elsevier Science Publishers, Amsterdam, North-Holland.
- Besley, Timothy and Stephen Coate (1995), 'Group lending, repayment incentives and social collateral', *Journal of Development Economics* **46**(1), 1–18.
- Bottomley, Anthony (1963), 'The premium for risk as a determinant of interest rates in underdeveloped rural areas', *The Quarterly Journal of Economics* **57**, 637–647.
- Bottomley, Anthony (1975), 'Interest rate determination in underdeveloped rural areas', *American Journal of Agricultural Economics* **57**, 279–291.
- Bowers, Richard H. (1983), 'From rolls to riches: King's clerks and moneylending in thirteenth-century England', *Speculum* **58**, 60–71.
- Bramoullé, Yann and Rachel Kranton (2007), 'Risk sharing across communities', *American Economic Review* **97**(2), 70–74.
- Brennan, Thomas (2006), 'Peasants and debt in eighteenth-century Champagne', *Journal of Interdisciplinary History* **XXXVI**(2), 175–200.
- Briggs, Chris (2002), *Creditors and debtors and their relationships at Oakington, Cottenham and Dry Drayton (Cambridgeshire), 1291–1350*, Oxbow Books, Oxford, pp. 127–148.
- Briggs, Chris (2003), Credit and the peasant household economy in England before the Black Death: Evidence from a Cambridgeshire manor, in 'The Medieval Household in Christian Europe, c. 850 –c. 1550', Brepols Publishers n.v., Turnhout, Belgium.
- Briggs, Chris (2004), 'Empowered or marginalized? rural women and credit in later thirteenth- and fourteenth-century England', *Continuity and Change* **19**, 13–43.
- Briggs, Chris (2006), Credit in the later medieval village: The example of Willingham, Cambridgeshire, 1377–1458. Presented at the Economic History Society Conference 2006.
- Briggs, Chris (2009), *Credit and Village Society in Fourteenth-Century England*, Oxford University Press, Oxford.
- Campbell, Bruce M. S. (2009), 'Factor markets in England before the Black Death', *Continuity and*

- Change* **24**, 79–106.
- Campos, Jose Edgardo and Hilton L. Root (1995), 'Markets, norms, and peasant rebellions: A rational choice approach with implications for rural development', *Rationality and Society* **7**, 93–115.
- Clark, Elaine (1981), Debt litigation in a late medieval English Vill, in 'Pathways to Medieval Peasants', Pontifical Institute of Mediaeval Studies, Toronto.
- Coate, Stephen and Martin Ravallion (1993), 'Reciprocity without commitment : Characterization and performance of informal insurance arrangements', *Journal of Development Economics* **40**(1), 1–24.
- Coulton, G.G. (1949), *Medieval Panorama, the English scene from Conquest to Reformation*, Cambridge University Press, Cambridge.
- Cressy, David (1986), 'Kinship and kin interaction in early modern England', *Past and Present* **113**(1), 38–69.
- DeWindt, Anne Reiber (1987), 'Redefining the peasant community in medieval England: The regional perspective', *The Journal of British Studies* **26**(2), 163–207.
- Dijkman, Jessica (2007), Debt litigation in medieval Holland, c. 1200–1350. Paper for the GEHN Conference, September 20–22, 2007, Utrecht.
- Duby, Georges (1968, 1962), *Rural Economy and Country Life in the Medieval West*, Edward Arnold Ltd. translated by Cynthia Postan.
- Dyer, Christopher (2002), *Making a Living in the Middle Ages, the people of Britain 850–1520*, Yale University Press, New Haven.
- Dyer, Christopher (2005), *An Age of Transition? Economy and society in England in the Later Middle Ages*, Clarendon Press, Oxford.
- Fafchamps, Marcel (1992), 'Solidarity networks in preindustrial societies: Rational peasants with a moral economy', *Economic Development and Cultural Change* **41**(1), 147–74.
- Ferrara, Eliana La (2003), 'Kin groups and reciprocity: A model of credit transactions in Ghana', *American Economic Review* **93**(5), 1730–1751.
- Fontaine, Laurence (2001), 'Antonio and Shylock: Credit and trust in France, c. 1680–c. 1780', *The Economic History Review* **54**(1), 39–57.
- Ghatak, Maitreesh (1999), 'Group lending, local information and peer selection', *Journal of Development Economics* **60**(1), 27–50.
- Ghatak, Maitreesh (2000), 'Screening by the company you keep: Joint liability lending and the peer selection effect', *Economic Journal* **110**(465), 601–31.
- Greif, Avner (2001a), Comment on Crafts, in J. E. Stiglitz and G. M. Meier, eds, 'Frontiers of Development Economics', Oxford University Press, Oxford, pp. 335–339.
- Greif, Avner (2001b), Impersonal exchange and the origin of markets: From the community responsibility system of individual legal responsibility in pre-modern Europe, in M. Aoki and Y. Hayami, eds, 'Communities and Markets in Economic Development', Oxford University Press, Oxford, pp. 3–41.
- Greif, Avner (2002), 'Institutions and impersonal exchange: From communal to individual responsibility', *Journal of Institutional and Theoretical Economics (JITE)* **127**(1), 168–.
- Greif, Avner (2006a), 'History lessons: The birth of impersonal exchange: The community responsibility system and impartial justice', *Journal of Economic Perspectives* **20**(2), 221–236.
- Greif, Avner (2006b), *Institutions and the Path to the Modern Economy*, Cambridge University Press, Cambridge, U.K.
- Guinnane, Timothy W. (2001), 'Cooperatives as information machines: German rural credit cooperatives, 1883–1914', *The Journal of Economic History* **61**(02), 366–389.
- Hatcher, John and Mark Bailey (2001), *Modelling the Middle Ages*, Oxford University Press, Oxford.
- Helmholz, R.H. (1986), 'Usury and the medieval English church courts', *Speculum* **61**(2), 364–380.

- Hill, Christopher (1964), *Society and Puritanism in Pre-Revolutionary England*, Martin Secker and Warburg Limited, Manchester.
- Hilton, R. H. (1966), *A Medieval Society, the West Midlands at the End of the Thirteenth Century*, Cambridge University Press, Cambridge.
- Hilton, R. H. (1975), *The English Peasantry in the Later Middle Ages*, Clarendon Press, Oxford.
- Hilton, Rodney (1996), Low-level urbanization: The seignueurial borough of Thornbury in the middle ages, in Z.Razi and R.Smith, eds, 'The Medieval Manor Court', Oxford University Press, Oxford, pp. 482–518.
- Hoffman, Philip, Gilles Postel-Vinay and Jean-Laurent Rosenthal (2000), *Priceless Markets, the political economy of credit in Paris, 1660–1870*, University of Chicago Press, Chicago.
- Hoffman, Philip T., Gilles Postel-Vinay and Jean-Laurent Rosenthal (1995), 'Redistribution and long-term private debt in Paris, 1660–1726', *The Journal of Economic History* 55(2), 256–284.
- Hollis, Aidan and Arthur Sweetman (1998), 'Microcredit in prefamine Ireland', *Explorations in Economic History* 35(4), 347–380.
- Homans, George Caspar (1960), *English Villagers of the Thirteenth Century*, Russell & Russell, New York.
- Ibbetson, D.J. (1999), *A Historical Introduction to the Law of Obligation*, Oxford University Press, Oxford.
- Kimball, Miles S (1988), 'Farmers' cooperatives as behavior toward risk', *American Economic Review* 78(1), 224–32.
- Kocherlakota, Narayana R. (1996), 'Implications of efficient risk sharing without commitment', *The Review of Economic Studies* 63(4), 595–609.
- Kranton, Rachel E (1996), 'Reciprocal exchange: A self-sustaining system', *American Economic Review* 86(4), 830–51.
- Laslett, Peter (1965), *The World We Have Lost*, Routledge, London.
- Leeson, Peter T. (2007), 'Trading with bandits', *Journal of Law & Economics* 50, 303–321.
- Leeson, Peter T. (2008), 'Social distance and self-enforcing exchange', *Journal of Legal Studies* 37(1), 161–188.
- Leeson, Peter T. (2009), 'The laws of lawlessness', *Journal of Legal Studies* 38, 471–503.
- Ligon, Ethan, Jonathan P. Thomas and Tim Worrall (2002), 'Informal insurance arrangements with limited commitment: Theory and evidence from village economies', *The Review of Economic Studies* 69(1), 209–244.
- Macfarlane, Alan (1978), *The Origins of English Individualism, the family, property, and social transition*, Basil Blackwells, Oxford.
- Macfarlane, Alan (2003), *The Savage Wars of Peace, England, Japan and the Malthusian Trap*, Palgrave MacMillan, London.
- Mailath, George J. and Larry Samuelson (2006), *Repeated Games and Reputations*, Oxford University Press, Oxford.
- McCloskey, Donald N. (1976), 'English open fields as behavior towards risk', *Research in Economic History* 1, 124–170.
- McCloskey, Donald N. (1989), The open fields of England: Rent, risk, and the rate of interest, 1300–1815, in D. W.Galenson, ed., 'Markets in History: Economic Studies of the Past', Cambridge University Press, Cambridge, pp. 5–51.
- McCloskey, Donald N. (1991), 'The prudent peasant: New findings on open fields', *The Journal of Economic History* 51(2), 343–355.
- McCloskey, Donald N. and John Nash (1984), 'Corn at interest: The extent and cost of grain storage in Medieval England', *The American Economic Review* 74, 174–187.
- McClure, Peter (1979), 'Patterns of migration in the late middle ages: The evidence of English place-name surnames', *The Economic History Review* 32(2), 167–182.

- McIntosh, Marjories K. (1986), *Autonomy and Community, the royal manor of Havering, 1200–1500*, Cambridge University Press, Cambridge.
- McNall, Chrisopher (2002), The business of statuory debt registries, in P.Schofield and N. J.Mayhew, eds, 'Credit and Debt in Medieval England c. 1180–c.1350', Oxbow Books, Oxford, pp. 68–88.
- Morduch, Jonathan (1999), 'The microfinance promise', *Journal of Economic Literature* 37(4), 1569–1614.
- Mukherjee, Anirban (2009), 'Sue Thy Neighbor': Transition of credit institutions in early modern England. UBC unpublished manuscript.
- Mundill, Robin R. (1998), *England's Jewish Solution: Experiment and Expulsion, 1262–1290*, CUP, Cambridge, U.K.
- Nightingale, Pamela (2002), The English parochial clergy as investors and creditors, in P.Schofield and N. J.Mayhew, eds, 'Credit and Debt in Medieval England c. 1180–c.1350', Oxbow Books, Oxford, pp. 89–105.
- Olson, Sherri (1991), 'Jurors of the village court: Local leadership before and after the plague in Ellington, Huntingdonshire', *The Journal of British Studies* 30(3), 237–256.
- Olson, Sherri (1996), *A Chronicle of All That Happens*, Pontifical Institution of Medieval Studies, Toronto, Canada.
- Pimsler, Martin (1977), 'Solidarity in the medieval village? the evidence of personal pledging at Elton, Huntingdonshire', *The Journal of British Studies* 17(1), 1–11.
- Platteau, Jean-Philippe (1987), 'An inquiry into quasi-credit contracts: the role of reciprocal credit and interlinked deals in small-scale fishing communities', *Journal of Development Studies* 23(4), 461–490.
- Platteau, Jean-Philippe (1997), 'Mutual insurance as an elusive concept in traditional rural communities', *Journal of Development Studies* 33(6), 764–796.
- Postan, M. M., ed. (1966), *The Cambridge Economic History of Europe, volume I, The Agrarian Life of the Middle Ages*, second edition edn, Cambridge University Press, Cambridge, U.K.
- Postan, M.M. (1928), 'Credit in medieval trade', *The Economic History Review* 1(2), 234–261.
- Postan, M.M. (1951), 'Spread of techniques: Italy and the economic development of England in the middle ages', *The Journal of Economic History* 11, 339–346.
- Postan, M.M. (1972), *The Medieval Economy and Society*, Weidenfeld and Nicholson, London.
- Postan, M.M. (1973), *Medieval Trade and Finance*, CUP, Cambridge, U.K.
- Postles, David (1996), 'Personal pledging: Medieval "reciprocity" or "symbolic capital"?', *Journal of Interdisciplinary History* 26(3), 419–435.
- Postles, David (2000), 'Migration and mobility in a less mature economy: English internal migration, c. 1200–1350', *Social History* 25(3), 285–300.
- Razi, Zvi (1981a), 'Family, land and the village community in later medieval England', *Past and Present* 93(1), 3–36.
- Razi, Zvi (1981b), 'Family, land and the village community in later medieval England', *Past and Present* 93(1), 3–36.
- Razi, Zvi and Richard Smith (1996), The origins of the English manor court tolls as a written record: A puzzle, in Z.Razi and R.Smith, eds, 'The Medieval Manor Court', Oxford University Press, Oxford, pp. 36–68.
- Richardson, Gary (2005), 'The prudent village: Risk pooling institutions in medieval English agriculture', *The Journal of Economic History* 65(2), 386–413.
- Rosenthal, Jean-Laurent (1993), 'Credit markets and economic change in southeastern France 1630–1788', *Explorations in Economic History* 30, 129–157.
- Rosenthal, Jean-Laurent (1994), 'Rural credit markets and aggregate shocks: The experience of Nuits St. Georges, 1756–1776', *The Journal of Economic History* 54(2), 288–306.

- Schofield, Phillip R. (1997), 'Dearth, debt and the local land market in a late thirteenth-century village community', *Agricultural History Review* **45**, 1–17.
- Schofield, Phillip R. (2002), Access to credit in the early fourteenth-century, in P.Schofield and N. J.Mayhew, eds, 'Credit and Debt in Medieval England c. 1180–c.1350', Oxbow Books, Oxford.
- Schofield, Phillip R. (2008), 'The social economy of the medieval village in the early fourteenth century', *The Economic History Review* **61**, 38–63.
- Scott, James C. (1976), *The Moral Economy of the Peasant, rebellion and subsistence in southeast Asia*, Yale University Press, New Haven.
- Smith, Richard M. (1984), 'Modernization' and the corporate medieval village community in England : some sceptical reflections, in A. R. H.Baker and D.Gregory, eds, 'Explorations in Historical Geography', Cambridge University Press, Cambridge, U.K.
- Smith, R.M. (1979), 'Kin and Neighbors in a Thirteenth-Century Suffolk Community', *Journal of Family History* **4**(3), 219–256.
- Stiglitz, Joseph and Andrew Weiss (1981), 'Credit rationing in markets with imperfect information', *American Economic Review* **71**, 393–410.
- Telser, L.G. (1980), 'A theory of self-enforcing agreements', *The Journal of Business* **53**(1), 27–44.
- Thomas, Keith (1971), *Religion and the Decline of Magic*, Weidenfeld & Nicholson, London.
- Titow, J. Z. (1969), *English Rural Society 1200–1350*, George Allen and Unwin LTD, London.
- Townsend, Robert M. (1993), *The Medieval Village Economy*, Princeton University Press, Princeton, New Jersey.
- Udry, Christopher (1994), 'Risk and insurance in a rural credit market: An empirical investigation in northern Nigeria', *Review of Economic Studies* **61**(3), 495–526.
- van Zanden, Jan Luiten (2008), 'The road to the industrial revolution: hypotheses and conjectures about the medieval origins of the European miracle?', *Journal of Global History* **3**(03), 337–359.
- van Zanden, Jan Luiten (2009), *The Long Road to the Industrial Revolution. The European Economy in a Global Perspective, 1000-1800*, Brill Publishers, Leiden.
- van Zanden, Jan Luiten, Tine de Moor and Jaco Zuijderduijn (2009), 'Micro-credit in late medieval waterland. households and the efficiency of capital markets in Edam en De Zeevang, 1462-1563', *Fondazione Istituto Internazionale di Storia Economica*.
- Windt, Edwin Brezette De (1972), *Land and People in Holywell-cum-Needingworth: Structure of Tenure and Patterns of Social Organization in an East Midlands Village 1252–1457*, Pontifical Institute of Medieval Studies, Toronto.
- Wolf, Eric R. (1957), 'Closed corporate peasant communities in Mesoamerica and central Java', *Southwestern Journal of Anthropology* **13**(1), 1–18.
- Wydick, Bruce (2001), 'Group lending under dynamic incentives as a borrower discipline device', *Review of Development Economics* **5**(3), 406–20.