

Constitutional reform and state capacity building:

The case of the Glorious Revolution

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Abstract

In the work we have tried try to explain why the delay in lowering the interest rate on English government debt after the Glorious Revolution is consistent with North and Weingast's thesis. The transfer of political power from the Crown to Parliament was followed not only by an increase in tax revenue but also by substantial changes in its composition, namely a significant increase in the share of excise taxes relative to total revenue. Before the Glorious Revolution, Parliament was against the king having a predictable and reliable revenue, such as that raised by excise duty. The availability of this income would have allowed the king to count on continuous and abundant resources, freeing him from the need, in times of war, to convene Parliament to ask for authorization to increase taxes. Having a large amount of predictable and certain resources at his disposal, the king could maintain a standing army. By eliminating this risk the Glorious Revolution allowed the state to pursue the intensive growth of excise revenues. This policy choice was made by a coalition of interest groups represented in Parliament, namely the landowners and monied interests. These groups decided to set up a bureaucracy and increase the revenue from indirect taxes. By this decision the groups represented in Parliament shifted the tax burden of increasing public spending on to interest groups that had no political representation.

Introduction

This paper is a re-assessment of North and Weingast's thesis according to which the ascent to the throne of England by William of Orange was accompanied by a reconfiguration of the distribution of political power

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between Parliament and Crown. Following this reconfiguration tax-raising powers passed to Parliament. At the same time there were other institutional changes, such as the emergence of a judiciary independent from the king and the founding of the Bank of England, which strengthened the protection of property rights. Corresponding to the greater degree of protection of property rights and a decreased risk of default, investors were willing to supply funds to the state and private enterprises at lower interest rates.

In North and Weingast's view this is exactly what happened after the Glorious Revolution. In support of this view, they present proof of a significant expansion of the English public debt in the period after 1688 and a drastic reduction in the rate of interest on public debt. They also argue that the significant expansion of the public debt market helped promote and develop a large market for private debt.

North and Weingast's thesis has been questioned because the empirical evidence does not seem to offer adequate confirmation of it. On the one hand, interest rates on public debt began to go down many years after the Glorious Revolution; on the other hand, if it is true that the public debt market expanded, it is equally true that a broad and depth private debt market failed to develop.

The disconnect between theoretical thesis and empirical evidence has given rise to much debate. This is illustrated in section 1. In particular, the *fiscal state hypothesis* goes against North and Weingast's thesis, arguing that the higher credibility of the English public debt is to be attributed to the increased tax revenue England gained from the development of an efficient tax bureaucracy. In section 2 it is shown that during the first decades of the eighteenth century the number of tax department officials increased considerably, and that there was a corresponding significant increase in revenue from indirect taxes, notably from excise duties. This increase was instrumental in producing an increase in tax revenue and contributing to the growth of state capacity.

Why was the growth of bureaucracy and the revenue from excise duties, which began in the seventeenth century, particularly marked in the early decades of the eighteenth century? Section 3 presents a model in which, similarly to Besley and Persson's seminal contribution in 2009, state capacity building is regarded as endogenous. However, in contrast to Besley and Persson, we hypothesize that the interest groups represented in Parliament – for example, the landowners and monied interests in seventeenth-century England – invested in the creation of a fiscal bureaucracy to shift the fiscal coverage of public spending onto interest groups not represented in Parliament.

From this perspective the conclusion is reached that, despite the claims of the fiscal state hypothesis, the construction of a bureaucracy that allowed England in the seventeenth century to increase the revenue of indirect taxes, including excise duties, was based on a joint decision made by interest groups represented in the Parliament.

The growth of tax revenues and the higher share of indirect taxes in total tax revenue made it possible to reduce the risk of default and thus favored a drastic decrease in the rate of interest on public debt, a pronounced expansion of debt and an increased share of long-term debt on total debt. These points are illustrated in section 4. The conclusions sum up our working hypothesis and the empirical evidence supporting it.

1. Survey of the literature

In 1989 North and Weingast published a seminal article in the *Journal of Economic History* in which they argued that the Glorious Revolution of 1688 had changed the structure of political power in England. This change had taken two forms. On the one hand, on the constitutional level, the Revolution had established the supreme authority of the House of Commons in fiscal matters: the monarch was stripped of the power to raise taxes, to introduce new taxes, to repudiate the debt and at the same time lost control over expenditure. On the other hand, the redistribution of powers on the constitutional level was accompanied by other institutional changes, such as the independence of the judiciary and, in 1694, the establishment of the Bank of England. As it was owned by individuals and from time to time had its charter renewed by Parliament, the Bank of England was at least to some extent independent of the executive. In this way the right of seigniorage – in other words, the power to obtain resources by debasing the currency – was taken away from the king.

North and Weingast see these institutional constraints as constituting a necessary and sufficient condition for the enforcement of private property rights. This in turn is a prerequisite for good economic performance. From this perspective, by strengthening the confidence of creditors that debtors, especially the state, would keep their commitments, the reforms brought by the Glorious Revolution favoured:

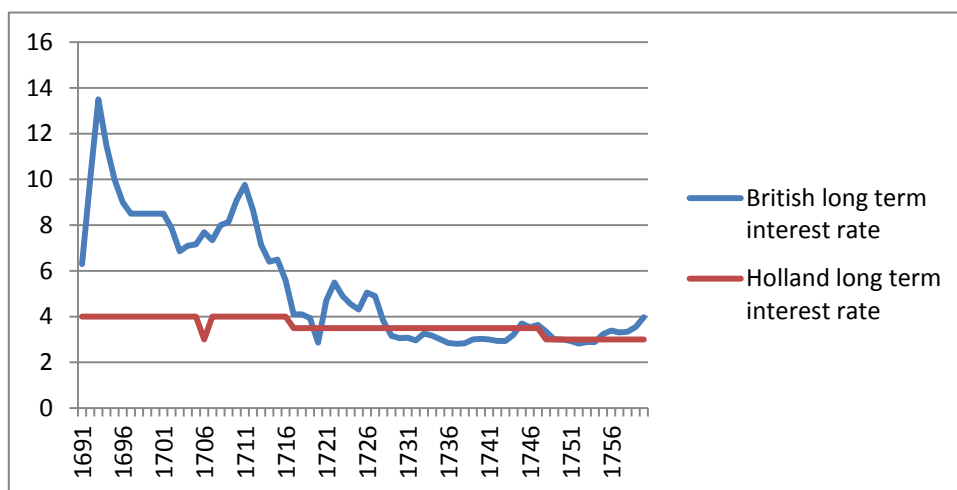
- a. a decreased default risk on public debt, and consequently a decrease in interest rates on the debt and the formation of a broad market for government securities;
- b. a large and efficient market for private debt associated with a decrease in interest rates on these securities.

The empirical evidence fails to offer clear confirmation of these two conclusions. In particular, with reference to point a., as shown in Figure 1, the interest rate on the English government debt in the latter part of the seventeenth century actually rose, and started to decrease in 1715, only falling as far as the level of the interest rate on Dutch public debt in the 1720s.

Equally, conclusion b. can hardly be said to be confirmed by the facts. In the eighteenth century the interest rate on private loans remained substantially on the same level as in the period before the Glorious Revolution. Nor was there any development of a broad and dense market in private credit.

The weak empirical confirmation of North and Weingast's thesis has helped render the debate on it and its implications heated.

Figure 1 – Interest rate on Dutch and British public debt



With reference to conclusion b., in particular, several reasons are given for the marked decrease in interest rates on private debt. Clark (1996), using Charity Commission data on private assets, shows that the decrease in interest rates on private loans after the Glorious Revolution was the continuation of a long-term trend. Using an econometric analysis, Temin and Voth (2008) conclude that the private credit market shrank after the Glorious Revolution. These points, however, do not falsify conclusion b. of North and Weingast. As

Quinn (2001) contends, when one considers public credit and private credit as substitutes rather than complements, it is reasonable to expect that the market for corporate bonds would be crowded out by the broadening of the government securities market.

A yet wider and more complex debate focused on the lack of empirical validation for conclusion a., in other words, the fact that the Glorious Revolution was not immediately followed by a decrease in the rate of interest on government bonds and that this decrease occurred only several decades after 1688.

Based on this evidence, many scholars feel the need to reject North and Weingast's thesis. According to Sussman and Yafeh (2006), for example, the interest rate differential between England and Holland only began to close in the 1720s, in other words, at a time when there were fewer exogenous shocks such as wars and political instability, which in previous decades had led to broad fluctuations in their level. A similar position is to be found in Barro (1987). Others attribute the decline of interest rates on English government debt in the eighteenth century not so much to the protection of property rights following the Glorious Revolution as to the foundation of a fiscal state, in other words, to the significant increase in the fiscal power of the English state.² This increase would, moreover, appear to be connected to the centralization of taxation and the establishment of an efficient bureaucracy to collect taxes. In short, in the eighteenth century the credibility of the English state grew not so much because of a constitutional as an administrative revolution. This revolution can be traced back to about the middle of the seventeenth century, when a government bureaucracy and a fiscal state began to form. This process of capacity building became necessary to finance wars that had become increasingly expensive due to innovations in military technology. Within the perspective just outlined, the Glorious Revolution played no part in creating the conditions that greatly expanded the borrowing capacity of the English state. Hence the hypothesis put forward by North and Weingast is to be rejected in favour of the "fiscal state" hypothesis.³

Several contributions have been published in defence of the validity of North and Weingast's thesis. Most try to reconcile the empirical evidence – in particular, the delay with which interest rates on the English debt decreased after the Glorious Revolution – with this thesis. An important attempt in this direction has been made by Robinson (1998) and Pincus and Robinson (2011). Drawing on Stiglitz and Weiss (1981), they

² Cf. in particular Brewer (1990) and O'Brien (2003).

³ Cf. O'Brien and Hunt (1997), O'Brien (2003), O'Brien and Mathias (1976), and Brewer (1990).

have suggested that the supply of credit is a non-linear function of the interest rate. In particular, in the face of high levels of risk, creditors probably resort to rationing: they prefer to limit the amount of funds dispensed and to leave part of the demand unsatisfied rather than raise the interest rate, and hence the probability of default. When there is rationing, the interest rate loses all informational value, and what matters is the evolution of quantities. The fact that after the Glorious Revolution, government debt rose so massively confirms the increased credibility of the English state. In this perspective, which we might call the “rationing hypothesis”, the fact that the interest rate on government debt fell some decades after the Glorious Revolution is irrelevant and does not disprove North and Weingast’s thesis.

Robinson’s rationing hypothesis is shared by Cox (2011), who sees the Glorious Revolution as bringing with it a change of equilibrium not only in terms of tax revenue, but also in terms of state expenditure. Previously, the actions of the English king were tainted by moral hazard when he decided to go to war with foreign countries: he would earn much if he won, but lose little if he lost. In the latter case he often defaulted and, as Hoffmann (2009) shows, did not run the risk of being removed.

Parliament’s assumption of control over spending did away with this form of moral hazard. Wars were decided and conducted with greater care and the profits from them were widely shared, also thanks to the establishment of joint-stock companies and the placement of their shares with a wide public.

Stasavage (2002, 2003; 2007) takes a different view from the rationing hypothesis. He emphasizes the role that political parties – and, in particular, the Whig party – came to have in Parliament. We shall call this the political party hypothesis. According to this hypothesis, the credibility of the English public debt was not a direct consequence of the Glorious Revolution, although this was the pre-condition. Indeed, giving the House of Commons and the House of Lords the right of veto on tax affairs allowed state creditors to better protect their property rights. This protection was therefore linked to the political power of the creditors, to the fact namely that they formed the government or held a majority in at least one of the two chambers. The exercise of the right of veto by the creditors was favoured not only by the increased power of Parliament after the Glorious Revolution, but also by the formation of political parties. These brought together interest groups around a political project even when they had different preferences.

In eighteenth-century England the Whigs and the Tory Party took a common stand on multiple issues relating to religion, foreign policy, finance and so on. From 1715 the Whig party was able to unite by

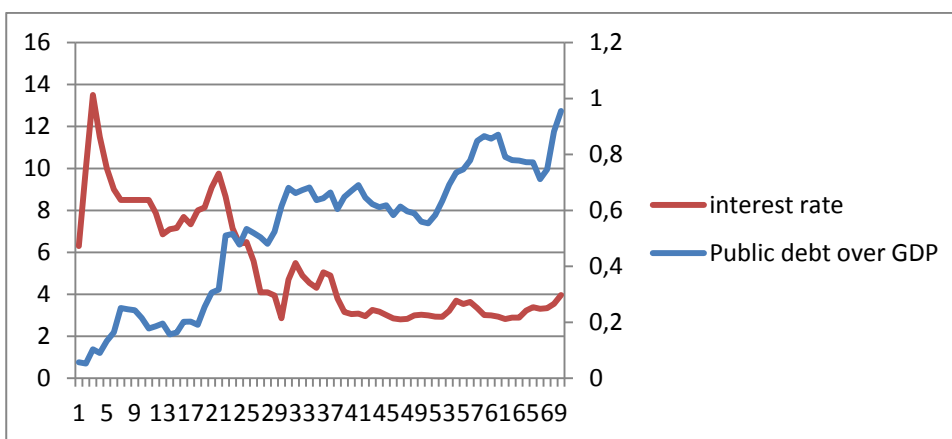
adopting a common attitude of religious tolerance, as opposed to the uncompromising stance taken by the Tories, who were staunch defenders of the Anglican Church and social groups with different economic interests: the great landowners and the monied interests. This political combination allowed the Whig party to dominate politics for many decades and gave England a long period of political stability. During this period the risk premium of the sovereign debt fell and the total number of government bonds absorbed by the market soared.

2. Changes in the structure of tax revenues

As seen in the previous section the two most important explanations of compatibility between North and Weingast's thesis and the persistence of high interest rates in the years immediately following the Glorious Revolution are the hypothesis of rationing and the hypothesis of political dominance of the Whigs.

Even if one shares the view that interest rates did not represent the equilibrium price between supply and demand of government debt and if one only looked at the outstanding amount of debt, it would still be necessary to explain the delay – with respect to the Glorious Revolution – with which lenders showed their willingness to purchase government bonds. Indeed, as shown in Figure 1, in England the government debt over GDP ratio began to increase significantly several years after the Glorious Revolution, more or less when the long term interest rate began to decrease.

Figure 2 – Public debt over GDP



Source: Broadberry *et al.* (2011).

It is presumable that rationing, if there were any one, continued also in the decades after the Glorious Revolution. In that period, in fact, the risk of default remains high. In fact, between 1688 and 1715 there were several episodes of partial default of the English state.⁴ In 1694, for example, the navy could not obtain supplies because of the government payments delays.⁵ Three years later, the government had to delay payments on short-term debts.⁶ Similar episodes happened during the war of Spanish succession: “Navy and Ordinance Bills, the short-term financial instruments used to pay military suppliers, were at heavy discount in 1709 and 1710”.⁷

Undoubtedly, the hypothesis of political dominance of the Whigs put forward by Stasavage explains why the interest rate persisted at high levels even for some time after 1689. In this hypothesis, in fact, the decline in interest rates in the 1720s is explained by the ability of the Whig party to build a coalition in Parliament between landowners and monied interests under the common denominator of religious tolerance toward dissenters and intransigence towards the Jacobites. In this perspective, on the one hand, it is asserted that the risk premium on English government debt declined as a result of the increased fiscal revenue of the English kingdom (Table 1), on the other hand, it is assumed that landowners have sacrificed their own economic interest, accepting higher levels of taxation, to their convictions in religious matters.

However compelling, this view has three kinds of weakness. Firstly, the Tories, by accepting the Hannoverian succession, showed that they had largely overcome their religious prejudices. As Colley writes (1982, p. 6), after 1715, “the Tory party was destroyed, destroyed by incompetent leadership... by its own internal contradictions, weakened by its virtues and lashed by events”.

The poverty of the Tory party’s political project had also led to a significant reduction in its numbers of members of Parliament: between 1710 and 1722 the number of Tory MPs went down from 329 to 169 (Table 1). This was largely due to the fact that religion had lost a large part of its distinctive value.

⁴ See Murrell (2008).

⁵ See Jones (1988; p. 11).

⁶ See Dickens (1967; p. 52).

⁷ See Carruthers (1996; p. 79).

Secondly, the dissolution of the Tory party had inevitable repercussions on the Whig party.⁸ This was not a party as we understand it today, with a leader and a common political programme, but as Earl Waldergrave said, “an alliance of different clans ... influenced and guided by their different chieftains.” On the basis of the points made here, it can be said that from the 1720s onwards Tories and Whigs lost their original characteristics. In particular, they lost their key distinguishing features on the level of ideals and values. As Macaulay observes, they “blended together, separated again, coaxed and abused each other; and even changed their very nature and essence according to their particular interests and necessities ... Thus have we seen the Whigs, in support of their administration, acting upon Tory Principles, and the Tories, in opposition, act upon the broad bottom of liberty and sound original Whiggism”.

If the Whigs in the eighteenth century were not a party in the sense we understand the word today, it is difficult to think that they could form a coalition around a shared project with social groups having conflicting economic interests.

Thirdly, as shown in Table 2, the increase in tax revenues occurred in the early decades of the eighteenth century in England was due mainly to revenues from indirect taxes rather than that resulting from direct taxes. Therefore, the increase of government fiscal income did not hit mainly landowners, as it happened in the previous decades when the king was in need of financing wars.

The drawbacks of the hypothesis of rationing and that of the political dominance of the Whigs do not imply that the North and Weingast hypothesis should be refused as supporters of the fiscal state hypothesis do. As well known, according to this hypothesis, the bureaucratic and administrative changes are exogenous technological innovations.⁹ In this work we put forward the hypothesis that the development of these innovations and their use to increase the borrowing capacity of the English state were endogenous rather than exogenous. They were only possible as a result of the shift of power from the monarch to parliament. The plausibility of this hypothesis requires some additional discussion of the evolution of the structure of English tax revenues in the 1700s.

We have already mentioned that the significant increase in tax revenues was accompanied by a marked increase in revenue from indirect taxes, particularly excise duties. As Table 2 shows, between 1695 and 1740

⁸ Cf. Brewer (1976).

⁹ See, among others, Brewer (1990) and Epstein (2000).

the share of revenue from customs and excise duties out of the state's total net income rose from 44.3 per cent to 73.7 per cent.¹⁰

Table 2 – Main sources of taxation

Year	Fiscal revenue over GDP	Customs	Excise	Stamps	Post Office	Land and Assessed taxes
1695		21.7	22.6	1.1	1.5	44.5
1700	4.40	35.1	23.7	2.0	1.8	34.1
1710	5.13	25.5	29.5	1.9	1.2	39.5
1715		30.4	41.5	2.6	1.7	20.4
1720	5.81	26.5	39.2	2.8	1.5	24.3
1725		28.7	46.0	2.6	1.7	19.3
1730	6.04	25.6	44.9	2.5	1.5	24.9
1740	5.62	24.7	49.0	2.3	1.5	21.8
1750	7.33	20.6	46.3	1.8	1.2	29.6
1760	8.51	22.9	45.8	3.1	0.9	26.1

Source: Mitchell (1988).

It is probable that before the Glorious Revolution it was impossible for there to be a permanent increase either of direct taxes or indirect taxes, particularly excise duties.

First of all, Parliament wanted, in fact, that the King “lived of his own”. The principle of undersupply resources to the King guaranteed frequent Parliament sessions and, therefore, a check on the political power of the Crown. “It was taken up as a general maxim, that a revenue for a certain and short term, was the best security that the nation could have for frequent Parliaments”¹¹ Come scrive Roberts (1977; p.. 58):

“Parliament in 1688 once and for all repudiated the ancient principle”.

¹⁰ On this aspect see Hartwell (1981) and more recently Ashworth (2003).

¹¹ See Burnet (1753; p. 61).

Secondly, as mentioned above, an increase in direct taxes was not accepted by the landowners who had a majority in the Commons. They were not even willing to accept a significant increase in indirect taxes. Prior to 1688, in fact, the Commons wanted to allow the king to have only limited and uncertain resources. This was a way of making it impossible for him to maintain a standing army and to consolidate his power in the absolutist sense. The pursuit of these goals was only compatible with tax revenues made up mainly of direct taxes. The king's hand was forced by the need, especially in the event of war, to convene Parliament to gain authorization for an increase in direct taxes. A substantial contribution to indirect tax revenue would have allowed the king to enjoy continuous and reliable resources.

The redistribution of political power following the Glorious Revolution removed the opposition by the Commons to the development of a state bureaucracy used for the collection of indirect taxes. As Brewer (1990, p. 81) points out, "... the switch from direct to indirect taxation meant that the bulk of the revenue was no longer collected by a hodgepodge of amateur and local officials, but by a centrally appointed body of crown employees."

In fact, between 1690 and 1763 the number of Tax Department officials more than tripled.

In the wake of this impressive growth, between 1690 and 1763 Excise employees went up from 46 to 53 per cent of revenue administration, and in absolute terms from 1211 to 3973 units. "Excise tax inspectors were stationed throughout the country, supervised by collectors who engaged in tours of inspections to measure and check the amount of bread, beer, and other goods subject to the excise tax".¹²

The growth of the Excise Department led to an expansion of fiscal bureaucracy and more in general to the growth of state capacity in England. This depended on the shift of political power following the Glorious Revolution, in at least two respects. On the one hand, the transfer of fiscal power, both in revenue and expenditure, from king to Parliament, removed the resistance of the House of Commons to providing the state with high and certain resources. On the other hand, it allowed Parliament to devote public resources to building a large and efficient state bureaucracy.

The above considerations lead to the conclusion that the Glorious Revolution was a necessary but not sufficient condition for the increased credibility of the English state. This was rather the result of a coalition of interest groups which, on the one hand, subsequent to the Glorious Revolution, acquired a large margin of

¹² Acemoglu and Robinson (2012; p. 196).

freedom in the fiscal management of the state and, on the other hand, took advantage of these margins in order to place the burden of the increasing military spending that was needed to ensure the security of the English state and to encourage colonial expansion on social classes not represented in Parliament.¹³ The conditions that made such a coalition possible to are illustrated analytically in the next section.

3.The model

In the previous section it was pointed out that from 1714 onwards the Tories underwent a process of dissolution. This process inevitably had repercussions on the Whigs, who in turn lost much of their identity. Subsequently, the political exchange tended to occur primarily through interest groups within the Whig party.¹⁴ There was, therefore, no debate between the parties, but simply a debate within the dominant party between the interest groups represented in Parliament: landowners and monied interests.

Excluded from this debate were the middle and lower classes, namely interest groups represented in neither the House of Commons nor the House of Lords.

Landowners and monied interests had political power that was denied to the middle and lower classes and were able to join forces to shift the tax burden onto those excluded from Parliament.

To illustrate the conditions and the consequences of this coalition we use a model based on Besley and Persson (2009) where the economy lasts for two periods, $s=1,2$, and there are three groups of agents, $J=A,B,C$. Only two groups, group A and B, are represented in Parliament. In each period one of them, say group A, holds political power and makes taxation and spending decisions.

Groups have same population share and per capita income. Per capita income is normalized to one, while total population to three, one for each group.

All agents derive utility from consuming private goods that they purchase with their after tax income and public goods provided by the government.

¹³ See Mokyr (2006) and Schofield (2003; 2009).

¹⁴ Cf. Brewer (1976).

Tax rates are group specific, t_s^J , and can be negative to allow for redistribution. The maximum tax rate is determined by the stock of state capacity in each period. In the first period the maximum tax rate is $t_{1,AB}$ for agents in group A and B and zero for people in group C, that is $t_{1,C}=0$.

The capacity to tax depends on the previous investment in building institutions. The government takes the stock of state capacity in the first period as given and decides the level of investment in state capacity. There are two possible kind of investments. A first one increases the maximum tax rate on people of group A and B, that is $t_{2,AB}$, but leaves taxes on group C to zero. This investment costs $F(t_{2,AB})=(t_{2,AB})^2$, i.e. F is an increasing and strictly convex function. The second kind of investment consists in building institutions to tax the third group, group C. If this investment is undertaken in the second period the maximum tax rate on group C is $t_{2,C} > 0$. This investment, however, is more costly. It costs $W(t_{2,C})=(a+t_{2,C})^2$. The coefficient a represents a fixed cost of building this kind of state capacity.

The government uses its resources to provide a public good, defense, G_s , from which all groups benefit. The value given to public goods in the utility function is denoted by α_s , which is a random variable with c.d.f. H and p.d.f. h on the interval $(0, \underline{\alpha})$. In periods when the threat of a war is high α assumes high values, when the threat of a war is low the value of defense is low and α assumes low values.

In each period, the timing of the events is the following: 1. Nature determines value of public goods, α_s , and which group is in power; 2. The government chooses taxes, t_s^J , spending in public goods, G_s , and the two level of investments, $t_2^{A,B}$ and t_2^C ; 3. Agents consume.

Assuming linear preferences in consumption, the indirect utility for each individual in group J is:

$$(1) U_s^J = \alpha_s G_s + (1 - t_s^J)$$

The government objective function is to maximize utilities of agents represented in Parliament, that is only agents belonging to group A or B. If group A is in power, the government weight more the utility of group A. In particular it gives a weight equal to $\rho \in \left(\frac{1}{2}, 1\right)$ to group A and a weight of $(1-\rho)$ to group B.

The first period problem of the government is to choose $G_1, t_1^A, t_1^B, t_2^{A,B}, t_2^C$ to maximize:

$$(2) \rho U_1^A + (1 - \rho)U_1^B + ENP$$

Where ENP stands for the second period expected net payoff for the group ruling in the first period.

Subject to the government budget constraint:

$$(3) \sum_J t_1^J = G_1 + F(t_{2,AB}) + W(t_{2,C})$$

And to the non negativity constraint for public good provision ($G_1 \geq 0$), and to the constraints that taxes cannot exceed the maximum amount given by the state capacity of the period ($t_1^{A,B} < t_{1,AB}, t_1^C \leq 0$).

Similarly, the second period maximization problem of the government is to maximize:

$$(4) \rho U_2^A + (1 - \rho)U_2^B$$

Subject to:

$$(5) \sum_J t_2^J = G_2 \text{ and } G_2 \geq 0; t_2^{A,B} < t_{2,AB}; t_2^C \leq t_{2,C}.$$

Substituting eq.(1) and (5) into eq. (4) we get:

$$(6) \alpha_2 \sum_j t_2^j + \rho(1 - t_2^A) + (1 - \rho)(1 - t_2^B)$$

The first derivatives of eq. (6) with respect to t_2^A is positive only if $\alpha_2 > \rho$. That is, public goods are provided only when the value of public goods is equal than or equal to the value that the group in power assigns to its own private consumption. Given the cumulative distribution of the stochastic variable α_2 , this event occurs with probability $[1-H(\rho)]$. Conversely, when $\alpha_2 < \rho$, the ruling group values public good less than its own private consumption and finds it optimal to set $G_2=0$ and to redistribute income taxes to itself.

Therefore, with probability $[1-H(\rho)]$ the value of public good provision is high and the optimal tax rate and public good provisions are:

$$(7) \quad t_1^A = t_1^B = t_{1,AB} \text{ and } G_1 = 2t_{1,AB} - F(t_{2,AB}) - W(t_{2,C})$$

$$(8) \quad t_2^A = t_2^B = t_{2,AB}; t_2^C = t_{2,C} \text{ and } G_2 = 2t_{2,AB} + t_{2,C}$$

While, with probability $H(\rho)$ the value of the public good provision is low and tax rates and public spending are:

$$(9) \quad t_1^B = t_{1,AB}; G_1 = 0; t_1^A = F(t_{2,AB}) + W(t_{2,C}) - t_{1,AB}$$

$$(10) \quad t_2^B = t_{2,AB}; t_2^C = t_{2,C}; G_2 = 0; t_2^A = -(t_{2,AB} + t_{2,C})$$

To calculate the optimal investment in state capacity we need to write down the second period Expected Net Payoff. The ruling group of the first period is assumed to keep the political power in the second period with probability $1/2$. When group A continues to rule in the second period its expected payoff is:

$$(11) \quad V_2^A = [1 - H(\rho)]\{(2t_{2,AB} + t_{2,C})E\{\alpha_2 | \alpha_2 \geq \rho\} + (1 - t_{2,AB})\} + \\ + H(\rho)\{\rho(1 + t_{2,AB} + t_{2,C}) + (1 - \rho)(1 - t_{2,AB})\}$$

When group A loses political power in the second period, its expected payoff becomes:

$$(12) \quad V_2^B = [1 - H(\rho)]\{(2t_{2,AB} + t_{2,C})E\{\alpha_2 | \alpha_2 \geq \rho\} + (1 - t_{2,AB})\} + \\ + H(\rho)\{\rho(1 - t_{2,AB}) + (1 - \rho)(1 + t_{2,AB} + t_{2,C})\}$$

The only difference between eq. (11) and eq. (12) is the last term, that is the fact that when group A is in power, when there is no risk of war the redistribution favors group A, while, when group B is in power, redistribution favors group B.

The expected net payoff (ENP) is, therefore:

$$(13) \text{ENP} = \frac{1}{2}V_2^A + \frac{1}{2}V_2^B - \lambda(\alpha_1) \left(F(t_{2,AB}) + W(t_{2,C}) \right)$$

where $\lambda(\alpha_1)$ is the Lagrange multiplier associated with the first period budget constraint. The first two terms corresponds to the benefits derived from investing in state capacity, whereas the last term is the cost in terms of the value of public funds. It is an expected payoff because the outcome depends on which group holds power in the second period. . After substitutions, eq. (12) becomes:

$$(14) \text{ENP} = [1 - H(\rho)] \left\{ (2t_{2,AB} + t_{2,C}) E\{\alpha_2 | \alpha_2 \geq \rho\} + (1 - t_{2,AB}) \right\} + \\ + H(\rho) \left\{ \frac{1}{2} \left\{ \rho(1 + t_{2,AB} + t_{2,C}) + (1 - \rho)(1 - t_{2,AB}) \right\} \right. \\ \left. + \frac{1}{2} \left\{ \rho(1 - t_{2,AB}) + (1 - \rho)(1 + t_{2,AB} + t_{2,C}) \right\} \right\} - \lambda(\alpha_1) \left(F(t_{2,AB}) + W(t_{2,C}) \right)$$

In order to determine the optimal level of investment in state capacity we derive the expected net payoff with respect to $t_{2,AB}$ and $t_{2,C}$. The two first order conditions are:

$$(15) t_{2,AB} = \frac{1}{2\lambda(\alpha_1)} \left\{ [1 - H(\rho)] \{ 2E\{\alpha_2 | \alpha_2 \geq \rho\} - 1 \} \right\}$$

$$(16) t_{2,C} = -a + \frac{1}{2\lambda(\alpha_1)} \left\{ [1 - H(\rho)] E\{\alpha_2 | \alpha_2 \geq \rho\} + \frac{1}{2} H(\rho) \right\}$$

The above two equations show that the optimal levels of investment in the two kind of state capacity depend on the main parameters of the model. We can therefore see how the optimal investment varies with parameters.

Proposition 1: *There is a positive investment in state capacity to collect indirect taxation only in state of the world when fixed costs to build it are low. The Glorious Revolution, reducing these costs, has permitted*

the building of state capacity in indirect taxation. Furthermore, a lower cost of state building capacity in indirect taxation increases this kind of investment.

Proof: there is investment in indirect tax building capacity only if the second part of eq. (15) is positive, ie, if $a < \frac{1}{2\lambda(\alpha_1)} \left\{ [1 - H(\rho)] E\{\alpha_2 | \alpha_2 \geq \rho\} + \frac{1}{2} H(\rho) \right\}$. Moreover, the derivative of eq. (16) with respect to a is negative, therefore a reduction of fixed costs increases state building in indirect taxation.

Proposition 2: *An increase in the future value of the public good (ie an increase in the future risk of a war) leads to a higher investment in both kinds of state capacity.*

Proof: An increase in the second period demand for public good results in a higher $E\{\alpha_2 | \alpha_2 \geq \rho\}$. Derivatives of eq. (15) and eq. (16) with respect to $E\{\alpha_2 | \alpha_2 \geq \rho\}$ are both positive.¹⁵

Proposition 3: *A higher level of the weight given to the opponent group in Parliament leads to a higher level of state capacity. In particular, it leads to a higher increase in indirect tax building.*

Proof: Taking derivatives of eq. (15) and (16) with respect to ρ we get:

$$(17) \quad \frac{\partial t_{2,AB}}{\partial \rho} = \frac{-h(\rho)\{2E\{\alpha_2 | \alpha_2 > \rho\} - 1\}}{2\lambda(\alpha_1)} < 0$$

$$(18) \quad \frac{\partial t_{2,C}}{\partial \rho} = \frac{h(\rho)\left\{\frac{1}{2} - 2E\{\alpha_2 | \alpha_2 > \rho\}\right\}}{2\lambda(\alpha_1)} < 0$$

A comparison of eq. (17) and (18) shows that a higher weight given to the opponent group in Parliament leads to higher investment in indirect taxation than in direct taxation.

¹⁵ As it stands, a higher risk of a war leads to higher increase in direct tax building than in indirect tax building. This result depends on the fact that direct taxes hit two persons, while indirect taxes hit only one person.

This model enables us to draw some conclusions, and in particular:

- a. a Parliament in which some citizens are excluded tends to form coalitions that promote a redistribution of income to the detriment of the interest group that is not represented;
- b. to promote this redistributive process, the government can invest in bureaucratic structures that enable innovative forms of taxation. In this context, therefore, state building is based on competition for the redistribution of income;
- c. the process of state building is stimulated by the need to cover the increase in public spending necessary to protect the interests of the state or those of dominant interest groups.

The conclusions of this model provide an alternative interpretation to North and Weingast's thesis. They show how the Glorious Revolution, by shifting power from king to Parliament, laid important groundwork for a liberal democracy, but in the short term gave rise to an oligarchic government.

Thus, contrary to what North and Weingast suggest, the credibility of England's public debt was not the result of the constitutional changes that came with the Revolution of 1688. They represented a necessary but not sufficient condition for increased confidence in the solvency of the English state. This was the outcome of a political game that led to certain policy choices. However, these choices were not, as Stasavage contends, the choices of one party, the Whigs, who united landowners and monied interests under the common denominator of religious tolerance. They were rather the outcome of a coalition of interest groups, landowners and monied interests, which, despite having different preferences with regard to taxation, had a common interest, strictly economic in nature, to shift the growing burden of military expenditure onto those not represented in Parliament.

This thesis can be subjected to empirical testing with reference to the Glorious Revolution by ascertaining whether in the years subsequent to the Revolution there was a connection between changes in the structure of tax revenues and the risk premium on English government debt and, thus, if it is possible to explain the delay in the reduction of the rate of interest on this debt by ascribing it to the marked increase in excise revenues after 1715.

4. Risk premium on government debt and revenue's sources

As it has already been said, the construction of an efficient bureaucracy and the increasing ability to levy indirect taxes, mainly excise and duties, involved a significant increase in tax revenue, accompanied by a marked increase in the tax burden (Table 4).

The increase in excise duties and tax revenues brought about a decrease in the risk premium on government debt. This decrease was reflected on the conditions under which the debt was placed and on its maturity structure. In particular, after 1714 the interest rate on new issues began to fall (Figure 1).

Table 4 – Exchequer revenue and fiscal pressure

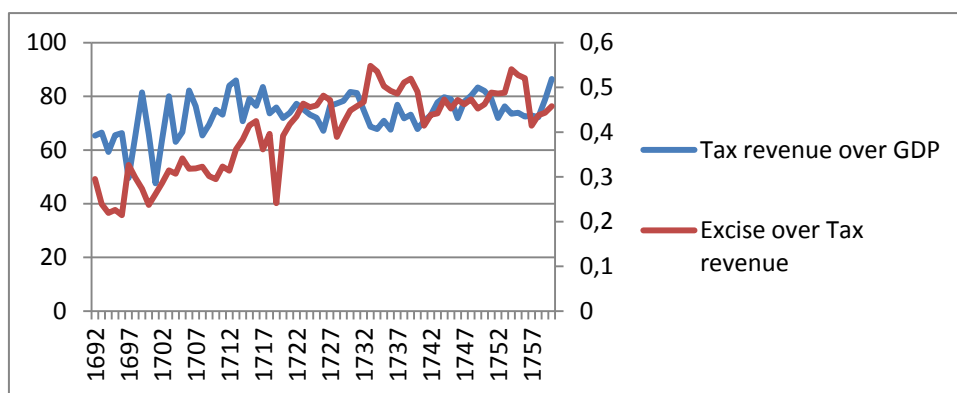
	Fiscal revenue	Fiscal pressure
1680	1.51	3.6
1690	2.05	6.7
1700	4.40	8.8
1710	5.13	9.2
1720	5.81	10.8
1730	6.04	10.7
1740	5.62	8.7
1750	7.33	10.5
1760	8.51	11.5

Source: O'Brien and Hunt (1997).

The decreased probability of default seems, therefore, to have been connected to two factors:

- a. the huge growth in tax revenue;
- b. the increased share of excise taxes in total revenue.

Figure 3 – Total revenue over GDP and excise revenue over total revenue



Therefore, factor **a.** is highly dependent on factor **b.:** resorting to direct taxation would not have given sufficiently broad coverage and sustainability to wide public debt. The landowners, who formed the majority in the Commons, would never have been willing to accept an increase in direct taxes such as to ensure an increase in revenue equal to that recorded between 1690 and 1760 by higher indirect taxes.

The share of excise tax revenues, between 1710 and 1720, rose from 29 to 39 per cent; correspondingly the share of direct taxes fell from 40 to 24 per cent.

The significant increase in excise duties contributed to a decrease in the risk premium on English government debt in both quantitative and qualitative terms.

In quantitative terms we have already shown how the growth of total tax revenue was linked to the growth of excise revenues. Its particular characteristics meant that this type of tax contributed to a decreased risk of default.

Firstly, excise duties, as it did not burden classes represented in Parliament and affected consumption, produced a more predictable and regular revenue. They were, that is, less exposed than other taxes to the economic and political cycle. As Brewer writes (1988, p. 73): "An effective tax system, providing the government with a substantial and regular income, was a necessary condition of the new credit mechanism which ... revolutionized eighteenth-century public finance."

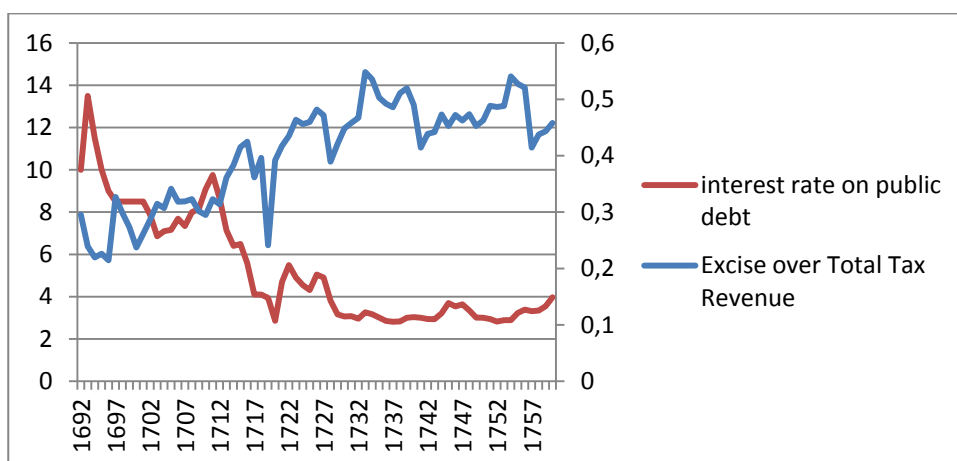
The close relationship shown in Figure 4 between the share of excise taxes in revenue and the development of the interest rate on public debt comes, therefore, as no surprise.

The decrease of the risk premium and consequently of the interest rate allowed the English government to expand in a significant way its debt (Figure 2).

Secondly, since excise duties burdened certain types of goods, it was possible to differentiate between the different revenues that resulted from each of them. This made it possible to introduce a major innovation in the type of public debt issued.¹⁶

At the end of the seventeenth century the English state issued three types of securities: lottery tickets, tontines annuities and special bonds.¹⁷

Figure 4 - Incidence of excise tax revenue and long-term interest rate



The first two types of securities were not, however, very successful. Lottery tickets were easily copied by private individuals and could therefore be replaced with private debt and did not entail a different degree of risk. Tontine annuities, on the other hand, had an excessively complicated reimbursement mechanism. Their issue was, therefore, of limited success.

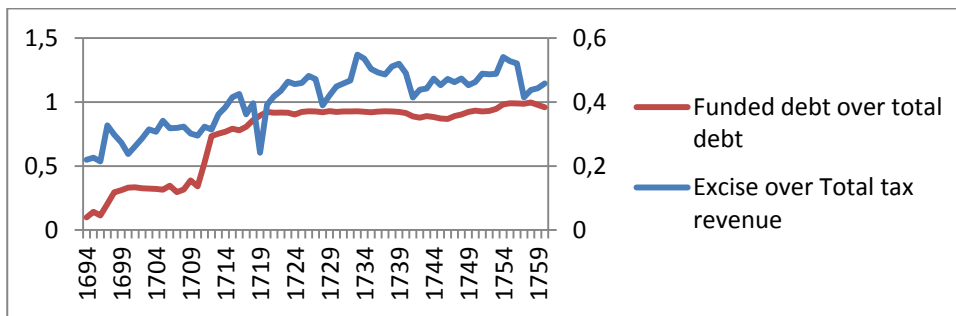
The third type of securities was bonds funded from specific taxes assigned to that purpose by Parliament. These were excise duties on certain goods: the revenue from these taxes was, therefore, a guarantee of repayment of state debt. The first issue of such securities occurred in 1694 and was successful thanks to the

¹⁶ See Bordo and White (1991).

¹⁷ See Dickson (1967; pp. 48-49).

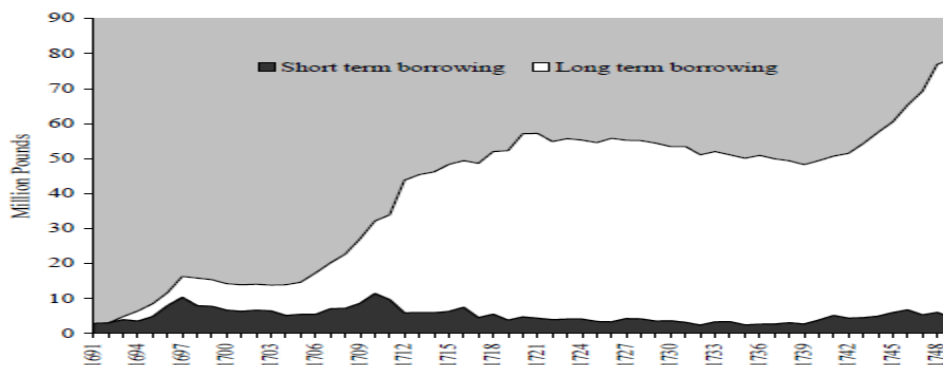
intervention of the Bank of England, established that same year. The possibility of issuing funded securities increased significantly in the eighteenth century thanks to the growth of excise revenues. Figure 5 highlights the close relationship between the development of funded debt and that of excise revenues.

Figure 5 – Funded debt and Excise revenues



The use of excise duties to guarantee the public debt contributed significantly not only to reduce the interest rate on it but also to increase its maturity (Figure 6). When a country has a large amount of short-term debt, on the one side, the debtor is likely to repay its debts by issuing new debts, but on the other side, it is exposed to self-fulfilling debt crisis. In fact, creditors may expect that other creditors will not purchase other sovereign debt and they themselves may decide not to purchase it.¹⁸

Figure 6 – Short and Long term public debt



Source: Harris (2004).

¹⁸ See Cole and Kehoe (2000).

Of the foregoing it may be done an econometric test. The rate of return on government debt was regressed on the rate of interest on the Dutch public debt and on the public deficit on GDP ratio. The expected signs for these variables are, respectively, positive and negative.

Using these variables we proceed to an econometric estimate for the period 1692-1760. The results of this estimate are shown in Table 5.

Table 5 – Determinants of the interest rate on British public debt: 1692-1760

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Constant	-14.80 (-7.64)	-4.822 (-1,226)	4.649 (1.329)	4.815 (1.800)	6.248 (2.287)	5.914 (2.568)
Interest rate on Dutch public debt (-1)	5.494 (10.247)	3.293 (3.580)	2.070 (2.720)	1.408 (2.296)	1.323 (2.193)	1.405 (2.907)
Whigs/Tories	-	-0.988 (-2.871)	-0.229 (-0.760)	-0.161 (-0.689)	-0.055 (-0.232)	-
Funded debt/total debt	-	-	-	-6.151 (-9.895)	-5.194 (-6.538)	-5.214 (-6.656)
excise/fiscal revenue	-	-	-16.171 (-6.154)	-	-5.009 (-1.881)	-5.157 (-2.009)
public deficit/GDP	-18.088 (-3.75)	-14.353 (-3.017)	-8.847 (-2.266)	-7.804 (-2.529)	-7.118 (-2.335)	-7.215 (-2.407)
Coeff. of Variation		0.290	0.231	0.184	0.180	0.179
R ²	0.641	0.6810	0.800	0.874	0.881	0.881
R ² adj	0.623	0.666	0.787	0.866	0.871	0.873
Mean Square Error	2.528	2.325	1.483	0.933	0.898	0.884
Square Root of MSE	1.59	1.525	1.218	0.966	0.947	0.940

The results of the basic equation are illustrated in column 1. The coefficients of the variables are significant and have the expected signs, respectively positive for the interest rate on Dutch public debt and negative for the ratio of public deficit to GDP.

Starting from this basic pattern a comparison was made between Stasavage's hypothesis of political party and the hypothesis advanced in this paper.

In the specification of the estimated equation, we added a further variable to the basic variables, namely, the ratio of Whig and Tory MPs. This was designed to define the periods and extent of the majority of the Whig party, regarded by Stasavage as the veto player protecting monied interests. The results of the estimate are given in column 2 of Table 5. The new variable is highly significant and has the expected sign.

Subsequently, in addition to the relationship between Whig and Tory Parliamentarians, we introduced another variable into the estimated equation, the ratio between excise revenues and total revenue. The results of the equation modified in this manner are given in column 3 of the table. They show that after the introduction of the new variable the ratio between Whig and Tory Parliamentarians maintains the expected sign but becomes insignificant. A similar result is obtained if we replace the relationship between excise revenues and total tax revenues with the share of funded debt on total debt (column 4). The significance of the relationship between Whig and Tory Parliamentarians decreases further when we introduce into the equation the relationship between excise revenues and overall tax revenues and the share of funded debt on total debt (column 5).

The econometric results confirm the hypothesis put forward in this paper, that is that the credibility of public debt derives from the increased tax receipts from excise and from the rising recourse to bond issues guaranteed by them. These factors are prevalent with respect to the fact that the Whigs had the majority in Parliament.

5. Political power, decrease of the risk of default and income distribution

The decreased risk premium on government debt benefited the interest groups in power. The monied interests drew immediate benefit from it. They enjoyed the advantages of a lower probability of default on the debt and the development of a large financial market which increased the liquidity of the securities held.

At the same time, the landowners, starting from 1715, saw themselves relieved of a tax burden that in the past traditionally afflicted them especially in times of war. Indeed, the increased borrowing capacity of the English state enabled it to spread over time the coverage of the huge military spending incurred through wars and, therefore, to avoid significant increases in direct taxes in wartime, as had usually been the case before 1715. On the basis of the above it is probable that the restructuring of excise tax revenue in favour of a redistribution of income disadvantaged the lower and middle classes. Two main factors will have contributed to this. In particular:

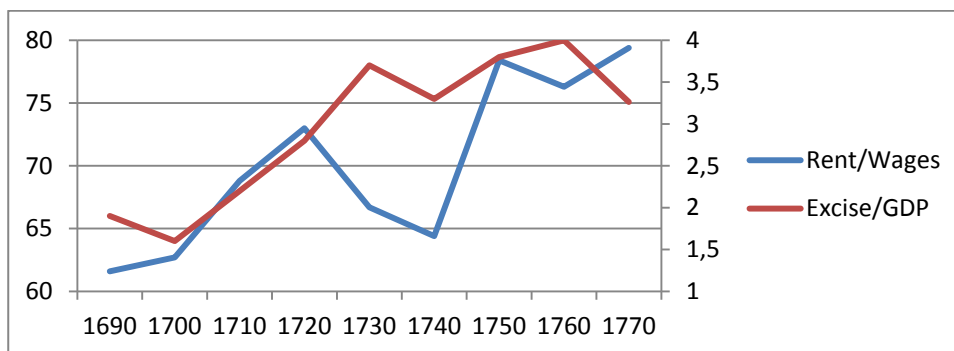
- a. the lower tax burdens that would otherwise have fallen on landowners and monied interests for higher levels of taxes on land and for the high probability of default of sovereign debt;
- b. The extensive use of indirect taxes, particularly excise duties on necessities, such as salt, beer, malt, candles, coal, etc..

Bearing in mind point **b.**, Mathias and O'Brien (1976) concluded that the approach to fiscal policy in eighteenth-century England was decidedly regressive.

This thesis has been challenged by McCloskey (1978; 1981), who argues that it is not possible today to establish whether excise duties affected the manufacturers who had to pay them or the consumers they were passed on to. Indeed, in order to determine this one would need to know if the goods on which excise duties was applied were produced under competitive conditions or not. The lack of data makes it impossible to reach a conclusion on this point. Nor is it possible today to determine whether any increase in direct taxes to cover increased spending was passed on from landowners to tenants.

A less insidious method to determine the redistributive effects of fiscal policy is to use indicators of the evolution of distributive inequality in eighteenth-century England. At that time agriculture represented a very significant share of GDP, amounting to ... per cent in 1692. Moreover, land was in the sole possession of the upper class. Lindert (1986) showed that at the end of the seventeenth century about 89 per cent of revenue was earned by the top tenth of the population. In a society structured in this way the ratio of land rents to the wages of common workers was an indicator of income distribution. An increase in this ratio implied an increase in inequality of distribution. Recent works show that the ratio of land rents to wages rose significantly starting from the 1720s (Figure7). The rise in this ratio points to a widening of inequality between the upper and middle classes, on the one hand, and the lower classes on the other.

Figure 7 – Ratio of land rents to wages



Indicators pointing in the same direction can be found when one considers inequality in wealth-holding. The distribution of wealth, in fact, largely reflects income distribution. Higher levels of savings – and, thus, of the accumulation of wealth – usually correspond to higher income levels. When considering the estimated net worth by social class we find a widening of its dispersion in the period between 1700 and 1740 (Table 6).

Table 6 – Shares of aggregate marketable net worth (England and Wales)

	Top 1% of households	Top 5% of adults
1670	48.9	84.6
1700	39.3	81.9
1740	43.6	86.9
1810	54.9	85.3

Source: Lindert (1998).

The above considerations suggest the conclusion that in the first half of the eighteenth century there was a process of redistribution to the benefit of the upper class,¹⁹ essentially made up of landowners and monied

¹⁹ Similar conclusions come out using life expectancy indices. Comparing life expectancy estimates of the peer done by Hollingsworth (1977) with those for the entire population done by Wrigley and Schofield (1981) we find that the gap between these two variables widened since the 1720s.

interests. This process is presumably to be attributed largely to the choices of successive governments, in particular Walpole's administration. One of the most important of these was undoubtedly fiscal policy, notably the extensive use of excise duty and debt to finance rising government spending.

Conclusions

In the work we have tried to explain why the delay in lowering the interest rate on English government debt after the Glorious Revolution is consistent with North and Weingast's thesis. It is a fact that the transfer of political power from the Crown to Parliament was followed not only by an increase in tax revenue but also by substantial changes in its composition, namely a significant increase in the share of excise taxes relative to total revenue.

Before the Glorious Revolution, Parliament was against the king having a predictable and reliable revenue, such as that raised by excise duty. The availability of this income would have allowed the king to count on continuous and abundant resources, freeing him from the need, in times of war, to convene Parliament to ask for authorization to increase taxes. Having a large amount of predictable and certain resources at his disposal, the king could maintain a standing army. This would have led to the risk of a significant strengthening of the power of the sovereign at the expense of Parliament.

By eliminating this risk the Glorious Revolution allowed the state to pursue the intensive growth of excise revenues. This policy choice was made by a coalition of interest groups represented in Parliament, namely the landowners and monied interests. These groups decided to set up a bureaucracy and increase the revenue from indirect taxes. By this decision the groups represented in Parliament shifted the tax burden of increasing public spending on to interest groups that had no political representation.

From this perspective, the coalition of landowners and monied interests was, therefore, not so much the result of the ability of the Whig Party to bring together different interest groups under a common religious denominator, as rather a concord of interests between the social groups represented in Parliament.

The growth of excise revenues, given the nature of these taxes, led to an increase not only in revenue, but also its degree of certainty and predictability. This brought about a reduction in the risk premium on

government debt, which in turn led to a sharp decrease in the rate of interest and a significant lengthening of the average expiry of loans to the English state.

Both landowners and monied interests drew benefit from this. The latter saw the probability of default reduced and, therefore, saw their property rights really protected. Landowners gained at least two advantages from the reconstruction of the sources of revenue of the English state in favour of excise duties. On the one hand, at least in relative terms they enjoyed a tax reduction: between 1714 and 1760 the share of direct taxes in total tax revenues fell from ... to ... percent. On the other hand, the expansion of public debt allowed the government to spread over time the coverage of massive military spending in times of war. It was possible, therefore, in these periods, to avoid recourse to marked increases in direct taxes.

The above considerations lead to the conclusion that the Glorious Revolution laid the conditions for the protection of property rights, primarily those of individuals with respect to the state. However, it was the policy choices of a coalition of interest groups that actually made possible the safeguarding of these rights. This coalition was formed from the groups represented in Parliament: these gave rise to an oligarchic government that tended to shift the tax burden deriving from increasing public expenditure on to interest groups that enjoyed no Parliamentary representation.

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