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Why Shylock Can be Efficient
A Theory of Usury Contracts

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I. Introduction

Is the usurer just an illegal banker? Economic literature generally gives a positive answer to this question, as it does not identify any specific feature to differentiate the market of usury from any other credit market[1].

The usurer offers a debit contract with the *same qualitative characteristics* of a standard bank contract except for bringing about harder conditions under a *quantitative* aspect. Those who are forced to accept such an unfair contract, had previously been restricted by the banking system due to imperfect information and competition. Therefore we can say that the main difference between a usury and a bank contract lies in the different interest rate they embody and usury can be deemed the consequence of some internal imperfections that affect legal credit markets. The usury contract is the consequence of a rent – seeking situation.

The present work adopts a different approach[2] and considers the usury contract as being *qualitatively different* from a bank contract due to some imperfections the nature of which is external to credit markets and is said to depend on the inefficient protection and transfer of property rights. In a system where the protection and transfer of property rights are imperfect, the value of goods and properties eligible to represent a

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1 See for example *Basu* (1984).

2 This model is the dynamic micro evolution of a "usury specialness" approach introduced in *Masciandaro* (1997) and developed in *Cifarelli, Masciandaro, Peccati, Salsa* and *Tagliani* (2000), using stochastic calculus and enriched in *Masciandaro* and *Battaglini* (2001) and in *Masciandaro* (2001) with empirical and comparative analysis.

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security for loans depends on the "technology" the credit supplier can use in order to get the credit back.

The specificity of a usury credit can be found in the different (illegal) "technology" adopted in credit collection and consequently in a different evaluation of the debtor's security goods and future income profiles. In such terms, usury can be said to depend on the gap between the legal credit supplier's technology in credit collection (judicial coercion) and the usurer's one (illegal compulsion). Therefore, the features (especially the interest rate) of the agreement between the credit supplier and recipient should not be looked upon as the main characterising element but just as external consequential elements of a different relationship between the contractors. In such a framework, the interest rate gap cannot be considered by economic theory as exogenous but should become the endogenous result of an analytical process.

The model that develops such an alternative approach features the following characteristics:

- it is more general than the traditional model as it approaches the credit markets' imperfections just as a particular case within a wider analytical framework;
- the difference between a legal and a usury contract does not only necessarily lie in the interest rate gap;
- usury can exist even with perfect competition on credit markets;
- the features of the contracts are *endogenous* with respect to the characteristics of credit suppliers. Economic literature, on the contrary, usually regards the distinctive features of usury (especially higher interest rates) as exogenous elements and consequently focuses on how such elements affect the behaviour of economic operators[3].

We will show how a subject might find it *ex ante* optimal to choose a usury funding and therefore pay a higher interest rate even when he is not restricted by legal credit suppliers.

A bank obviously offers a more convenient interest rate but provides the credit recipient with a lower guarantee of renegotiating the debt in case of liquidity shortage in the short period. The latter therefore might fear that in case of liquidity shortage he would not be able to fully enjoy the investment opportunities on a longer time basis and would be forced

[3] See *Blitz* and *Long* (1965), *Boyes* (1982), *Brucker* (1977), *Crafton* (1980), *Glaeser* and *Scheinkman* (1998), *Greer* (1977), *Ostas* (1976), *Peterson* (1977), *Robins* (1974), *Villegas* (1982).

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into bankruptcy. Usurers, on the other side, have an easier access to recover security goods thanks to illegal methods and might enjoy greater personal benefits from the financed investment[4].

Therefore, in case of the debtor's liquidity shortage, the usurer allows higher probabilities of renegotiating the debt contract. For such an extra-chance the usurer obviously charges higher interest rates which the credit recipient might be willing to bear when facing the trade-off between a lower debt and a higher – but costly! – likeliness of renegotiating the contract in case of a non-satisfactory investment output in the short term.

Therefore, the *ex ante* optimal choice of usury – the term "optimal" obviously merely applies to a private, not a social perspective – might turn out to be *ex post* non-optimal if liquidity shortage did not arise. Usury can be seen as a binding commitment that people might choose in order to limit the risk of losing what has been put in security for the debt. Such a commitment becomes dramatically strategic and involves a long time basis as it necessarily cannot be feasible for the debtor to switch from one financing source to another.

As we already stated, the present analysis highlights two relevant features that are not usually associated with usury:

1. *The protection of property rights*. The advantage of turning to a usurer comes from his different technology in ensuring credit collection, which is more effective than the one adopted by banks due to the use of violence. Engaging in the usury commitment might serve the debtor's purpose of reducing the risk of a non-renegotiable credit in case of liquidity shortage in the short term. The value of the usurer's technology crucially depends on the degree of perfection shown by credit markets: the higher the efficiency of the juridical system – i.e. of the "legal technology" for collecting credits – the lower the intrinsic value of the usurer's methods.
2. *Financial structure*. The inefficiency described in the present model is due to the fact that banks lack the proper technology for re-negotiating contracts in case the credit recipients incur liquidity shortages. In a "perfect world", a bank would solve such a situation by handing over the credit to the agent having the best technology to suit the

[4] For the different relationships between crime, money laundering and usury see *Masciandaro* (1999), (2000).

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problem. Legal markets are in fact characterised by strong inefficiencies in credit assignment, which makes the option of usury more and more attractive.

II. The Model

A dynamic model will be adopted in order to explain the co-existence of usury and bank credit. Let us proceed step by step:

Case A: Let us figure an entrepreneur who owns some goods eligible to be put in security for a loan but has no available capital for investment. The subject in time $t = 0$ aims at implementing an investment project with a future certain profit big enough to recover the initial capital in time $t = 2$. If such a profit cannot be verified by the bank due to the risk of some asset diversion, the bank will not finance the project for fear that the entrepreneur might "hide" future profits. The above informational asymmetry will end up producing inefficiency in the system.

Case B: If we add an intermediate time interval ($t = 1$), the whole scenario is subject to change. Let us figure in $t = 1$ a positive but uncertain investment output. The bank might agree to finance the entrepreneur on a short time basis (up to $t = 1$) with the threat of forcing him into bankruptcy in case he would not be able to repay the loan. If this happened, it would prevent the possibility of getting the certain profit in time $t = 2$. Such a threat makes sense from the point of view of the credit supplier, who knows he would not get the money back in time $t = 2$ because of the entrepreneur's opportunistic behaviour: that is why it is more convenient to collect the credit in time $t = 1$ instead of $t = 2$.

Our model includes an extra-hypothesis with respect to case B, as in $t = 1$ we picture two possible scenarios: a good one featuring a positive investment output and a bad one with an investment loss. Therefore, future income profiles are not only unverifiable but also completely uncertain and random with respect to the entrepreneur's good will. If the investment output in the intermediate period is positive enough, the bank will keep on financing the project until time $t = 2$. Then, if the good scenario shows up, the entrepreneur will repay the bank and enjoy his final certain profit in time $t = 2$ (Case B).

On the other hand, if things do not work out fine in $t = 1$, we will end up in Case A where the bank cannot be repaid. Such a random case does not depend on the entrepreneur's behaviour and will still be followed by positive and certain profits in time $t = 2$. In $t = 2$, however, the bank

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fears that the entrepreneur might conceal his profits and consequently it is not willing to re-negotiate the credit (the bank prefers to get the security goods in time $t = 1$ rather than wait for time $t = 2$ if the discount rate is positive). Such a framework would make sense even with a non-total risk of asset diversion, where the bank might finally recover a fraction $1 - \alpha$ of the enterprise value.

Let us now see what difference a usurer can make in such a framework. While the bank adopts legal methods to collect its credit, the usurer has his own "technology" to limit the entrepreneur's opportunistic behaviour and also enjoys some private benefits from not stopping the investment in $t = 1$, as explained below. A usury contract therefore offers a more likely re-negotiation that could be greatly taken into account by the credit recipient, who might be willing to pay a higher interest rate in order to enjoy such a chance.

Let us now consider an agent having the following opportunities:

1. Investing I in time $t = 0$.
2. Getting P in $t = 1$ with a probability of p and 0 with a probability of $(1 - p)$.
3. Gaining a certain profit H in $t = 2$, if he has not previously run into bankruptcy.

The investment, due to the certain profit occurring in $t = 2$, has a positive expected value no matter what the output will be in $t = 1$. Such an investment structure allows for a possible liquidity shortage in the short term even when the final output is to be positive on a longer time basis.

The agent does not have the initial capital required to start the investment, but he can offer a value of $C < I$ in security for being granted a loan. As described in Hart and Moore (1989), the investor can hide future profits and carry out an asset diversion, with the following consequences:

1. nobody will be willing to finance the investment project with risky capital, as the entrepreneur might simulate zero or very low profits;
2. nobody will be willing to finance the investment project on a long time basis (until $t = 2$), because the entrepreneur might find it more convenient to go bankrupt (with H big enough to cover the security C) rather than pay back the debt.
3. Short term financing, however, is feasible if the following trivial condition applies:

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$$P \geq \frac{(1+r)I - C(1-p)}{p}$$

The credit supplier can ask for an interest rate that will allow zero or positive profits and in case of a positive investment output and a sufficient H, the credit recipient will be willing to pay. If the loan is not repaid, the credit supplier will call for bankruptcy and the debtor will lose H.

In the model we figure two alternative financing sources: the bank and the usurer. Perfect competition is assumed to hold on the legal credit market – with *ex ante* zero bank profits – where the bank gathers capitals paying an interest rate r. The usurer is assumed to gather capitals and pay an interest rate r as well. Both credit suppliers, in order to grant credit, must bear a fixed cost N that can be considered to include all the expenses for obtaining information on the credit recipient and settling the affair.

As we already mentioned, the usurer can also enjoy some personal benefits named B from not stopping the investment; such an assumption captures several crucial features of usury:

1. the usurer might benefit from spreading his personal influence over an economic activity that could later be useful for implementing money-laundering activities;
2. the usurer's intimidating power is stronger than the bank's, thus allowing him to reduce the risk of profit concealment.

Assumption number 2 is similar to the one found in Masciandaro (1997) where the usurer was characterised by making a greater evaluation of the debtor's guarantee compared to what the bank did, thanks to the possibility of enjoying some personal benefits related to his illegal goals.

Dealing with an illegal subject, i.e. an usurer, obviously brings about some risks and uncertainties for the credit recipient that we will synthesise by the means of parameter η (η obviously increases the lower the debtor's propensity to illegality is).

The game between the credit supplier and recipient is therefore structured as shown in figure 2 (see below). In time $t = 0$, the investor obtains loan I and places C in security for the credit. In $t = 1$, if the investment output is equal to P, the subject will repay the sum R (loan plus interests) – where obviously $R \supseteq (1+r)I$ – thus gaining a net income of (P–R)

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while the credit supplier will get $(R - r)I$. If the investment output is equal to zero in $t = 1$, the debtor will call for a credit re-negotiation that will give rise to troublesome consequences.

1. *Incomplete Markets and the Protection of Property Rights*

Before developing the model, we should give a proper definition of what we mean by incomplete markets and protection of property rights.

As shown above, the credit recipient offers two kinds of guarantee for the loan: capital C as well as future income flows H that will arise in case of upcoming bankruptcy. The distinction between these two forms of capital turns out to be crucial, as they embody two different degrees of protection of property rights.

Initial capital C is made of goods that carry clear and easily assertable property rights. Even in such a case, when goods have a well-defined and "certain" value, it could be hard for the credit supplier to recover the credit due to long-winded bureaucracy and expensive procedures. Anyway, we can say that the protection of property rights for such goods is substantially granted: if a mortgage exists, then the credit supplier will be informed about it ensuring that the recovery process will not depend on the debtor's will. Technically this is a case of complete contracts, where the future destination of inherent goods is fully specified and clearly defined.

Completely different implications are brought about by future cash flows, whose random nature prevents the implementation of complete contracts. Sometimes it is even impossible to determine what sort of activity the enterprise will give life to – given that we figure the credit recipient to be an entrepreneur – whether it will be finally profitable or just resource-consuming.

In the present model we disregard guarantee C and we will focus on the more analytically challenging variable represented by future income from investment I. C raises no problems at all: if the debtor does not repay the loan, then the credit supplier will assert his right to the goods bearing complete contracts and will consequently obtain their specified inherent value.

The protection of property rights fails in the case of future income profiles that do not allow the raise of a mortgage. Therefore, if the bank

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wants to recover the credit, it must "find its way" with the credit recipient: we will call α the parameter that embodies this kind of negotiation among the two contractors, influenced by several factors such as the type of activity involved in the investment project or the degree of legal protection that relates to the debtor's position.

The lack of complete contracts is in fact held responsible for the results of the model: as the credit supplier can "internalise" only part of future profits, he inevitably tends to over-react in $t = 1$ in order to recover the guarantee, thus forcing the debtor into bankruptcy if he runs into liquidity shortage.

The specification of what is the nature of the guarantee therefore becomes essential for two reasons:

1. because future profits are likely to become the most relevant part of the investment (compared to the initial guarantee);
2. because empirical evidence seems to support the existence of a negative relationship between the spread of usury and the protection of property rights[5].

Regarding point 2, we will see how crucial is the tie between the reported cases of usury and the portion of debtors' liabilities due to the selling of movables. The latter are obviously not put in security for a loan before immovables: that is why movables are likely to be put up to auction only when no other immovable guarantee is available. Therefore, such goods feature the case of an incomplete protection of the credit supplier's position: for example, a credit recipient with no available immovable might be forced to sell the enterprise machinery in order to pay back the loan . A more efficient protection in such a situation would reduce the legal credit supplier's aversion to the entrepreneur's opportunistic behaviour and would consequently give the usurer smaller room for action. This result is exactly where the model will lead us to.

2. *The Role of Re-negotiation*

Let us assume that, due to a difficult appropriation of future profits from the financed investment, the bank can finally obtain only a fraction $(1 - \alpha)$ of future income in case of the debtor's bankruptcy.

Given the situation, the bank will accept to re-negotiate the credit in $t = 1$ only if the expected profit in $t = 2$ (conditioned upon the event

[5] See *Masciandaro* and *Battaglini* (2001).

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$P = 0$) is bigger than the expected output from bankruptcy in $t = 1$. If in the event of renegotiation $P = 0$ actually takes place, then the bank will get a profit of:

$$\Pi_B|_{re-negot.} = (1-\alpha)H + C - (1+r)^2 I$$

The above expression is equal to the fraction of the investment profit that the bank is able to recover plus the guarantee, net of the opportunity cost of capital for the two periods.

On the contrary, if re-negotiation is not subscribed to by the bank, bankruptcy will occur in $t = 1$ and the pay-off to the bank will be equal to:

$$\Pi_B|_{bankrupt} = C - (1-r)I$$

The credit supplier, therefore, will accept re-negotiation only if the following condition applies:

$$\Delta\Pi_B|_{P=0} = (1+r)^{-1}\Pi_B|_{Re-negot.} - \Pi_B|_{bankrupt} = \frac{1-\alpha}{1+r}H - \frac{rC}{1+r} > 0$$

which can also be written as:

$$1 - \alpha > \frac{rC}{H} \tag{1}$$

Condition [10] can easily be interpreted as follows: if the banker forces the debtor into bankruptcy, he will obtain the guarantee before re-negotiation. The opportunity cost of postponing this decision is therefore equal to the interests he would lose, i.e. rC. On the other hand, if re-negotiation is achieved in $t = 2$, the bank will get a higher income of $(1-\alpha)H$. Consequently, re-negotiation will take place if $(1-\alpha)H > rC$.

In case of a complete income diversion ($\alpha = 1$), re-negotiation never occurs, for whatever values of H and C. Given condition [10], we can calculate the expected profit for the debtor in $t = 0$:

$$\Pi_D^{t=0} = \begin{cases} p\left[\dfrac{P - R_1^B}{1+r} + \dfrac{H}{(1+r)^2}\right] - (1-p)\left(\dfrac{C}{1+r}\right) & \text{if } r > \dfrac{(1-\alpha)H}{C} \\ p\left[\dfrac{P - R_2^B}{1+r} + \dfrac{H}{(1+r)^2}\right] + (1-p)\left(\dfrac{\alpha H - C}{(1+r)^2}\right) & \text{if } r < \dfrac{(1-\alpha)H}{C}. \end{cases} \tag{2}$$

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R_B^1 & R_B^2 in the above expression represent the amount to be paid back by the debtor to the bank in $t = 1$ whether re-negotiation takes place or not. It is calculated R_B^1 & R_B^2 and shows that $R_B^1 < R_B^2$. In fact:

In *(2)* R_B^1 e R_B^2 represents the payment which the debtor has to make to the bank in period 1 irrespective of renegotiation.

When renegotiation is not possible, the bank has zero profits for $pR + (1-p)C = (1+r)I + N$; therefore $R_B^1 = \dfrac{I(1+r) - (1-p) + N}{p}$.

When renegotiation is possible, profits are zero if $pR + \dfrac{(1-p)}{1+r}[(1-\alpha)H + C] = (1+r)I + N$; therefore

$$R_B^2 = \frac{I(1+r) - \dfrac{(1-p)}{(1+r)}[(1-\alpha) + C] + N}{p}.$$

The latter can be rewritten as:

$$R_B^2 = \frac{I(1+r) - \dfrac{(1-p)}{(1+r)}C\left[\dfrac{(1-\alpha)}{C} + 1\right] + N}{p}$$

Since renegotation is not possible at the bank (1), therefore:

$$R_B^2 = \frac{I(1+r) - \dfrac{(1-p)}{(1+r)}C\left[\dfrac{(1-\alpha)}{C} + 1\right] + N}{p} < \frac{I(1+r) - \dfrac{(1-p)}{(1+r)}C[1+r] + N}{p} = R_B^1$$

The expected profit for the debtor shows a discontinuity in $r^* = \dfrac{(1-\alpha)H}{C}$, where it features a change in the bank's optimal choice in $t = 2$; the *ex ante* optimal choice for the legal credit supplier is assumed to be exogenous and depending on the parameters of the model.

The usurer's problem is different: on one side, he has a stronger interest in not stopping the investment because of the personal benefits he will be allowed to enjoy if the project comes to an end. On the other side, as we have already explained, the debtor must bear some costs for re-negotiating the credit with a usurer. Such costs are likely to rise the higher the debtor's aversion is to illegality. The usurer therefore re-negotiates the credit only if

$$\Delta\Pi_{U|P=0} = (1+r)^{-1}\Pi_{U|re-negot.} - \Pi_{U|bankrupt} = \frac{1-\alpha}{1+r}H + (1/(1+r))B - \frac{r}{1+r}C > 0$$

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which can be written as

$$1-\alpha > \frac{rC-B}{H} \tag{3}$$

Given the choice of re-negotiation either with the bank or the usurer, when will the debtor go for usury? Obviously the choice will be influenced by the interest rate in $t=1$, provided that liquidity shortage does not occur. With such a perspective, the usurer is subject to two constraints: he must obtain the reserve utility u (even with $u=0, R_U$ ought to show a minimum positive value) and he must arrange a more appealing offer than the bank, which implies a maximum value of R_U.

If we calculate the debtor's profit both with a bank loan and usury financing, given the assumption of an equal interest rate from the two financing sources ($R_B = R_U$), it is easy to show that $R_B = R_U$ does not identify an equilibrium condition.

In fact for

$$\frac{rC-B}{H} < 1-\alpha < \frac{rC}{H}$$

the expected income in the case of a bank loan is lower than the one from usury, thus implying the choice of the latter. Such a result would hold also if the usurer asked for a slightly higher interest rate. In the equilibrium condition, the usurer chooses the highest possible R_U that guarantees the debtor's indifference. If the above constraint is non-strictly satisfied, then the usurer would be willing to reduce R in order to attract "new clients".

In equilibrium we can state the following proposition:

Proposition 1: given the assumption of the model, the following is verified:

a) when $1-\alpha < \frac{rC-B}{H}$, usury never occurs;

b) when $1-\alpha > \frac{rC}{H}$ usury occurs and the usurer will ask for an equilibrium interest rate of

$$R_U = \begin{cases} R_B^1 + \frac{1-p}{p}\left[\frac{aH}{1+r} - \frac{\eta(1+r)}{1-p}\right] \text{se } \frac{rC-B}{H} \leq 1-\alpha \leq \frac{rC}{H} \\ R_B^2 - \frac{1+r}{p}\eta \text{ se } 1-\alpha \geq \frac{rC}{H} \end{cases}$$

where R_B^1 *e* R_B^2 represent the bank interest rates in the relative intervals.

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Let us proceed in order:

1. If $1-\alpha < \frac{rC-B}{H}$, the debtor prefers the usurer if:

$$p\left[\frac{P-R_B^1}{1+r}+\frac{H}{(1+r)^2}\right]-(1-p)\frac{C}{1+r}-p\left[\frac{P-R_U}{1-r}+\frac{H}{(1+r)^2}\right]+(1-p)\frac{C}{1+r}+\eta \leq 0$$

therefore if:

$$\frac{p(R_U-R_B^1)}{1+r}+\eta \leq 0 \quad \text{(A1)}$$

But there is a restriction placed on the participation of the usurer, namely that the expected profits be positive. This implies that

$$R_U > \frac{I(1+r)-(1-p)C}{p} = R_B^1$$

therefore, given this relationship, the left side of the unequal equation *(A1)* is the sum of two positive addends which is never zero. *(A1)* is never verified, there is no room for the credit of the usurer.

2. If we compare the two sources of financing with regard to the debtor's payoff in the interval $\frac{rC-B}{H} \leq 1-\alpha \leq \frac{rC}{H}$ we see that the usurer is preferred if

$$\frac{p(R_U-R_B^1)}{1+r}-\frac{(1-p)}{(1+r)^2}\alpha H+\eta \leq 0$$

The obligation is certainly met, in fact, it requires that it be

$$R_U \geq R_B^1-\frac{1-p}{p}\frac{B}{1+r}$$

The rate requested by the usurer is therefore:

$$R_U = R_B^1+\frac{1-p}{p}\left[\frac{\alpha H}{1+r}-\frac{\eta(1+r)}{1-p}\right]$$

3. For $1-\alpha > \frac{rC}{H}$ the procedure is the same as the one above.

In the interval $1-\alpha > \frac{rC}{H}$ bank re-negotiation always takes place, thus making it more efficient for the investor to ask for legal credit which does not imply an illegality cost η. In order to compete with the bank,

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the usurer must therefore offer a lower interest rate in the short term (R_U), so as to make up for cost η. Such a strategy might be convenient for the usurer as well, taking into account the personal benefits B he might enjoy from the investment project. For all the values $(1-\alpha)$ lower than rC/H, the income diversion problem is so serious that the bank prefers to push the debtor into bankruptcy when he faces liquidity shortage, even if still credit-worthy in $t = 1$.

In such a case, two alternative situations may occur: when it is extremely difficult for the credit supplier to keep an exact track of the investor's future profits (i.e. high possibility of income diversion, as expressed by $1-\alpha < \frac{rC-B}{H}$), neither the bank nor the usurer will be willing to re-negotiate the credit. The usurer, losing his own advantaged position with respect to the bank, is less efficient due to the cost of illegality η and is therefore never chosen by the investor.

A more interesting case arises along the interval $\frac{rC-B}{H} \leq 1-\alpha\frac{rC}{H}$. On one side, the usurer is less efficient than the bank because of η, but he has the important advantage of granting re-negotiation. Given the fact that the debtor is always benefited by re-negotiation (as he can divert future profits, he will anyway get an income of αH in $t = 2$), the usurer can reasonably ask to be paid for such a "service". That is why for small enough values of η, usury interest rate is in equilibrium higher than the bank's.

Such an equilibrium holds along an even wider parameters interval according to the value of B.

Let us now focus on a crucial hypothesis of the model. The usurer can enjoy personal benefits from a long term commitment with the investor, i.e. from not stopping the investment project in $t = 2$.

Such a plausible assumption brings about some remarkable consequences: if the usurer did not enjoy any personal benefits, then in $t = 1$ he would never re-negotiate debtors that were previously refused re-negotiation by the bank.

Therefore, an investor choosing whether to be financed by a bank or a usurer is well aware of the long-term implications in terms of future credit re-negotiation opportunities in case liquidity shortage occurred in $t = 1$ and the financing source could not be switched.

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Finally, what happens if we allow the financing source to be changed in $t = 1$?

In such a framework the usurer would obviously become the debtor's ultimate resource if things finally went wrong. Given this new assumption, the following proposition is verified:

Proposition 2: Even if we assume that the usurer enjoys some personal benefits also from a short-term relationship with the debtor and we allow for the possibility of changing the financing source in $t = 1$, there is always an interval of the model's parameters where usury is chosen in $t = 0$ and the debtor consequently accepts to bear higher interest rates with respect to the bank's proposal.

The credit exchange between the bank and the usurer in $t = 1$ takes place at the "price" (the Nash solution) $P = \frac{1}{2}\left[\frac{(1-\alpha)H + C + B}{1+r} - C\right]$. For the usurer it is advantageous to assume the credit in $t = 1$ if $\frac{1}{2}\left[\frac{(1-\alpha)H + C + B}{1+r}\right] > N + \frac{1}{2}C$, which can be rewritten as:

$$1 - \alpha > \frac{2(1+r)\left(N + \frac{1}{2}C\right) - C - B}{H} = \Phi$$

Since $\Phi > \frac{rC - B}{H}$ for every $N > 0$, therefore the interval $\frac{rC - B}{H} < 1 - \alpha < \Phi$ is never empty.

The reason why proposition 2 holds is absolutely simple: as already mentioned, credit emission implies a fixed cost N for the credit supplier due to information gathering, bureaucracy practices, etc. If the credit is granted in $t = 0$, such a cost is included in $t = 0$ and has no marginal influence on the choice in $t = 1$.

If $t = 1$ features a change in the financing source, then the marginal cost of re-negotiation is increased by N which makes it harder, if not even impossible, to carry out credit re-negotiation in $t = 1$. That is why the debtor will find it more convenient to "set down the business" directly in $t = 0$ with the contractor that guarantees re-negotiation, i.e. the usurer.

Moreover, there are some other intuitive reasons for believing that our previous main conclusions would hold even if the usurer's private benefits did not depend only on the financing time-length. Among such reasons, the most outstanding find it rational in some inefficiencies that affect the credit transfer mechanism.

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In case of liquidity shortage, if the bank does not subscribe to credit re-negotiation we have two possible outputs:

a) the bank causes the debtor's bankruptcy and obtains $C - (1 + r)I$;

b) the credit is "sold" to the usurer.

The bank should theoretically be willing to accept option b) if the usurer paid $\Phi = C + \varepsilon$ for any $\varepsilon < 0$, which would make it more convenient for the bank than the bankruptcy solution.

The above scenario is obviously quite unrealistic, while it is more likely for the debtor to turn to usury in order to pay back the bank. Especially for small debts, the bank might be willing to avoid the client's bankruptcy if it gets paid back enough not to suffer any losses, i.e. $R_B \geq (1 + r)I$: in such a case the usurer could not accept the deal. In other words, it is easy to believe that handing over a credit involves some costs that negatively affect the usurer propensity to "buy" the credit in $t = 1$.

What we have just explained highlights another important element in the analysis of usury: the tie between usury and the efficiency of financial markets.

When the latter show some inefficiencies, debtors must take into account that it will not be feasible to change the financing source half the way through a project.

Such a framework forces them sometimes to prefer usury in order to ensure future re-negotiation, even if the choice is not convenient in the short term due to high interest rates.

III. Conclusions

The use of economic theory in drawing the analysis of usury represents the main feature and maybe also a limit of the present work. It could be a limit if we think of usury as a complex phenomenon which involves not only economic and financial aspects, but also juridical, institutional, social and cultural implications that would require a multi-disciplinary perspective.

Nevertheless, economic analysis remains indispensable to capture the inner nature of usury, which makes it a truly economic kind of crime and rules its structural mechanisms.

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The present work has focused on the peculiar features of usury contracts compared to legal credit contracts which find their rationale in the usurer's different objective function with respect to the bank's. It has consequently been demonstrated how the interest gap alone is not sufficient to make a thorough distinction between a usury and a bank contract.

An effective anti-usury policy should therefore be based upon a correct knowledge and identification of what a usury contract is. The latter is characterised by peculiar credit recipients, made up of people facing financial difficulties, as well as particular credit suppliers, the usurers, who have peculiar objective functions due to the goal that motivates credit supply, the value they put in the guarantee and the methods of credit re-negotiation.

The result of such a framework is a usury contract which differs from a legal credit contract not only by a higher interest rate: we might even think of legal and illegal contracts carrying an equal interest rate that cannot be called usury.

The present work therefore aims at giving a specific contribution to the research field which targets the ties between the management of justice and market efficiency. Economic theory has pointed out the crucial role of a well-functioning justice system for the healthy state of a market economy. Such results can be applied in a new perspective to shed light on socially non-optimal behaviours within an economic system and in particular within the banking system.

The main insight is clear and straightforward: without an efficient justice, the functioning of banking markets is hindered by *direct and indirect burdens*.

Given a certain degree of efficiency in the supply of credit and banking services, *direct burdens* are to be connected to the assignment of auxiliary functions to financial intermediaries in order to pursue goals of social utility.

Indirect burdens, on the other side, condition the mechanisms ruling the supply of credit and banking services. Such an influence depends on the fact that contracts regulating the exchange of goods and services among economic operators, although being institutionalised, are intrinsically *incomplete*.

In other words, it is virtually impossible for a contract to foresee all the possible scenarios affecting the output of the production or exchange operation in the object. Here we see the importance of the invisible good

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represented by *efficient justice*: an incomplete contract can be subscribed and carried out effectively if there is a common trust among the contractors. The latter is granted by two fundamental function of the judicial system: minimising uncertainty and ensuring the observance of contractual obligations.

The less efficient justice is, the higher is the spread of distrust and the expense of resources and time devoted to reduce uncertainty in order to guarantee the observance of contracts. Such a framework is also very likely to induce legal operators to adopt certain behaviours that would lower the overall efficiency in resource allocation and particularly in credit allocation: opportunistic behaviours and insurance behaviours. As seen in this work, the very same environment also gives room to the activity of illegal operators.

In such a perspective, the present study has tried to demonstrate how some socially non-optimal behaviours of financial intermediaries, responsible for raising the risk of usury, can be the endogenous result of an inefficient justice system.

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Summary

Why Shylock Can be Efficient
A Theory of Usury Contracts

In this paper we demonstrate the characteristic of usury contracts in respect to bank loan contracts. Traditionally usury is an inefficient result of credit market failures. On the contrary in our dynamic micro model, usury can be more efficient than the bank loan contract because debt renegotiations are more likely to be implemented, given specific features of the illegal usurer technology and an entrepreneur's decreasing risk aversion. We also show that a high level of interest rate does not represent a necessary or a sufficient condition for the existence of usury contracts. (JEL K40, K42, K14, G18)

Zusammenfassung

Warum Shylock effizient sein kann
Eine Theorie über Wucherverträge

In diesem Beitrag demonstrieren wir die Besonderheit von Wucherverträgen in bezug auf Bankdarlehen. Wucher ist gewöhnlich ein ineffizientes Ergebnis versagender Kreditmärkte. In unserem dynamischen Mikromodell dagegen kann Wucher effizienter sein als mit Banken geschlossene Darlehensverträge, weil in Anbetracht spezifischer Kenndaten für ungesetzliche Wuchermethoden und für eine auf seiten des Unternehmens festzustellende abnehmende Risikoaversion Neuverhandlungen wahrscheinlicher sind. Es wird ebenfalls bewiesen, daß ein hohes Zinsniveau weder eine notwendige noch eine ausreichende Bedingung für das Vorliegen von Wucherverträgen darstellt.

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Résumé

Pourquoi Shylock peut être efficient
Une théorie des contrats d'usure

Dans cet article, l'auteur démontre les particularités des contrats d'usure par rapport aux les contrats de prêt bancaire. Traditionnellement, l'usure est un résultat inefficient d'échecs du marché financier. Dans le micromodèle dynamique présenté ici, au contraire, l'usure peut être plus efficiente que le contrat de prêt bancaire parce que les renégociations de la dette ont plus de chance d'être réalisées, étant donné les caractéristiques spécifiques de la technologie illégale de l'usurier et une aversion au risque décroissante des entrepreneurs. L'auteur montre aussi qu'un niveau élevé des taux d'intérêt ne représente pas une condition nécessaire et suffisante pour l'existence de contrats d'usure.

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