Optimal fiscal illusion and the size of government

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1. Introduction

Buchanan and Wagner (1977) have argued that complex and indirect tax payment structures create a fiscal illusion that will systematically produce higher levels of public outlay than those that would be observed under simple payments structures. The basic idea is that complex payments structures induce underestimation of the tax-price of public expenditure, and therefore result in voting behavior favoring relatively large public sectors.[1]

Not that the idea of fiscal illusion (if not the precise term) is all that new. The classical economist and government administrator J.R. McCulloch (1851) took the attitude that since the public underestimated the benefits of government, the latter could legitimately use what we now call fiscal illusion to cause taxpayers to underestimate the costs:

> The benefits derived from government, though of the highest importance, being neither so very obvious nor striking as to be readily felt or appreciated by the bulk of the people, there is in the great majority of cases a strong disinclination to the payment of direct taxes. For this reason governments have generally had recourse to those that are indirect. Instead of exciting the prejudices of their subjects by openly demanding a portion of their incomes, they have taxed the articles on which these incomes are usually expended.[2]

J.S. Mill, also a public administrator, expressed similar reasoning in his *Principles of Political Economy* (1848).[3] Over a hundred years later, and in contrast to the Buchanan-Wagner view, Anthony Downs (1960) concluded that the actual budget will be smaller than the 'correct' budget because even indirect taxation is more apparent than many remote government benefits.[4]

The purpose of this paper is to interpret the fiscal illusion hypothesis,

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and the works just referred to, in the context of a voting model. In Section 2 the *act of deluding* taxpayer-voters is posited to be the rational action of utility maximizing political agents, subject to the control of the median voter. Criticism of recent empirical work on fiscal illusion will be advanced on the basis of this discussion. Section 3 extends the model so as to derive the optimal investment of resources by political agents in the act of deluding. We also explore here the limits to the illusion hypothesis. In particular, we argue that it cannot easily be used as a means of explaining the relative growth of the public sector.

2. Fiscal illusion in a simple median voter model

We begin by assuming the government behaves 'as if' it maximizes median voter utility, subject to its budget restraint, i.e., the government maximizes:

$$U(G^*, Y - T^*)$$

subject to:	G	=	T,
where	G^*	=	βG and $T^* = \delta T$,
with	G^*	=	*perceived* public services
	$Y - T^*$	=	*perceived* disposable income
	Y	=	exogenously given gross income (assumed known with certainty)

The government is assumed to balance its budget, keeping *actual* expenditures G equal to *actual* taxes T, and perceived and actual quantities are assumed to be proportional; for example, if $\beta = 0.5$, the individual perceives only one half the 'true' value of *actual* government services.[5]

Using the assumption that the median voter knows his gross income with certainty, it is possible to argue that there will be no tax illusion; for a costless flow of market information will prevent it. Certainly with no *commodity* taxes the voter can easily calculate his tax payments as simply the difference between his gross income and his expenditure on private goods and services. But full information on his taxes does not, by itself, indicate the quantity of publicly provided goods they purchase for him. How much national defense, for example, does a Trident submarine provide him? There may still be misperception, therefore, on the (public) expenditure side.

Where commodity taxes *are* present, and if, as is usual, these are of uncertain magnitude, market data will not necessarily allow the voter to calculate even his tax burden; for then he does not know with certainty what parts of his private consumption expenditures have gone to the tax collector.

The final assumption of the model is that the government knows G, T, δ and β, while the voter knows only G^* and T^*. It will subsequently become

clear that this difference in information, possessed by political agents on the one hand and by voters on the other, is crucial to the fiscal illusion hypothesis.

The condition that the government knows β and δ, may seem overly strict; but it is not any more so than the assumption which underlies the 'as if' median voter model. Just as the successful party is assumed to 'zero in' (perhaps by trial and error) on that point in the median voter's preference map that maximizes his utility, so too, we assume that the successful party will eventually elicit knowledge of median voter misperception.

In this model, the *actual* tax-price of public services is represented by T/G or 1, while *perceived* tax-price is T^*/G^* or δ/β. We can then interpret the diverse positions of Buchanan-Wagner, McCulloch and Downs, mentioned earlier, as different statements about δ/β.

This interpretation is presented graphically by Figure 1. Here *actual* government expenditures (= taxes) relating to the median voter are measured on the vertical axis below 0. The government benefits (expenditures) that are *perceived* by the median voter, G^*, are measured on the horizontal axis. Consider, for example, the actual government expenditure of $0G_1$ on the vertical axis. This quantity corresponds with 0C *perceived* benefits by the median voter on the abcissa. The general relationship between actual and perceived expenditures (benefits), when benefit illusion is some fixed proportion, β, is determined by the ray from the origin in the bottom quadrant. This is at the angle θ, when $\tan\theta = 1/\beta$.

Since government operates under a balanced budget restraint, actual expenditure $0G_1$ is equal to actual taxes (of $0G_1$). Whether *perceived* taxes are greater or less than actual taxes depends on whether δ is greater or less than one.

We focus next on the upper half of Figure 1. The first opportunity line $[Y, \beta/\delta_1 Y]$ represents all possible alternatives for the government under the balanced budget restraint when illusion on the tax side is some given proportion, here δ_1.[6] Given β, which we shall assume fixed throughout this section, and given $\delta = \delta_1$, the government is able to generate any *perceived* level of services from 0 to $\beta/\delta_1 \cdot Y$ and still balance its budget. It cannot go beyond this point, however, since to do so would involve perceived taxes greater than Y, which no voter would tolerate.[7]

The controlling influence of the median voter leads to an equilibrium at E_1; perceived services would then be $0C$, at a perceived tax bill of AY. At E_1 the *perceived* tax-price per unit of G is δ_1/β while the *actual* tax-price is 1. If $\delta_1 > \beta$, E_1 represents the view of Downs: even indirect taxation is more apparent than government benefits.

At this point, it is important to distinguish between (a) illusion as a given state of the world, and (b) illusion in the making, that is the *act of deluding*. In the next section we shall also comment on the difference between (c), short-term illusion, and (d), illusion in the long-run. Our primary interest in this section is with (b), the act of deluding.

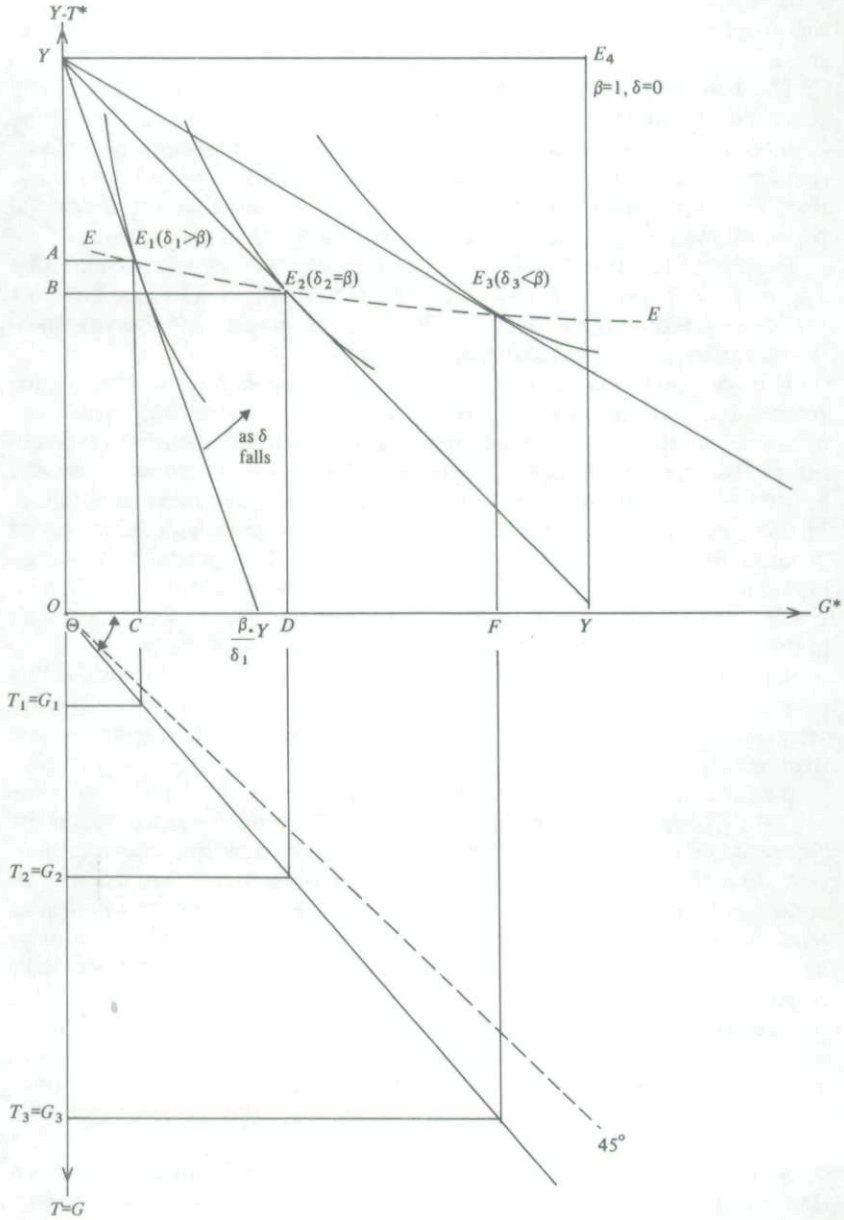

Figure 1. Fiscal illusion in a median voter model

We could start with a situation where $\delta > \beta$ (such as E_1 in Figure 1) arises 'naturally', that is without any political contriving. The Downsian (1957) notion of 'rational ignorance' could be one explanation for this sort of phenomenon. It is possible that the benefits to the voter of acquiring information about political behavior are less than the costs of doing so, because the individual voter's ability to influence that behavior (by using his one vote) is insignificant.[8]

The authorities might next wish deliberately to manipulate the tax or expenditure structure in such a way as to facilitate the increase in the size of the public sector beyond E_1. The central focus of our paper is to determine what makes this possible.

One familiar answer employs an analogy to the Williamson (1964) theory of the firm.[9] 'Public managers' (politicians or bureaucrats) direct the 'firm's resources' (gross income of citizens) to increase their own utility. Since this utility is positively related to the size of the public sector, via the various emoluments of office, the authorities will attempt to expand it as much as possible.[10] Unfortunately for the median voter there are the costs of acquiring information about the fiscal environment and of enforcing activity consistent with his preferred choice between government services and disposable income. Consequently, the constraints placed on the government by the need to satisfy the median voter do not preclude the creation of fiscal illusion by political agents if information costs can be manipulated by them. Changing the nature of the tax structure, for example, in the way indicated in our opening quotation from J.R. McCulloch, may increase the cost of estimating tax burdens. The voter's estimate of his tax burden will certainly allow for this political behavior to some extent; but by our definition of fiscal illusion as 'contrived imperfect knowledge', correcting this estimate cannot be done costlessly, and therefore may not be done exactly.

It is important to note before going further that the foregoing interpretation of the act of deluding is compatible with the notion of rational expectations, as interpreted by Walters (1971), because deluding is consistent with the structure of our model. Also we note that the use by governments of revenue structures so as to maximize emoluments of office does not imply global inefficiency. All one need assume is that each citizen votes for whichever budgetary process yields the most efficient allocation of his resources. In general, any budgetary process will be subject to manipulation by its managers. Presumably, then, the current system reflects a choice (subject to the costs and benefits involved) between institutions or governments that maximizes the utility of the median voter, given the behavior of the government under each alternative. Otherwise we should have observed some other budgetary process.[11]

So by introducing more indirect taxes, it may be possible for the government to induce expansion of the public sector by reducing δ. Ironically, this act of deluding is benign, since the reduction in δ leads the median

voter to a higher level of utility. In Figure 1, reducing δ from δ_1 to δ_2 increases the size of government from $0G_1$ to $0G_2$ and places the taxpayer on a higher indifference curve.[12]

With $\delta_2 = \beta$, E_2 represents the policy prescription of McCulloch (when $\beta < 1$); underestimation of the level of services is countered by inducing underestimation of tax burdens. This view, by a public administrator, that the benefits of government services are underestimated is not unpredictable. Meanwhile, Buchanan-Wagner argue that E_3 is the usual case, where $\delta_3 < \beta$.

2.1 Implications of the model for empirical research

The difference between Downs's view, at E_1, McCulloch's at E_2, and Buchanan-Wagner's at E_3, brings out an important aspect of the fiscal illusion hypothesis. The success of any attempt to manipulate the expenditure process depends on the size of δ *relative* to β. Therefore, evidence of underestimation of existing tax burdens alone does not necessarily imply 'too large' a public sector. Voters may equally underestimate benefits. If we can assume β remains constant, a reduction in δ, say from δ_1 to δ_2, will cause a change in G, as argued by Buchanan-Wagner and McCulloch. However, if the expenditure structure of government does not stay constant it is not clear what will then occur following a reduction in δ. Indeed, the Downsian position is also a possible outcome.

Thus because they do not deal with δ relative to β, the interesting empirical work of Wagner (1974), Clotfelter (1976), and Pommerehne and Schneider (1978) does not contain unambiguous information about the historical relationship between fiscal illusion and the size of the budget.

3. Optimal investment of resources in deluding and the limits to the illusion in hypothesis

In this section we show there is an optimal level of investment in deluding, and we consider the limits to the act of deluding. In Figure 1, reducing δ relative to β certainly increases the actual size of the public sector. But if the manipulation of δ and β is costless, it is clearly optimal for the government to expand taxes to the value of income Y. It could do this, for example, by reducing δ to 0 and increasing β to 1 (a condition sufficient, but not necessary, for this result, since it is β relative to δ that matters). Only then will median voter utility be maximized. At this point, E_4, the median voter pays all of his income in taxes, but regards his tax burden as negligible. On the other hand, he receives the equivalent of his income in public services. Not only has the government convinced the voter that he is getting a cheap lunch, but also that he is receiving a free lunch.

More realistically, there are definite limits to the extent of ignorance that

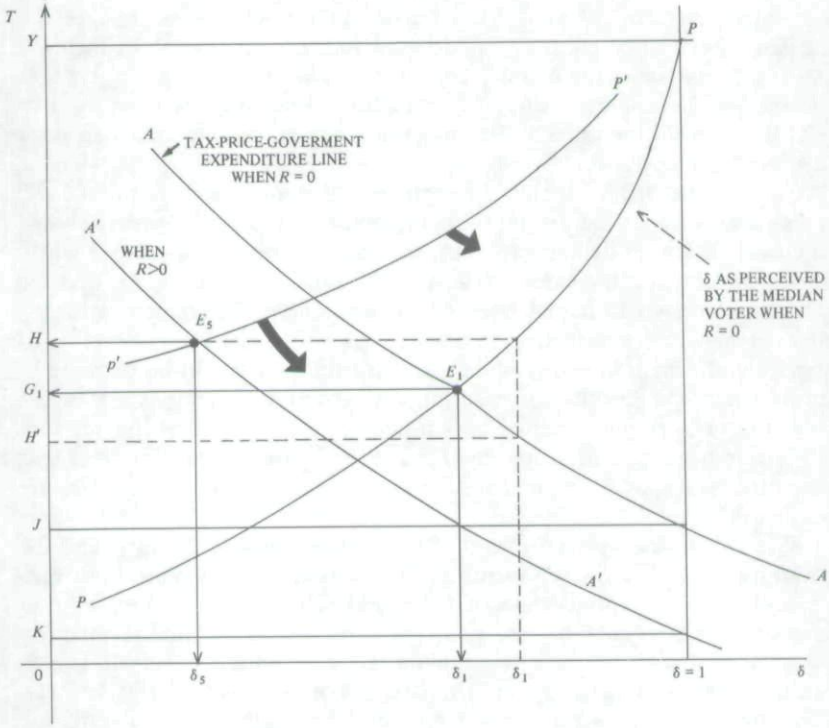

Figure 2. Determination of optimal tax illusion for given β

can be induced. There will also be, from the point of view of *both* the voter and the government, an optimal degree of deluding. To show this, we first extend the simple median voter model of the previous section to account explicitly for the use of resources during the act of deluding. These resources would include all the extra costs involved in using indirect rather than direct taxation, the costs of advertising the virtues of public services, and so forth.[13]

Refer now to Figure 2. Here the axes have been changed to actual taxes T on the vertical ordinate, and δ on the horizontal. Given a fixed proportion β between perceived and actual values of G, and assuming for the moment no investment of resources R in deluding, line AA is derived from the tax-price/government expenditure line EE in Figure 1 (transposed in terms of the lower quadrant). In Figure 1, as δ is hypothetically reduced (going from left to right), the size of the public sector, measured by T, that

maximizes median voter utility increases monotonically as long as the median voter's price elasticity of demand remains negative.[14] In Figure 2 this relationship between δ and T appears as the *negatively* sloped curve AA; the *smaller* the assumed value of δ in Figure 2 (moving now from right to left) the *larger* is the value of T commensurate with maximum median voter utility, as given by AA.

On the other hand, the line PP represents the voter's beliefs about δ. PP is also drawn under the assumption of no expenditure on resources devoted to conscious acts of deluding ($R = 0$), and can be constructed independently of AA. As actual T increases, for whatever reasons, we shall assume that the ratio of perceived to actual taxes ($= \delta$) rises. The positive slope of the PP curve stems from a reduction in costs to the voter, relative to benefits, of acquiring information about actual tax burdens. This would be the case if, for instance, the benefits of ensuring that government actions are in the voter's interest rise with actual tax burdens, while costs fall as contact with the government, also measured by T, increases.[15] We have drawn PP so that δ approaches 1 as T approaches Y. Other configurations, however, are possible.[16]

With $R = 0$, the optimal extent of tax illusion for *both* the voter and the government is δ_1. This represents an equilibrium in which illusion or misconception is a 'natural' state of the world. That is, δ_1 represents voter misperception in equilibrium, given that no resources are devoted by political agents to the act of deluding. It is an optimum for all agents, because the government is on AA (it is maximizing voter utility at $T = 0G_1$, given $\delta = \delta_1$) while the voter is on PP (and thus δ_1 represents the voter's best or utility maximizing estimate of δ, given public sector size $0G_1$, and the cost of acquiring information).[17]

Lines AA and PP in Figure 2 can also be thought of as reaction curves. The government chooses T and therefore a relative size, say $0G_1$. This generates a perceived δ, given PP, of δ_1. With median voter perception represented by δ_1, it turns out that $0G_1$ is consistent with maximizing voter utility. However, if the government tried to operate at T of, say, $0H$, this larger size implies, on PP, a perceived δ of $\delta_1{}'$. But then maximum median voter utility is consistent with a size, on AA, of only $0H'$. The government will find itself under pressure to reduce T below $0H$, and so on.

Now let us assume the act of deluding is directed to the tax side exclusively and that this activity uses resources. With R resources devoted to deluding, the budget restraint becomes $G + R = T$, rather than $G = T$. The feasible combinations for the government in our first Figure 1 would then be represented by budget lines shifted inward and parallel to the original budget lines. For example, a new line corresponding to the budget line Y,Y (where $R = 0$) would be a line $[Y - \delta_2 R, \beta/\delta_2(Y - \delta_2 R)]$. In our second diagram, Figure 2, the line $A'A'$ then shows the smaller utility maximizing size of the public sector for each hypothetical δ.[19]

$P'P'$ in Figure 2 is also drawn under the assumption that $R > 0$, and that investing resources in the act of deluding reduces perceived taxes relative to actual for any given T. Equilibrium for $R = \bar{R}$, say, is at E_5. The act of deluding has increased the relative size of the public sector by G_1H.

To reach the optimal extent of deluding, the government iterates on R. Resources invested will not be infinite, however, since as $P'P'$ is shifted upwards with R, $A'A'$ shifts downwards. In Figure 2, we can be sure the final equilibrium T on the vertical axis exceeds $0G_1$ since we have $\bar{R} > 0$ generating a larger equilibrium size, $0H$. However, it may be that no R generates a public sector larger than $0G_1$. In that case, final equilibrium is at E_1 with $R = 0$. The government does not invest any resources in the creation of fiscal illusion on the tax side.

A similar analysis, sketched in Figure 3, can be used to determine the optimal illusion coefficient β on the expenditure side except that the slope of the curves will normally be reversed. In Figure 3, the analogy to $A'A'$ in Figure 2 is given by $B'B'$, and the analogy to $P'P'$ is given by $Q'Q'$.

Note that $P'P'$ in Figure 2 and $Q'Q'$ in Figure 3, are not drawn independently of each other, a complication that does not arise when the model is formulated mathematically as in the Appendix. When $A'A'$ (and AA) was constructed from Figure 1, β was held constant. Now, as resources are invested in deluding on the expenditure side, β will normally be increased. But this means δ/β will be reduced for each δ shown on the vertical axis in Figure 2. Consequently, $A'A'$ (and AA) will shift upwards since for each δ in Figure 2, δ/β is smaller, and thus (in the normal case) the equilibrium size of the public sector will be larger. An analogous argument applies to $Q'Q'$ (and QQ). Moreover, for δ_5 in Figure 2 and β_5 in Figure 3 to be consistent with a final equilibrium simultaneously, they clearly must imply the same public sector size. Otherwise the government would not be balancing its budget. For this reason, we have drawn $B'B'$ to intersect $Q'Q'$ at a public sector size of $0H$.

The above analysis gives the government a system sufficient to determine equilibrium values of δ and β.[19] While this equilibrium is sustainable as long as δ and β are not known to the voter, we note that it is a static equilibrium. The existence of voter misperception in equilibrium by itself does not imply a continually growing public sector, unless new or cheaper devices for inducing voter misperception are constantly introduced into the model.

On the other hand, the extent to which the equilibrium δ/β actually differs from 1 will at all times be an empirical question. It may be a significant factor, or it may not. While information may be equally possessed by all agents in stock markets, it may or may not be so in political markets.

This analysis could be made dynamic. We could reasonably assume that rapid adjustment towards a larger public sector size rotates the $P'P'$ curve to the right and the $Q'Q'$ curve to the left as indicated. Perceptions may be

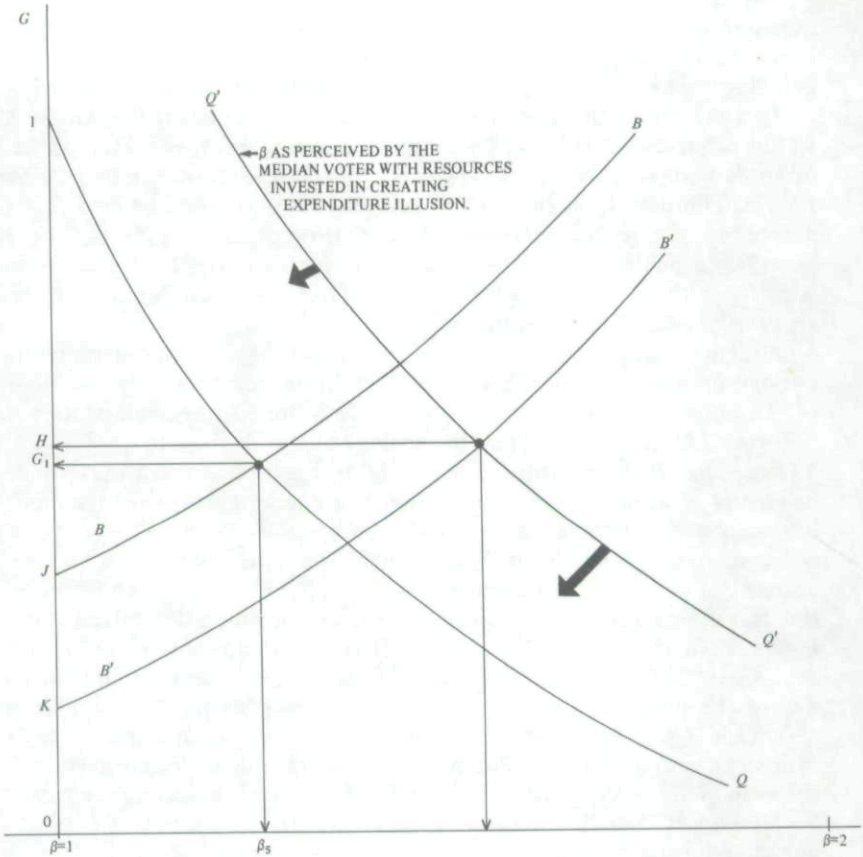

Figure 3. Determination of optimal benefit illusion for given δ

more accurate the faster the tax burden changes. Public managers will then trade off the emoluments of office foregone when adjustment is slower, with the benefits of a larger equilibrium budget. However, this will not lead to a continually growing public sector unless adjustment is slow.

3.1 Illusion in the long-run

Will tax illusion in fact collapse with the passage of time? In Figures 2 and 3, this is analogous to asking if $P'P'$ and $Q'Q'$ will rotate simply with the passage of time, perhaps becoming vertical at $\delta = 1$ and $\beta = 1$ respectively. With $R = 0$ in that case, actual taxes in the long-run would appear in Figure

2 as $0J$. But if $R > 0$, the government would only be able to impose a tax burden of less than $0J$, such as $0K$. Hence fewer resources would be invested in deluding over time as voters learn. In fact, R would approach zero. We should expect this according to Mill's observation that: 'The real incidence of indirect taxation is every day more generally understood and familiarly recognised.'[20]

However, just as in the matter of illusion at a point in time, it would seem that the persistence of illusion over time, on both tax and benefit sides, is an empirical question. Over long periods, the extent of illusion will depend on demographic factors, such as the number of citizens coming to voting age. This determines, in part, who the median voter is. It is not at all clear that subsequent median voters are always better informed.[21]

Illusion in the long-run will also depend on the degree of political competition, which may be viewed as a shift variable in the $P'P'$ and $Q'Q'$ curves. It is in the self-interest of opposition parties and special interest groups to absorb information costs in order to provide the median voter with 'valuable' information. The government will counter with the 'truer' picture so as to assure itself of the median voter's vote. Thus political competition tends to provide information and enforce preferred government activity at zero cost to the median voter. Hence, with perfect political competition, $P'P'$ and $Q'Q'$ would always be vertical at $\delta = 1$ and $\beta = 1$, respectively, and no utility maximizing political agent would use any resources in the act of deluding. Needless to say, there is no reason for assuming the existence of perfect political competition.

4. Conclusions

The interpretation of the long-standing fiscal illusion hypothesis presented here is that the illusion is the result of attempts by utility maximizing public managers (politicians or bureaucrats) to direct the resources of the community toward themselves. In general, they will succeed if the costs of information about or enforcement of managerial behavior are nonzero, and political competition is imperfect. The consequences of this application of the Williamson theory of the firm, in the context of a median voter model, include the following:

1. There will be an optimal level of illusion for the public manager and median voter simultaneously; and this is consistent with the rationality of all agents.
2. Underestimation of tax-prices by the median voter at this point by itself does not imply a *continually growing* public sector.
3. Misperception of taxes or expenditures alone does not imply anything about the affect of misperception on the size of the budget. For the same

reason, a change in information costs is ambiguous (in the present model) in its effects on budget size, because this will influence both tax and expenditure illusions.

4. The importance of tax or expenditure structure manipulation in determining the size of the budget is an empirical question. It may be that the fiscal illusion hypothesis is empirically relevant, or it may not. Whether illusion collapses over time depends on such factors as the age structure of the electorate and the extent of political competition.

It is interesting to note, incidentally, that the real 'hidden persuaders' may well be in the public sector if competition is more imperfect in political markets than in private. Yet, those who complain about the artificial creation of wants by private business call at the same time for greater government intervention.[22]

Appendix

Let

C = degree of political competition
R_δ = resources invested in fostering tax illusion
R_β = resources invested in fostering benefit illusion

See main text for remaining definitions.

The government chooses G, T, R_δ and R_β so as to maximize median voter utility.

$$U(G^*, Y - T^*) \tag{A1}$$

where

$$G^* = \beta G \text{ and } T^* = \delta T$$

subject to the government's budget restraint.

$$G + R_\delta + R_\beta = T \tag{A2}$$

and

$$\delta = f(T/Y, R_\delta, C), f_1 > 0, f_2 < 0, f_3 > 0 \tag{A3}$$

$$\beta = g(G/Y, R_\beta, C), g_1 < 0, g_2 > 0, g_3 < 0 \tag{A4}$$

(A3) corresponds to the $P'P'$ curve in Figure 2, and (A4) is the complement for β given in Figure 3 as $Q'Q'$.

Given Y and C, maximization of (A1) subject to (A2)-(A4) yields 4 equations in G, T, R_δ and R_β. The solution can be used to solve for δ/β.

NOTES

1. Buchanan and Wagner cite the Italian economist Puviani (9103) as providing the first comprehensive study of fiscal illusion. This work is reviewed by Buchanan (1967: Ch. 10).
2. J.R. McCulloch (1851: 281). McCulloch held a position in the Stationary Office.
3. See Book V, Ch. VI.
4. For Downs (1960) it would appear that the correct budget is the one which would exist in a world in which all voters acquire information without cost.
5. The condition that the government budget is balanced with respect to the median voter can be relaxed without altering the conclusions we reach in this paper. For example, we could define G^*, T^*, and G and T as *total* (for all citizens) perceived and actual quantities, and consider the maximization of: $U(G^*/N^\eta, Y - T^*/N^\theta)$ subject to $G = T$, where N is population, η is the degree of publicness and θ is the degree of tax burden inequality. Note also that the budget restraint for the median voter is $(Y - T^*) + T^* = Y$.
6. The intercepts of this line can be determined as follows: When $Y - T^* = 0$, $Y = T^* = \delta_1 T$. Because $Y = \delta_1 T$, $T = Y/\delta_1$, and since $G^* = \beta G$ and $G = T$, $G^* = \beta/\delta_1 \cdot Y$. The latter point gives the intercept on the horizontal axis when $Y - T^* = 0$. When $G^* = 0$, $\beta G = \beta T = 0$, and hence if $\beta \neq 0$, which we assume, $T = 0$. The vertical intercept is then given by Y, since $T^* = \delta_1 T = 0$.
7. There is another constraint on government behavior not shown in Figure 1. Not only can the government not take more than Y in perceived taxes (and still remain in office) but it certainly cannot take more than Y in actual taxes, which is all there is to be had. Depending on δ and β, this could occur at a point corresponding to a G^* of less than $\beta/\delta_1 \cdot Y$. For example, let $\delta_1 = 0.5$ and $\beta = 2$. Then if $Y = T^*$, G must be equal to $2Y$. For simplicity we shall assume this latter restraint is never binding.
8. This is a contentious issue. Stigler (1972), for example, has argued that the nature of political competition implies every vote has influence. Political behavior is different if a party wins by 52 percent rather than 51 percent. Consequently, the fact that decisions are made according to majority rules does not, by itself, bias the voter against acquiring information. A bried survey of this debate is given by Staaf (1978).
9. The application of Williamson's model to the present situation is suggested by Alchian (1965: 135). See Migue and Belanger (1974) and Niskanen (1975) for application of the model to the theory of the bureau.
10. We are aware that Migue and Belanger (1974) have pointed out this as one limiting type of behavior by political or bureaucratic agents. At the other limit, if these agents do not value output, the output level will be smaller but will be produced above minimum cost. (Maximizing the size of the public sector or bureau

requires production of output at minimum cost.) Niskanen (1975) has shown explicitly how both types of behavior may be considered as outcomes of the same utility maximizing model.

11. This argument follows McManus (1975).
12. Since actual G is increased, and $G = T$, actual taxes also rise. Notice also that perceived services rise by CD, while perceived taxes rise by AB. The exact effect of the change in δ depends on the median voter's price-elasticity of demand. We have shown the elastic case here, since total perceived outlay has risen by AB. Finally, we note that it is not our intention in the present paper to give an exhaustive description of the ways in which perceptions might be manipulated. An important omission is use of the inflation tax. See Johnson (1977). Another potential device for deluding is manipulation of what Darby and Karni (1973) call 'credence' quality. On the use of bond-financing to induce underestimation of tax prices, see Buchanan and Wagner (1977, 1978).
13. The preceding argument is suggested by the analyses of Williamson (1967) in the context of the firm, and Breton (1975: 167-8) or Niskanen (1975: 623-9) in the context of the bureau.
14. For simplicity, the following argument is carried out in terms of the absolute size of the public sector T (or G), even though it may be more appropriate to consider a relative measure such as T/Y (or G/Y). Since we hold Y fixed throughout, it makes no difference here.
15. The idea that benefits of acquiring information rise with T, and therefore T/Y follows Stigler (1961).
16. The PP curve could also approach the vertical line $\delta = 1$ from the right. In that case, overestimation of tax burdens is the norm. The shape of the PP curve is not essential to our main argument, and we shall not consider the pathological cases here.
17. Models possessing equilibria in which different agents possess different information are not new. See Backhaus (1978) for a description of such a model by Pareto. Shefrin (1978) has recently formulated a model containing a fulfilled expectations equilibrium in which the agents have differential information.
18. We assume the median voter's income elasticity is always positive, thus $A'A'$ lies everywhere below AA.
19. A simple mathematical formulation of the complete system is given in the Appendix.
20. J.S. Mill, op. cit., Book V, Ch. VI.
21. A similar argument is found in Johnson (1977). The crude form of this argument is attributed to P.T. Barnum. An analogy for goods supplied privately is that those producers whose market is a narrow age group can perpetrate more fraud than producers who sell to a wide variety of age groups. The reason is that each age group has insufficient incentive to pass on information to the next.
22. Recalling from Section 2, that the act of deluding causes a change in voter utility, it is interesting to note global Pareto optimality requires $\delta W/\delta Rip = \delta E/\delta Rix$, where W = total welfare, Ri = resources invested in the act of deluding, p = public services, and x = private goods. If 'hidden persuaders' operate in the private sector, then Pareto optimality requires that they also operate in the public sector.

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