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# The cost disease and government growth: Qualifications to Baumol[1]

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**Abstract.** Changes in real world wage movements across sectors account for about a third of the rise in the cost of U.S. government services between 1959 and 1989, while relatively slower productivity in the public sector acccounts for the remaining two-thirds. Even though it is slower, however, the productivity record still is positive even in the labor intensive government sector. Consequently Baumol argues that the public's likely future objection to necessary increases in the share of expenditures over the next 50 years will betray a fiscal illusion unless policymakers take pains to dissolve it. But slower productivity may be equally due to the structural organization. Removing public monopolies, reducing bureaucracies, and undertaking privatization in education for example, are other policy options that could radically change the productivity record. Meanwhile in his recent calculations of dramatic government expenditure increases expected in the next half century, Baumol omits reference to the marginal welfare cost of public funds, which on our estimates, will increase at least ten times to reach 1.71 by the year 2040.

In a recent article, William Baumol (1993) has argued that unless the public is made to recognize that the real costs of providing government services such as health care and education will inexorably continue to rise, an uninformed public may wish to privatize public services unwisely and/or harass government officials into reducing the rate of growth of health care and education services. To illustrate that at least one part of this problem involves an illusion, Baumol distinguishes between the money cost of producing real government services ("appearing to rise out of control") and the labor-time used to produce those real service outputs (which continues to fall). Despite a continuing rise in money prices, he argues, continuous innovation throughout the economy increases labor productivity on average and reduces the labor-time needed to produce the same levels of service. Hence even if service productivity in the government rises more slowly than in manufacturing (the cost disease hypothesis), *any* increase in productivity means that the same levels of service can be provided with fewer real resources. For government to maintain a constant real share of the overall expansion of economic activity, an ever larger share of the economy's monetary expenditures must go through the public sector. But if the community comes to believe that it can not afford this, it faces a fiscal illusion. The task facing Baumol's informed economic commentator is then "... to

convince the intelligent layperson that, even though the prices of personal services seem to be rising at a rate that is out of control, in fact the costs of those services ... are really gradually declining ..." (p. 26).

While agreeing with parts of Baumol's argument, we have two major qualifications. First we argue that Baumol overstates the role of productivity differences by understating an important production cost consideration relevant to the observed cost disease. Second, we stress the importance of including the deadweight costs generated by raising tax revenues to fund ever more expensive services. With distortionary taxation, maintenance of the same real government share in GDP implies an ever increasing monetary expenditure share (i.e. increased tax revenues) and therefore progressively increasing deadweight tax collection costs. In the final sections of the paper, this general point is made specific and is illustrated with reference to education.

Section 1 reviews elementary economic theory of the direct output measure of real cost and emphasizes that from the input side, changes in cost depend upon relative wages as well as relative productivity. Measuring the period 1959–89, our empirical Section 2 concludes that changes in real wages across sectors accounted for approximately one-third of the rise in the real cost of government services while slower productivity growth accounted for the remaining two-thirds. Section 3 takes as its starting point the rough estimate in Baumol (1993) that between 1990 and 2040 the share of health care in GNP will almost treble. It then shows the striking implications for the growth of the excess burden of taxation over the same period. Section 4 examines more closely the particular example of education and discusses not only the expected prohibitive rises in the welfare costs of taxation but also the probable improvements in productivity that would occur with privatization. Section 5 offers our main conclusions.

## 1. Input versus output theories of value

In this section we illustrate why a relatively slow rate of growth in the productivity of government services (the cost disease hypothesis) does imply an increase in the real cost of providing government services, why the appearance of increasing cost is not a fiscal illusion and why slower productivity growth represents only one part of the observed continuing rise in real cost. To do so we begin by defining cost and emphasizing the two sided nature of its measure in equilibrium.

In a competitive market equilibrium, the quantities produced are determined by the marginal condition that the demand price (representing consumers' marginal willingness to pay) just equals the supply price (measuring the alternative value of the resources used in the marginal unit of output). Opportunity cost,

*Table 1.* Productivity and cost: homogeneous labor inputs

| Output | Period 1 | Period 2 | Period 3 | Period 4 |
|---|---|---|---|---|
| Education services | 100 | 100 (1.03) | $100\ (1.03)^2$ | $100\ (1.03)^3$ |
| Manufacturing products | 100 | 100 (1.05) | $100\ (1.05)^2$ | $100\ (1.05)^3$ |
| Education cost = units of manufacturing output per education unit | 100/100 = 1 | 105/103 = 1.0194 | 110.25/106.09 = 1.0392 | 115.76 – 109.27 = 1.06 |

the measure of the value of alternatives foregone, can then be measured either as the value of output foregone or the foregone value of the inputs used. Over time, changes in tastes or technology change one or other part of the marginal condition and so evoke quantity responses as competition among producers and among consumers reallocates resources across alternative uses. It follows that any measured change in cost between positions of equilibrium, while initiated by a shift on one side of the equilibrium condition, will invoke further changes in the marginal condition as the relative quantities adjust along the shifted schedules to restore equilibrium. Only in exceptional cases (such as constant costs) will measured changes in cost fully capture one initial cause. Most often the measured change will reflect the blending of demand and supply side influences.

To establish the link between productivity and cost, we illustrate in Table 1 the simple case of a social choice between two alternative outputs that can be produced using labor time: one that produces educational services using an hour of classroom time and a second that uses the same common labor hour to produce manufacturing output. In row 2 of Table 1, the equilibrium alternatives are shown as the hypothesized values: 100 units of education output and 100 units of manufacturing output. The output measure of education cost is then the quantity of manufacturing output that society is willing to forego to acquire an additional unit of education services. Alternatively, the cost to the community can be measured as the alternative value of the hour of labor service use, where the labor could have been used to produce manufacturing output. Because the same quantity of homogenous labor is used to produce a marginal unit of each output, the opportunity cost of a unit of education services is measured in either way as the one unit of manufacturing output that would have been produced with the same quantity of freed labor time.

Suppose next that while the two outputs continue to be produced under conditions of constant cost, the techniques for producing are subject to innovation

and hence experience continuous but differing rates of productivity growth through time (e.g. labor productivity in education and manufacturing are assumed to grow at rates of three and five per cent, respectively). The larger potential outputs associated with the higher levels of productivity (using the same quantity of labor) are represented in the adjacent three columns. The bottom row continues to represent cost as the ratio of the two outputs.

What is apparent from the table is that although more of both can be produced in succeeding periods (so that the labor-time needed to produce a single unit of output falls continuously), there is an ever increasing cost of continuing to use labor to produce education services instead of manufacturing output. Moreover, as Table 1 illustrates even a relatively minor difference in the productivity growth rate will lead to an ever increasing gap in the real cost of producing the less productive output. Because real cost measures the output foregone for the same quantity of labor use, the fact that each output becomes increasingly productive is relevant for determining only the magnitude, rather than the existence, of that real cost.

The differences between this simple example and Baumol's case of relatively slow productivity growth in government services are the complications caused by the fact that education services are not produced under constant cost nor are the relative quantities produced those that would arise in a competitive market equilibrium. In addition, the outputs and labor inputs used to affect the real cost comparison are not homogeneous and may vary in quality and price over time. The former considerations mean that the "real" measure of cost is no longer anchored by a constant marginal value on one side of the equilibrium condition while the latter means that a new common unit in which heterogeneous units can be compared is needed (and provided by money prices). What tends to remain hidden by the technical change in measures is the fact that the observed measures of cost no longer correspond to competitive market equilibrium. Using X to represent education services and Y to represent manufacturing output, the cost of education services as the ratio of the money prices of the two outputs measures the quantity of manufacturing output that could be purchased by using the dollars freed through the use of a unit less of educational services. That is, by definition,

$$\text{Cost of Education} = \frac{p_x}{p_y} = \frac{\Delta\$/\Delta X}{\Delta\$/\Delta Y} = \frac{\Delta Y}{\Delta X}. \qquad (1)$$

However, although the principle of comparing alternative real output units remains the same, the earlier direct link with the value of input use and labor productivity now becomes somewhat remote. The problem presented by the money measure is that the ratio of money prices need not reflect the underlying social cost of production and will not in the presence of market imperfections

such as monopoly power and/or externalities. Market prices and particularly administered prices may include elements of rent (representing rent transfers rather than resource cost), and while they affect individual decision making, they do not reflect underlying social costs. It follows that when a real output comparison is made through money prices from the output side (as above) or the input side by accounting explicitly for heterogeneity in the units of labor used through money prices, the conversion to a common basis through money measures may include elements beyond those of real cost. Looking then at relative cost through common input use, where the common dollar buys units of labor which in turn produce units of output, the measured cost of producing X can be represented as

$$\text{Cost of Education} = \frac{\Delta Y}{\Delta X} = \frac{(\Delta\$/\Delta L_x)(\Delta L_x / \Delta X)}{(\Delta\$/\Delta L_y)(\Delta L_y / \Delta Y)} = \frac{w_x(\Delta L_x / \Delta X)}{w_y(\Delta L_y / \Delta Y)}. \quad (2)$$

As equation (2) illustrates, changes in measured relative costs depend upon changes in relative wages as well as changes in relative productivity. Given unchanged wage rates across the two sectors and a competitive political market to reallocate final output produced at constant cost, Baumol's cost disease hypothesis of relatively slow productivity growth in government services would translate directly into the prediction of increasing measured and real costs of providing government services. When relative wages change, this one-to-one correspondence disappears.

The accounting nature of equations (1) and (2) means that when changes arise in relative wage rates for any reason, changes in measured relative output prices cannot be attributed to productivity change alone. But while relative wage changes may change the money price measure of cost, the implication of those changes for social welfare (and hence for social cost) will depend upon the reason for why relative wages have changed. In general, real wages can differ across sectors either because competitive markets pay heterogeneous workers wage differentials that reflect individual productivity differences (e.g. workers embody different amounts of human capital) or because differences in the degree of competition across sectors are reflected in the returns realized by different (otherwise homogeneous) labor groups. Only changes in the former affect the "real" relationship between input use and potential output and so change the real resource cost of providing units of education services from foregone manufacturing output. Relative wage rate increases that reflect increases in the degree of market power only redistribute rents at the social level rather than change the technical relationship between input and outputs use. In Section 4 we advance reasons for believing that, at least for education, increases in relative wages are attributable primarily to increases in rent rather than changes in social cost.[2] At this stage, however, we are content merely to

underline the theoretical relationship that indicates that traditional productivity measures may not account for all of the measured cost changes arising across sectors.

## 2. The rise in the cost of government services

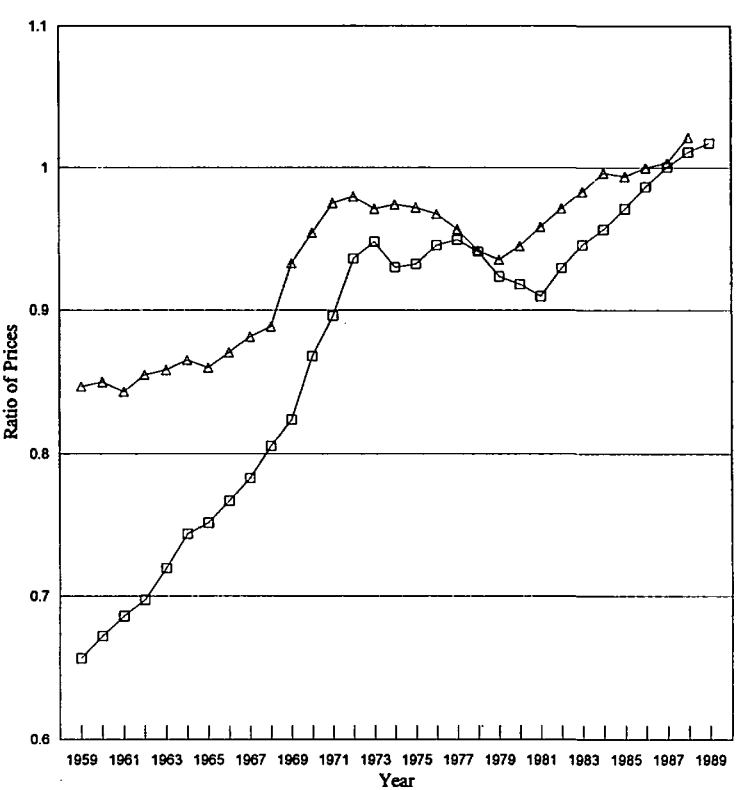
In Figure 1 we present the time series for both the cost of government services [where cost is measured, as in equation (1), as the ratio of the implicit GDP price indices (1987 = 100)] and the relative labor cost of providing government services for the period between 1959 through 1989 (also with 1987 = 100).[3] As that figure illustrates, the period as a whole was one of increase for both series, with the general pattern of increase broken only for a short period in the late seventies. A number of different reasons have been advanced for the continuing rise in the cost of providing government services, with Baumol's explanation being only one of a number of competing cost side hypotheses. In this section, we test for the significance of the different rate of productivity growth in government relative to manufacturing as a determinant of the measured real cost of government and follow this with an attempt to calculate the relative strength of slower productivity growth compared to relative wage changes as determinants of the measured cost disease phenomenon.

In Table 2 we present a series of regressions designed to test the explanatory power of changes in labor productivity as a determinant of the cost disease

*Table 2.* Determinants of changes in the cost of U.S. government services, 1959–1989

| Independent variables | D(RELPRICE) (1) | D(RELPRICE) (2) | D(RELPRICE) (3) |
|---|---|---|---|
| CONSTANT | 0.0039 | −0.002 | −0.003** |
| | (1.09) | (1.40) | (1.68) |
| D(RWAGEM) | 0.009 | 0.032* | 0.032* |
| | (.881) | (6.81) | (6.93) |
| D(RELPROD) | −0.434* | −0.099 | −0.119** |
| | (2.96) | (1.47) | (1.77) |
| D(PAYRATIO) | | 0.852* | 0.849* |
| | | (11.48) | (11.71) |
| D(GOVEMP) | | | 0.582 |
| | | | (1.49) |
| Adj$R^2$ | 0.271 | 0.875 | 0.880 |
| F | 6.40 | 68.9 | 54.6 |
| D.W. | 1.22 | 2.00 | 1.84 |

t statistics in brackets below estimated coefficients
* significant at one per cent, ** significant at 10%




Source: Citibase

*Figure 1.* Relative cost of government 1959–1989

phenomenon. Before beginning, however, we note two special features of the data in our tests. First, because the measured cost of government output (RELPRICE) continued to rise throughout our time period, this time series as well as the others in the analysis is unlikely to be stationary over time. This expectation was confirmed in a series of unit root tests.[4] Since the interpretation of the level form of these tests is susceptible to presence of spurious correlation in the data, all our equations were run with the variables in first differences (shown in the table using the difference operator, D). The second problem was

to derive an appropriate measure of the relatively slow rate of productivity growth in the government sector. To measure productivity change in government relative to that in manufacturing we used two proxies: the first was real manufacturing wages, RWAGEM, and the second was the ratio of the average labor product of government output relative to that in manufacturing, RELPROD. The first measure assumes that some portion of the increase in manufacturing marginal productivity will be captured in higher real wages, while the second measure assumes that changes in the ratio of the average product reflect changes in the marginal product of the same scale and direction. Since manufacturing productivity fell only for a short period in the late seventies, this may not be too misleading. The data appendix of this paper presents the details of the derivation of the specific variables.

The two specific hypotheses tested in the regression analysis are called, for convenience, the productivity hypothesis and the relative wage hypothesis. Given our variables, the productivity hypothesis predicts that increases in real manufacturing wages will be positively related to RELPRICE (the coefficient on REWAGEM will be positive) while the average measure of relatively slow productivity growth will be inversely related to RELPRICE (the coefficient on RELPROD will be negative). The relative wage hypothesis focuses on the extent to which changes in relative output prices across sectors are reflected in changes in relative wage costs. The prediction is that increases in the relative wage rate between the government sector and the manufacturing sector produce increases in relative money prices. The coefficient on PAYRATIO is expected to be positive. In the final column of Table 2, we control for the scale of the government sector by including a size variable, GOVEMP (the fraction of the population employed in the government sector). If increases in the scale of government are expected to increase the unit cost, GOVEMP would be expected to increase RELPRICE.

The first equation (second column) of Table 2 presents the results of the ordinary least squared regression of the real cost of government on the Baumol proxies alone, i.e. real manufacturing wages and relative productivity. While that equation has some success in explaining the rise in the measured cost of government services (i.e. both coefficients have their expected signs and RELPROD is significantly different from zero), the equation explains only a quarter of the variation and has a low Durbin-Watson statistic (suggesting misspecification). The third column represents the least squares results for the more complete specification suggested in equation (2) above. As would be expected, this equation performs much more satisfactorily. The explanatory power of the joint hypothesis rises dramatically and the Durbin-Watson statistic now exceeds the upper bound (1.65), indicating the absence of serial correlation in the residuals. The last column in the Table presents the regression results

with the addition of GOVEMP to control for changes in the scale of real government activity. With its addition, both the F statistic (for the null hypothesis that all coefficients are zero) and the Durbin-Watson statistic fall. For this reason, we reject the third equation in favour of equation 2 as a more reasonable description of factors that have affected the real cost of government services.

As the three columns vividly illustrate, all the proposed variables play some role in explaining the variation in D(RELPRICE). Of the eight coefficients in the three equations, all eight had their predicted signs and five of the eight are significantly different from zero at one percent (an additional one at ten percent). All the variables used to represent Baumol's productivity change hypothesis have their expected sign and three of the six coefficients are significantly different from zero at one percent. In the second equation, which has the best overall fit with the data, RELPROD becomes insignificantly different from zero. While supportive of the productivity hypothesis, the data are also consistent with a significant role for relative wages in explaining the phenomenon of rising cost. In equations two and three, the coefficient on D(PAYRATIO) is positive as predicted, both are large and significantly positive (at one percent). At least in this time period, then, both sets hypotheses appear to capture significant determinants of the growth in the measured real cost of government.

For our purposes, these regression findings are significant because they demonstrate that the relative productivity hypothesis (i.e. Baumol's cause of the cost disease hypothesis) is not sufficient, in itself, to explain fully past movements in measured real cost. Moreover, while the relative size of the coefficient on D(PAYRATIO) reflects the different scale of the variable used in the equation, the significance of PAYRATIO as a variable does suggest that the relative wages may explain a relatively large proportion of the change in RELPRICE over this period. To test this hypothesis we used the regression coefficients of the second equation as unbiased estimates of the coefficients appropriate for levels and used these values to proportion the change in RELPRICE over the 1959 to 1989 period.[5] Using the second equation of Table 2 where all relative price change is attributed either to the productivity or real wage factors, our findings suggest that changes in real wage movements across sectors can account for roughly a third of the rise in the real cost of government services. Slower productivity growth accounted for the remaining two thirds.[6]

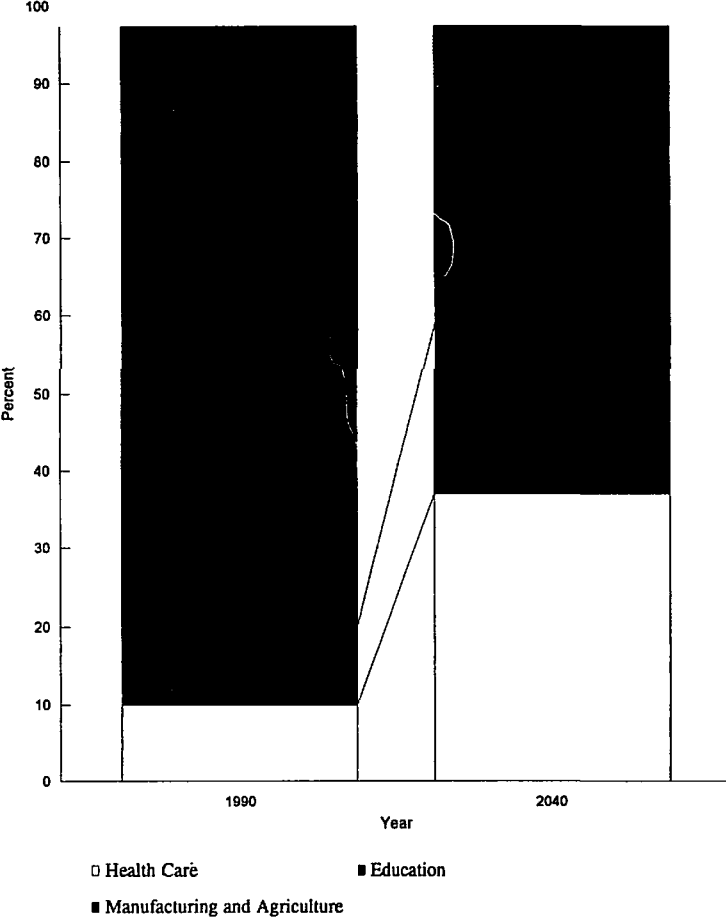
## 3. Deadweight cost considerations

While the previous section proportions the increase in the real production costs of government between relative wage and productivity changes, the finding that some two thirds of the rise in real cost can be attributed to productivity

differences does not imply necessarily that the slow rate of productivity growth in the government sector is either inevitable or unavoidable. Productivity change may have been prevented artificially from affecting government sector output. With sufficient institutional revision to bring economic incentives to bear in the future, the public sector may become more sympathetic (less antagonistic) to innovation. Similarly, privatisation may itself provide incentives that increase the rate of absorption. By and large, however, the factors impeding the absorption of innovation and reform are multifaceted and sector specific. The last section of this paper illustrates the specific institutional factors that underlie both the slower rate of productivity growth and adverse rate of change of relative wages in the education subsector. In this section, we turn from institutional features to broaden the definition of government service cost to the *full cost of providing these services, i.e. production cost plus the deadweight* welfare costs of taxing to finance the provision of government services.

The fact that deadweight costs are generated by the necessity of raising revenues through nonlump sum taxes is now well recognized and their probable magnitude have been reported in the literature since the 1970s. For Canada there has been the work of Campbell (1972), while Stuart (1981) and Atkinson and Stern (1974) have produced estimates for the U.S. More recent calculations for the U.S. are reported in Browning (1987) and Ballard *et al.* (1985). Using data for 1972 and applying general equilibrium analysis, the latter report that the marginal cost of raising one dollar of extra revenue ranged between 17 and 56 cents in that period, depending on different assumptions of elasticities of savings and labor supply. Using a partial equilibrium approach, Browning (1987) produced similar findings. It is necessary, also, to refer to work by Usher (1986). He demonstrates that the analysis adopted by writers such as Ballard *et al.* underestimates the cost of public funds by ignoring the welfare cost of tax evasion. This latter cost will also increase with government's GNP share. Incorporating tax evasion costs, Usher then calculates that with a government share of GNP of 50% and tax evasion of 10%, it will cost 80 cents to raise a $1 of extra tax revenue. In other words the total burden on taxpayers when one extra dollar of revenue is raised will amount to $1.80.

We shall now adjust Baumol's suggestive extrapolations with our own rough estimate of expected change in deadweight taxation costs. Following Baumol, consider as the initial scenario an expected growth in GNP between 1990 and 2040 where the economy continues to produce education, health care and everything else in their current relative proportions. Aggregate growth is based on the assumption that the number of hours of labor performed in the U.S. remains contant but that productivity in the economy grows at its historic rate of approximately two per cent. Although by 2040 the proportions of real resources devoted to education, health and everything else remain as in 1990, proportions of *expenditures* can be predicted to change drastically because of




Source: Baumol (1993), p. 25

*Figure 2.* Hypothetical changes in total spending shares assuming historic sectoral productivity growth rates.

the presence of Baumol's "cost disease". This can be seen in Figure 2 [taken from Figure 6 in Baumol (1993)] where the expected expenditure proportions in 1990 appear in the left hand bar. Baumol appears to attribute government services entirely to health and education services so that on that basis the right-hand bar shows that by 2040 the share of education plus health care in GNP

will almost treble, rising from about 20% in 1990 to nearly 60% four decades later.

The difficulty that Baumol sees in such a dramatic situation is that of convincing the intelligent layperson to rationally accept that even though there will be an unprecedented rise in the prices of personal services such as health and education, yet, in fact, "the costs of those services ... are really gradually declining" (because of increases in labor productivity) [Baumol 1993, pp. 25, 26.] Baumol concludes that persuading the public that these changes can be rationally accepted should not be beyond the means of those who specialize in the art of communication.

In our assessment, however, rational acceptance of these expected changes can be seriously challenged. The challenge becomes apparent the moment we include the expected increases in the deadweight cost of taxation over the same fifty year period. In calculating these increases we shall rely upon Browning's (1987) formula for the marginal welfare cost of taxation in the case that assumes marginal government spending provides benefits that return taxpayers to their initial (i.e. before tax and expenditure change) utility levels.[7] The formula is as follows:

$$\frac{dW}{dR} = \frac{\left[\frac{m+0.5dm}{1-m}\right]\eta\frac{dm}{dt}}{1-\left[\frac{m+dm}{1-m}\right]\eta\frac{dm}{dt}}$$

where dW/dR is the ratio of change in total welfare cost to the change in tax revenue produced when tax rates are varied in some specific way.

m is the marginal tax rate

dt is the change in the average tax rate evaluated at the initial level of earnings (bearing in mind that some revenue can be lost from a reduction of earnings following a tax increase)

$\eta$ is the labor supply elasticity.

From our Figure 2 the appropriate magnitude for m in 1990 appears to be 0.2 since education and health together are presented by Baumol as accounting for 20 per cent of GNP. For the parameter dm we use 0.01. It will initially be assumed that the tax rate is proportionate so that $dm/dt = 1$. We agree with Browning, meanwhile, that a labor supply elasticity of 0.3 is a reasonable assumption. Inserting these parameters into Browning's equation produces for the year 1990:

$$\frac{dW}{dR} = \frac{\left[\frac{0.2+0.5(0.01)}{0.8}\right]0.3}{1-\left[\frac{0.2+0.01}{0.8}\right]0.3} = \frac{.077}{0.93}.$$

Therefore the marginal welfare cost for 1990 = 0.083.

For the year 2040 Baumol assumes that government expenditure (mainly on education and health) has risen to about 60% of GNP (see Figure 2). This means that m is now 0.6. Assuming the other three parameters to remain the same as before, the numerical values in the equation are now as follows:

$$\frac{dW}{dR} = \frac{\left[\frac{0.6+0.5(0.01)}{0.4}\right]0.3}{1-\left[\frac{0.6+0.01}{0.4}\right]0.3} = \frac{.454}{.543}.$$

Thus the marginal welfare cost for 2040 = 0.837.

These calculations suggest, therefore, that the rise in government expenditures on health and education between 1990 and 2040 contained in Baumol's crude estimates, will be accompanied by approximately a ten-fold increase in the marginal welfare cost of taxation (i.e. from 8.3 to 83.7%.)

So far we have assumed a proportionate tax on labor. Since the tax, in reality, is progressive we need a more plausible parameter for dm/dt. Browning's preference is for 1.39. Substituting this in our calculations produces a marginal welfare cost of 0.35 in 1990 rising to 1.71 in 2040.

These calculations produce overestimates insofar as we recognize that Baumol's figures wrongly assume that all spending on education and health is undertaken by government. In Figure 2 it is total spending, not government spending, that is measured. Government spending is more likely to constitute say 15 per cent of GNP rather than the 20% assumed in our calculations.

Four additional considerations, however, suggest that we have underestimated the marginal welfare cost of public funds. First, and following Browning, our estimates relate only to the labor supply distortions of taxes. The resultant neglect of distortions on other margins of choice must bias our estimates downwards. Second, we have applied a formula that assumes marginal government spending provides benefits that return taxpayers to their original utility levels. Where there are possibilities of inefficiency in government supply, the above assumption does not apply and marginal welfare costs increase in proportion to the waste involved. In Section 4 we shall demonstrate that significant inefficiencies in government supply do occur in reality. Third,

further and substantial allowance should be made for administrative and compliance costs. Fourth, the equally substantial costs of tax evasion need also to be added (Usher, 1986).

It is now time to demonstrate why we believe that the changes predicted by Baumol for the next half century are *not* rationally acceptable. When the marginal welfare costs of taxation approach 1.71 (see our last calculation above), we have a substantial *real* increase in the cost of government-provided health and education services. The conventional law of demand predicts that less will be purchased at a higher price than at a lower one. This case is no exception, nor would it be expected to be one. A reduction in demand would fail to occur only if there are no private substitutes for government-provided health care and education. Since such substitutes are available, and assuming that there is some elementary recognition by the public of the deadweight costs (which seems entirely reasonable),[8] substitutes can be predicted to be increasingly purchased.

## 4. The inevitability of the cost disease? The example of education

In Section 3 we briefly referred to private alternatives to the public provision of health and education services. Here we return to indicate our specific concerns with respect to education. Baumol acknowledges that, theoretically at least, privatization may offer a potential escape route. He emphasizes, however, that it will not eliminate the cost disease. Because of this, private entrepreneurs will be forced to match persistent, cumulative and compounded rises in their costs by corresponding increases in their prices. This inevitable occurrence will make them the subject of suspicion and hostility. In consequences there will be a strong temptation by politicians to offer the popular "remedy" of price controls, an action designed to curb what consumers perceive to be excessive total revenues going to private suppliers. The result, Baumol observes, will be a deterioration in the quality of privately supplied education services.

Even on its own terms, however, this argument does not unambiguously dispose of privatisation as a solution. The problem of hostility against suppliers who are perceived to be enjoying undeserved total revenues is common to both privatised and collectivised modes of supply. In Baumol's own analysis, voters are predicted to become increasingly hostile to what they see to be "excessive" revenues enjoyed by the public system. The political reaction will inevitably be reductions in the growth of expenditures on public education. And these reductions will have their own adverse effects on quality.

But the argument hitherto outlined, should not be accepted on its own terms. Privatisation could lead to significant changes in the structure of supply that result in "genuine" reductions in real costs. These could be expected following

the breakup of what is now a monopoly system of schooling. One aspect of this system, for instance, is the higher incidence of unionized labor. Recent econometric evidence has found, that compared with nonunionized districts, unionized districts are associated with increases in expenditures per student of between 7 and 15 per cent (Eberts and Stone, 1986). Other evidence, moreover, shows that the size of the representative school district is growing, a phenomenon that increases the potential for the effective exercise of monopoly power.[9] The primary cause of the cost differential between the two systems is the higher compensation of unionized teachers. Since private school teachers are less heavily unionized, full privatisation can ultimately be expected to yield corresponding labor cost reductions.

Baumol warns that proposing an increasing switch to private enterprise will elicit determined opposition "which has shown itself, for example, whenever any measure is proposed that is perceived as even a minor threat to the public schools" (pp. 26, 27). The "determined opposition" to privatisation, however, is concentrated among those employed in the public school system and who have the most to lose through the erosion of their monopoly. This opposition, in other words, is itself a measure of the degree of monopoly power within the existing system. Gallup polls, meanwhile, show that around fifty per cent of parents with school age children favor education vouchers that would pave the way for competition. Being more dispersed than school employees, these parents certainly face higher transactions costs of political lobbying. But this does not imply that their opposition to monopoly is less important in welfare terms than the opposition by the public education establishment to proposals for competitive supply.

There is an important sense indeed in which opposition to monopoly supply should be part and parcel of Baumol's argument. If by privatization he means a return to a full market system of supply, we must envisage the complete switch to a for-profit system of provision rather than stopping with the hybrid system of nonprofit organizations currently in place. Several inefficiencies in nonprofits have been recognized by economists. Newhouse (1971) shows, for instance, that nonprofit decision-makers choose quantity-quality of mixes of output that are optimal for them, but not necessarily for society. But the discovered inefficiency of nonprofit organization that is most relevant to the present discussion is their sluggish response to dynamic change. Suppose, for instance, that new cost saving techniques in education become available and are not widely adopted. In a for-profit free entry system, entrepreneurs incorporating the new methods will seize the opportunity of realizing direct and unambiguous income increases from new entry and/or expansion. The system contains the incentives that encourage the implementation of technical change. In a world of nonprofit organizations, in contrast, the incentives to innovate are more diffuse and the restriction of entry (as in the case of public education)

removes the discipline of outside competition. The result is that the rate of productivity change tends to be institutionally constrained. Costs are not pressured down adequately and potential rents are dissipated through higher paid returns to artificially scarce factors of production. The cause of this deficiency is the institutional form chosen by past policy makers. It brings with it its own "cost disease", but the inevitability that Baumol speaks of is missing in education because it can be largely removed by organizational reform.

Baumol refers obliquely to what are potentially more legitimate grounds for continuing with the public provision of education. No matter how one feels about the other arguments. Baumol observes, "a dispassionate evaluation will surely recognize that many of the objections raised against privatisation of some of these traditionally public activities are not entirely without merit" (p. 27). Since he does not elucidate these objections, we conjecture that he is referring to the following well-known type of economic reasoning. The main argument for government intervention stems from the postulated need to correct market failures. The public sector, it is argued, is better able than the private sector to internalize Pareto-relevant externalities.

Although this proposition is controversial in itself, we shall here assume its validity. We shall suppose therefore that there is a marginal external benefit from government spending on education that justifies current spending. When, however, the marginal welfare cost of spending rises over time (as our analysis predicts), and assuming the marginal external benefit remains unchanged, efficiency calls for reduced government spending on education. In short, if marginal welfare cost rises over time, the efficiency case for government spending becomes weaker, and the case for more privatization becomes stronger.

## 5. Conclusion

Baumol's cost disease theory has plausible validity but it is important to try to test it empirically and explore the full implications. Our own investigation of the evidence suggests that changes in real wage movements across sectors accounts for roughly a third of the rise in the cost of government services, while slower productivity growth, which is the focus of the cost disease theory, accounts for the remaining two-thirds. Baumol's belief, meanwhile, that the slower productivity in the public sector is largely inevitable (because of its greater labor intensity) should also be placed in perspective. The literature on nonprofit organizations find them to be pronouncedly sluggish where innovation and invention are concerned. The implication is that privatization of schooling would significantly improve productivity records.

Our most important qualification to the reasoning in Baumol (1993), however, relates to his omission of reference to the enormous increase in the wel-

fare costs of public funds that are implied in his own calculations of government expenditure increases expected between 1990 and 2040. When these extra costs are included, it is difficult to see how the pressure to privatize can be resisted.

## Notes

1. We would like to acknowledge the exceptionally helpful comments of a referee on an earlier draft of this paper.
2. The possibility that adverse relative wage costs in government services may reflect the latter is suggested by the monopoly power available to be exploited by labor when the government becomes the sole supplier of "public" goods. In education, for example, the removal of systems competitive with public provision is often associated with higher degrees of unionization and correspondingly higher wages.
3. See the appendix for a detailed description of data sources.
4. The augmented Dickey-Fuller test statistics (with constant and time trend) for RELPRICE, PAYRATIO, RWAGEM and RELPROD were, respectively: −1.65, −3.04, −2.71 and −1.09. All were lower (in absolute terms) than the ten percent MacKinnon critical value of −3.22.
5. Calculations for the proportioning of the change in RELPRICE (1959 to 1989)

| | | | |
|---|---|---|---|
| RELPRICE | begins at 0.657238 | ends at 1.017759 | Change = 0.36*65.7 = 24% |
| PAYRATIO | begins at 0.8109 | ends at 0.9607 | Change = 0.15*0.852 = 0.13 |
| RWAGEM | begins at 19.61 | ends at 27.57 | Change = 7.96*0.03 = 0.24 |
| RELPROD | begins at 0.799073 | ends t 0.405544 | Change = −0.39* −0.099 = 0.04 |

   Total change "explained" by variables = 0.41 (changed 0.36 in total).
   Percentage of predicted change accounted for by productivity factors = RWAGEM + RELPROD = (0.28/0.41)*100 = 68%. Percentage accounted for PAYRATIO = (0.13/0.41)*100 = 32%.
6. Both Borcherding (1985) and Ferris and West (1993) use a more comprehensive approach to the influences on real government size and its cost to conclude that Baumol's cost disease can explain only a relatively small part of the growth in government spending. Our results for the past forty years suggests a somewhat more important role than would Borcherding's finding (of 31%) for the century as a whole.
7. See Browning, 1987, page 18, equation 11.
8. Some measure of the layman's recognition of the welfare burden of taxation up to now is demonstrated in Ferris and West, 1993.
9. L.W. Kenny and A.B. Schmidt (1994).

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## Appendix: Data sources

The data in this study is taken from Citibase, Citicorp Database Services, 1992. The primary variable names then reflect their Citibase nomenclature. The variable names used in the text were designed to carry easy interpretation and their construct is as follows:

RWAGEG = real government sector labor compensation per full and part time equivalent government employees = [GAPG/GAFG][1/GDPDEF = GAND82/GAND].
RWAGEM = real manufacturing labor compensation per full and part time equivalent employee = [GAPM/GAFM][1/GDPDEF]
D(RWAGEM) = RWAGEM – RWAGEM(–1)
PAYRATIO = RWAGEG/RWAGEM
D(PAYRATIO) = PAYRATIO – PAYRATIO(–1)
RELPROD = real government output per full and part time employee divided by real manufacturing output per employee = GPROD/MPROD = [GA8GGE*1000/GAFG]/LOUTM. Multiplication by 1000 was to allow the ratio to be formed from the same units.
D(RELPROD) = RELPROD – RELPROD(–1)
RELPRICE = Government GDP index divided by GNP Deflator (Index 1987 = 100) = GDGG/GD converted to annual values from quarterly data.
D(RELPRICE) = RELPRICE – RELPRICE(–1)
GOVEMP = Full and PT government employees divided by population 20yrs&older = GATG/PAMF20
D(GOVEMP) = GOVEMP – GOVEMP(–1)