INTEREST RATE RESTRICTIONS IN A NATURAL EXPERIMENT: LOAN ALLOCATION AND THE CHANGE IN THE USURY LAWS IN 1714*

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This article studies the effects of interest rate restrictions on loan allocation. The British government tightened the usury laws in 1714, reducing the maximum permissible interest rate from 6% to 5%. A sample of individual loan transactions reveals that average loan size and minimum loan size increased strongly, while access to credit worsened for those with little 'social capital'. Collateralised credits, which had accounted for a declining share of total lending, returned to their former role of prominence. Our results suggest that the usury laws distorted credit markets significantly; we find no evidence that they offered a form of Pareto-improving social insurance.

Almost since the beginning of recorded history, usury restrictions have been widely used. The laws of Hammurabi from the 2nd millennium BC regulated interest rates, as did the Old Testament and the Catholic Church. While early rules often outlawed the taking of interest altogether, later restrictions stipulated maximum permissible interest rates. To the present day, many developing and Islamic countries and US states impose limits on private loan contracts to stamp out predatory lending by 'credit sharks'; only recently Italy re-introduced a law against usurious credit contracts (Glaeser and Scheinkman, 1998; Blitz and Long, 1965; Homer and Sylla, 1996).

The effects of usury regulation have remained controversial. Numerous scholars have argued that they had damaging consequences and that this conclusion applies to both the prohibition of interest as well as to limitations on maximum rates. Max Weber famously argued that the Catholic Church's restrictions on interest slowed capital accumulation and growth (Weber, 1998; Tawney, 1926). Ekelund *et al.* (1989) examine medieval restrictions on maximum interest rates, arguing that lower interest rates served to extract rents from lenders. Glaeser and Scheinkman (1998), on the other hand, argue that usury laws act as a form of insurance that transfers resources from states of the world where the marginal utility of income is low (when households are well-off) to states when it is high (after negative income shocks etc.). They show that usury restrictions can be Pareto-improving if income shocks are mainly temporary and idiosyncratic.

This study exploits a unique dataset of hundreds of eighteenth-century loan transactions, collected from the archives of Hoare's, a private London bank.[1] These records contain detailed evidence on loan rates, amounts lent and the identity of borrowers.

[1] This is the only London bank of the period with archives complete enough to evaluate the effects of the usury law.

When the English government changed the usury rate in 1714, Hoare's Bank drastically altered its loan allocation policy. The minimum loan size increased sharply after the reduction in the usury limit, in line with the predictions of a view of lending behaviour as profit maximisation with fixed costs rather than as providing social insurance. Discrimination in favour of wealthy and well-connected borrowers increased, suggesting that the bank sharply reduced the risk profile of its lending activity. This implies that the usury laws in England provided little if any insurance and instead acted as a means of rent extraction. We also document a retreat into collateralised borrowing after the change in the usury law, in line with predictions. In combination, these findings suggest that small changes in government regulation of credit transactions can have drastic effects on loan allocations and that usury laws are not social insurance.

Few previous studies have examined the effects of the usury laws empirically based on micro-data. Alessie *et al.* (2001) study the introduction of legal maxima on interest rates for consumer credit in Italy in 1996. These rates were set at 1.5 times average rates on similar transactions. The authors find that credit allocation did not change markedly – rejection rates stayed broadly constant after the change in the law. Empirical studies have been rare partly because economic historians traditionally believed that usury laws were ignored in practice. Yet there is growing evidence that, at least in some countries and periods, they were strictly enforced. Evasion was difficult and rare (Rockoff, 2003; Tan, 2001). Practical difficulties in tracing the usury laws' effects abound. Conclusive studies require micro-evidence, which is hard to find for most of the relevant historical periods.[2] While regulations remain unchanged, it is difficult to determine how lending decisions would have been made in the absence of constraints. This is why our study of a change in the usury law's provisions offers a unique opportunity to study their impact.

Other related literature includes work on financial repression and the interaction of finance and growth. Shaw (1973) and McKinnon (1973) argued that the quality of financial services was as important as quantity. Demetriades and Luintel (1996) and Dickson (1997) analysed financial conditions and aggregate time-series evidence for India, arguing that financial regulations retarded economic growth on the subcontinent. Fry (1997) summarised the experiences with restrictions in several countries. A recent literature using growth regressions has highlighted the importance of finance for growth (Levine, 1997; King and Levine, 1993; Levine and Zervos, 1998; Rousseau and Sylla, 2003). Paradoxically, however, the consensus view is that finance did not matter for the British Industrial Revolution (Mokyr, 1999; Neal, 1994). Before 1850 few enterprises received outside financing. Our results can provide a partial explanation why lending to enterprises was rare at that time: regulatory intervention may have stood in the way. If so, the benign effects of the Glorious Revolution, emphasised by North and Weingast (1989), may need to be counted against some of the countervailing effects of financial repression.

We proceed as follows. The next Section places the change in the English usury law in 1714 in its historical context and describes how our dataset was constructed. Section 2 derives testable implications from a basic model of lending behaviour, and Section 3 presents our main empirical results as well as possible objections. Finally, the conclusion summarises what can and cannot be inferred from a case study of lending behaviour at one bank.

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[2] Existing historical studies do not analyse the economic impact in any detail (Shatzmiller, 1990).

1. Data and Background

In this Section, we give a brief overview of the legal context of the natural experiment that we exploit. We explain the origin of our data and the way it was collected, and provide a summary of some key characteristics.

1.1. *Usury Laws in England*

Before 1545, lending at interest was outlawed (except for Jews). Henry III set a maximum rate of two pence per pound per week (54% annual) lending by Jews. From 1545 to 1552, a maximum rate of 10% applied to all transactions. Under Queen Mary, the taking of interest was once more outlawed. It was reinstituted in 1571 at the old maximum, which was lowered to 8% under James I, to 6% in 1660, and to 5% in 1714. The change in the law applied from the end of September. Throughout, punishment for transgressions was severe; the standard penalty for usurious contracts was forfeiture of three times the principal and interest (Rockoff, 2003).[3] Probably, the Hanoverian government used the coming of peace after the end of the Wars of the Spanish Succession to force through permanently lower borrowing rates, allowing it privileged access to the 'sinews of power' (Brewer, 1989).

The final period of usury laws in England began with Jeremy Bentham's *Defence of Usury*. He argued that mutually beneficial transactions between adults should be allowed, and that the usury laws often forced borrowers into the arms of loan-sharks (Rockoff, 2003). Adam Smith, on the other hand, saw the usury laws as a potential blessing and as an actual one in England. In his view, maximum rates had followed market rates. Anticipating arguments about adverse selection (Stiglitz and Weiss, 1981), he argued that interest rate limits in private loan transactions ensured that honest borrowers could obtain loans, while keeping fraudsters out of the credit market:

> The legal rate . . . though it ought to be somewhat above, ought not to be much above the lowest market rate. If the legal rate of interest . . . was fixed so high as eight or ten per cent, the greater part of the money which was to be lent, would be lent to prodigals and projectors, who alone would be willing to give this high interest. Sober people, who will give for the use of money no more than a part of what they are likely to make by the use of it, would not venture into the competition. A great part of the capital of the country would thus be kept out of the hands which were most likely to make a profitable and advantageous use of it, and thrown into those which were most likely to waste and destroy it. Where the legal rate of interest . . . is fixed but a very little above the lowest market rate, sober people are universally preferred, as borrowers, to prodigals and projectors.[4]

Eventually, the liberal argument won. In 1833, usury limits were lifted for bills of exchange and were finally abolished altogether in 1854.

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[3] 'From 29th Sept. 1714 Interest upon Loan of Money, &, at above the Rate of 5l. per Cent per Ann. not to be taken.' 13 Anne c. 15. *The Statutes of the Realm: printed by command of His Majesty King George the Third* (London: Dawson's, 1963), vol. 9, p. 928.

[4] Smith (1982 [1776]).

1.2. *Hoare's Bank and Transactions Data*

Our data come from Hoare's Bank, founded by Sir Richard Hoare in the late seventeenth century. Originally a goldsmith, he shed this side of the business in the 1690s. Hoare's remains a private bank in Fleet Street to the present day. The representativeness of our data is difficult to establish. Compared to a giant, state-backed institution like the Bank of England, Hoare's was probably much more typical of the large number of banks operating in the West in the early century. It was part of a small pioneering group of institutions that acted as credit intermediaries, taking deposits and making loans to a larger group of clients than earlier merchant banks.[5] By 1725, it has been estimated that there were 24 banks in the London West End. Where we have points of comparison for banking practices elsewhere – from record keeping to interest calculations at Child's Bank, for example, or contemporary handbooks – we find many similarities (Cooper, 1740; Quinn, 2001).

Survivorship bias could imply that our data are highly unrepresentative. In the absence of comprehensive banking statistics, this cannot be examined much further. Yet the very fact that Hoare's was not particularly profitable during the years we examine should reduce any potential 'survivorship bias' (Temin and Voth, 2003). It took many more years for the business to be firmly established. Between 1702 and 1725, the bank's assets varied between £100,000 and £200,000.[6] Steady growth only set in after 1730.

We use data on 877 loan transactions, involving 542 different clients. For each loan, we can determine the total amount lent, the duration of the loan, the interest paid, the type and value of collateral offered, as well as the name of the client. Hoare's Bank kept loan registers in the form of double entry ledgers. Against the date of the transaction, debits were entered on the left and credits on the right. The register also contains the title of the borrower, and tracks relevant changes in status closely. In most cases, the clerk noted the collateral offered for a new loan. He occasionally put down the contracted loan rate but we need to calculate the interest rate from the payment streams in most cases. Hoare's bank did not use compound interest, in line with contemporary handbooks on how to calculate interest for loans (Cooper, 1740).

Names of Hoare's customers were checked against a variety of sources to establish their identity and to analyse their position in Hanoverian England. A substantial proportion of large borrowers can be matched against entries in the *Dictionary of National Biography* (DNB) and *Cokayne's Complete Peerage*. Borrowers were frequently noblemen, officers, church officials and wealthy traders; Hoare's clients clearly were not representative of the English population as a whole.

We plot the median interest rate on loans made by Hoare's over this period in Figure 1. The graph suggests that Hoare's bank strictly adhered to the usury limits. We checked if there were offsetting deposits by borrowers; there were none. There is no evidence that the bank used this possible trick to bypass the regulation, or that customers paid an up-front fee.[7] The median interest rate on new loan transactions dropped from almost exactly 6% before 1714 to 5% after the change in the limit. The overall degree of compliance is impressive – if the bank did evade the usury laws, it left

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[5] Kashyap *et al.* (1999) explore the synergy between there two activities.
[6] £150,000 in 1720 is worth about £18,500,000 in goods today (Officer, 2008).
[7] The bank's annual profit calculation also strongly suggests that Hoare's complied with the usury laws.

Table 1

Descriptive Statistics

	Mean	Median	Standard deviation	Minimum	Maximum	N
Loan characteristics						
loan amount – £	775.01	201.7	1741.72	5	27290	877
Duration – days	884.06	281	1511.89	1	14007	853
Interest rate – %	3.85*	5	2.49	0	7**	877
Type of collateral						
Any	0.42	0	0.50	0	1	877
Mortgage	0.04	0	0.20	0	1	877
Securities	0.07	0	0.25	0	1	877
Borrower characteristics						
Aristocracy	0.13	0	0.34	0	1	876
Minor	0.15	0	0.36	0	1	876
Known	0.15	0	0.35	0	1	877
Female	0.11	0	0.31	0	1	877

Note. *including loans at zero interest
**short loan, interest rate calculated from cash flows; intended interest rate was probably 6%.

no traces of such wrongdoing in its account ledgers. As Sydney Homer argued for usury restrictions more generally, the enforcement of interest rate limits in eighteenth-century England was probably effective and widespread (Homer and Sylla, 1996). Figure 1 also shows that the loan market did not balance through interest rate changes; 92% of loans were made at the usury limit. Instead, credit rationing must have been the primary allocation mechanism. This unfortunately also means that we cannot learn much from analysing loans made below the usury limit.

Table 1 provides summary statistics for the loan dataset. Median loan value was just over £200 but differences between small and large transactions could be considerable – the Gini coefficient on loan size is 0.72. The maximum loan was for a massive £27,290. Average loan duration was quite short (a median of 281 days). This means that the change in the permitted interest rate affected the bank's loan book quickly. Loan duration could be as short as one day and as long as 38 years. Almost half of all loans were against collateral, of which 4% were against mortgages and another 7% against securities. Members of the aristocracy accounted for 13% of all transactions and those of minor nobility for another 15%.

2. Hypotheses

We focus on changes in lending behaviour after 1714. A common view is that changes in the usury law should have had only minimal effects. If regulations were widely circumvented, there should be no significant shift in lending behaviour. This is what we would also expect if the lowering of the interest rate ceiling was a reflection of lower market interest rates.[8] A second possibility is based on the predictions by Glaeser and Scheinkman (1998). They see usury regulations as a form of social engineering that

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[8] We have examined the question of possible violations of the usury laws elsewhere (Temin and Voth, 2003). We essentially find that had Hoare's lent at rates higher than the permitted maximum, we cannot square loan revenues and profits as reported on the balance sheets. Also, the loans that may be considered 'suspicious' (at zero interest) were often given to customers who had just borrowed at the maximum usury rate.

may be Pareto improving for society as a whole. Lower interest rates should have provided cheaper social insurance – access to credit should have widened. Third, the classic view, embodied in the writings of Shaw and McKinnon, sees interest rate restrictions as an impediment to the functioning of the financial system. If this interpretation is correct, then we should find large shifts in credit allocation after 1714 – and in a direction that potentially reduced the efficiency of the intermediation process overall. We use the data from Hoare's Bank to distinguish between these views.

The three competing interpretations of usury limits have testable implications. In order to do tests, we need to have a closer look at the bank's loan allocation policy. The market for loans, as discussed above, did not balance through changes in interest rates. Instead, as Figure 1 illustrates, credit was habitually rationed at the maximum permitted interest rate. If the usury laws acted as social insurance – in line with the Glaeser and Scheinkman model – we should expect to find a continuous supply of credit to less advantaged households. Changes in the total supply of credit should be minimal – depositors implicitly know that they will be able to borrow cheaply when they face a negative shock. Also, since banks did not pay interest on deposits, the supply of loanable funds should be unaffected. In equilibrium, those that found it relatively harder to borrow (and to show ability to repay interest and principal) before 1714 should receive greater access to credit. Second, the minimum loan size should drop, as wider groups of creditors can now claim 'insurance'.

If, on the other hand, the financial repression and rent-seeking models of usury regulations are correct, we should expect the opposite – minimum loan size should increase and privileged groups should borrow even more on the new, favourable terms. Lower lending rates translate directly into lower revenue per loan made, and commensurately lower profits. In order to break even and recoup its fixed costs, the bank would need to make loans of greater minimum size. This is the first empirical prediction necessary to support the financial repression interpretation. A related argument can be made with respect to the bank's credit allocation and the risk of default. Clearly, the extent to which a bank can take on risk depends on the interest rate it is permitted to charge. With a lower rate, the maximum default rate it can tolerate will decline. This yields the second empirical implication – borrowers regarded as relatively more attractive before the change in the usury laws should continue to
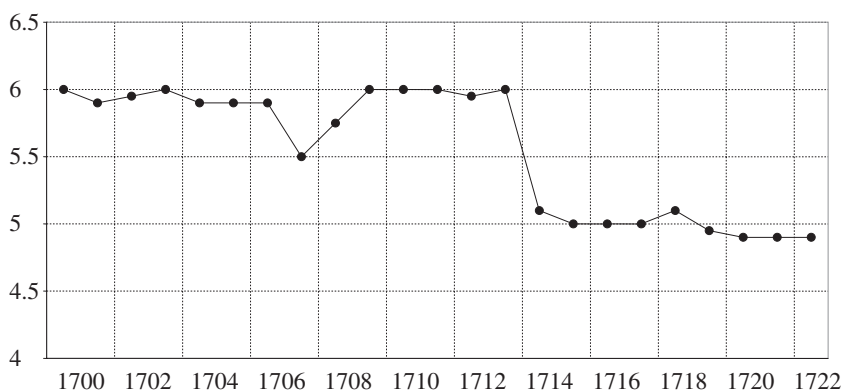
Fig. 1. *Median Interest Rate on Loans against Interest, Hoare's* 1702–1725

Table 2

Usury Laws, Impact on Main Variables

Regression Dependent variable	1 Loan interest rate*	2 Loan amount	3 Collateralised lending (dummy)
Estimation method	OLS	OLS	Probit
Usury dummy	−0.84	551	0.532
	(4.8)	(3.32)	(3.9)
Trend	0.006	4	−0.02
	(0.7)	(1.4)	(4.5)
N	671	877	877
Adj. R^2/Pseudo-R^2	0.05	0.02	0.02

Note. *for loans at an interest rate greater zero.

receive liberal access to credit, while those with less desirable characteristics are (partly or fully) shut out of the market. Finally, we should expect that the importance of collateral increases as the maximum loan rate is reduced. This allows the bank to reduce its risk in yet another way, effectively closing off access to credit by borrowers who do not own assets equivalent to the value of the loans they seek.

3. Empirical Results

In this Section, we examine the evidence from Hoare's loan ledgers. Table 2 presents a summary of our main findings. We regress each of our indicator variables – the interest rate, the size of loans, and the use of collateral – on a dummy for the changed usury law (and a time trend, to control for other factors). While we ideally would like to use an endogenous break-point test to demonstrate that the usury laws caused a discontinuity relative to earlier trends, the frequency of our data does not permit this. The summary results in Table 2 suggest that the period before and after 1714 showed markedly different lending behaviour by Hoare's in three key dimensions – the interest rate charged, amounts lent, and collateral demanded. None of the changes can be explained as a simple continuation of earlier trends. We find that the typical interest rate charged on a loan transaction fell sharply after 1714, and we cannot reject the null that it changed by exactly one percentage point. This suggests a high degree of compliance with the new regulation. This, in its own right, is important. It confirms that, for Hoare's Bank at least, much of the traditional scepticism about the effectiveness of usury regulations was misplaced. Note that there was no clear trend towards lower interest rates. Loan volumes surged after 1714, with values increasing by 68%. Loan values were trending up by 1.4% per year before 1714; the jump associated with the usury laws is equivalent to 52 years of the pre-intervention trend. Finally, the percentage of loans collateralised jumped sharply, when it had declined for much of the earlier period. We next examine these changes in detail.

3.1. *High Status and Access to Credit*

Table 3, regressions 1 and 2 look at the determinants of lending volume. Before 1714, members of the English political and commercial elite that were important enough to be

traceable via entries in the DNB or Cokayne's received more liberal access to credit – either because they were wealthier, or because their social connections made it sensible for Hoare's to lend to them. Being traceable in either the DNB or the lists of aristocrats ('known') yielded large returns – an additional £342 (mean, 122 median).[9] Women were offered less credit, on average, than men. After controlling for inclusion in the main biographical dictionaries, those of noble birth (aristocracy, minor nobility, or those with any title recorded in the ledger) did not consistently receive larger loan allocations.[10] Repeat customers also did not receive more credit. As is often the case in studies attempting to explain loan allocation, the overall explanatory power is not high. Since loan sizes were highly unequal, and results could have easily been influenced by outliers, we also estimate a median regression (Koenker and Hallock, 2001). The results, shown in Table 3, are broadly similar, and the benefits of being 'known' are confirmed.

Crucially, loan allocations changed markedly after 1714. Average loan size grew from £640 to £1,259. There is no obvious reason why loan demand should have changed so strongly and abruptly; changes in supply are a much more likely explanation, even if we cannot disentangle effects perfectly. Figure 2 plots the median value of loans over time, taking the pre-1714 average as a benchmark. The number of loans in any one year was not large, and the averages are variable. Yet before 1714, loan sizes largely stay within the 2 standard deviation band (calculated with pre-1714 data), while trending up gradually. After the change in the usury limit, all years show loans sizes markedly above the upper bound of the earlier distribution.

Table 3, regressions 1 and 2 show that the increase in average loan size was not simply the result of changes in observable customer characteristics.[11] We include an interaction effect between being 'known' and the new usury regulation. After 1714, the gains from being connected became much larger. Being known under the new usury regulation produced an additional £1,025 in credit (£624 in the median regression), on top of the baseline advantage. The further increase in loan size for those 'known' is significant at the 1% level in both regressions.[12] These results provide the conditional mean and median of the distribution of loan size changes with the tightening of the usury laws, assuming that these effects are linear.

Matching estimators form groups of 'comparable' individuals, and calculate differences between them. Borrowers receive a propensity score based on a set of observable characteristics. We use nearest-neighbour matching, comparing a borrower before 1714 with someone as similar as possible thereafter. The difference in loan amount received becomes the basis for an estimate of the average treatment effect of the usury laws. As the number of matches, we use either 1 or 4.[13] In addition, we also use the kernel estimator that offers an efficient combination of the

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[9] The result is significant at the 90% level of confidence. It is even stronger in a setup without a time trend.

[10] The positive coefficient for the aristocracy in the median regression suggests that outliers are responsible for the large standard error under OLS.

[11] We also examined if the year of the South Sea bubble is partly responsible for the results. Since credit conditions were highly unusual – with a credit crunch developing in the fall – this is a real possibility. Also, there may have been a surge of borrowing against collateral (Neal, 1990; Carswell,1993). However, re-estimating Table 3 without 1720 yields virtually identical results.

[12] Including a time trend or the size of the banks balance sheet to control for other factors that may have driven changes in loan size does not influence our results in an important way.

[13] As suggested by Abadie *et al.* (2002).

Table 3

Determinants of Lending Volume and Collateral

Regression	1	2	3	4
Dependent variable	Lending volume	Lending volume	Collateralisation dummy	Collateralisation dummy
Estimation method	OLS	Median regression	Probit	Probit
Usury	342	122	1.2	0.1
	(1.7)	(2.6)	(6.04)	(0.4)
Known	805	96	−0.06	−0.11
	(3.93)	(2.0)	(0.4)	(0.77)
Known × Usury	1,025	624		
	(2.45)	(6.5)		
Trend	5.5	4.8	−0.07	−0.94
	(0.64)	(2.4)	(6.2)	(7.9)
Usury × Trend				0.26
				(6.5)
Female	−473	−101	−0.13	−0.16
	(2.4)	(2.2)	(0.9)	(1.0)
Aristocracy	−366	45	0.18	0.18
	(1.7)	(0.9)	(1.1)	(1.1)
Minor	−138	94	0.36	0.33
	(0.7)	(2.2)	(2.5)	(2.3)
Repeat	−202	16	−0.23	−0.2
	(1.6)	(0.5)	(2.3)	(2.1)
Title	57	20	−0.06	−0.11
	(0.4)	(0.6)	(0.4)	(0.77)
			0.09	0.07
			(0.8)	(0.6)
Constant	629	102	0.36	0.33
	(4.3)	(3.0)	(2.5)	(2.3)
Adj. R^2/Pseudo-R^2	0.06	0.033	0.06	0.11
N	824	824	809	809

Note. Under OLS, standard errors clustered at the level of borrowers

nearest-neighbour and group-estimation (Heckman *et al.*, 1998). We match loans on the characteristics of borrowers, using the same set of explanatory variables as in Table 3 as well as the attractiveness indicator and the dummy for repeat customer status.[14] Table 4 shows the results. We find differences between £490 and £630 before and after the usury laws, very similar to the £467 in Table 3. The effect is significant in all cases. The sharp increase in loan sizes offers support for our first empirical hypothesis.

OLS, quantile regressions and matching estimators all show that the bank reacted to the restriction on the interest it could charge by increasing the size of loans it made, and by cutting lending to the smallest borrowers. Discrimination in favour of highly-connected individuals was one element pushing up lending volumes. Those who received large amounts of credit before the change in the usury law continued to receive loans – and while they paid a lower interest rate, they also received larger credits. How valuable was the subsidy received by borrowers after 1714? The median (mean) loan value was £500

[14] We use the psmatch2 routine by Sianesi and Leuven for kernel matching, using the bootstrap routine with 100 repetitions to estimate the standard error. For nearest-neighbour matching, we use the match estimator by Ibid.
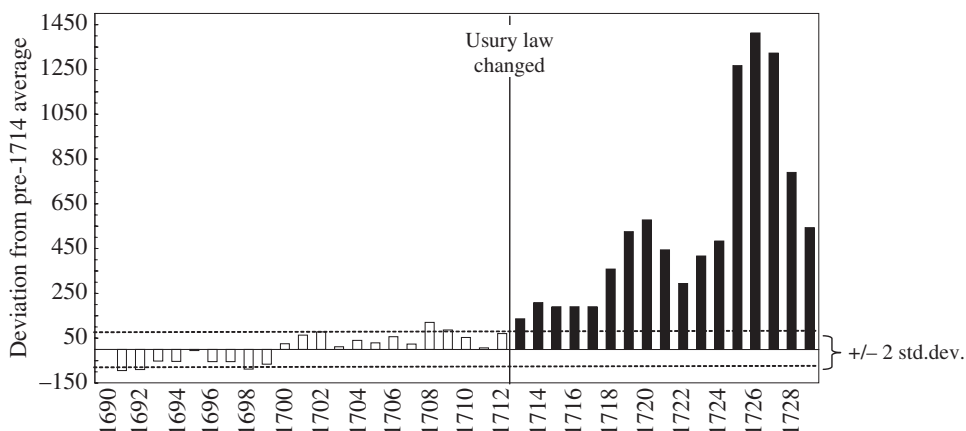
Fig. 2. *Hoare's Median Lending Amounts* (3-year-moving average)

Table 4

Average Treatment Effects, Matching Estimator (dependent variable: loan size in £ sterling)

Matching estimator	Number of neighbours	Propensity score calculated based on:	Woman, aristocracy, minor, known, title	Attractiveness, repeat
Neighbour	1		490	608
			(197; 805)	(324; 891)
	4		496	708
			(188; 805)	(407; 1010)
Kernel			608	630
			(332; 884)	(344; 916)

Note. 95% confidence interval in parentheses; estimated from bootstrap with 100 repetitions.

(£1,356), and the average duration was 252 (736) days. The median (mean) interest rate was 1% (0.8%) lower, suggesting a saving of £4.3 (£21.9) for each typical loan.

The underlying assumption for all the statistical methods used so far is conditional independence – that the error term in a regression of loan amount on borrower characteristics is not correlated with the characteristics themselves. Yet we know that the composition of borrowers changed. The implicit assumption – that the assignment of borrower to the period before or after the change in the usury law was random – may well not hold. If the bank began to discriminate more strongly against certain types of borrowers (not just by reducing their loan allocation, but by excluding them altogether), the true effect of being high-born or well-connected may well be larger than our results so far suggest.

Our data are compatible with such an interpretation; see Table 5. We analyse all the customers that the bank served in the period 1705–1714, and then identify those with whom the bank continued a lending relationship after the tightening of the law. Customers who continued to receive loans ranked markedly higher on the attractiveness scale (0.27 vs. –0.029). They were twice as likely to belong to the aristocracy and to

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Table 5

Lending to Select Customers, Before and After 1714

	Aristocracy	Minor	Female	'Known'	Repeat customers	N
proportion of number of loans						
pre-1714	0.13	0.13	0.12	0.14	0.37	686
post-1714	0.13	0.21	0.05	0.16	0.48	191
retained customers	0.21	0.19	0.02	0.26		85
proportion of total lending						
pre-1714	0.11	0.16	0.03	0.28	0.33	686
post-1714	0.16	0.21	0.01	0.33	0.43	191
retained customers	0.28	0.14	0.005	0.59		85

qualify as 'known' in our dataset. The number of women who remain as customers is markedly lower than in the pre-1714 sample as a whole, and the number of gentry is higher. The customer profile changed, possibly as a result of a deliberate effort to attract borrowers after 1714 who resembled the preferred customers before then.

3.2. *Defaults and the Use of Collateral*

Risk can be reduced by selecting different customers, or by tightening collateral requirements. Table 6 shows the use of collateral over time. With every five-year period that passed before 1714, fewer transactions involved the posting of security. Increasingly, the bank genuinely offered access to fresh funds for borrowers, instead of just liquidity services. Immediately before 1714, only 1 out of 10 pounds lent was secured by collateral. After 1714, the figure jumped to 67% – as high as it had been in the 1690s. Changing incentives caused a retreat from genuine credit intermediation. Also, the duration of loans fell abruptly after 1714, from 940 to 680 days. Borrowers could therefore only use the proceeds of loans for the short term, reinforcing the shift from fresh funds to liquidity services.

Simple probit estimation, with the use of collateral as a dependent variable, confirms this (Table 3, regressions 3 and 4). Before 1714, there is a clear trend away from using collateral. If we simply use a usury dummy, we see a very large jump in the probability of using some security. If we use an interaction term (*Usury × Trend*), we see that the earlier trend actually reversed; after 1714, the use of collateral started to grow again.[15] Only mortgage lending appears unaffected by the change in the usury laws. They continued to be larger than ordinary credits, and increased by 42% in value after 1714. In the eyes of contemporaries, the economic implications were not benign. As Adam Smith put it, '[t]he only people to whom stock is commonly lent, without their being

[15] With non-linear models, the significance of the interaction term cannot be determined by the z-statistic on the multiplied variables (Norton *et al.*, 2004). We checked using the inteff stata-routine for the significance of the interaction, which is high over the entire range of predicted values. Results are available from the authors upon request. Note also that the South Sea bubble is not responsible for the increase in lending against securities. The bank acted very cautiously in lending against shares in 1720, imposing a hefty 'haircut' compared to market value, and not lending at all against South Sea shares during the height of the bubble. If we re-estimate regression 4 in Table 3 without the year 1720, we obtain a coefficient of 1.14 (t-statistic 5.55) on the usury dummy. The interaction term *Usury × Trend* drops to 0.25 (t-statistic 6.2); inteff confirms its significance.

Table 6

Collateralised and Uncollateralised Lending

		1690–99	1700–04	1705–09	1710–14	1715–24
By number of loans	No collateral	43	161	174	102	118
		26.7%	54.8%	72.2%	87.9%	57.0%
	Collateralised	118	133	67	14	89
		73.3%	45.2%	27.8%	12.1%	43.0%
By value	No collateral	17,326	135,086	101,447	85,684	90,822
		25.1%	54.6%	58.0%	89.5%	32.5%
	Collateralised	51,739	112,312	73,434	10,054	188,435
		74.9%	45.4%	42.0%	10.5%	67.5%

expected to make any very profitable use of it, are country gentlemen, who borrow upon mortgage' (Smith, 1976 [1776]).

Defaults are crucial for our argument that the bank was trying to reduce risk in response to the change in the usury laws. They were rare indeed. We can identify them because they were finally repaid by selling the collateral (typically, jewellery) or by transferring the loan to a partner. We found fewer than 15 such defaults in our period for an aggregate value of £6,000, on which Hoare's lost the interest but not often the principal. We may have been unable to identify some defaults but we did not find any evidence that this was a major problem for the bank. Getting paid for its services, however, was another story. The records do not indicate the fears of Hoare's partners, only the results of their actions. We argue that the partners broadly solved the problem of risk, as the data show. We cannot know how intense their concern about it was.

Changing lending practices after 1714 may well have reduced default risk. Before 1713, there were 13 defaults. Afterwards, there were none. A Chi^2-Test shows that the change in relative frequency is significant at the 5% level. There is uncertainty surrounding our classification of defaults, and these results do not prove that risk-reduction was the prime motivation for the bank. Yet the data suggest that the dramatic changes in lending behaviour were partly intended to reduce defaults.

3.3. *Alternative Interpretations*

What other factors could account for the observed changes in lending behaviour? We discuss five possible alternatives – reduced government borrowing, shifts in macro-economic conditions, the South Sea bubble, changes in general interest rates and the Hoare family's changing fortune.

The Wars of the Spanish Succession ended in 1713. While they were fought, the English state borrowed heavily, and 'crowding out' may have been substantial (Williamson, 1984; Temin and Voth, 2005). Could it be that less government borrowing led to a fall in the market interest rate – with the usury rate merely following? This is implausible. First, the growth of public debt was also almost identical before and after the war – the period 1702–13 saw an increase in debt by £1.7 million and the years 1714–24 registered a rise of £1.5 million.[16] Therefore, even if 'crowding out' of private investment was an important factor overall, the change in the usury rate was probably

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[16] Mitchell (1971, p. 600).

not driven by it. Second, the end of war may have led to higher private borrowing, countervailing any effect. Finally, differences in minimum loan size and social composition between the two periods are unlikely to have been caused by reduced state borrowing (Williamson, 1984).

Also, the periods 1702–1713 and 1714–1725 are broadly comparable in macroeconomic terms. Differences in business cycle conditions are not responsible for the changes we find. Ashton's classification of business cycles suggests two peaks during the first period from 1702–1713, while the second registered three. Periods of crisis also occurred twice during the first period and three times in the second (Ashton, 1959).

The change in the usury laws was not driven by a general decline in market interest rates.[17] While Sussman and Yafeh (2002) find that their measure of interest rates fell from 6.1% in 1708 to 4.2% in 1713, this was not different from earlier fluctuations – the rate also fell from 6.1% in 1702 to 4.5% in 1705. Yet the usury rate was adjusted downwards only on the second occasion, not on the first. This suggests that the government decided to 'lock in' the lower rates permanently on the second occasion, perhaps to guard against possible future increases.

Finally, we might wonder if the social climbing of Richard Hoare (and not the usury laws) was responsible for the gentrification of the bank's customers. Richard represented the City of London in Parliament from 1709 to 1713 and, in 1712, was elected Lord Mayor of London. He received a knighthood shortly after the accession of Queen Anne (Hoare, 1932). We cannot rule out that the accumulation of these honours made it easier to gain blue-blooded clients. Yet if this was the key reason behind the shift in loan allocation, we should see a gradual transition. Neither in the case of returns to being 'known', nor minimum loan size, nor in the collateralisation do we see a slow shift. Also, Sir Richard died in 1718, and his son Henry was not as successful at climbing the rungs of Hanoverian England's social hierarchy – he did not even receive a knighthood. Only during five years (out of 12) in the second period could Sir Richard's connections have influenced the bank's lending directly. Finally, if Sir Richard felt that noblemen made better customers throughout, there is no obvious reason why he should have lent to commoners and less well-connected individuals before 1713.

4. Conclusions

In this case study of a single goldsmith's bank, Hoare's, we document the effects of a change in the usury laws that lowered the maximum permissible rate to 5%. Our results indicate that the bank reacted aggressively to the new regulation. Interest rates charged fell immediately. Also, the bank only engaged in the safest transactions. It successfully avoided defaults, reducing them from already very low levels before the change in the usury laws to zero. Hoare's achieved this by lending only to the most attractive borrowers. In eighteenth-century Britain, these were overwhelmingly of high birth or had important connections in the political elite. The change in the usury law therefore had redistributive effects.[18] The Glaeser and Scheinkman rationale for usury laws receives

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[17] This is the argument in North and Weingast (1989).
[18] This echoes the recent findings by Braggion (2005), who found evidence that access to credit in Victorian England was much easier for firms that had titled directors.

no support from our data. In at least this case, lower limits on permissible interest rates did not produce 'social insurance'.

Combined with other changes that followed the tightening of the usury laws, developments at Hoare's suggest that this regulation may have had a negative impact on Britain's banking system. Hoare's resumed collateralised lending to minimise risks, focusing on liquidity services for the upper classes. In contrast to the North and Weingast's (1989) argument, the lower maximum interest rate may not have simply been a reflection of falling market rates. The very fact that we see sharp changes in lending behaviour speaks against this. It is important to note that the bank eventually managed to return to growth despite the usury laws – steady growth began some 15 years later, when general economic and population growth as well as a run of good harvests provided a favourable environment. Adapting to the new environment required drastic changes in lending practices.[19] We know little about the many banks operating in the 1710s that did not survive. It may well be that Hoare's was one of the few institutions whose blue-blooded customer list allowed it to adopt decisive, compensating measures to make banking profitable despite a maximum interest rate of 5% (Joslin, 1954).

Did the usury laws have an impact on the economy? The fact that intermediated finance apparently only played a limited role in the Industrial Revolution has continued to puzzle scholars. Britain generated enormous savings in the eighteenth century. The ratio of debt to GDP surged to over 200% by 1815, mostly in the form of government debt. At the same time, capital employed in the private sectors was scarce throughout the period.[20] Given the changes at Hoare's bank after 1714, it is less surprising that little intermediated finance for business ventures existed.[21] Normal banks found it difficult to take the risk of loaning to potentially useful and profitable commercial and industrial projects. Riskier projects were effectively shut out of the loan market by the usury laws. An incumbent bank like Hoare's with high-level contacts managed to grow despite the usury laws, yet the drastic changes it undertook suggest that dealing with a reduction in maximum interest chargeable was no easy matter.

What little credit there was in an environment with loan restrictions largely ended up in the hands of the nobility, often against mortgages – the least useful form of lending, in Adam Smith's view. Combined with massive public borrowing and existing restrictions on the formation of joint-stock companies as a result of the Bubble Act of 1720, there is evidence of what development economists call financial repression. Instead of private and public credit growing in tandem, the tightening of the usury laws may have hindered private-sector-led financial deepening, even while it facilitated massive, war-induced borrowing. If the changes in lending practice at Hoare's Bank are found to be representative of trends in the banking system elsewhere, Panglossian assessments of the 'financial revolution' will have to be rewritten (Dickson, 1967).

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[19] We also examined if aggregate lending volume (or growth) had a systematic effect on the distribution of lending, and found no evidence for this hypothesis.

[20] Calculations by Allen (2005) show that marginal rates of return on capital surged to over 22% in England over the time. The work by Stokey (2001) implies similar orders of magnitude.

[21] Brunt (2005) argues that some country banks acted as venture capitalists.

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References

Abadie, A., Drukker, D., Leber Herr, J. and Imbens, G. (2002). 'Implementing matching estimators for average treatment effects', UC Berkeley, Working Paper.

Alessie, R., Hochguertel, S. and Weber, G. (2001). 'Consumer credit: evidence from Italian micro data', CEPR Discussion Paper No. 3071.

Allen, R.C. (2005). 'Capital accumulation, technological change, and the distribution of income during the British industrial revolution', Nuffield working paper.

Ashton, T. S. (1959). *Economic Fluctuations in England, 1700–1800*, Oxford: Clarendon Press.

Blitz, R. and Long, M. (1965). 'The economics of usury regulation', *Journal of Political Economy*, vol. 73(6), pp. 608–19.

Braggion, F. (2005). 'Credit market constraints and financial networks in late Victorian Britain', unpublished manuscript, Northwestern Economics Department.

Brewer, J. (1989). *The Sinews of Power: War, Money and the English State, 1688–1783*, New York: Alfred A. Knopf.

Brunt, L. (2005). 'Rediscovering risk: country banks as venture capital firms in the first industrial revolution', *Journal of Economic History*, vol. 66(1), pp. 74–102.

Carswell, J. (1993). *The South Sea Bubble*, Dover, NH: Alan Sutton.

Cooper, T. (1740). *The Universal Pocket-Book: Being the Most Comprehensive, Useful, and Compleat Book of the Kind Ever yet Publish'd*, London: T. Cooper.

Demetriades, P.O. and Luintel, K.B. (1996). 'Financial development, economic growth and banker sector controls: evidence from India', ECONOMIC JOURNAL, vol. 106(435), pp. 359–74.

Dickson, P.G.M. (1967). *The Financial Revolution in England: A Study of the Development of Public Credit 1688–1756*, London and New York: Macmillan.

Dickson, P.G.M. (1997). 'The direct costs of financial repression: evidence from India', *Review of Economics and Statistics*, vol. 79(2), pp. 311–20.

Ekelund, R.B., Jr., Hebert, R.F., and Tollison, R.D. (1989). 'An economic model of the medieval church: usury as a form of rent seeking', *Journal of Law, Economics, and Organization*, vol. 5(2), pp. 307–31.

Fry, M.J. (1997). 'In favour of financial liberalization', ECONOMIC JOURNAL, vol. 107(442), pp. 754–70.

Glaeser, E. and Scheinkman, J. (1998). 'Neither a borrower nor a lender be: an economic analysis of interest restrictions and usury laws', *Journal of Law and Economics*, vol. 41, pp. 1–36.

Heckman, J., Ichimura, H. and Todd, P. (1998). 'Matching as an econometric evaluation estimator', *Review of Economic Studies*, vol. 66, pp. 261–94.

Hoare, H.P. (1932). *Hoare's Bank. A Record 1673–1932*, London: Butler and Tanner.

Homer, S. and Sylla, R.E. (1996). *A History of Interest Rates*, New Brunswick, N.J.: Rutgers University Press.

Joslin, D.M. (1954). 'London private bankers, 1720–85', *Economic History Review*, vol. 7, pp. 167–86.

Kashyap, A.K., Rajan, R. and Stein, J.C. (2002). 'Banks as liquidity providers: an explanation for the coexistence of lending and deposit-taking', *Journal of Finance*, vol. 57(1), pp. 33–73.

King, R. and Levine, R. (1993). 'Finance and growth: Schumpeter might be right', *Quarterly Journal of Economics*, vol. 108(3), pp. 717–37.

Koenker, R. and Hallock, K.F. (2001). 'Quantile regression', *Journal of Economic Perspectives*, vol. 15(4), pp. 143–56.

Levine, R. (1997). 'Financial development and growth: views and agenda', *Journal of Economic Literature*, vol. 35(2), pp. 688–726.

Levine, R. and Zervos, S. (1998). 'Stock markets, banks, and economic growth', *American Economic Review*, vol. 88, pp. 537–58.

McKinnon, R.I. (1973). *Money and Capital in Economic Development*, Washington, Brookings Institution.

Mitchell, B. R. (1971). *Abstract of British Historical Statistics*, Cambridge: Cambridge University Press.

Mokyr, J. (1999). *The British Industrial Revolution: An Economic Perspective*, Boulder, CO: Westview Press.

Neal, L. (1990). *The Rise of Financial Capitalism*, Cambridge: Cambridge University Press.

Neal, L. (1994). 'The finance of business during the industrial revolution', in (R. Floud and D. McCloskey, eds.), *The Economic History of Britain since 1700, Volume I: 1700–1860*, pp. 151–81, Cambridge: Cambridge University Press.

North, D. and Weingast, B. (1989). 'Constitutions and commitment: the evolution of institutions governing public choice in seventeenth-century England', *Journal of Economic History*, vol. 49(4), pp. 803–32.

Norton, E. Wang, H. and Ai, C. (2004). 'Computing interaction effects and standard errors in logit and probit models', *Stata Journal*, vol. 4(2), pp. 103–16.

Officer (2005). 'What were the UK earnings and prices then?' www.MeasuringWorth.Com.

Quinn, S. (2001). 'The glorious revolution's effect on English private finance: a microhistory, 1680–1705', *Journal of Economic History*, vol. 61(3), pp. 593–615.

Rockoff, H. (2003). 'Prodigals and projectors: an economic history of usury laws in the United States from colonial times to 1900, NBER Working Paper 9742.

Rousseau, P.L. and Sylla, R. (2003). 'Financial systems, economic growth, and globalization', In (M. Bordo, A.M. Taylor *et al.*, eds.), *Globalization in Historical Perspective*, Chicago: University of Chicago Press.

Shatzmiller, J. (1990). *Shylock Reconsidered: Jews, Moneylending, and Medieval Society*, Berkeley: University of California Press.

Shaw, E. S. (1973). *Financial Deepening in Economic Development*, New York: Oxford University Press.

Smith, A. (1976 [1776]). *An Enquiry into the Nature and Causes of the Wealth of Nations*, Oxford: Clarendon Press.

Stiglitz, J.E. and Weiss, A. (1981). 'Credit rationing in markets with imperfect information', *American Economic Review*, vol. 71(3). pp. 393–410.

Stokey, N. (2001). 'A quantitative model of the British industrial revolution, 1780–1850', *Carnegie-Rochester Conference Series on Public Policy*, vol. 55, pp. 55–109.

Sussman, N. and Yafeh, Y. (2002). 'Constitutions and commitment: evidence on the relation between institutions and the cost of capital', unpublished manuscript, Hebrew University, Jerusalem.

Tan, E. (2001). 'An empty shell? Rethinking the usury laws in medieval Europe', *Journal of Legal History*, vol. 23(3), pp. 177–96.

Tawney, R. H. (1926). *Religion and the Rise of Capitalism; a Historical Study*, New York: Harcourt Brace.

Temin, P. and Voth, H.-J. (2005). 'Credit rationing and crowding out during the industrial revolution: evidence from Hoare's bank, 1702–1862', *Explorations in Economic History*, vol. 42 (July), pp. 325–48.

Temin, P. and Voth, H.-J. (2006). 'Banking as an emerging technology: Hoare's bank 1702–1742', *Financial History Review*, vol. 13(2) (October), pp. 149–78.

Weber, M. (1998). *The Protestant Ethic and the Spirit of Capitalism*, Los Angeles: Roxbury Pub.

Williamson, J.G. (1984). 'Why was British growth so slow during the industrial revolution?' *Journal of Economic History*, vol. 44(3), pp. 687–712.