

11. English Debates over Interest Rates and Public Credit

Public lotteries do less harm than private ones but are contrary to the interest of the state; they wrong the public, taking the little money that they earn from their work, rendering them unhappy with their condition, and giving them the desire to enrich themselves by resorting to chance and fortune, the servants having no more money are tempted to steal from the master so as to have funds for the lotteries, and the bourgeois spend money on these lotteries that they should use for their business and to pay their creditors. It is certain that these projects should not be permitted in well run states. (John Law 1715)

What Interest Rate Theories?¹

Financial economics is concerned with how interest rates are used to determine the price of securities. The issue of how both the level and term structure of interest rates are determined falls more appropriately within the scope of other areas of economics, specifically macroeconomics and monetary theory. However, this subject also comes within the purview of the history of financial economics in various ways. One obvious example is that, prior to the mid-17th century, much analysis of interest rates was closely connected to the evolution of scholastic usury doctrine. The individuals writing on interest rate theories based their analysis on concepts that are systemic to financial economics. In addition, accurate interpretation of other interest rate theories, especially the mercantilist theories, requires understanding of the financial market practices that prevailed at the time. This requisite background has been developed in previous chapters.

Initially, discussion of interest rates was conducted almost exclusively within the scholastic context, for example, under what conditions is the taking of interest permitted? As the social acceptance of interest increased laws permitting the taking of interest were introduced, albeit with a maximum permitted interest rate. Once the social issue of taking interest was decided, discussion focused on: what was the permissible maximum interest rate? The development of economic thought on this issue roughly corresponds with the progress of legislation. For

example, in 1545 Henry VIII relaxed the usury laws of 1487 and 1495 to permit interest payments up to a maximum of 10%. The prohibition on interest was reintroduced by Edward VI only to be rescinded by Elizabeth I in 1571. The 10% maximum was in place until 1624 when James I reduced the rate to 8%. In 1660, this maximum was further lowered by Charles II to 6% and, in 1713, to 5% by Queen Anne.

The initial period associated with legislation permitting, prohibiting and then permitting interest corresponds with a 'legion' of texts and pamphlets, often by ecclesiastical writers, but also including writings such as Thomas Wilson, *A Discourse on Usury* (1572). While attention was predominately on the doctrinal and scholastic issues surrounding interest payments, there were writers, such as Wilson, with some crude insight into the variables and theoretical processes that determined interest rates. By the time of James I, theoretical analysis of interest rates had become decidedly more sophisticated. Though still crude by 18th century standards, writers such as Malyne and Mun had made considerable progress in recognizing the connection between the supply of money and the rate of interest. Haphazard connections were directly and indirectly made between factors determining the supply of money and the rate of interest.

By the latter part of the 17th century, there was a marked increase in sophistication in interest rate theories. Much of this analysis was explicitly directed at legislative proposals to lower the legal maximum rate of interest. Included in the debates of this period are important figures in the conventional pre-Smithian history of economic thought: John Locke and Josiah Child. This stage included Locke's seminal contribution identifying 'in abstract terms the relationship between the rate of interest and the quantity of money' (Keynes 1936, p.342). From the early 18th century until the publication of the *Wealth of Nations*, debates over maximum interest rate legislation were no longer the source of the most important contributions on interest rate determination, as evidenced in Richard Cantillon's *Essai* (1755), the most significant work of this later period.

The Mercantilist Contributions

Until the mercantilist writings, the study of interest rates was largely confined to questions concerning the legitimacy of loan interest. In the scholastic writings, various arguments were presented detailing the conditions under which the payment of interest was licit or illicit under this or that state of affairs. Theoretical analysis of the factors

determining a specific level of interest rates was seldom within the focus of discussion, except where the level was so high as to trigger social concerns. The onset of the Reformation turned the discussion into an open debate between those in favour and those hostile to the payment of interest. Again, the focus was on whether interest ought to be paid rather than the factors determining a specific level of interest rates. It is not until the writings of the mercantilists that well developed theories of interest rate determination start to be presented.

At the time of the watershed debate between Malyne, Mun, and Missleden during the 1620s, mercantilist views on interest rate determination were decidedly underdeveloped. Both Malyne and Missleden recognized that interest rate levels were determined by the availability of money, but did not develop the implications of interest rate changes for other parts of their analysis. For example, Missleden made general statements such as 'the remedy for usury may be plenty of money'. Similar generalities were proposed by Malyne. Yet, abatement of the maximum interest rate was discussed and, in 1624, the legal maximum was lowered from 10% to 8%. The public discussion surrounding this policy change marks the beginnings of substantive mercantilist analysis on the role of interest rates.

Arguably, the roots of mercantilist writings on interest rates can be traced to Sir Thomas Culpepper's *A Tract against Usury* (1621).² The 17th century was a period of transition regarding social acceptance of interest payments. At the beginning of the century, there was still the medieval concern with usury. Culpepper's *Tract*, which was published anonymously, starts with the observation, 'To leave the proofs of the unlawfulness of usury to divines, wherein a number, as well Protestants as Papists, have learnedly written, here is only to set down some arguments to show how great the hurt is it does to this Kingdom'. Having acknowledged the importance of the scholastic position on usury, the pamphlet proceeds to develop the general theme that: 'The high rate of usury decays trade'.

An important feature of the argument made by Culpepper's *Tract* is the identification of the economic success of the Dutch with their low interest rates, which were attributed to a combination of government policy and the high propensity to save among the frugal Dutch populous.³ Culpepper argued for legal restriction of interest rates to levels similar to those in Holland. Culpepper's *Tract* went into at least two further editions, including one printed by his son, who was also Sir Thomas Culpepper. The younger Culpepper also made his own contribution to the mercantilist debate on interest, *A Discourse, showing*

the many advantages which will accrue to this kingdom by the abatement of Usury... (1668). The 1668 reprint edition of the *Tract* was, almost certainly, the result of Sir Josiah Child publishing the original text of the *Tract* as an appendix to his *Brief Observations concerning trade, and interest of money*.

By the time of Child's *Brief Observations*, there had been a marked change in social acceptance of interest payments. Usage of the word 'usury' to refer to interest payments had largely disappeared and had been replaced with references to 'interest'. In conjunction, writings on the subject were no longer confined to practical musings advanced by prominent merchants. Individuals of academic stature, such as John Locke (1632-1704), became participants.⁴ Not surprisingly, the intellectual and theoretical content of the analysis increases significantly. The debate involving Child and John Locke over reduction in the legal maximum interest rate represents one of the first stages in the evolution of 'scientific economics', a subject that Letwin (1964) argues starts with the contributions of Sir William Petty (1623-1687).

Keynes on Mercantilist Interest Theories

Despite his considerable reputation in other areas of economics, Keynes had real limitations as a historian of economic thought. In particular, his interpretation of mercantilist economic theory contained in Chapter 23 of the *General Theory*, 'Notes on Mercantilism, the Usury Laws, Stamped Money and Theories of Under-Consumption', has been severely criticised by various experts on the subject. To quote de Roover (1949, p.287):

Perhaps I should have referred to the chapter which Lord Keynes of Tilton devotes to mercantilism in his book, *The General Theory of Employment, Interest and Money* ... I may shock many admirers of the late Lord Keynes by stating that his pronouncements on this subject are no credit to the great economist. This chapter is so full of inaccuracies and misinterpretations that I have preferred to ignore it.

In Chapter 23, Keynes draws heavily on quotes from the first edition of Hecksher's *Mercantilism* (1931) to support his argument. In the second edition of *Mercantilism* (1955), Hecksher includes an Appendix giving a detailed discussion of Chapter 23. While couched in polite terms, Hecksher's views on the limitations of Keynes's views on mercantilism are apparent.

Keynes (1936, p.341) makes substantial claims for the mercantilist theory of interest rates:

Mercantilist thought never supposed that there was a self-adjusting tendency by which the rate of interest would be established at the appropriate level. On the contrary they were emphatic that an unduly high rate of interest was the main obstacle to the growth of wealth; and they were even aware that the rate of interest depended on liquidity-preference and the quantity theory of money. They were concerned both with diminishing liquidity-preference and with increasing the quantity of money, and several of them made it clear that their preoccupation with increasing the quantity of money was due to their desire to diminish the rate of interest.

This sweeping statement is followed by a long quote from Hecksher purporting to support his interpretation.

A hint about Keynes's somewhat flimsy approach to historical analysis is provided by a subsequent discussion of 'the great Locke' who was 'perhaps, the first to express in abstract terms the relationship between the rate of interest and the quantity of money in his controversy with Petty'. The controversy at issue was between Locke and Child, with Petty playing, at best, a minor role. Blaug (1978, pp.18-24) and others find little of interest in mercantilist interest theory, other than the so-called 'Mercantilist Dilemma'.⁵ Speaking directly to Keynes's views on mercantilist, Blaug (p.15) observes:

No doubt the English economists of the 17th and 18th centuries often sound like precursors of Keynes. They railed against 'locking up money', converting it into 'dead stock'; they urged spending on luxury goods and proposed public works programs to relieve 'super numeraries'; and the frequency with which statements concerning the desirability of bullion were associated with a belief in its employment-producing effect is indeed striking. But this is not to say that the writers of this period had a pre-Keynesian appreciation of the problem of effective aggregate demand. Keynes' defense of mercantilism seems to rest in part on the modern inference that a persistently favourable balance of trade must be associated with the export of capital as an offsetting item, thus absorbing excess savings at home. But foreign investment plays no role in mercantilist analysis, and there are no instances of arguments in favour of maintaining a steady flow of investment before James Steuart, writing in the 1760s. The basic flaw in Keynes's interpretation, however, as Hecksher points out in his critique of Keynes's 'Notes on Mercantilism', is the belief that unemployment in the mercantilist era was similar in character to technological and cyclical unemployment recurrent in industrialized economies.

Blaug (p.16) sums up Keynes's interpretation of mercantilism as 'unhistorical'.

In a detailed examination of Keynes's views, Hecksher (1955) directly criticises Keynes at various levels. Writing at a time when Keynes's idea were still being digested, Hecksher (1955, p.350) even questions the validity of Keynes's model of interest rates and liquidity preference:

We must now turn our attention to the question of the supply of money. When, as with Keynes, interest is expressly regarded as interest on money and the level of interest as determined by the quantity of money, then the actual supply of money or purchasing power, must be taken to be the historically determining factor. If there is an adequate supply of the means of payment, then, no matter how great 'liquidity preference' may be, according to this line of thought the needs of the economy will always be satisfied ... As far as I can see, Keynes gives no indications which would help one to decide what he regards as positive criteria of an adequate supply of the means of payment, other than changes in the rate of interest itself; but in order to use this as a criterion, it is necessary to start by assuming what we are trying to prove, i.e., by accepting the validity of the theory itself. This is obviously unsatisfactory.

Despite all this, it is difficult, at this juncture, to find much fault with Keynes, even though liberties have apparently been taken with the historical facts. The basic point is that Keynes, himself, felt a greater affinity with the mercantilists than the classicals. Given the profound impact that Keynes has had on modern economic thinking, this is a more essential observation than questioning his abilities as a historian of economic thought. While a number of attempts have been made, a fully adequate analysis of the connection between Keynes and the mercantilists has yet to be written.

Cantillon and the Loanable Funds Theory

Cantillon's contribution to interest rate theory is connected to his resolution of the 'mercantilist dilemma' surrounding the quantity theory of money (Blaug 1978, pp.18-24). Though typical of most mercantilists, the dilemma can be illustrated by Thomas Mun who maintained that 'all men do consent that plenty of money in a Kingdom doth make the native commodities dearer' and 'as plenty of money makes wares dearer, so dear wares decline in their use and consumption'. The dilemma arises because this negative view of increasing money stocks is in opposition to the standard mercantilist

policy prescription of pursuing an export surplus to increase the stock of money. Mercantilists did not generally advocate inflation, a result that the quantity theory of money would suggest is the likely outcome of the export surplus doctrine.

The resolution of the mercantilist dilemma is that mercantilists did not adhere to the quantity theory of money that, from the equation of aggregate exchange, $MV = PT$, requires a stable velocity of money, V , and a volume of trade, T , which is determined by real forces, allowing changes in the money stock, M , to produce changes in the aggregate price level, P . More precisely, a central tenet of mercantilism, of both the early and later variety, was that 'money stimulates trade'. Hence, changes in M impact on T leaving P relatively unchanged. Cantillon extended this approach substantially by observing that the impact of M on T and P depends on the process by which the increase in M is generated, the 'Cantillon effect'. If the source is from domestic mine output, the impact will likely fall on P with little impact on T . If the source is an export surplus, then an increase in T will benefit disproportionately. Even if an export surplus does have some impact on P , this will tend to make the terms of trade more favourable, increasing the potential for future export surpluses. Cantillon also recognized that different types of M increases will lead to different types of relative price changes.

Even if Cantillon did not fully subscribe to the 'money stimulates trade' orthodoxy, he was still a mercantilist at heart (Brewer 1988). He argued forcefully for regulation of foreign trade by 'examining the results of each branch of commerce singly' and his rationale for this position still has modern implications:

It will always be found by examining particular cases that the exportation of all manufactured articles is advantageous to the state, because in this case the foreigner always pays and supports workmen useful to the state, that the best returns or payments imported are specie, and in default of specie the produce of foreign land into which there enters the least labour.

Despite advocating one of the central propositions of mercantilism, the Cantillon effect had dramatic consequences for the mercantilist theory of interest rates. In effect, Cantillon has moved into a theoretical realm dramatically different from that of the early mercantilists who provided the intellectual foundation connecting foreign exchange, interest rates and national objectives.

Keynes's views notwithstanding, mercantilists did generally subscribe to a monetary theory of interest rates. Statements such as Malyne's, 'Plenty of money decreaseth usury in price and rate' or Misselden's 'The remedy for Usury may be plenty of money', are indicative of the accepted view. Interest is the cost of borrowing money and, as Cantillon summarized the prevailing mercantilist view (1755, p.213):

It is a common idea, received of all those who have written on Trade, that the increased quantity of currency in a State brings down the price of Interest there, because when Money is plentiful it is more easy to find some to borrow. This idea is not always true or accurate.

Cantillon attacked the inadequacy of monetary interest rate theories and proposed a loanable funds model that, ultimately, is a real interest model. More precisely, the rate of interest results from an equilibrium of the demand for loanable funds, dependent on a combination of the profitability of commercial investment and the propensities of the landed classes, and the supply of loanable funds, dependent on the level and distribution of national wealth.

Further Debates on Legal Maximum Interest Rates⁶

A fundamental proposition of modern financial economics is that interest rates for fixed income securities can be determined by adding an appropriate risk premium to a riskless rate of interest, which is often empirically identified with the rate on short-term government securities. In the form of the capital asset pricing model, this proposition is extended to where the expected return on any capital asset is equal to the riskless rate of interest plus an additional return associated with the systematic or market risk of the asset. This approach, which identifies the riskless rate with the return on a government security, is diametrically opposed to classical and neoclassical economic orthodoxy where the rate of interest is governed by the 'profits of stock' (Hume 1742) or 'the price of private capital'.

These two distinct methods of determining the rate of interest are the source of many differences and confusions in modern economics. Despite having gained so much from the earlier debate between Locke and Child over the maximum legal rate of interest, it is unfortunate from a modern perspective that more attention has not been given to the debates of 1737 surrounding Sir John Barnard's proposal to again lower the legal maximum interest rate (Dickson 1967, ch. 19). To quote

Barnard, a central feature of Barnard's argument in favour of such a reduction was: 'the rate of interest upon public securities has always had, and always will have, a great influence upon the rate of interest between man and man'. This was an empirical fact that 'no gentlemen will question'. The policy prescription was apparent: 'the natural rate of interest upon public securities will always be lower than the natural rate of interest upon private; therefore the only method of reducing the latter is to reduce the former'.

Unfortunately for Barnard's legislative proposal, numerous 'gentlemen' did question Barnard's empirical assumptions about the relationship between private and public natural rates of interest and the bill was defeated. Despite this lack of success, the level of debate over the correct specification of the interest rate generating process had moved well beyond the Locke-Child controversy of the Charles II period (Dickson 1967, pp.479-80):

What sort of argument might Barnard have used to support his thesis? Perhaps it could have run something like this. Over a given period a given flow of savings becomes available for lending. Part of this will, assuming sufficient security, be invested in government stock, the rest will go to private borrowers. As the market yield on government stock falls, owing to this steady new demand for it, some investors will switch their funds into private loans in order to get a higher return. The more the yield on government stock falls, the more this process will occur. The rates paid by private borrowers will therefore tend to decline in step with the yield on government stock, but at one stage behind it. An individual private lender cannot afford to ignore this state of affairs and charge a very high rate since there will always be other lenders who will charge a more reasonable one in order to obtain the business.

While modern economists would likely be appalled at arguments seeking to restrict the maximum possible interest rate, the sophistication of the arguments being made deserve recognition.

Adam Smith and the Financial Revolution

Like David Hume before him, Adam Smith was concerned about the political and economic implications of the Financial Revolution in government debt. In Book V, Chapter 3, of the *Wealth of Nations*, Smith provides a detailed chronology and commentary on the Financial Revolution. Smith commences with a brief review of the government borrowing programme:

David Hume on the Disadvantages the Public Debt

David Hume's essay "Of Public Credit" is a well reasoned account of the evils associated with the Financial Revolution. Numerous themes identified in this essay, such as the relationship between interest payments on the debt and 'The taxes which are levied to pay the interest of these debts'. Hume (1742, pp.359-60) provides the following list of 'the many disadvantages which attend our public debts':

First, It is certain that national debts cause a mighty confluence of people and riches to the capital, by the great sums levied in the provinces to pay the interest, and perhaps, too, by the advantages in trade ... which they give the merchants in the capital above the rest of the kingdom. The question is, Whether, in our case, it be for the public interest that so many privileges should be conferred on London, which has already arrived at such an enormous size, and seems still increasing? Some men are apprehensive of the consequences. For my own part, I cannot forbear thinking, that, though the head is undoubtedly too large for the body, yet that great city is so happily situated, that its excessive bulk causes less inconvenience than even a smaller capital to a greater kingdom. There is more difference between the prices of all provisions in Paris and Languedoc, than between those in London and Yorkshire. The immense greatness, indeed, of London, under a government which admits not of discretionary power, renders the people factious, mutinous, seditious, and even perhaps rebellious. But to this evil the national debts themselves tend to provide a remedy. The first visible eruption, or even an immediate danger of public disorders, must alarm all the stockholders, whose property is the most precarious of any, and will make them fly to the support of government, whether menaced by Jacobitish violence, or democratical frenzy.

(cont'd)

During the reigns of king William and queen Anne, large sums were frequently borrowed upon annuities for terms of years, which were sometimes longer and sometimes shorter. In 1693, an act was passed for borrowing one million upon an annuity of fourteen per cent., or of 140,000 l. a year, for sixteen years. In 1691, an act was passed for borrowing a million upon annuities for lives, upon terms which in the present times would appear very advantageous. But the subscription was not filled up. In the following year the deficiency was made good by borrowing upon annuities for lives at fourteen per cent., or at little

more than seven years' purchase. In 1695, the persons who had purchased those annuities were allowed to exchange them for others of ninety-six years, upon paying into the Exchequer sixty-three pounds in the hundred; that is, the difference between fourteen per cent. for life, and fourteen per cent. for ninety-six years, was sold for sixty-three pounds, or for four and a half years' purchase. Such was the supposed instability of government, that even these terms procured few purchasers. In the reign of queen Anne, money was upon different occasions borrowed both upon annuities for lives, and upon annuities for terms of thirty-two, of eighty-nine, of ninety-eight, and of ninety-nine years. In 1719, the proprietors of the annuities for thirty-two years were induced to accept in lieu of them South Sea stock to the amount of eleven and a half years' purchase of the annuities, together with an additional quantity of stock equal to the arrears which happened then to be due upon them. In 1720, the greater part of the other annuities for terms of years both long and short were subscribed into the same fund. The long annuities at that time amounted to 666,821 l. 8s. 3 1/2d. a year. On the 5th of January, 1775, the remainder of them, or what was not subscribed at that time, amounted only to 136,453 l. 12s. 8d.

David Hume on the Disadvantages the Public Debt
.... (cont'd)

Secondly, Public stocks, being a kind of paper credit, have all the disadvantages attending that species of money. They banish gold and silver from the most considerable commerce of the state, reduce them to common circulation, and by that means render all provisions and labour dearer than otherwise they would be.

Thirdly, The taxes which are levied to pay the interest of these debts are apt either to heighten the price of labour, or to be an oppression of the poorer sort.

Fourthly, As foreigners possess a great share of our national funds, they render the public in a manner tributary to them, and may in time occasion the transport of our people and our industry.

Fifthly, The greater part of the public stock being always in the hands of idle people, who live on their revenue, our funds, in that view, give great encouragement to an useless and inactive life.

Attention then shifts to an analysis of the demand for the various types of government securities that were on offer:

During the two wars which begun in 1739 and in 1755, little money was borrowed either upon annuities for terms of years, or upon those for lives. An

annuity for ninety-eight or ninety-nine years, however, is worth nearly as much money as a perpetuity, and should, therefore, one might think, be a fund for borrowing nearly as much. But those who, in order to make family settlements and to provide for remote futurity, buy into the public stocks, would not care to purchase into one of which the value was continually diminishing; and such people make a very considerable proportion both of the proprietors and purchasers of stock. An annuity for a long term of years, therefore, though its intrinsic value may be very nearly the same with that of a perpetual annuity, will not find nearly the same number of purchasers. The subscribers to a new loan, who mean generally to sell their subscription as soon as possible, prefer greatly a perpetual annuity redeemable by parliament, to an irredeemable annuity for a long terms of years of only equal amount. The value of the former may be supposed always the same, or very nearly the same; and it makes, therefore, a more convenient transferable stock than the latter.

Smith's empirical observation that a redeemable perpetual annuity was more marketable than a long-term irredeemable annuity seems odd. He possibly means that the redemption feature would have value but the enhanced liquidity of the perpetual would be sufficient to offset the premium such that the 'value of the former may be supposed always the same or very nearly the same'.

Smith now turns his attention to life annuities, a subject that had been explored in considerable theoretical detail by his time:

Annuities for lives have occasionally been granted in two different ways; either upon separate lives, or upon lots of lives, which in French are called Tontines, from the name of their inventor. When annuities are granted upon separate lives, the death of every individual annuitant disburthenes the public revenue so far as it was affected by his annuity. When annuities are granted upon tontines, the liberation of the public revenue does not commence till the death of all the annuitants comprehended in one lot, which may sometimes consist of twenty or thirty persons, of whom the survivors succeed to the annuities of all those who die before them; the last survivor succeeded to the annuities of the whole lot. Upon the same revenue more money can always be raised by tontines than by annuities for separate lives. An annuity, with a right of survivorship, is really worth more than an equal annuity for a separate life, and from the confidence which every man naturally has in his own good fortune, the principle upon which is founded the success of all lotteries, such an annuity generally sells for some thing more than it is worth. In countries where it is usual for government to raise money by granting annuities, tontines are upon this account generally preferred to annuities for separate lives. The expedient which will raise most money, is almost always preferred to that which is likely to bring about in the speediest manner the liberation of the public revenue.

Smith was familiar with the both the French and English government usage of life annuities in government finance:

In France, a much greater proportion of the public debts consists in annuities for lives than in England. According to a memoir presented by the parliament of Bourdeaux to the king in 1764, the whole public debt of France is estimated at twenty-four hundred millions of livres; of which the capital for which annuities for lives had been granted, is supposed to amount to three millions, the eighth part of the whole public debt. The annuities themselves are computed to amount to thirty millions a year, the fourth part of one hundred and twenty millions, the supposed interest of that whole debt. These estimations, I know very well, are not exact, but having been presented by so very respectable a body as approximations to the truth, they may, I apprehend, be considered as such. It is not the different degrees of anxiety in the two governments of France and England for the liberation of the public revenue, which occasions this difference in their respective modes of borrowing. It arises altogether from different views and interests of the lenders.

In England, the seat of government being in the greatest mercantile city in the world, the merchants are generally the people who advance money to government. By advancing it they do not mean to diminish, but, on the contrary, to increase their mercantile capitals; and unless they expected to sell with some profit their share in the subscription for a new loan, they never would subscribe. But if by advancing their money they were to purchase, instead of perpetual annuities, annuities for lives only, whether their own or those of other people, they would not always be so likely to sell them for a profit. Annuities upon their own lives they would always sell with loss; because no man will give for an annuity upon the life of another, whose age and state of health are nearly the same as his own, the same price which he would give for one upon his own. An annuity upon the life of a third person, indeed, is, no doubt, of equal value to the buyer and the seller; but its real value begins to diminish from the moment it is granted, and continues to do so more and more as long as it subsists. It can never, therefore, make so convenient a transferable stock as a perpetual annuity, of which the real value may be supposed always the same, or very nearly the same.

In France the seat of government not being in a great mercantile city, merchants do not make so great a proportion of the people who advance money to government. The people concerned in the finances, the farmers general, the receivers of the taxed which are not in farm, the court bankers, &c. make the greater part of those who advanced their money in all public exigencies. Such people are commonly men of mean birth, but of great wealth, and frequently of great pride. They are too proud to marry their equals, and women of quality disdain to marry them. They frequently resolve, therefore, to live bachelors, and having neither any families of their own, nor much regard for those of their relations, whom they are not always very fond of acknowledging, they desire only to live in splendour during their own time, and are not unwilling that their fortune should end with themselves. The number of rich

people, besides, who are either averse to marry, or whose condition of life renders it either improper or inconvenient for them to do so, is much greater in France than in England. To such people, who have little or no care for posterity, nothing can be more convenient than to exchange their capital for a revenue, which is to last just as long, and no longer than they wish it to do.

Smith's sociological explanation for the different usage of life annuities by the French and English governments is particularly novel, if not overly convincing. Presumably Smith was unaware of the Genevan banker syndicates and other syndicates involved in purchasing French government life annuities using pools of nominees. Perhaps the decidedly poor pricing of the French life annuities, decidedly in favour of a typical purchaser in the lower age brackets, also played an important role?

At this point, Smith shifts from a discussion focused primarily on financial securities, a subject that is not his strong point, to concerns more related to political economy. The difference in the quality of the analysis is striking:

The ordinary expense of the greater part of modern governments in time of peace being equal or nearly equal to their ordinary revenue, when war comes, they are both unwilling and unable to increase their revenue in proportion to the increase of their expense. They are unwilling, for fear of offending the people, who by so great and so sudden an increase of taxes, would soon be disgusted with the war; and they are unable, from not well knowing what taxes would be sufficient to produce the revenue wanted. The facility of borrowing delivers them from the embarrassment which this fear and inability would otherwise occasion. By means of borrowing they are enabled, with a very moderate increase of taxes, to raise, from year to year, money sufficient for carrying on the war, and by the practice of perpetual funding they are enabled, with the smallest possible increase of taxes, to raise annually the largest possible sum of money. In great empires the people who live in the capital, and in the provinces remote from the scene of action, feel, many of them, scarce any inconveniency from the war; but enjoy, at their ease, the amusement of reading in the newspapers the exploits of their own fleets and armies. To them this amusement compensates the small difference between the taxes which they pay on account of the war, and those which they had been accustomed to pay in time of peace, which puts an end to their amusement, and to a thousand visionary hopes of conquest and national glory, from a longer continuance of the war.

Smith recognizes that gains associated with the Financial Revolution have largely served to perpetuate the government's ability to wage war. Smith continues with a rather damning assessment of the sinking fund:

The return of peace, indeed, seldom relieves them from the greater part of the taxes imposed during the war. These are mortgaged for the interest of the debt contracted in order to carry it on. If, over and above paying the interest of this debt, and defraying the ordinary expense of government, the old revenue, together with the new taxes, produce some surplus revenue, it may perhaps be converted into a sinking fund, even supposing it should be applied to no other purpose, is generally altogether inadequate for paying, in the course of any period during which it can reasonably be expected that peace should continue, the whole debt contracted during the war; and, in the second place, this fund is almost always applied to other purposes.

The new taxes were imposed for the sole purpose of paying the interest of the money borrowed upon them. If they produce more, it is generally something which was neither intended nor expected, and is therefore seldom very considerable. Sinking funds have generally arisen, not so much from any surplus of the taxes which was over and above what was necessary for paying the interest or annuity originally charged upon them, as from a subsequent reduction of that interest. That of Holland in 1655, and that of the ecclesiastical state in 1685, were both formed in this manner. Hence the usual insufficiency of such funds.

During the most profound peace, various events occur which require an extraordinary expense, and government finds it always more convenient to defray this expense by misapplying the sinking fund than by imposing a new tax. Every new tax is immediately felt more or less by the people. It occasions always some murmur, and meets with some opposition. The more taxes may have been multiplied, the higher they may have been raised upon every different subject of taxation; the more loudly the people complain of every new tax, the more difficult it becomes too either to find out new subjects of taxation, or to raise much higher the taxes already imposed upon the old. A momentary suspension of the payment of debt is not immediately felt by the people, and occasions neither murmur nor complaint. To borrow of the sinking fund is always an obvious and easy expedient for getting out of the present difficulty. The more the public debts may have been accumulated, the more necessary it may have become to study to reduce them, the more dangerous, the more ruinous may be to misapply any part of the sinking fund; the less likely is the public debt to be reduced to any considerable degree, the more likely, the more certainly is the sinking fund to be misapplied towards defraying all the extraordinary expenses which occur in time of peace. When a nation is already overburdened with taxes, nothing but the necessities of a new war, nothing but either the animosity of national vengeance, or the anxiety for national security, can induce the people to submit, with tolerable patience, to a new tax. Hence the usual misapplication of the sinking fund.

In Great Britain, from the time that we had first recourse to the ruinous expedient of perpetual funding, the reduction of the public debt in time of peace, has never borne any proportion to its accumulation in time of war. It was in the war which began in 1688, and was concluded by the treaty of Ryswick in 1697, that the foundation of the present enormous debt of Great Britain was laid.

Smith's concerns with high and increasing taxes combined with use of government debt to facilitate the imposition of further taxes are echoed in modern times.

The Sinking Fund Debate

The sinking fund debate is so far removed from modern political realities that it is difficult to grasp all the subtleties associated with financial debates during the early part of the Financial Revolution in England (Dickson 1967). Methods for managing the national debt were still in the exploratory stage. The sinking fund was a proposal with inherent value, which was to be ultimately defeated by political expediency. The debate itself is of considerable interest as it included contributions from individuals such as David Hume and Richard Price. Being both in favour of a sinking fund, these individuals supported what was, eventually, to be a losing intellectual position. Yet, much of their underlying reasoning was sound, such as their profound concern over the future tax implications of inadequately funded government debt. The public debt was still of interest by the time of the *Wealth of Nations*, though Smith (Bk. V, Ch. 3, pp. 868) considered the sinking fund to warrant only a passing negative comment.

The sinking fund was a government funding mechanism designed to ensure that old debts would be retired.⁷ These debts were often accumulated during periods of protracted national hostilities. During breaks in hostilities, there was a need to paydown the outstanding debt in order, at the least, to have sufficient borrowing capacity to sustain government military expenditure during the next outbreak of hostilities. This military backdrop was combined with the practice of tying payments on debt issue to specific sources of tax revenue. Over time, this led to a spiralling upward of the stock of debt, interest payments on that stock, and the funding taxes used to make the debt payments. For example, consider the British debt situation at selected years prior to the appearance of the *Wealth of Nations*, shown in Table 11.1.

The sinking fund was a technical response to an overwhelming public concern with the repayment of national debts, incurred primarily during times of war. The first version of the scheme appeared in two Bills that received royal assent in 1717. Price (1772, p. 126) captures the public perception of these funds:

The sinking fund was established in the year 1716, or soon after the accession of the present family, at a time when the public debts, tho' not much (more)

than a third of what they are now, were thought to be more considerable as to be alarming and dangerous. It was intended as a SACRED DEPOSIT never to be touched; the law which established it declaring, that it was to be applied in the payment of the principal and interest of such national debts and incumbrances, as had been incurred before the 25th of December 1716.

The sinking fund was much more than a technical scheme to Price, Hume and those strong proponents of the plan. The sinking fund was a promise, from the government of the day to the taxpayers, to eliminate the future tax burden arising from excessive government debt.

Table 11.1 Debt and taxes in Britain, 1740–1775 (in £'000s)

Year	Taxes	Debt Payments	
		Total	Funded
1740	5,745	2,102	1,790
1753	7,338	2,762	2,394
1764	10,221	4,887	4,230
1775	11,112	4,674	4,010

Source: Weir (1989)

Price (1772, p.107) took a particularly jaded view of the progress of the national debt:

At the Revolution, an era in other respects truly glorious, the practice (of raising the necessary supplies for every national service by borrowing money at interest) began. Even since, the public debt has been increasing fast, and every new war has added much more to it, than was taken from it, during the preceding period of peace. In the year 1700, it was 16 millions. In 1715, it was 55 millions. A peace, which continued till 1740, sunk it to 47 millions; but the succeeding war increased it to 78 millions; and the next peace sunk it to no lower than 72 millions. In the *last* war it rose to 148 millions; and, at a few millions less than this sum it now stands, and probably will stand, 'till another war raises it perhaps to 200 millions — *One cannot reflect on this without terror.* (emphasis added)

To this was added a feeling of betrayal about the promise of the sinking fund (p.129):

The faith of *parliament* ... as well as the security of the kingdom, seemed to require, that (the sinking fund) should be preserved carefully and rigorously

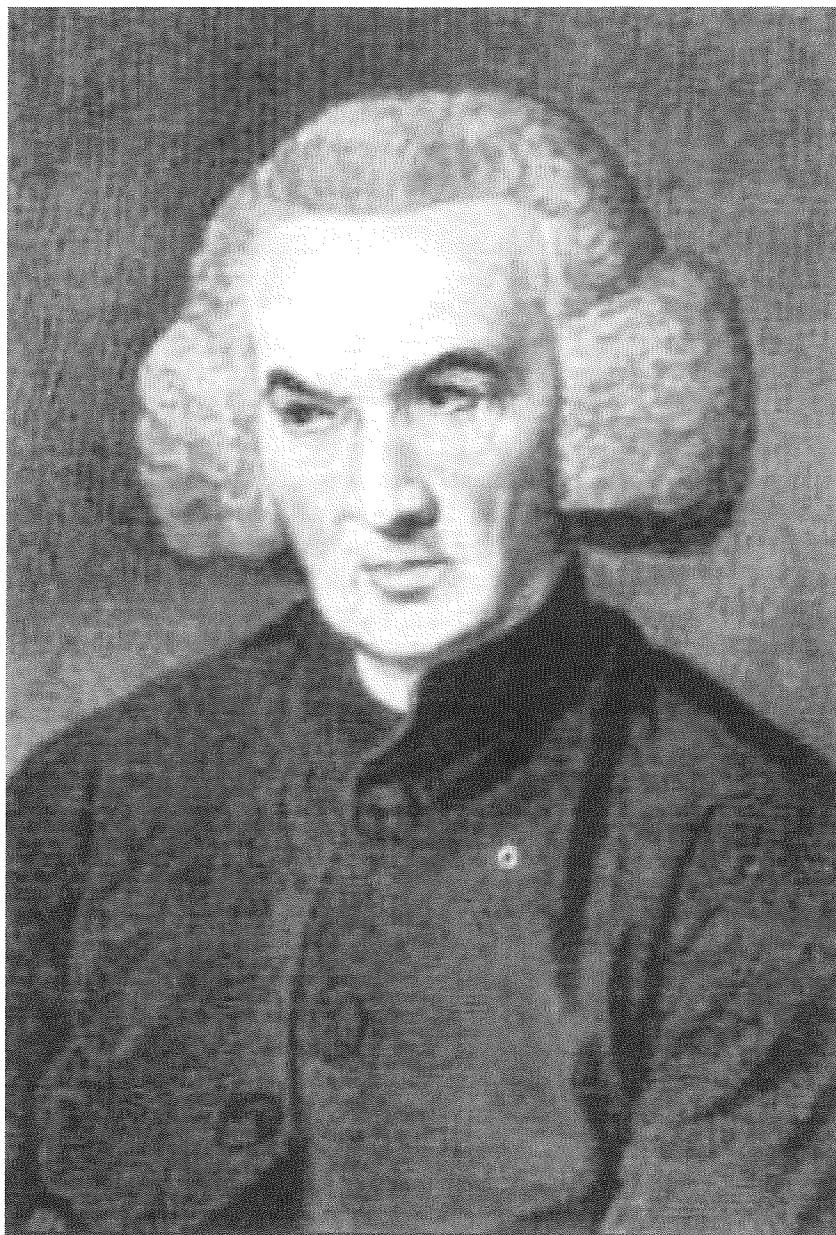
from alienation. But, notwithstanding this, it has been *generally* alienated; and the produce of it employed, in helping to defray such expenses as the exigencies of the state rendered necessary.

In essence, the sinking fund debates had two somewhat distinct tracks. One track was concerned with the practicality of the sinking fund, whether the concept was capable of achieving the goals that had been set out. Another track was concerned with deeper philosophical issues, dealing with the conduct of government policy. Modern economic pundits would do well to consider the insights contained in the sinking fund debate, particularly the connection between debt levels and future tax burdens.

Who was Richard Price?

To say that Richard Price (1723-1791) (Figure 11.1) was a remarkable individual is an understatement. He was a caricature for English intellectual achievement in the 18th century. Price's writings stretch from the political realm, where *Observations on the Nature of Civil Liberty, the Principles of Government, and the Justice and Policy of the War with America* (1776) had a profound influence on the American forefathers, to the religious realm, where *The Importance of Christianity, the Nature of Historical Evidence and Miracles* (1768) established his 'reputation as a theologian with a new view of morals and religion' (Pearson 1978, p.378), to actuarial science, where *Observations on Reversionary Payments* (1771) has been recognized as 'perhaps the most remarkable textbook ever issued on actuarial science'.

Richard Price was, first and foremost, a minister. Born in 1723, Price was the son, by a second marriage, to Rees Price: 'The early influences on him were the severe Calvinism of the father and the gentle character of his beautiful and delightful mother.' As it turns out, being raised and educated as a dissenter was to pay real dividends for Price. At a relatively young age, Price was obliged to make his own way in the world and decided he would seek the help of his uncle in London. It was in London, studying at the dissenting academy founded by one Mr Coward, Price had the good fortune to be instructed by John Eames (1685-1744), FRS, a good mathematician and friend of Isaac Newton. 'Thus it came about that Richard got an education of university standard, especially in mathematics and theology, possible a better education than he would have received at the universities' (Pearson 1978).

Figure 11.1 Richard Price

From the time of his graduation from the academy in 1744 until 1756, Price served as a family chaplin. During this time he was able to make an important contribution to moral philosophy, *A review of the principal questions and difficulties in morals*, a companion piece for the important works of David Hume that appeared around this time. In 1756, Price came into a substantial legacy and, with the improvement in his fortunes, Price was able to get married and dedicate even more time to his studies. One of the intellectual tasks that Price undertook was to edit and prepare for submission to the Royal Society, the papers of Thomas Bayes, FRS. Like Price, Bayes was a dissenting minister, and a more than competent mathematician. It was Price, in a letter dated Nov. 10, 1763, who communicated to the Royal Society the contents of a theorem that Price had unearthed. That letter contained the now famous Bayes Theorem.

Formal academic recognition came to Price in 1765 with his election to the Royal Society. The degree of Doctor of Divinity was conferred on him by Marischal College, Aberdeen, in 1767. All of this had been achieved prior to Price's involvement with the Equitable Society, which started in 1768. What is perhaps his most important intellectual contribution, *Observations on Reversionary Payments* (1772), was still to come, as was his most important political and social contribution, his support and participation on the American side in the American Revolution. At the end of his life, Price also came out in support of the French Revolution (Figure 11.2), an event that eventually evolved into a blood-bath. However, Price died in 1791 before the French Revolution could take its darkest turns. In the end: 'Price was a mild and gentle man whose strength of character led him into a position of great authority, yet without any trace of self-seeking. In some ways he was remarkably far-sighted and in other remarkably wrong-headed, but with it all honest and candid' (Ogborn 1962, p.97).

Opinions on the Sinking Fund

David Hume (1742, p.355) claims that the preconditions for a sinking fund could be found in the ancient civilizations: 'It appears to have been the common practice of antiquity, to make provision, during peace, for the necessities of war, and to hoard up treasures beforehand as the instruments either of conquest or defence; without trusting to extraordinary impositions, much less to borrowing in times of disorder and confusion.' Hume was deeply concerned about the accumulating English government debt, and the practices that were being used to

Ogborn (1962) on the Prehistory of Richard Price

Ogborn (1962) is concerned with the history of the Equitable Life Assurance Society. Because Richard Price played such an important early role in the Equitable Ogborn (1962, p.85) spent some time exploring the prehistory of Richard Price:

The intellectual and spiritual background of Richard Price derived from the Act of Uniformity of 1662, when clergymen who could not, for conscience' sake, subscribe to the Articles of the Church of England, were ejected from their livings and began to minister in barns and farmhouses to those of their flock who followed them. Such clergymen might be supported by a few wealthy families and often took up teaching as a means of supporting themselves. One of these clergymen was Samuel Jones, vicar of Llangynwyd in Glamorgan who, after his ejection, ministered to congregations meeting in Brynillywarch, a farmhouse belonging to his father-in-law, and in neighbouring farmhouses. These congregations afterwards built meeting-houses in Bridgend and Bettws. Among the influential families to whom he ministered were the Prices of Tynton. Two sons of this family were so influenced by him that they followed him into the ministry; the elder brother, Rees Price succeeded him at Brynillywarch and the younger brother, Samuel Price, became a co-pastor with Isaac Watts in St. Mary Axe, Bury Street, London.

manage that debt: 'our modern (18th century) expedient, which has become very general, is to mortgage the public revenues, and to trust that posterity will pay off the incumbrances contracted by their ancestors ... the abuses of mortgaging are ... certain and inevitable: poverty, impotence and subjection to foreign powers' (p.356).

In a statement that foreshadows modern times, Hume (1742, p.357) clearly saw the dangerous incentives that unrestrained borrowing presented to politicians:

It is very tempting to a minister to employ (public borrowing as) as an expedient, as it enables him to make a great figure during his administration, without overburdening the people with taxes, or exciting any immediate clamours against himself. The practice, therefore, of contracting debt, will almost infallibly be abused in every government. It would scarcely be more imprudent to give a prodigal son a credit in every banker's shop in London, than to empower a statesman to draw bills, in this manner, upon posterity.

Adam Smith on the Sinking Fund

In the *Wealth of Nations*, Book V, Chapter 3, Smith makes a reasoned argument about limitations of the sinking fund. Judging from his negative view on this subject, Smith appears to feel that the sinking fund is a non-starter:

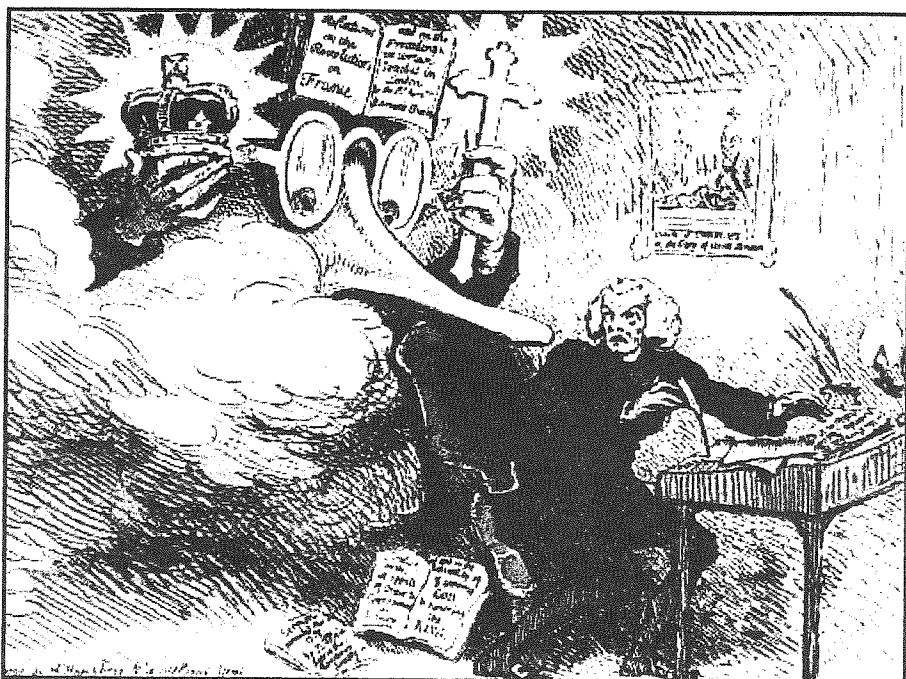
During the reign of queen Anne, the market rate of interest had fallen from six to five per cent., and in the twelfth year of her reign five per cent. was declared to be the highest rate which could lawfully be taken for money borrowed upon private security. Soon after the greater part of the temporary taxes of Great Britain had been rendered perpetual, and distributed into the Aggregate, South Sea, and General Funds, the creditors of the public, like those of private persons, were induced to accept of five per cent. for the interest of their money, which occasioned a saving of one per cent. Upon the capital of the greater part of the debts which had been thus funded for perpetuity or of one-sixth of the greater part of the annuities which were paid out of the three great funds above mentioned. This saving left a considerable surplus in the produce of the different taxes which had been accumulated into those funds, over and above what was necessary for paying the annuities which were now charged upon them, and laid the foundation of what has since been called the Sinking Fund. In 1717, it amounted to 323,434 l. 7s. 7 1/2d. In 1727, the interest of the greater part of the public debts was still further reduced to four per cent., which reductions still further augmented the sinking fund.

A sinking fund, though instituted for the payment of old, facilitates very much the contracting of new debts. It is a subsidiary fund always at hand to be mortgaged in aid of any other doubtful fund, upon which money is proposed to be raised in any exigency of the state. Whether the sinking fund of Great Britain has been more frequently applied to the one or to the other of those two purposes, will sufficiently appear by and by.

To Hume, the stakes in the public debt were immense: 'It must, indeed, be one of these two events; either the nation must destroy public credit, or public credit will destroy the nation. It is impossible that they can both subsist, after the manner they have been hitherto managed, in this, as well as in some other countries' (p.366).

Why was Hume so adamant about the dangers inherent in the public debts? Others writing around this time were decidedly in favour of the

Figure 11.2 An 18th century cartoon about Richard Price, questioning his loyalty to the English crown due to his sympathies in the French Revolution



public debt, or at least not overly concerned. For Hume, the situation was apparent and dangerous. A hint is provided in a discussion about 'a scheme for the payment of our debts, which was proposed by an excellent citizen, Mr Hutchison, about thirty years ago, and which was much approved by some men of sense' (p.366). Hume hypothesizes that (p.367):

it is not altogether improbable that when the nation becomes heartily sick of their debts, and is cruelly oppressed by them, some daring projector may arise with visionary schemes for their discharge. And as public credit will begin, by that time, to be a little frail, the least touch will destroy it, as happened in France during the regency; and in this manner it will *die of the doctor*.

Evidently, the memory of John Law was still fresh in Hume's mind.

Judged from a modern perspective, Richard Price would seem to have taken a 'wrong-headed' position on the Sinking Fund. Richard Price (1723-1791) did not turn his attention to political and economic matters until somewhat latter in life. Pearson (1978, p.381) hypothesizes that Lord Shelburne may have been a key motivator in getting Price to shift his attentions from writing on religious matters. In any event, some two or three years after Price became well acquainted with Shelburne, *An Appeal to the Public on the Subject of the National Debt* (1771). Price (*Observations*, p.xii) says the following about the Sinking Fund Debate:

there is no part of this work in which the public is so much concerned, as the 3rd Chapter ('Of Public Credit and the National Debt'). It will be there proved, that had the sums raised for public services since the REVOLUTION, been much greater than they have been, the increase in the public debts to their present state might have been prevented in the easiest manner, and at a trifling expense.

Like Hume before him, Price viewed the sinking fund as a mechanism for eliminating the future burden of the public debt. More than a technical financial mechanism, the sinking fund contained a promise from the government to exercise prudence and fiscal responsibility, aiming to achieve an ultimate goal of eliminating the government debt.

In a detailed examination of the 'schemes for paying off the capitals which entitle public creditors to annuities', Thomas Mortimer (1774) effectively dismantles the arguments of Hume, Price and others regarding the public credit, in general, and sinking funds, in particular. Mortimer is unambiguous in his position, 'Public credit is a national good ... the nation must support, not destroy PUBLIC CREDIT' (p.365, p.375). Mortimer undertakes to chronicle the various arguments made against the national debt, including a detailed examination of the positions of both Hume and Price that recognizes the decided similarities in their positions. Mortimer (1774, p.372) quotes Price directly:

The practice of raising the necessary supplies for every national service, by borrowing money on interest, to be continued till the principal is discharged, must be in the highest degree detrimental to a kingdom, unless a plan is settled for putting its debt into a regular and certain course of payment. When this is not done, a kingdom, by such a practice, obliges itself to return, for every sum it borrows, infinitely greater sums; and, for the sake of a present advantage,

subjects itself to a burden, which must be always growing heavier and heavier, till it becomes unsupportable.

Mortimer also recognizes, and agrees with, Price's view that an *exorbitant* national debt acts as a check on 'the exertions of the spirit of liberty in the kingdom' (pp.372-3).

Mortimer (p.374) proceeds to identify 'three other grievances, which have been the general topics of conversation, and the subjects of most of our temporary essays in the public prints, on the national debt'. Not being the most systematic analyst, the three grievances listed by Mortimer have some overlap with the views of Hume and Price. As for the three grievances (pp.374-5):

The FIRST is, the draining of the nation of coin, for subsidies to foreign princes; to pay armies on the continent, in times of war; and the interest due to foreign stockholders, the creditors of the nation ... The SECOND is, the pernicious and fatal consequences of stockjobbing, by which thousands of families have been ruined, and private credit is every day more or less affected: the spirit of gaming in the alley, having diffused itself amongst the mercantile people, who waste their time, alienate their property, in the pursuit of visionary schemes of the alley ... The THIRD, and the greatest evil of all in the whole catalogue, is, the number and perpetuity of our taxes, for the payment of the interest on the national debt.

To the first of these objections, Mortimer makes an empirical argument. Instead of being an economic detriment, the national debt had a stimulative impact. To the second grievance, Mortimer observes that it is possible for the government to sell the debt without the use of stockjobbers. Both of these observations are refreshingly modern, especially considering the formidable academic opponents.

Yet, it is in discussing the third objection, relating the debt burden with taxes, that Mortimer makes his most insightful contribution (p.378):

The mal-administration and misapplication of the immense sums raised on the solidity of our national credit, is a different subject: it is an abuse by no means chargeable on the funding system itself; and, therefore, not to be confounded with it in our exculpation of public credit. This is an error into which our opponents have fallen, but which we must carefully avoid; from it will be discovered, on a nearer view, that all the ills resulting from the establishment of public credit, arise from impolitic and partial taxes; for an unjust distribution of them; from the expensive mode of collecting them; and from a corrupt dissipation of their produce when collected: and that the plan of public credit, freed from these excrescences, is a master-piece of human policy.

In effect, Mortimer is seeing beyond the public debt to uncover the expenditures that led to the original borrowing. It is not the act of borrowing, *per se*, which is the problem but, rather, the unwise expenditure of those moneys.

In addition to considering the implications of the national debt, Mortimer also examines the 'Several plans (which) have likewise been published, for redeeming part, or the whole, of the immense capital of one hundred and twenty-six millions, the reputed national debt'. At Mortimer's time, there had been only one unsuccessful attempt at implementing a sinking fund, the Walpole plan of 1716. The Walpole sinking fund was actually a consolidation of the various smaller funds, aimed at retiring specific debt issues. The drafters of the sinking fund legislation were careful to include wording that would ensure that surpluses in the sinking fund, aimed at reducing the national debt, could not be alienated. Despite these efforts, by 1734, the sinking fund had been alienated. Mortimer (p.422) correctly concluded that: 'the sinking fund has never answered the purpose of paying the capitals, or of exonerating us of the taxes appropriated for the payment of yearly rents due on them. It is therefore inadequate to the ends proposed by its institution.'

On the connection between debt and tax levels, Mortimer was not without sympathy for the views of Hume and Price. His primary arguments against the various sinking fund proposals revolved around their inadequacy. There is an essential element missing from the schemes (p.415):

It is a most impolitic, injudicious misapplication of the surpluses of the permanent revenues of the kingdom, to employ them in paying off capitals, unless the taxes which were imposed and appropriated to the payment of the annual interests of such capitals are abolished at the same time. (emphasis added)

The connection that Mortimer makes between debt repayment and taxes is quite remarkable. It provides a blueprint for debt reduction. In isolation from corresponding restrictions on tax policy, debt reduction strategies are doomed to failure. This insightful advice still rings true in modern times.

Appendix: British and Dutch Interest Rates, 17th-18th Centuries

During most of the 17th century, the advantages accruing to the Dutch from a lower interest rate level were recognized by a number of

authors, including Thomas Culpepper. Barbour (1950, pp.82-3) provides an overview of the evolution of Dutch interest rates during the 17th century:

The rates at which (Dutch) governments —— municipal, provincial, or federal —— could borrow, were fixed by resolution of their respective assemblies, but subscription had to be invited on terms likely to loosen the purse-strings of men as hard-headed and tight-fisted as the deputies and town-councillors themselves, who were in fact principal investors in these securities. In 1644 interest on the debt of Holland was reduced from 6 1/2 to 5 per cent, and five years later interest on the federal debt was similarly reduced. In 1655, at the close of the first English war, another reduction, from 5 to 4 per cent, was voted. On the eve of the second English war the deputies of Amsterdam tried to induce the States of Holland to lower the rate to 3 per cent. 'But there are so many Estates that have their monies upon the Cantores that this is no acceptable proposition to them.' It was not until the year 1672 that another conversion brought down the rate to 3 3/4 per cent. New loans could sometimes be floated by Holland at 3 per cent when the country was at peace; in war the rate might range from 4 to 6 1/2 per cent. In 1662 the provincial debt of Holland was about f. 120,000,000; in 1676 about f. 200,000,000; in both years the interest was 4 per cent. *At the later date Charles II of England was paying no less than 10 per cent, and his brother of France in the neighbourhood of 15 per cent.* The credit of Amsterdam was maintained through a succession of wars. In January 1679, at the close of six years of war, the city's debt came to a moderate sum of f. 7,185,475, and the treasurer was urging the reduction of interest from 4 to 3 1/2 per cent, pointing out that several towns of Holland —— Alkmaar for instance —— were paying only 3 per cent. (emphasis added)

Despite this advantage in the 17th century, following the Glorious Revolution there is a decided narrowing of the Dutch-English interest rate differential to the point where any advantage for one country is transitory.

Table 11.2 Summary of 17th century interest rates

<i>Loans to Princes (Short-term)</i>			
England	Crown loans by goldsmiths, usual	1640-1690	6-12%
England	Crown loans by goldsmiths, emergency	1640-1690	20-30
France	From <i>partisans</i>	1643-1661	15-60
Spain	Example	1673	40
<i>Commercial loans (Short-term)</i>			
England	Legal limit (all private loans)	1571-1624	10%
England	Legal limit (all private loans)	1624-1651	8
England	Legal limit (all private loans)	1651-1714	6

England	Chamber loans to merchants	1630	6-7
England	Good credit loans	1640	8
England	Good credit loans	1688	4-6
England	Bank of England discounts	1694-1699	3-6
Holland	Private loans	1650-1675	3-4½
Holland	Private loans as low as	1700	1¾-2
	<i>Deposits</i>		<i>(Short-term)</i>
England	Goldsmiths pay	1660-1690	4-6%
Holland	City of Amsterdam	1603	6¼-8½
Holland	City of Amsterdam	1659-1700	3-4
France	State Savings Bank pays	1674	5
	<i>Annuities and Mortgages</i>		<i>(Long-term)</i>
England	Mortgage loans	1600-1625	10%
England	Mortgage loans	1666	4-6
England	Mortgage loans	1670	4
England	Mortgage loans	1687	?-5
England	Mortgage loans	1696	5-6
England	Private bonded debt (example)	1675-1677	5-6
	<i>Loans to States</i>		<i>(Long-term)</i>
England	A government life annuity	1692	10%
England	A government 16-year lottery loan	1693	14
England	A government perpetual annuity; advanced by the Bank of England	1694	8+
Holland	Sinking fund annuities of government	1600-1640	6¼-8½
Holland	Sinking fund annuities of government	1640-1672	3¾-5
Holland	Sinking fund of government (war)	1672-1700	4-12½
Holland	Sinking fund of government (peace)	1672-1700	3-3¾

Source: Adapted from Homer and Sylla (1991).

A number of sources are available for 17th and 18th century Dutch and English interest rates. Sources used here are Homer and Sylla (1991) and Dickson (1967). In turn, these sources construct the interest series from various primary sources. This process is, at best, imprecise, especially for the 17th century quotes, though the quotes do improve in accuracy and frequency as time progresses. Table 11.2 provides a sampling of 17th century interest rates, while Table 11.3 has interest rates on 18th century British government securities. Finally, Table 11.4 has a sampling of 18th century Dutch interest rates.

Table 11.3 Yields on new British Government long-term issues, 1700-1770

Year	Conditions of Issue	Estimated Effective Yield %
1702	Nominal rate; yield undetermined	(6.0?)
1706	Nominal rate; yield undetermined	(6.0%)
1710	With lottery privileges	8.3
1711	With lottery privileges	8.7
1712	With lottery privileges	8.7
1713	With lottery privileges	5.9
1714	With lottery privileges	6.5
1715	New money and conversion	5.0
1717	Funding	4.0-5.0
1718	Funding	4.0-5.0
1719	New money and conversion	4.0
1721		5.0
1722	Funding nominal rate; yield undetermined	(3.0?)
1726	With lottery privileges	3.0
1727	Conversion	4.0
1731	3s. lottery; 3½s. new money	3.0-3.5
1736		3.0
1739		3.0
1743	Some with lottery privileges	3.0
1744	Some with lottery privileges	3.0
1745	Also lottery at 5.6% cost	3.0
1746	Also lottery at 10.2% cost	3.0
1747	With lottery privileges	4.0
1748	With lottery privileges	4.4
1749	Funding	3.0-4.0
1750	Conversion	3.0
1751	Conversion with lottery privileges	3.0
1755	With lottery privileges	2.7
1756	With lottery privileges	3.4
1757		3.7
1758	With lottery privileges	3.4
1759	With lottery privileges	3.4
1760	With lottery privileges	4.1
1761	With lottery privileges	4.0
1762		4.9
1763	Some with lottery privileges; funding	4.0
1766	With lottery privileges	3.0
1767	With lottery privileges; conversion	3.0
1768	With lottery privileges	3.0
1770	With lottery privileges; conversion	3.0

Source: Adapted from Homer and Sylla (1991)

Table 11.4 18th century Dutch interest rates

Date	Interest Rate (%)
1690-1730	5, 4.5, 4
1709-13	4, 4.25, 4.5
1712	6
1712-13	5
1714	4.5, 5
1715-16	4
1716	4
1717-19	3.5, 4
1721-3	3
1724-5	4, 3
1725	3.5
1725-9	3.5, 3
1729-35	3.5, 3
1730-37	3.5, 6
1730-40	4, 3.75, 3.5
1740	3.5, 4
1741-44	3, 3.5
1741-45	3, 3.5
1747	3.5
1748-49	4
1750	4, 3.5
1751	2.5, 4.5
1752	4

Source: Adapted from Dickson (1967). The following sources were referenced by Dickson in constructing the interest rate series: Ledgers of *Quirijn Brants in Zoon* 1715-63, Amsterdam, *Gemeente Archief, Archief Brants*, 565-7; Ledgers of Simon Bevel 1710-36, *ibid.* 1736-42; Amsterdam, *Gemeente Archief, Registers van Schepenkennissen*; Amsterdam, *Gemeente Archief*, Hamilton index of loans in Notarial Archives 1711-25.

Notes

1. This chapter only examines interest rate theories which are financial in nature. Interest rate theories which are derived primarily from physical processes, such as Turgot's Fructification Theory (Böhm-Bawerk 1914, pp.40-41), are not examined.
2. The exact title of this publication is given differently in various sources. Schumpeter (1954, p.328) refers to *Tract against the High Rate of Usury*, noting an enlarged edition of 1641 and his son's reprint of 1668. Letwin (1964, p.88) references *Tract Against Usury* and acknowledges his son's reprint of 1668. The reference used in the text, *A Tract against Usury* (1621), is from Hutchison (1988), where reference is made to 'several editions in the ensuing decades'.
3. The connection between Culpepper's observations and those of de Pinto over a century later is interesting. In de Pinto's case, he was writing to examine the positive benefits that the English had obtained from the development of a market for government debt. His suggestions were targeted at the French which lacked such a capital market, to the detriment of the French state.
4. Aspromourgos (1988, p.347) and Schumpeter (1954) recognize three general, not mutually-exclusive classes of contributors to 17th century economics: merchants, philosopher-scientists and consultant-administrators: 'the literature is dominated by the merchant writers — the very designation of that literature as "mercantilist" is a reflection of that fact'.
5. This does not refer to later writers, especially Cantillon, who adhered to basic elements of mercantilist thought but had substantively more developed theories of interest rate determination.
6. Adam Smith was definitely not a mercantilist. Neither did Smith write much on the subject of interest rates. What Smith did write on interest is primarily in Book II, Chap. 4 of the *Wealth of Nations* and Part II, Sec. 14 of the *Lectures*.
7. In modern times, sinking fund provisions appear primarily on corporate bond issues. In these sinking funds, the corporation sets aside each year either a certain percentage of the outstanding par value of the issue or a specified dollar amount. This payment is made to a fund, usually a sinking fund trust managed by a sinking fund agent. The agent is designated to use the money in the fund to call a portion of the bond issue, usually at some premium, or to purchase some of the bond issue on the open market if prices are favourable. Because the sinking fund provision substantially reduces the risk of default at maturity, a modern sinking fund provision on a bond issue is included to enhance the credit rating of the issue. The cost of the sinking fund provision is that the term to maturity of the issue will be uncertain, making the issue harder to price and deterring certain types of purchasers.