

Economia da Educação

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**LISBOA
SCHOOL OF
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A doença dos custos de Baumol



10 Baumol's cost disease

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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 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:

Capacity 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 = $8000 \text{ divided by } 4000 = 2$.

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.



Table 10.1 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



Table 10.2 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



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 from 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.



Table 10.4 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).



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Disease or utopia? Testing Baumol in education[☆]

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Expenditure growth outstripping inflation is now well-documented in a number of sectors, with education and health care the canonical examples. The cost disease concept introduced by Baumol (1967) offers a compelling, if grim, explanation of this trend in labor-intensive industries. The cost disease broadly posits that "stagnant" sectors with no productivity growth must increase wages in order to compete for workers with the high productivity growth "progressive" sectors. Such stagnant-sector wage growth inevitably generates unbalanced growth among sectors.

A much less dire interpretation of this unbalanced growth, however, is also available. Cowen (1996) offers an income-effect

explanation in which consumers feel so much richer from the increases in manufacturing productivity (and the concomitant decrease in the prices of manufactured goods) that their demand for services such as education and health care rises. This higher demand then increases labor demand and drives the higher wages. Rather than a cost-disease, this sectoral imbalance is a "cost-utopia" (p. 208), and society is strictly better off. This key point was first made by Robinson (1969), and Baumol (2012) indicates a shift to this latter position.

While the cost disease has long provided a shorthand explanation for rising costs in service sectors, it is only recently that

Table 2
OLS regression of growth rate of teachers per 1000 pupils in US K-12 public schools (1998–2010).

Dep var	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	TP						
MWD	-0.177*** (0.061)	-0.187*** (0.065)	-0.190*** (0.065)	-0.191*** (0.064)	-0.185*** (0.068)	-0.177*** (0.057)	-0.181*** (0.063)
MWE					0.062 (0.038)	0.070* (0.042)	0.097* (0.058)
Post2007?	-0.018*** (0.004)	-0.018*** (0.003)	-0.018*** (0.003)	-0.017*** (0.003)	-0.016*** (0.003)	-0.016*** (0.003)	-0.016*** (0.003)
GDP			0.012 (0.068)			-0.035 (0.074)	
DI				0.028 (0.047)			0.000 (0.054)
NDI				0.008 (0.014)			-0.019 (0.020)
Fixed effect on state	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	659	659	659	659	659	659	659
R ²	0.046	0.083	0.083	0.084	0.086	0.087	0.087

Clustered standard errors in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Estimates for constant terms are not shown.

Variables:

TP = growth rate of state teachers per thousand pupils

MWD = growth rate of state per employee manufacturing real wage and salary disbursement

MWE = growth rate of state manufacturing wage and salary employment

Post2007? = Binary indicator for later/last period after 2007 (i.e., 2008 or later)

GDP = growth rate of state per capita real GDP

DI = growth rate of state per capita real disposable income

NDI = growth rate of state per capita real non-disposable income.





Estimates of the key parameter γ are in the top row of each table. In all regressions, our measure of productivity growth in the progressive sector has a significantly negative relationship with the quantity measure. Baumol's original (and more pessimistic) story appears to carry the day.