11 Baumol's cost disease

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In 1966, William J. Baumol and William G. Bowen published *Performing Arts: The Economic Dilemma.* Their book was extraordinarily influential and it is generally agreed that analysis of the economics of the arts had its origin in that work.

The economic dilemma Baumol and Bowen referred to was the problem of financing the performing arts in the face of ineluctably rising unit costs. These, they argued, are the result of 'productivity lag'. The resulting cost pressure has come to be known as 'Baumol's cost disease'. Productivity is defined by economists as physical output per work hour. Increases in productivity over time may occur for the following reasons: (1) increased capital per worker, (2) improved technology, (3) increased labour skill, (4) better management, and (5) economies of scale as output rises.

As this list suggests, increases in productivity are most readily achieved in industries that use of a lot of machinery and equipment. In such industries output per worker can be increased either by using more machinery or by investing in new equipment that embodies improved technology. As a result, in the typical manufacturing industry the amount of labour time needed to produce a physical unit of output declines dramatically decade after decade. The live performing arts are at the other end of the spectrum. Machinery, equipment and technology play only a small role in their production process and, in any case, change very little over time.

That is not to say that technological improvements are entirely absent. For example, stage lighting has been revolutionized by the development of electronic controls and audience comfort greatly enhanced by air conditioning, which also facilitates longer seasons and more flexible scheduling. But these improvements are not central to the business at hand. As Baumol and Bowen point out, the conditions of production themselves preclude any substantial change in productivity because 'the work of the performer is an end in itself, not a means for the production of some good' (ibid., p.164). Since the performer's labour *is* the output – the singer singing, the dancer dancing, the pianist playing – there is really no way to increase output per hour. It takes four musicians as much playing time to perform a Beethoven string quartet today as it did in 1800.

The productivity lag argument

The productivity lag argument can be summarized as follows. Costs in the live performing arts will rise relative to costs in the economy as a whole because wage increases in the arts have to keep up with those in the general economy even though productivity improvements in the arts lag behind. It is not suggested that artists must be paid the same hourly wage as workers in other jobs, since working conditions and the non-monetary satisfaction obtained from employment differ across occupations. Rather, the argument is that all industries, including the arts, compete to hire workers in a nationally integrated labour market and that artists' wages must therefore rise over time by the same proportion as wages in the general economy to enable the arts industry to hire the workers it needs to carry on.

Of the five sources of increased productivity cited above, only economies of scale as a result of longer seasons is really effective in the live performing arts. With only that factor to rely on, the live performing arts, as Baumol and Bowen emphasized, 'cannot hope to match the remarkable record of productivity growth achieved by the economy as a whole' (1966, p.165). As a result, cost per unit of output in the live performing arts is fated to rise continuously relative to costs in the economy as a whole. That, in brief, is the unavoidable consequence of productivity lag.

A hypothetical example

In Table 1 we compare two industries, the widget manufacturing industry in which productivity rises steadily, and the symphony concert industry in which it is stagnant.

The widget manufacturer

Output per work hour (opw) is measured by widgets produced per worker per hour. We assume that it rises from 20 widgets in 1990 to 24 in 2000, an

Table 1 Hypothetical illustration of productivity lag

	1990	2000	Change (%)
Widget industry			
Output in widgets per work hour (opw)	20	24	+20
Wage per hour (w)	\$10	\$12	+20
Unit labour cost (ulc) per widget = w/opw	\$0.50	\$0.50	0
Symphony orchestra			
Output, measured by admissions per work hour (opw)	2	2	0
Wage per hour (w)	\$20	\$24	+20
Unit labour cost (ulc) per admission = w/opw	\$10	\$12	+20

increase of 20 per cent. Wages rise at the same rate as productivity, going from $10 per hour in 1990 to $12 per hour in 2000. Unit labour cost (ulc) equals wages per work hour divided by output per work hour. In 1990, ulc equals $10/20 widgets, or 50 cents per widget. In 2000, unit labour cost is unchanged. Though wages have risen 20 per cent, so has output per work hour, leaving ulc still at 50 cents per widget. Thus wages in a progressive industry can rise as fast as productivity without causing any increase in costs.

The symphony orchestra
To explain and quantify output per work hour for a symphony orchestra, we make the following assumptions:

Size of concert hall = 1600
Concerts per week = 5
Potential admissions per week = $5 \times 1600 = 8000$
Number of musicians = 100
Musicians' work hours per week = 40
Orchestra hours per week = $100 \times 40 = 4000$
Orchestra output per work hour (opw) = admissions per week divided by orchestra hours per week = 8000 divided by 4000 = 2.

As to wages, we assume musicians are paid $20 per hour in 1990. By the year 2000 musician wages have risen 20 per cent, to $24 per hour, in order to keep pace with rising wages in the general economy. Unit labour costs, which equal wages per hour divided by output per work hour, therefore rise from $10 to $12. Thus unit labour cost rises by the same proportion as productivity lags.

Historical evidence on costs
The historical record strongly supports the hypothesis that, because of productivity lag, unit costs in the live performing arts have increased substantially faster than the general price level. Baumol and Bowen (1966) provide abundant examples, pieced together from remarkable historical sources.

Using a set of account books for the Drury Lane and Covent Garden theatres in London covering the years 1740–75, Baumol and Bowen calculate that the average cost per performance came to an estimated £157 in the five-year period 1771–2 to 1775–6. For the sake of comparison, they estimated that the average cost per performance at the Royal Shakespeare Theatre in 1963–4 stood at £2139, or 13.6 times its eighteenth-century level. Over the same period (1771–2 to 1963–4) the general price level in England rose to about 6.2 times its initial level. Thus 'the cost per performance over

the period as a whole went up more than twice as much as the price level' (ibid., p.183).

The above conclusion is based on the comparison of costs of two different organizations at two points in time. Baumol and Bowen were also able to measure the change in costs within a single organization over a long period. For the New York Philharmonic Orchestra they put together a nearly continuous cost history covering 1843 to 1964. Over that period cost per concert rose at a compound annual rate of 2.5 per cent while the US index of wholesale prices rose an average of only 1.0 per cent per year (ibid., p.186).

For the years after World War II, they analysed data on 23 major US orchestras, three opera companies, one dance company, and a sample of Broadway, regional and summer theatres. Table 2 shows that in every group the results were the same: cost per performance rose far faster than the general price level.

Table 2 Growth in expenditure per performance and in the wholesale price index, postwar period, USA

Organization	Period	Average annual percentage increase (compound rate)	
		Expenditure per performance	Wholesale price index
23 major orchestras	1947–64	3.1	1.3
Metropolitan Opera	1951–64	4.4	0.3
City Center Opera	1958–63	2.0	0
New York City Ballet	1958–63	2.3	0
Theatres:			
Broadway sample	1950–61	6.0	1.4
Regional theatre A	1958–63	11.2	0
Regional theatre B	1958–63	6.0	0
Regional theatre C	1955–63	2.5	0.9
Summer theatre	1954–63	3.6	0

Source: Baumol and Bowen (1966, Table VIII-3, p.199).

An international comparison

Baumol and Bowen also found that their evidence, although rather sketchy, did support a conclusion that the problem of productivity lag is international in scope. In the theatres they investigated in Great Britain in the 1950s and 1960s, 'cost per performance rose at a rate of 7 to 10 percent while prices went up at about a 4 percent rate' (1966, p.201). In the USA,

'Costs rose during the postwar period at an annual rate close to 4 percent while prices went up between 1 and 2 percent'. Thus the ratio was roughly 2 to 1 in both countries, suggesting to the authors that the problem of productivity lag 'knows no national boundaries' (ibid., p.201).

The earnings gap

From the beginning, Baumol and Bowen were concerned about the financial implications of productivity lag for performing arts firms. The principal implication, as they saw it, was that, because of productivity lag, costs would rise ineluctably. Revenues, having no built-in growth mechanism, would necessarily lag behind, and the earnings gap would grow continuously.

At this point we must define some terms. The absolute size of the earnings gap equals expenditures less earned income. Its relative size equals that amount as a percentage of earned income. Since non-profit firms generally cannot run an operating deficit, the gap must be approximately covered by *un*earned income. The amount of unearned income is therefore another measure of the gap.

In the foreword to Baumol and Bowen's book, August Heckscher, director of The Twentieth Century Fund, which had financed its publication, wrote: 'It is not only that the live performing arts do not pay for themselves, but that, within the developing economic system, they will show deficits of increasing size' (1966, p.vii). Indeed, a whole chapter of the book is devoted to 'Trends in the Income Gap' and the final chapter, entitled 'Prospects', deals with little else. Moreover, the authors found evidence of a growing earnings gap not only in the USA and Great Britain, but also in Italy and Sweden.

On the basis of postwar experience, Baumol and Bowen estimated that, from the mid-1960s to the mid-1970s, expenditures of performing arts firms would rise between 5 and 7 per cent per year while earned income would rise only 3.5 to 5.5 per cent yearly, resulting in continued relative (as well as absolute) growth of the gap. Fortunately, that did not happen. Expenditures continued to increase rapidly, but in some art forms earned income rose as fast or faster, so that the gap in some areas declined in relative size. Data from a Ford Foundation study (for which Baumol was a consultant) show that, from 1965–6 to 1970–71, the gap as a percentage of total expenditures rose for symphony orchestras and non-profit theatres, but fell for opera, ballet and modern dance companies (Ford Foundation, 1974, pp.388–93). A study by Samuel Schwarz and Mary G. Peters (1983) indicated that, in the 1970s, the relative size of the gap fell substantially in ballet, modern dance and non-profit theatre, declined slightly for symphony orchestras, and was approximately stable for opera.

Table 3 The earnings gap: contributed income as percentage of total revenue

	Sample size	Beginning year	(%)	Ending year	(%)	Change
Symphony orchestras	39	1972	36.4	1992	35.4	−1.0
Opera[a]	24	1981	48.7	1991	46.2	−2.5
Ballet	7	1983	36.6	1992	34.2	−2.4
Modern dance	6	1983	43.0	1992	56.1	13.1
Non-profit theatres	39	1980	38.0	1992	38.1	0.1

Note: [a]excluding the Metropolitan Opera.

Source: Felton (1994).

More recent data gathered by Marianne Felton (1994), indicate that the gap continued to decline into the early 1990s, except in the field of modern dance (see Table 3). It should be noted that in Great Britain a study by Peacock, Shoesmith and Millner of the performing arts in the 1970s found no evidence of the cost disease in that decade. Apparently, the extremely high rate of inflation in those years induced performing arts companies to adopt cost-reducing policies that temporarily halted the operation of the cost disease (see Towse, 1997b, p.351).

On the whole, then, dire predictions that productivity lag would lead to a relentlessly increasing earnings gap proved to be incorrect. A number of factors can work to offset the effects of productivity lag. In this instance expenses of performing arts companies did increase more or less as predicted, but earned income rose at an equal or slightly higher rate, so the relative size of the gap began to decline. What explains the rise in earned income? Apparently, ticket prices rose much faster than the general price level without causing a drop in attendance. (I say 'apparently' because we have no summary measure of ticket price movements.) As a result, box office revenues, adjusted for inflation, rose substantially. Thus productivity lag in the arts persisted, but so did some of its potential offsets.

Interpreting the earnings gap

Something more must be said by way of interpretation. Schwarz and Peters point out that, since performing arts firms in the non-profit sector cannot normally operate with a cash deficit, an earnings gap cannot exist unless unearned income is available to cover it. Emphasis on the earnings gap as the starting point in a financial analysis leads one to think of unearned income as a passive factor that responds after the fact to the financial needs

of the company. But one could just as well look at it the other way around and argue that the existence of unearned income makes it possible for a performing arts firm to finance expenditures in excess of earned income. A very large earnings gap for a given firm might indicate, not that the firm is in serious financial trouble, but rather that it has succeeded in finding generous outside support, probably in response to its very high quality of operation.

Is there an 'artistic deficit'?

Faced with the continual upward pressure on costs generated by productivity lag, firms in the live performing arts might be expected to seek ways of economizing by gradually altering their choice of repertory or their production process. For example, theatrical producers might look for plays with smaller casts or plays that could be mounted with a single rather than multiple stage sets. Or they might try to compensate for higher costs by shunning artistically innovative plays that do not draw well at the box office and so have to be 'carried' by revenues from more conventional offerings. Orchestras and opera companies, too, might be driven away from innovative or 'difficult' material by box office considerations. Or, operating on the cost side, they might select programmes with an eye to reducing rehearsal time or hire fewer outside soloists or other high-priced guest artists.

Although experience clearly teaches us that firms will respond to rising input costs by economizing in the use of the offending inputs, economists interested in the arts are likely to be disturbed when they find firms in the performing arts doing just that. They are offended at the notion that *Hamlet* is no longer viable because its cast is too large, or that piano concertos will be less frequently heard because soloists have become too expensive. When that occurs it has been said that performing arts firms are reducing their fiscal deficit by incurring an 'artistic deficit'.

It is worth noting that this problem is peculiar to the performing arts. In the fine arts – for example, in architecture – we fully expect practitioners to adapt their 'products' to changes over time in the relative prices of alternative inputs. We are not surprised to find that modern buildings are devoid of the elaborate hand-carved stonework that decorated important buildings in earlier times. Indeed, the aesthetic rationale of the modern movement in architecture was precisely to design buildings that could use machine-finished materials in place of the increasingly costly hand-finished ones. In this instance it is not too strong to say that the necessity of adapting was the challenge that gave rise to a whole new school of design.

What makes the performing arts different is that the past provides much of the substance that we want to see performed. We do not want *Hamlet* with half the characters omitted because of the high cost of labour. Nor do

we wish to give up symphony concerts in favour of chamber music recitals simply because symphonies employ too many musicians. We want the range of 'artistic options' to include the option of hearing or seeing performances of great works that were invented under very different economic circumstances than our own. There would indeed be an artistic deficit if today's companies became financially unable to present for us the great works of the past.

Have our performing arts institutions, responding to financial pressure, already begun cutting back along some dimensions of quality? Are we even now the victims of an artistic deficit? Some of the evidence is what social scientists call 'anecdotal', but there is systematic evidence, as well. Table 4 reproduces data from a study by the Baumols showing that average cast size for all non-musicals produced on Broadway fell from 15.8 in 1946–7 to 8.1 in 1977–8. More recently, this author has shown that, from 1983 to 1998, companies have produced popular operas at the expense of new or less well-known works, which could be interpreted as evidence of a growing artistic deficit in the field of opera (Heilbrun, 2001, pp.63–72).

Table 4 Cast size of broadway plays

Broadway season	Average cast size
1946–7	15.8
1953–4	14.4
1957–8	13.4
1962–3	12.4
1967–8	8.9
1972–3	10.2
1977–8	8.1

Note: As a result of printing/editing errors, table 11 did not actually appear in the cited source. It is used here with the permission of the authors.

Source: Baumol and Baumol (1985), 'The Future of the Theater and the Cost Disease of the Arts', in Mary Ann Hendon, James F. Richardson and William S. Hendon (eds), *Bach and the Box*, a special supplement to the *Journal of Cultural Economics*, Akron: Association for Cultural Economics, table 11.

Income from the mass media in the USA

Some years ago it was suggested that performing arts firms might be able to earn income from the mass media to help relieve the financial pressure generated by productivity lag. Symphony orchestras, to pick the most obvious example, might be able to earn royalties from the sale of recordings. Theatre, ballet, and opera companies, in addition to earning royalties

from the sale of pre-recorded tapes or videodiscs, might be paid for performances on broadcast or cable TV. After all, in the analogous case of professional sports, earnings from television far outweigh income from ticket sales.

Unfortunately, this potential revenue never materialized. Royalties are trivial for most US symphony orchestras, and the trend has been down. (See the evidence cited in Heilbrun and Gray, 2001, pp.148–50.) Nor did performing arts companies ever earn significant income from television performances. In the early days of commercial television, the networks made a modest effort to present high culture on the tube. But as time went by and public television became increasingly important, the commercial networks virtually abandoned cultural programming to the public stations. A commercial market for culture on TV no longer exists.

In assessing the prospect that the mass media might at some future date become heavy purchasers of performing arts material, there is further bad news: Hilda and William Baumol have shown that programme production costs on television are subject to inflation on account of productivity lag for exactly the same reasons as costs in the live sector are (Towse, 1997a). Thus the same cost problem that bedevils live production of the performing arts reappears to limit the prospect of substantial sales to the mass media.

Baumol's good news

The problem of productivity lag exists only because there is persistent technological progress in the general economy which causes a rise in output per work hour and in real wages, in other words a rise in per capita income, which, in turn, increases the demand for the arts. In the case of the live performing arts, that means the demand for tickets increases: at any given price level the public will be willing to buy more tickets than it did previously. Thus, while productivity lag causes ticket prices to rise, which will lead to a decline in quantity demanded, rising income to some extent offsets that effect by stimulating ticket purchases. This does not mean that productivity lag causes no problems, but only that rising living standards work to mitigate them. Perhaps an analogy is in order. Because of productivity lag in the business of high-quality food preparation, the price of a meal in a gourmet restaurant has risen sharply in recent years. That probably causes a good deal of anguish to both customers and owners, but it has not prevented the gourmet restaurant business from growing. A similar effect is likely in the live performing arts. Baumol and Bowen were criticized for failing to emphasize that possibility, but Baumol has corrected that failure in a more recent paper (Baumol, 1996, pp. 183–206).

Productivity lag does not justify subsidies

The hypothesis that productivity lag is bound to cause a long-run increase in the real cost of the performing arts was often cited by arts advocates as a justification for public subsidies. Without subsidies, it was asserted, either ticket prices would have to rise continuously, which would end all hope of reaching new audiences, or else performing arts companies would face increasingly large deficits that would force many of them out of business. Leaving aside the fact that there are some alternatives to these gloomy predictions, it must now be emphasized that productivity lag *per se* does not provide justification for government subsidy. Productivity lag is a market process that would cause unit cost to rise in any technologically unprogressive industry. But there is no reason to subsidize an industry simply because it is technologically unprogressive. On the contrary, given that its real costs are rising relative to those in more progressive industries, it is best to let its prices increase to reflect the rise in real costs. As long as markets are operating efficiently, those higher costs will be absorbed optimally by the economy. We would all be better off if there were no technologically unprogressive industries, but, since there are, matters are made worse, not better, if we use subsidies to prevent market prices from reflecting their true costs. Lag or no lag, subsidies can be justified only by some form of market failure.

Indeed, economists have written extensively about market failure, and Baumol and Bowen discuss the rationale for public support of the performing arts in Chapter XVI of their book. But this is not the place to enter into that large and complicated subject.

See also:

Chapter 10: Ballet; Chapter 17: Costs of production; Chapter 44: Opera; Chapter 45: Orchestras.

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