Debt Repudiation and Risk Premia: The North-Weingast Thesis Revisited*

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July 1998

Abstract

North and Weingast (1989) argued that the English Glorious Revolution of 1688 redistributed political power in such a way as to enhance the enforcement of property rights. They supported their hypothesis by presenting evidence that interest rates fell and interpreted this as a fall in the risk premium demanded by lenders. I argue that one cannot test their theory in this way since it implicitly rests on the assumption that the risk of debt repudiation was exogenous. This was clearly not so. If lenders anticipated that the incentives of the Stuart monarchs to default depended on the interest rate, then instead of charging a risk premium, they ration credit. There is in fact much evidence that this was the case. In these circumstances a reduction in the desire, or the ability, of the monarch to default leads not to a fall in interest rates, but a relaxation of rationing. Thus the theory of North and Weingast is immune to the critique of Clark (1996) and is entirely consistent with the available evidence.

*I am grateful to Daron Acemoglu for his helpful suggestions.

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1 Introduction

In an important paper, North and Weingast (1989) argued that the Glorious Revolution in England in 1688 altered the domestic structure of political power in such a way as to enhance the enforcement of property rights. In their view the Revolution marked the rise of parliament against the monarchy and generated a balance of powers which inhibited future monarchs from arbitrary taxation, confiscations, or repudiations of debt. This had both direct and indirect effects which helped to lay the foundations for subsequent economic growth and industrialization. On the one hand it enhanced the ability of the government to borrow and stimulated the subsequent rapid development of British financial markets which was an indirect stimulus to industry, on the other it led to a more secure regime of property rights and thus directly stimulated investment. Their theory has however been challenged by Clark (1996). North and Weingast provided evidence that interest rates fell after 1688 and argued that this was consistent with their theory. However, as Clark points out, this fall was part of a long downward trend which began sometime in the late sixteenth century. Using statistical techniques he finds that the Glorious Revolution did nothing to alter this trend and appears to have had an insignificant impact on interest rates. He concludes that the interpretation of North and Weingast is incorrect.

In this paper I argue that one cannot reject North and Weingast's interpretation of the Glorious Revolution from the interest rate evidence alone. The idea connecting political reform to interest rates is appealing, but, I shall argue, misleading. It is as follows: Before the Glorious Revolution a whole string of Stuart monarchs consistently destabilized property rights, and there was also the continual threat of their reneging on, or arbitrarily renegotiating their own debt. This implies that private lenders would require a higher rate of return in order to lend to the Monarch, the opportunity cost of funds plus a risk premium, in order to compensate for the extra risk of lending to the King. Given the general instability of property rights, such predatory behavior by the Monarchy ought to also induce risk premia on loans between private citizens. After the Glorious Revolution parliament got the upper hand on the King and this restricted his ability to default. In this case, since the probability of debt repudiation fell, so should the risk premium, and we ought to observe a general fall in interest rates. This is the

argument which North and Weingast make and which Clark rejects.

The above argument, while intuitive, rests on an implicit and incorrect assumption, namely, that the probability of default on loans to the King is exogenous. If this is not so, in particular, if the credit market is characterized by moral hazard, then, as Stiglitz and Weiss (1981) initially pointed out, the amount that the King can borrow and the terms on which he can borrow, is not determined by the intersection of the supply and demand for loans. In general, *credit will be rationed*. This is for the simple reason that when default risk is endogenous, lenders take into account that charging the King a higher interest rate or lending him more funds may increase his incentives to repudiate. Theoretical models where the risk of default is endogenous have been developed recently to understand the implications of the international debt crisis (see the surveys of Kletzer 1988, Eaton and Fernandez 1998, and Basu 1997) and they have similar implications: in situations where sanctions against defaulters are limited and where the probability of default is endogenous credit rationing will arise. Of crucial importance to this paper are the comparative static properties of such models.

In the next section I develop a very simple model of the credit market where I demonstrate that a reduction in the incentive of the King to default will have no effect on interest rates but will lead to a relaxation in credit rationing. The result that the effect of endogenous repudiation manifests itself only in the quantity of loans and not in their price stems from another very standard and natural feature of this situation: competition between the lenders drives the rate of return down to the opportunity cost of funds. At this rate the lenders are not prepared to lend the King as much as he wants since in general they know that he will not pay them back, therefore they ration the King (they only lend him an amount which satisfies an *incentive compatibility constraint*).

This argument appears to apply to lending to the King, but what about private financial markets? The main body of data that Clark appeals to in order to reject the North-Weingast thesis is on private assets.[1] North and Weingast argued that the Glorious Revolution not only reduced the likelihood that the government would default on its own debt, but also the likelihood that it would expropriate wealth more generally. The

[1]Most of the data that Clark uses is on land and houses, and neither he nor North and Weingast actually suggest that the Stuart Kings ever threatened to expropriate land or houses. Implicitly the argument seems to be that there is some sort of arbitrage relationship between the rate of return on these assets and the rate of return on others that the King might have been likely to expropriate.

general threat of expropriation should lead to higher risk premia not only on loans to the government, but on all loans. Nevertheless, I show that the intuition of credit rationing extends to this case. The fact that the King can potentially confiscate private wealth (not just refuse to pay back his own debt) clearly affects private financial markets because agents whose wealth has been expropriated cannot repay loans. But this just implies that lenders must take into account the incentives of the King to both default on loans and expropriate wealth when they make their lending decisions. I show that this leads to both the King and private agents being credit rationed in situations where private lending increases the incentives of the King to engage in expropriation.

Thus what we would expect to see following the Glorious Revolution would, rather than a fall in interest rates, be a rapid expansion of credit available to the government and the private sector. As the research reported by North and Weingast suggests, this is exactly what did happen. They themselves provide copious evidence that credit to the King was rationed and therefore that the interest rate did not move to clear the credit market. For example, they note (p. 804) "After the first few years of the Stuarts' reign, the Crown was not able systematically to raise funds," and after the Glorious Revolution the government "gained access to an unprecedented level of funds. In nine short years (from 1688 to 1697), government borrowing increased by more than an order of magnitude. This sharp change in the willingness of lenders to supply funds must reflect a substantial increase in the perceived commitment by the government to honor its agreements." All of the standard sources on government finance during the reigns of Charles I and II and James II suggest that they were rationed in how much they could borrow at going interest rates (see for example Ashton 1960, Chandaman 1975, Dickson 1967, and Hill 1961). After 1688 it was this rationing that was dramatically relaxed (see North and Weingast 1989, and Brewer 1989). North and Weingast also document the expansion of private credit markets after 1688.

2 A Simple Model

I now build a simple model in order to illustrate the different implications that changes in the exogenous and endogenous parts of default risk have. The aim of the model is to show as simply as possible that falls in exogenous components of risk will be manifested in a

falling risk premium while changes in the endogenous component will instead relax credit rationing under the standard assumption that there is competition amongst lenders. I first study a situation where there is lending only to the King and then extend it to show that when private sector agents also borrow, but face the risk that their wealth will be expropriated by the King, credit rationing extends to the private sector.

Consider a partial equilibrium model of the capital market where a large number of identical risk neutral lenders lend to the King (for simplicity only the King borrows). The model lasts for two periods. To introduce a motivation for the King to borrow I assume that in the first the King has no income and therefore needs to borrow in order to consume and to make unavoidable expenditures. I shall denote these expenditures by g and assume them to be fixed and I let L denote the total amount borrowed. In the second period the King has income (tax revenues and incomes from crown lands) but this is uncertain: with probability p the income of the King is high, denoted y^h, while with probability $1-p$ it is low, y^ℓ, with $y^h > y^\ell$.[2]

The King's preferences depend on the amount of consumption that he gets in each period (and not directly on other things, for example g) and I model the welfare he gets from consumption by defining a utility function for consumption in the two periods. For simplicity I assume that there is no discounting of second period utility (no 'time preference') and also that the marginal utility of consumption at either date does not depend on the amount of consumption at the other date (utility is 'time separable'). The utility of consumption over the two periods is therefore given by the function $U(c_1)+U(c_2)$ where I assume the function U to be a twice continuously differentiable function, strictly increasing (so that the King's utility is higher if he consumes more) and strictly concave (so that marginal utility is diminishing) with first and second order derivatives, $U' > 0$ and $U'' < 0$.

In the first period consumption of the King is $c_1 = L - g$, while in the second it is either y^h or y^ℓ, depending on which state occurs, minus the repayment of the loan. Indirect utility when the King always repays a loan of size L when the interest rate is r

[2]The idea here is that the King's taxation revenues are uncertain and depend on things like harvest failures or economic depressions or wars which might disrupt tax collection. This uncertainly is however exogenous in the sense that it is unaffected by any actions the King might take.

(so that total loan repayment is $(1+r)L$) is therefore,

$$U(L-g)+(1-p)U(y^{\ell}-(1+r)L)+pU(y^{h}-(1+r)L) \tag{1}$$

To make a distinction between endogenous and exogenous sources of default I shall now assume that $y^{\ell}=0$ so that with probability $1-p$ the King has no income and has no choice but to default on the loan. Thus lenders know that they will only be paid back in state y^{h} (at least when $y^{h}\geq(1+r)L$). However, even in this state repayment is endogenous. The King does not have to repay, he must want to.

The focus of North and Weingast's study is on this issue. Since the King is the highest authority in the land, no citizen can force him to repay if he does not want to. Knowing this they will not loan to him unless they know he will subsequently find it in his own interest to repay the loan (in which case the loan is incentive compatible). I model this aspect of the capital market in a simple way. I shall assume that if the King refuses to pay a loan then the lenders can impose a penalty of C units of income on the King.[3] Having borrowed L the King will repay the loan in state y^{h} if the utility from doing so is greater than that from reneging, or if,

$$U(L-g)+(1-p)U(0)+pU(y^{h}-(1+r)L)\geq$$

$$U(L-g)+(1-p)U(0)+pU(y^{h}-C)$$

Cancelling the first two terms from either side and then dividing by p, this inequality reduces to: $U(y^{h}-(1+r)L)\geq U(y^{h}-C)$, or, $C\geq(1+r)L$. This is the *incentive compatibility constraint*. It says something very intuitive: the King will repay the loan only if the amount of the repayment is smaller than the cost which the lenders are able to impose on the King should he default.[4]

Turning to the lenders, let R denote the risk free opportunity cost of funds for a lender considering lending to the King. This return might come from lending in the

[3]In models of sovereign debt repayment where there are no courts to enforce debt repayment there are several approaches to the question of how to enforce loans. One way in an infinitely lived relationship is to refuse to lend in the future (see the models in Cohen (1991)). This type of punishment mechanism could easily be used in the present paper but involves considerably more analytical complexity. The way I model this captures the essence of such models in a reduced form way which is sufficient for my purposes. Moreover, it captures quite well the reality of the enhanced ability of Parliament to enforce loans following 1688. This stemmed from their ability to more effectively withhold taxes from the King which I model as an increased ability to impose costs on the King.

[4]Note that in the other state, since the lenders know that the King is involuntarily in default, they cannot enforce repayment by threatening the King with punishment.

private sector or perhaps overseas. A lender charges the interest rate r defined above and since all lenders are risk neutral they care only about the expected return.[5] In this case a lender would lend to the King if the expected return was at least the opportunity cost of funds, or $p(1+r) \geq (1+R)$.

To complete the description of the model we need to specify the demand for funds by the King. I shall begin with the simple case where the King never voluntarily defaults. The King chooses the amount to borrow to maximize his expected utility defined by (1) and the demand for loans therefore satisfies the first-order condition,

$$U'(L-g) = p(1+r)U'(y^h - (1+r)L) \tag{2}$$

Equation (2) implicitly defines the demand for loans as a function of r and p. I shall denote this $L(r,p)$. This function describes how the demand for loans depends on the exogenous probability p and the interest rate r. It has standard properties. Firstly, a higher interest rate reduces the demand for loans (notice that the negative income effect of the higher r reinforces the substitution effect for a borrower). Secondly, higher p reduces the demand for loans since it increases the probability that state y^h will occur and therefore that the King will pay back.

To see what the equilibrium in the capital market looks like in this case consider the behavior of the lenders. (2) shows the amount the King wishes to borrow at any r they offer. Given that the King always pays back in state y^h they make an expected profit on lending to the King if $p(1+r) \geq (1+R)$. To understand where the equilibrium r will settle I assume that there is competition between the lenders. Note that if the interest rate being charged by lenders was $\widehat{r}$, with $p(1+\widehat{r}) > (1+R)$, then one lender could increase his profits by offering a slightly smaller interest rate to the King. By underbidding other lenders this lender would take the whole market and increase his or her expected profits since the expected return would still be above the opportunity cost of funds. Such competition therefore implies that the interest rate will be bid down until $r = (1+R)/p - 1$ and all lenders will make zero profits. The supply of funds is therefore perfectly elastic at the interest rate $(1+R)/p - 1$.

In terms of Figure 1 the downward sloping curve is derived from (2) and shows how

[5]The assumption of risk neutrality is not important for the results of the paper, it is only Bertrand competition between the lenders that matters.

much the King wishes to borrow at any level of r.[6] The horizontal line at $(1+R)/p-1$ represents the supply of loans. Equilibrium would be where these two functions intersect so that the equilibrium interest rate would be $(1+R)/p-1$ with the King borrowing L^e, implicitly given by the equation,

$$U'(L^e - g) = \frac{(1+R)}{p} U'(y^h - (1+R)L^e/p).$$

Now consider the case where the King can default in state y^h. In this case the incentive compatibility constraint becomes relevant. L^e will only be the equilibrium amount of lending to the King if it satisfies the condition, $C \geq (1+r)L^e$. If this is not so then the maximum amount of loans that the King can raise will be,

$$L^{ic} = \frac{C}{1+r} \tag{3}$$

Equation (3) defines a downward sloping locus in Figure 1 and it shows the pairs of loans and interest rates which are incentive compatible (i.e. pairs where the King voluntarily finds it in his own interest to repay - given the fact that failure to repay will be met by the imposition of the cost C). However, a crucial observation here is that even when the King can endogenously default the equilibrium interest rate is again $(1+R)/p-1$. This is because the process of Bertrand competition between lenders will again drive profits to zero. Thus substituting into (3) we find that in an equilibrium where the King may choose to default, $L^{ic} = pC/(p+R)$. I shall assume that, $L^e > L^{ic}$ so that the incentive constraint binds and the King is rationed at the interest rate $(1+R)/p-1$. Notice that if the ability of lenders to punish the King is small, so that C is small, then the amount loaned to the King is small and it will certainly be true that $L^e > L^{ic}$.

Consider now the impact of the Glorious Revolution in this situation. If this manifested itself as a fall in the exogenous probability of default, p, then this would have exactly the effects suggested by North and Weingast and Clark, namely a fall in r. However, the whole point of the institutional changes which the Revolution brought concerned limiting the ability of the King to voluntarily default. In terms of the model this concerns state

[6]The negative slope follows from totally differentiating (2), giving,

$$\frac{dr}{dL} = \frac{U''(c_1) + p(1+r)^2 U''(c_2)}{pU'(c_2)} < 0.$$

y^h. The way to model this is not by varying p but rather by increasing C. The increased control of Parliament over fiscal policy allowed them to punish the King by withholding taxes. This made it relatively less attractive for the King to default and so reduced the incidence of default thereafter. In the equilibrium with credit rationing an increase in C causes L^{ic} to rise but leaves r unchanged (at $(1+R)/p-1$). In term of Figure 1 the locus $L^{ic} = C/(1+r)$ moves to the right. Thus an increased ability of lenders to enforce debt contract leads not to a fall in the risk premium on government debt, but rather to a relaxation of credit rationing at an unchanged interest rate.

3 Introducing Private Sector Borrowing

I now extend the model of the previous sector to introduce the possibility that private sector individuals, not just the King borrows on financial markets. I now allow for the King to not only default on his own debt, but also to expropriate the wealth of other agents. What are the implications of this?

Imagine that in total private sector agents had wealth W and could impose a cost C on the King if he expropriated W. In this case as long as $W > C$ the King would expropriate all wealth and the amount of this wealth which is lent to him or anyone else is irrelevant. Presumably however, there is a difference between defaulting on government borrowing and mass expropriation of wealth. The former might incur costs, the latter might induce revolution. The Stuart Monarchs attempted to selectively default and expropriate, increasing their consumption while minimizing the penalties that citizens could impose upon them.

What I shall now show is that if private lending increases the temptation of the King to expropriate wealth, then lenders will ration credit not just to the King but also to private agents. I also assume for simplicity that if the King either defaults on his debt or expropriates private wealth he incurs a cost C. In this circumstance the King will both default and expropriate, or do neither. To model this situation I model the preferences of the King exactly as before, but now allow him to expropriate the wealth of private sector agents in the second period. To get the result that credit rationing occurs for private sector agents as well as the King all that must be true is that the extent of lending to private sector agents affects the incentives of the King to expropriate private wealth.

This will happen if, for a fixed penalty imposed on the King, borrowing increases the total amount of wealth. This seems plausible since a positive interest rate suggests that borrowing is productive and thus increases total wealth.

I capture this idea in a simple way by assuming that in addition to the King there are now private sector agents who wish to borrow from lenders. Lenders constitute a continuum of mass one and own all the wealth, denoted W. To focus on the incentives of the King I assume that these borrowers never default on loans. The wealth of both lenders and borrowers can be expropriated by the King in the second period. Assume that there is a continuum of size 1 of borrowers and each of these agents have access to a productive investment opportunity which increases any amount of money invested by an amount AI^{α} where $0 < \alpha < 1$ and $A > 0$. Assume that borrowers, like lenders, are risk neutral, do not discount the future, and simply aim to maximize total consumption over the two periods. In the case where no wealth expropriation takes place in equilibrium, borrowers thus choose the amount to borrow, L^j, and the amount of invest, I, to maximize,

$$A\left(L^j\right)^{\alpha} - (1+R)L^j. \tag{4}$$

Since there is no risk that a borrower defaults, they will be charged the opportunity cost of funds, R. Clearly, such an agent will wish to invest up to the point where the marginal benefit is equal to the marginal cost, so that the optimal level of investment must satisfy $1 + R = \alpha A \left(L^j(R)\right)^{\alpha-1}$, or

$$L^j(R) = \left(\frac{1+R}{\alpha A}\right)^{\frac{1}{\alpha-1}},$$

where $L^j(R)$ denotes the total demand for loans by the private sector. The important point here is that investment is productive in the sense that $A(L^j)^{\alpha} > L^j$ - private sector lending increases the total amount of wealth in the economy.

Let $L^k(r, p)$ denote the demand for loans from the King derived above with L^k being the amount lent in equilibrium. The incentive compatibility constraint is now in terms of the total wealth of the private sector. It is,

$$C \geq (1+r)L^k + A(L^j)^{\alpha} + W - L^k - L^j. \tag{5}$$

Here, $W - L^k - L^j$ is the wealth remaining in the hands of the lenders. $A(L^j)^{\alpha}$ is the after investment wealth of borrowers when they borrow an amount L^j and $(1+r)L^k$ is the loan

repayment that the King has to make. Thus the right-side of (5) is the total amount of wealth that the King could get by simultaneously defaulting and expropriating.

Lenders will only lend an amount which will satisfy (5). Denote the right-hand side of (5) $\Delta(L^k, L^j, W)$ then Δ is an increasing function of L^j for all $L^j < L^j(R)$. If (5) is violated at $L^k(r,p)$ and $L^j(R)$, i.e. if,

$$C < (1+r)L^k(r,p) + A(L^j(R))^\alpha + W - L^k(r,p) - L^j(R)$$

and there will be credit rationing. This is because by reducing L^k and L^j lenders reduce the right-side of (5) and reduce the incentive of the King to subvert property rights. Lenders will choose L^k and L^j to maximize their income subject to (5). Since lenders make zero expected profits to either the King or the private sector the actual composition of lending made by lenders is indeterminate. However, as long as on the margin rationing impinges on both the King and borrowers then an increase in C relaxes credit rationing on both and leads to credit expansion throughout the economy.

The model is completely consistent with the evidence that the monarch paid a higher interest rate than private citizens (for example Clark 1996 p. 566) since the equilibrium rate of interest for the King is $(1+R)/p - 1$ while for the private sector it is R. This result follows from the plausible assumption that it was more likely that the King would default. Private sector agents could use the courts to enforce private sector loans, but such enforcement does not work nearly so effectively with the King.

In order to keep the model simple and also because it is a logically separate issue, I have also abstracted from the issue of why interest rates trended downwards in the seventeenth century. This can easily be explained in the model by a fall in R over time. It seems plausible that this was due to capital accumulation during this period (with a consequent falling marginal productivity of capital) and the general deepening of financial markets which took place.

4 Conclusion

In this paper I have shown that when the capital market is characterized by moral hazard, as it surely was in the seventeenth century, then institutional changes which increase the ability of lenders to enforce their loans to the King would not be expected to cause

decreases in interest rates. This is so because competition between lenders pins the interest rate at the opportunity cost of funds. When the probability of default is endogenous, the interest rate does not increase to clear the loan market since this would simply induce default. Instead we should expect to see credit rationing. Increased ability to enforce loans then relaxes this rationing, it does not cause interest rates to fall. Thus the available evidence about the behavior of capital markets following the Glorious Revolution of 1688 is perfectly consistent with the theory of North and Weingast (1989) and the evidence presented by Clark (1996) does not contradict it.

Bibliography

Ashton, Robert H. (1960) *The Crown and the Money Market, 1603-1640*, Oxford University Press, Oxford UK.

Basu, Kaushik (1997) *Analytical Development Economics*, MIT Press, Cambridge MA.

Brewer, John (1989) *The Sinews of Power: War, Money and the English State, 1688-1783*, Harvard University Press, Cambridge MA.

Chandaman, C.D. (1975) *The English Public Revenue, 1660-1688*, Clarendon Press, Oxford UK.

Clark, Gregory (1996) "The Political Foundations of Modern Economic Growth: England, 1540-1800," *Journal of Interdisciplinary History*, 26, 563-588.

Cohen, Daniel (1991) *Private Lending to Sovereign States: A Theoretical Autopsy*, MIT Press, Cambridge MA.

Dickson, Peter G.M. (1967) *The Financial Revolution in England: A Study of the Development of Public Credit, 1688-1756*, MacMillan, London.

Eaton, Jonathan and Raquel Fernandez (1998) "Sovereign Debt," in Gene M. Grossman and Kenneth S. Rogoff eds. *The Handbook of International Economics Volume III*, North-Holland, Amsterdam.

Hill, Christopher (1961) *The Century of Revolution, 1603-1714*, W.W. Norton & Co., New York NY.

Kletzer, Kenneth (1988) "External Borrowing by LDC's: A Survey of Some Theoretical Issues," in Gustav Ranis and T. Paul Schultz eds. *The State of Development Economics: Progress and Perspectives*, Basil Blackwell, Cambridge MA.

North, Douglass C. and Barry R. Weingast (1989) "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England," *Journal of Economic History*, 49, 803-832.

Stiglitz, Joseph E. and Andrew Weiss (1981) "Credit Rationing in Markets with Imperfect Information," *American Economic Review*, 71, 393-410.