

THE ECONOMIC DILEMMA OF THE GREEK PERFORMING ARTS PRICING AND SUBSIDIZING POLICIES

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Pure public goods, which are not subject to the exclusion principle cannot be allocated by the commercial principle. Hence one of the main characteristics of Public-goods is the case of «market failure».

Quasi - public goods (impure public goods), on the other hand, which are economic goods with a degree of «Publicness», having mixed characteristics from both Public and Private goods, can often be priced since their benefits are ~~often~~ partially subject to the exclusion principle.

In the subsequent analysis, we will consider the performances of the State Theatre as a quasi-Public good, with considerable externalities in consumption. I propose that the social benefits from the Arts are greater than the private benefits. Attending the opera, the theatre or going to a museum, it is alleged leads the consumer to be a 'better citizen' The rationality of this sentence appears to be based on the proposition that Arts are educational. Generally theatre attendance benefits people.

In this paper we will see how the public sector influence the supply of this quasi-Public good and what will be the result if we will consider government versus market allocation in the production of this good.

PRICING POLICY AND SUBSIDIES

In some enterprises an increase in output can reduce cost per unit, and as the market expands each unit can be provided more and more cheaply. One may

well ask whether this pattern is relevant to the performing Art organisation — whether they too can benefit from economies of scale, when they increase the availability of performance to the public. From some alternative empirical estimations, (in order to succeed in getting the best fit to the data), we can say that the stage theatres in Greece are facing decreasing production cost; and this occurs because all the state theatres operate in large cities (Athens, Thassaloniki,) and they can present the same performance many times. The production cost of a play, which encompasses the cost of rehearsals, scenery, costumes etc. usually constitutes a very substantial proportion of the total cost, for the running of that play. Consequently as the length of run increases, the proportion of the fixed production cost declines and so the average cost per performance. This is the case of economies of large - scale operations

Since «imperfect» market structure characterises the state theatre performances, and since many instances of governmental allocation influences the supply of the quasi - public good we will consider here three alternative pricing policies. The whole analysis will be based on the static equilibrium approach. (Figure I provides the whole diagrammatic representation of these pricing policies).

1) Unregulated Private sector provision of the good. This is the case of profit maximizing pricing determining the equilibrium at the point where $MC=MR$ (point c in Fig. 1). The MC curve is under the whole of the AC curve. AC at this equilibrium is under the AR. So there are profits per unit as determined by the vertical difference between $AR-AC$. The shaded area gives the level of profits. The price output combination is shown by P_1Q_1 and shows that at a very high price only a low amount of Q is demanded.

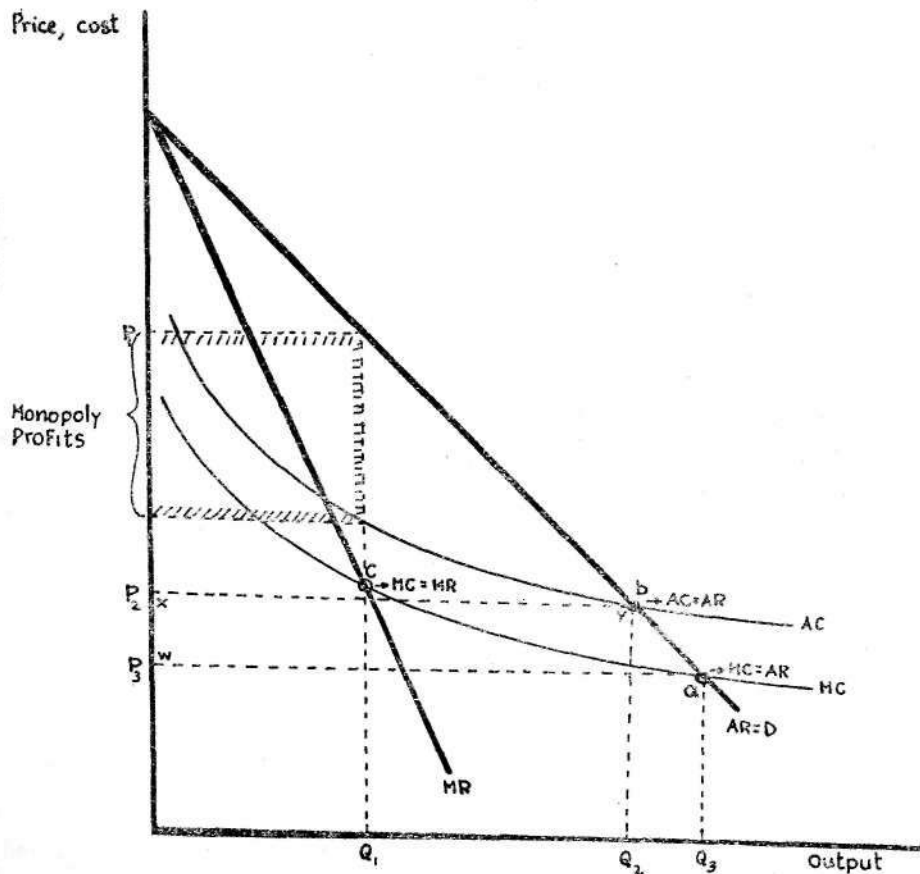
This is a non-optimal Pareto allocation; and there does not exist any governmental regulation to compel lower prices and greater output.

A private firm of course could not make a profit, producing at optimal social output OQ_3 and charging price OP_3 because average cost exceeds price (average revenue) at that output. This is true when we have the case of «decreasing average cost».

Marginal cost must be below average cost causing the intersection of marginal cost and average revenue, at this point where average revenue is less than average cost. Consequently, total losses are WXYZ when we have a firm producing at social optimal, point a in Fig I. Losses per unit is the vertical distance WX. In such a situation if the Government thinks that the good must be provided in a Pareto optimal situation they must subsidise the amount of total loss, WXYZ. So to summarise, when we leave the production of this good to the private sector

without the Government's intervention we will have the price OP_1 and at this price only OQ_1 quantity will be produced. The shaded area shows the monopoly profits. Alternately, perhaps the public sector could require the production of good through «public utility regulation». In this case the firm could be earning a «normal» economic profit, and could produce output at the level of OQ_2 which is a point near to the social optimum.

FIGURE 1
PRICING POLICIES



Eventually, if the Government thinks that this particular good, because of its externalities in consumption must be provided in a greater quantity; and because of inability of the private sector to produce it at a pareto-optimal point, then we need a subsidization which will cover the total losses which are created when we have a production at the optimal social point a, where $MC = AR$.

2) Average Cost Pricing ($AC = AR$) (Point b in Fig I) or Full Cost Pricing. This is the case of private provision of the good under direct governmental regulation. This pricing policy determines again a non-Pareto optimal allocation **but** is preferable to the previous stated, because this pricing policy is very near to the Pareto optimal allocation. This pricing determines the price output combination, $P \ll Q^*$.

3) **Marginal Cost Pricing** $MC = AR$ (Point a in Fig. I). This is the case of the private sector production of the good, with governmental subsidy. According to the Pareto optimality criterion this is the best allocation in the production sector, by which we can produce a Social Welfare optimality.

The price output combination in this situation will be P_3Q_3 .

SUBSIDIZING POLICIES

Lord Bridges supporting the idea for public subsidies to the Arts stated :

«The heart of this matter is surely that the Arts can give to all of us, including those who lack expert knowledge of any of them, much of what is best in human life and enjoyment; and that a nation which does not put this at the disposal of those who have the liking and the capacity for it, is failing in a most important duty.

In the economic literature Baumol (1965), (1966), (1967), (1971), Blaug (1976), Peacock (1969 a.b.) as well as a number of researchers have proposed different kinds of subsidizing policies.

We may classify the alternative forms of subsidization into two broad categories.

The first category refers to direct subsidies to the consumer and the second category deals with subsidies to producer.

A. Direct subsidies

Alan Peacock (1968), (1969 a.b.), (1972), (1973), (1975), supports a «ticket Voucher» scheme. That means that theatres and concert halls would change commercial prices and a certain proportion of seats would be available for a specific group (students, children, trade unions) who would pay for their seats with issued vouchers. The vouchers collected by the manager of the theatre would be exchanged by the state for cash.

This scheme has the enormous advantage of selecting the people to whom we wish to give the subsidy, and it can be used as an incentive for non theatre-goers (or those who do not go often).

B. Subsidies to Producer

Considering the alternatives of subsidization policy to producers we may distinguish the following forms of subsidization.

1. An annual lump sum subsidy based on the annual estimated revenues. This policy seems to give no incentive to producer to maximise ticket revenues because they think that by the end of the year they will be financed regardless of their economic performance.
2. A lump sum subsidy for each performance (subsidization of output, regardless of sales).
3. A subsidization policy which is based on the revenues received by a certain tax plus an annual lump sum subsidy. This is the case of levying taxes to a certain sector of the economy which has external diseconomies and revenues of these taxes are going as subsidies to the sector which has external economies.
4. Subsidization according to the defined objectives of the theatre. We can suggest subsidization policy according to the success or failure of one of the main objectives. For instance, if one of the objectives of the Ministry of Culture is the encouragement of Modern Performing Arts then a subsidy must be given only to those performances which are referred to as modern plays.

In the empirical part of our analysis we will see that none of the above policies is adopted in Greece. The only objective of the Greek Subsidization policy is to cover the deficits of the state theatres. However, this policy does not introduce neither cost controls nor efficient utilization of the existing resources.

THEORETICAL MODEL

At the point where a Pareto optimal allocation ($MC = AR$) the average cost is greater than the average revenue ; and in order for the firm to be at a viable level we have to give subsidies per unit equal to the losses per unit ;

$$S = AC - AR$$

The average revenue should be at this level where ($AR = P^*$) the Pareto condition holds.

Then

$$S = AC - P^*$$

Considering a more specific model for the case for the National Theatre in which we wish to cover three activities we can from the following model :

$$C = C_1(Q_1) + C_2(Q_2) + C_3(Q_3) \quad \text{Cost function}$$

$$R = R_1(Q_1) + R_2(Q_2) + R_3(Q_3) \quad \text{Revenue function}$$

Pareto optimality requires that $AR = MC$, forming the condition where

there exists a unit subsidy for the case of a decreasing cost function. We get the following unit subsidy per activity :

$$\begin{array}{l|l} AR_1 + S_1 = AC_1 & S_1 = AC_1 - AR_1 \\ AR_2 + S_2 = AC_2 & \Rightarrow S_2 = AC_2 - AR_2 \\ AR_3 + S_3 = AC_3 & S_3 = AC_3 - AR_3 \end{array}$$

THE ECONOMETRIC MODEL

So far three alternative pricing policies have been considered for the allocation of a quasi-public good and it has been found that a unit subsidy must be given in order to establish the optimal price, p^* (where $MC = AR$).

In the empirical section, in order to support the previously mentioned theory, estimations of the cost and total revenues function have been calculated for the National Opera and the National Theatre. However the lack of required data and mainly the lack of any audience survey compel one to study the whole subsidisation system from a general and more abstract point of view. Thus one is obliged to concentrate on a limited amount of statistical observations, which as we see do not adequately explain the whole phenomenon.

From alternative estimations (see Appendix A) we choose the following equation.

$$TC = 1091Q - 20.9Q^2 + 289NW - 99931$$

$$(t = 5.07) \quad (-4.88) \quad (6.13) \quad (-4.27)$$

$$R^2 = 0.83$$

where Q = annually presented performances

TC = annual total cost

NW = wage price index. It shows the wage rate per performance

The above equation passes all the statistical tests adequately. However only the DW is not significant and is very low. The performances to be performed each year are determined by the performances of the previous years and this accounts for the low DW. The graph for total cost is an increasing function (positive coefficient of Q) and the second derivative is negative (negative coefficient of Q^2). Considering the AC function we obtain a decreasing cost function which supports our hypothesis that state theatres are facing decreasing average cost curve.

Considering the revenue, all the empirical estimations are represented in appendix one. They are not as they give very low R^2 , low t-ratio and extremely low F. None can be used empirically for the level of subsidy determination. Choosing the 'best form' I will refer to the 1st estimation, which at least statistically provides estimators. From this equation, one can infer that the total revenue seems to be a quadratically increasing function with a decreasing second derivative. From our estimation we get :

$$TC = 1.091 Q - 2.79 Q^2$$

$$MC = 1.091 - 5.58 Q$$

$$AC = 1.091 - 2.79 Q$$

$$TR = 46.61 Q - 0.15 Q^2$$

$$MR = 46.61 - 0.30 Q$$

$$AR = 46.61 - 0.15 Q$$

However when the condition $MC = AR$ was found and $S = AC - AR$ was applied unrealistic results were obtained. Also in the estimation for the National Theatre model the same occurred.

Considering the model for the National Theatre a cost function with significant t-ratios at both 1 % and 5 % levels were obtained (see estimation 3 of appendix I) but, however, the DW shows once again an autocorrelation of the residuals, which can be explained in a similar manner to that for the Lyric Opera. R^2 is again very low.

Considering the total revenue functions, only the Athens Festival revenue function passes all the statistical tests adequately.

The National Theatre total revenue function passes all statistical tests significantly.

The empirical form of our model is as follows :

$$TC = 125.4Q_1 - 0.15Q_1^2 + 151.4Q_2 - 3.47Q_2^2 + 919.1Q_3 - 66.12Q_3^2$$

$$TR = 96.5Q_1 - 0.13Q_1^2 + 183Q_2 - 0.25Q_2^2 + 4162Q_3 + 14.12Q_3^2$$

$$MC1 = 125.4 - 0.30Q$$

$$MR1 = 96.5 - 0.26Q$$

$$MC2 = 151.4 - 6.94Q$$

$$MR2 = 183 - 0.50Q$$

$$MR3 = 919.1 - 132Q$$

$$MR3 = 41.62 - 28.24Q$$

Defining $MC_i = AR_i$ at this condition we can calculate S_i which is the unit subsidy that must be given to each of the above activities of the National Theatre.

SUBSIDISING THE DEFICIT

The decision for subsidies are based more on the estimation of yearly total revenues than the subsidies per unit.

A regression was run between subsidies and income gap (which is $TC - TR$) and the following result was obtained :

$$\begin{array}{ll} \text{Subsidies} = 0.91 \text{ Cap} + 5670 & DW = 1.78 \\ (t = 9.07) (1.01) & \bar{R}_2 = 0.85 \end{array}$$

Which means that the main objective of the state is only to cover as far as possible the difference between Box Office Receipts and Total Expenditure.

The coefficient of Gap provides us with the explanation that (*Ceteris paribus*) if the gap will increase by one monetary unit then the subsidies will cover 0.91 of that unit.

CONCLUSION

Since the Second World War there has been a growing interest among economists such as Paacock, Baumol, Bowen Blaug and others to investigate the artistic activities from an economist point of view. Gradually a school of «cultural economists» dealing with the Economics of the Arts was established. A great deal of work is now going on in this area and some notable additions are expected to come and enlarge the economic literature.

One of the main themes considered by the cultural economists in Canada, U.S.A., Great Britain, Australia Thailand and now in Greece is to investigate the alternative forms of pricing and, subsidizing policies to the theatres. This paper deals with these issues.

At the beginning we consider three forms of pricing policies i.e. private sector pricing, marginal cost pricing and average cost pricing, furthermore two forms of subsidizing policies are presented i.e. subsidies to consumer via a «voucher ticket» scheme and four alternative forms of subsidies to producer.

None of these policies were adopted in Greece because subsidies to the

State Theatres are mainly related to ad hoc political decisions. The different Governments increase or decrease the subsidies to the theatres according to It was found tural policies, that the various Governmental policies even after 1974 aimed at the coverage of the gap between total expenditure and box office receipts without taken into account any output, quantitative or qualitative criteria.

The system of arts subsidy in some countries like England is pluralist but as it was argued by Hutchison (1980) «the flaw in the pluralist heaven is that the heavenly choir sings with a strong, upper - class accent.» However nowadays in many countries like Greece there is a widespread acceptance of the Brinson view who stated that « . . .the arts are not only a way of communicating ideas, but away of having ideas, a training for creative thinking of all kinds and, therefore, of direct value to the economy».

APPENDIX I

ALTERNATIVE ESTIMATIONS FOR THE COST FUNCTIONS OF THE NATIONAL LYRIC OPERA

Means

Total cost mean = 29476

Q = Performances' mean = 132

Q₂ = Square perf » = 19457

Index of wages input (N.W) = 136

REGRESSIONS

1st Estimation

TC = 1091Q — 2.79Q² — 289N.W. - 99931 DW = 0.929

(se 214) (0.57) (47) (23350) R² = 0.83

(t = 5.07) (-4.82) (6.13) (-4.27) \bar{R}^2 = 0.78

F_(2,13) = 19.36

2nd Estimation

$$TC = 146.3Q - 0.88Q^2 + 25298$$

$$(se \ 292) \ (0.95) \ (20949)$$

$$(t = 0.5) \ (-0.92) \ (1.3)$$

$$DW = 1.52$$

$$R^2 = 0.29$$

$$R^2 = 0.18$$

$$F_{(3,13)} = 2.68$$

3rd Estimation

$$TC = 119.7Q + 45288$$

$$(se = 56.1) \ (7828)$$

$$(t = 2.13) \ (5.78)$$

$$DW = 1.54$$

$$R^2 = 0.24$$

$$\bar{R}^2 = 0.19$$

$$F_{(1,14)} = 4.55$$

ALTERNATIVE ESTIMATIONS FOR THE COST FUNCTION OF THE NATIONAL THEATRE

Means

$$\bar{TC} = \text{total cost mean} = 25050$$

$$\bar{Q}_1 = \text{central stage perf. mean} = 303$$

$$\bar{Q}_1^2 = \text{sq. } \gg \gg \gg \gg = 97316$$

$$Q_2 = \text{Festival of Athens perf. mean} = 26$$

$$\bar{Q}_2^2 = \text{sq. } \gg \gg \gg \gg \gg = 883$$

$$\bar{Q}_3 = \text{Festival of Epidavros perf. mean} = 7$$

$$\bar{Q}_3^2 = \text{Sq. } \gg \gg \gg \gg \gg = 60$$

Index of wages input ($\bar{N.W.}$) 36.18

\bar{Q} = Total number of performances mean = 357

\bar{Q}^2 = sq. » » » » » = 135980

REGRESSIONS

1st Estimation

$$TC = 125.4Q_1 - 0.15Q_1^2 + 151.4Q_2 - 3.47Q_2^2 + 919.1Q_3 - 66.12Q_3^2 + 135NW + 6995$$

(se=169) (0.23) (510) (8.4) (481) (59.7) (171) (36675)

(t=0.73) (-0.65) (0.29) (-0.41) (1.9) (-1.10) (0.79) (0.19)

DW = 1.72

R² = 0.89

\bar{R}^2 = 0.80

F_(7,8) = 9.88

2nd Estimation

$$TC = 40.5Q_1 - 0.04Q_1^2 + 320.5Q_2 - 1.58Q_2^2 + 1049Q_3 - 90.62Q_3^2 + 29234$$

(se=129.1) (0.18) (454) (7.8) (444) (50.1) (23183)

(t = 0.31) (-0.23) (0.70) (-0.20) (2.36) (-1.80) (1.26)

DW = 1.69

R² = 0.88

\bar{R}_2 = 0.81

F_(6,9) = 11.92

3rd Estimation

$$\begin{aligned} \text{TC} &= -242.8Q + 0.32Q^2 + 67092 \\ & \quad (\text{se} = 132) \quad (0.16) \quad (25483) \\ & \quad (t = -1.83) \quad (2.03) \quad (2.6) \end{aligned}$$

$$\begin{aligned} \text{DW} &= 0.75 \\ \bar{R}^2 &= 0.34 \\ R^2 &= 0.24 \\ F_{(2,13)} &= 3.4 \end{aligned}$$

4th Estimation

$$\begin{aligned} \text{TC} &= 24.13 Q + 16422 \\ & \quad (\text{se} = 16.3) \quad (6024) \\ & \quad (t = 1.47) \quad (27.2) \end{aligned}$$

$$\begin{aligned} \text{DW} &= 2.56 \\ \bar{R}^2 &= 0.13 \\ R^2 &= 0.07 \\ F_{(1,14)} &= 2.18 \end{aligned}$$

INCOME GAP AND SUBSIDIES REFERRING TO THE WHOLE STAGE THEATRES

INCOME GAP = Total cost — Total Revenue

Sub = Subsidies

Means

Gap mean = 51205

Sub. mean = 52.500

1st Estimation

$$\begin{aligned} \text{sub} &= 0.914 \text{ Gap} + 5670 \\ &(\text{se} = (0.10) \quad (5582)) \\ &(\text{t} = 9.07) \quad (1.0) \end{aligned}$$

$$\begin{aligned} \text{DW} &= 1.78 \\ R^2 &= 0.854 \\ \bar{R}^2 &= 0.84 \\ F_{(1,14)} &= 82.3 \end{aligned}$$

**ALTERNATIVE ESTIMATIONS OF THE TOTAL REVENUE FUNCTION
OF THE NATIONAL LYRIC OPERA**

P.O. = opera performances

TR = Total Revenue

S.R.O. = squares of opera performances

1st Estimation

$$\begin{aligned} \text{TR} &= 46.61\text{PO} - 0.15 \quad + 10.7 \\ &(\text{t}=1.08) \quad (-1.14) \quad (0.035) \end{aligned}$$

$$\begin{aligned} \text{DW} &= 0.67 \\ R^2 &= 0.093 \\ \bar{R}^2 &= 0.046 \\ F_{(2,13)} &= 0.66 \end{aligned}$$

2nd Estimation

$$\begin{aligned} \text{TR} &= -1.4\text{OP} + 3256 \\ &(\text{t}=-0.16) \quad (2.79) \end{aligned}$$

$$\begin{aligned} \text{DW} &= 0.54 \\ R^2 &= 0.002 \\ \bar{R}^2 &= 0.004 \\ F_{(1,14)} &= 0.028 \end{aligned}$$

3rd Estimation

$$TR = 3226PO + 3735700$$

$$(t = -0.40) \quad (3.36)$$

$$DW = 2.13$$

$$R^2 = 0.011$$

$$R^2 = 0.0059$$

$$F_{(1,14)} = 0.163$$

ALTERNATIVE ESTIMATIONS OF THE NATIONAL THEATRE TOTAL REVENUE FUNCTION (SPECIAL REFERENCE TO EACH ACTIVITY)

T.R. = Total Revenue

P.A. = Central stage performances of the Nat. Theatre

S.A. = sq. » » » » » » »

P.F. = Athens Festival performances

S.F. = sq. » » »

P.E. = Epidavros performances

S.E. = sq. » »

1st Estimation

$$DW = 65.5P.A - 0.13S.A + 1.83P.F - 0.25S.F + 41.62PE + 14.12SE - 752.4$$

$$(t = 0.89) \quad (-0.82) \quad (0.048) \quad (-0.38) \quad (+0.11) \quad (0.33) \quad (-0.38)$$

$$DW = 1.40 \quad R^2 = 0.56 \quad \bar{R}^2 = 0.28 \quad F_{(6,9)} = 1.98$$

2nd Estimation

$$TR = 7.11PA - 127.6PF + 35.2PE + 8368$$

$$\begin{array}{cccc}
 (t=0.95) & (-3.10) & (0.15) & (2.77) \\
 DW = 1.07 & R^2 = 0.52 & R^2 = 0.41 & F_{(3,12)} = 4.47
 \end{array}$$

ESTIMATIONS OF THE ATHENS FESTIVAL REVENUE FUNCTION

3rd Estimation

$$\begin{array}{l}
 TR = 85205PA - 1395S - 105730 \\
 (t = 3.28) \quad (-3.18) \quad (0.32)
 \end{array}
 \left|
 \begin{array}{l}
 DW = 2.3 \\
 R^2 = 0.46 \\
 \bar{R}^2 = 0.37 \\
 F_{(2,13)} = 5.56
 \end{array}
 \right.$$

4th Estimation

$$\begin{array}{l}
 TR = 35556PA + 865420 \\
 (t = 0.77) \quad (6.33)
 \end{array}
 \left|
 \begin{array}{l}
 DW = 2.0 \\
 R^2 = 0.041 \\
 R^2 = 0.0027 \\
 F_{(1,14)} = 0.60
 \end{array}
 \right.$$

ESTIMATION OF THE EPIDAVROS FESTIVAL REVENUE FUNCTION

5th Estimation

$$\begin{array}{l}
 TR = 132690PE - 3602SE + 2130060 \\
 (t = 0.86) \quad (-0.44)
 \end{array}
 \left|
 \begin{array}{l}
 DW = 0.44 \\
 R^2 = 0.09 \\
 \bar{R}^2 = 0.048 \\
 F_{(2,13)} = 0.65
 \end{array}
 \right.$$

6th Estimation

$$\text{TR} = 66984\text{PE} + 423250$$
$$(t = 1.08) \quad (0.9)$$

$$\left. \begin{aligned} \text{DW} &= 0.40 \\ \text{R}^2 &= 0.088 \\ \bar{\text{R}}^2 &= 0.012 \\ \text{F}_{(1,14)} &= 0.40 \end{aligned} \right|$$

ALL THE ACTIVITIES OF THE NATIONAL THEATRE

Q = all performances from all the activities

Q2 = sq. » » » » » »

1st Estimation

$$\text{TR} = 529.9\text{Q} + 0.81\text{Q}^2 + 92.226$$
$$(t = 5.9) \quad (-6.25) \quad (6.16)$$

$$\left. \begin{aligned} \text{DW} &= 1.77 \\ \text{R}^2 &= 0.79 \\ \text{ }^2 &= 0.76 \\ \text{F}_{(2,13)} &= 25.10 \end{aligned} \right|$$

2nd Estimation

$$\text{TR} = 234\text{Q} - 224.4$$
$$(t=1.72) \quad (0.50)$$

$$\left. \begin{aligned} \text{DW} &= 0.613 \\ \text{R}^2 &= 0.17 \\ \bar{\text{R}}^2 &= 0.11 \\ \text{F}_{(1,14)} &= 2.9 \end{aligned} \right|$$

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