Regional Theatre: Statistical Reflections on the Bottom Line

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ABSTRACT

The purpose of this paper is to paint a statistical portrait of the current economic state of regional theatre in the United States. How have regional theatre companies fared during the 1980's and into the 90's? As a result of rising production costs, increased competition for audience, and widely acknowledged diminishing federal support, are these theatres now subject to the same financial strains as Broadway theatre? This study uses the SAS System to reveal trends in the bottom line in the state of representative regional theatre. In particular, PROC PLOT, PROC CORR, PROC MEANS and PROC REG are used to identify and test for the significance of trends in regional theatre in the 1980's and 1990's. The author concludes with comments on the ease of learning and using the SAS System.

HISTORICAL PERSPECTIVE ON REGIONAL THEATRE

Following the Louisiana Purchase in 1803, territorial limits of the United States had begun to greatly expand. Florida, Texas, the southwest and California were added by the 1840's. As settlers began to move into these new territories, theatre, too, expanded beyond the regions of the east coast. By the 1850's approximately thirty-five regional, resident acting companies were in existence. However, by the late 19th century these companies were undermined by touring shows featuring well-known international 'stars' as well as increasing production costs (resulting from the demand for scenic splendor, realistic detail and spectacular special effects). The result was the long-run policy (allowing a show to run long enough to return a profit to the company manager and any investors), as opposed to the repertory system, the reduction in the number of productions and hence the number of company members. All these factors contributed to a decline in regional theatre and the establishment of New York as the only major center of production in the U.S. This dominant hold would last through the first half of the 20th century.

Broadway, however, began to experience serious threats to its monopoly on the recreational dollar as the century progressed. Motion pictures, sporting events, and television, as well as steadily escalating ticket prices drew potential patrons away from the theatre. Consequently the number of productions on "The Great White Way" steadily declined. Hence, the move to diversity theatre in the U.S. was renewed. Off-Broadway and off-Off-Broadway was the result of producers' desire to both maintain greater freedom and daring in the selection of potential material for production as well as an attempt to cut production costs substantially. The reemergence of regional theatres was also a result of this general sensibility to diversity. In 1947, Margo Jones established an arena theatre in Dallas. Nina Vance founded the Alley Theatre in Houston, Zelda Fichandler was instrumental in starting the Arena Stage in Washington, D.C ., and Jules Irving and Herbert Blau began the San Francisco Actors' Workshop in 1952. The 1960's saw the greatest expansion of theatre outside New York City since the 19th century. Impetus came from the Ford Foundation, which, in 1959, began giving substantial grants to small companies across the country deemed to be doing exciting work of high artistic merit. The National Endowment of the Arts (NEA) was established in 1965 to also lend financial assistance to artistic pursuit. Other important regional, not-for-profit (not solely dependant upon ticket sales for survival, but rather federal, state and municipal grants, corporate sponsorship, private donors etc.) include the Guthrie Theatre was founded in 1963 in Minneapolis by Tyron Guthrie, the Yale Repertory Company, The American Repertory Theatre at Harvard University, the Actors Theatre of Louisville, The Long Warf Theatre in New Haven, the Mark Tapor Theatre in Los Angeles and the Missouri.

ANALYSIS OF REGIONAL DATA USING PROC PLOT: GUTHRIE THEATRE, MINNEAPOLIS MINNESOTA

The initial data used for this paper is operational revenue and expenses for the Arena Stage Theatre in Washington, D.C. and the Guthrie Theatre Foundation in Minneapolis [additional data will be used for the final paper]. The following plots present a time series of relevant revenue and expense variables used for the analysis.

The revenue variables used to analyze the Guthrie Theatre are mainstage revenue, grants/gifts revenue, endowment revenue and total revenue. The expenditure variables used are physical production expense and total expense.

Following is a plot of total revenue and total expenditure using PROC PLOT. This graph shows the total revenue and total expenditure of the Guthrie Theatre from 1986 to 1995.

[==> For the final paper, PROC GPLOT will be used and the number of plots will be more succinctly summarized]

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Plot of TR*YEAR.  Symbol used is 'r'.
Plot of TE*YEAR.  Symbol used is 'e'.
 R |
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13000000 |
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        86    87    88    89    90    91    92    93    94    95    Year

Plot of MAIN*YEAR.  Symbol used is 'm'.
Plot of TR*YEAR.  Symbol used is 'r'.
Plot of ENDOW*YEAR.  Symbol used is 'e'.

 MAIN
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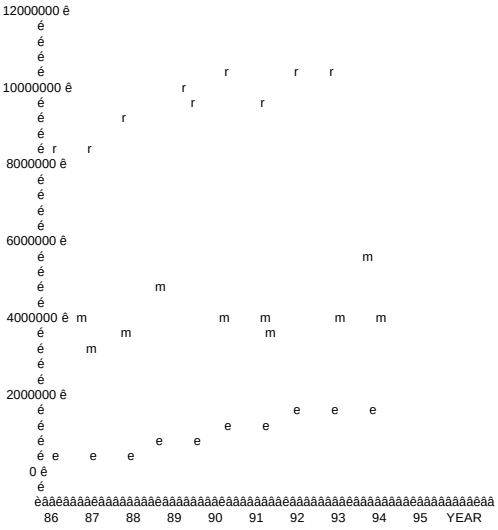
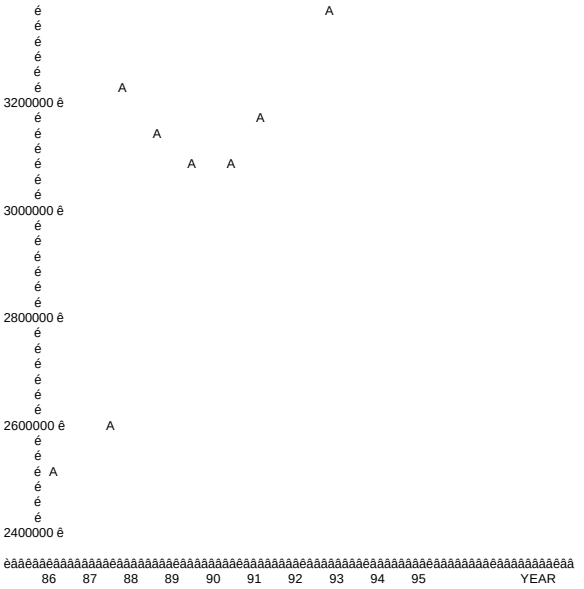
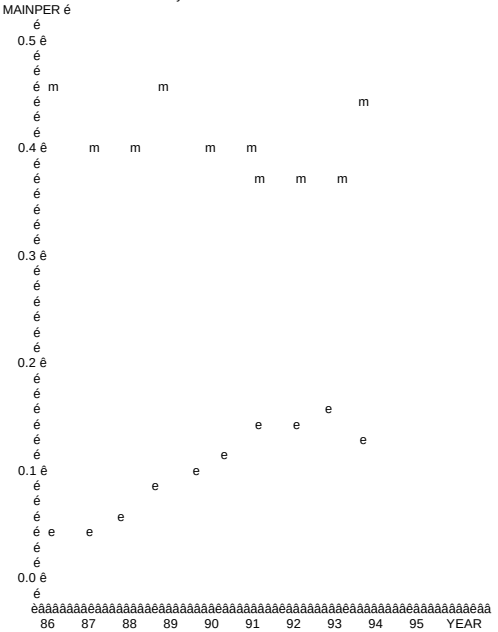


The above graph overlays the relationship between mainstage revenue, total revenue and endowment income.



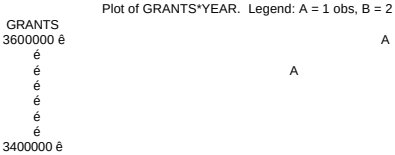
Following is a plot of mainstage revenue per total revenue and endowment revenue per total revenue. This graph illustrates the trend of proportional revenue coming to the Guthrie Theatre due to mainstage performances and from endowments.

Plot of MAINPER*YEAR. Symbol used is 'm'.
Plot of ENDOWPER*YEAR. Symbol used is 'e'.



Another important source of revenue is the amount of grants and gifts given to the theatre. Following is a graph of the amount of grant money over time.

Plot of GRANTS*YEAR. Legend: A = 1 obs, B = 2 obs,



ANALYSIS OF GUTHRIE THEATRE REGIONAL DATA USING PROC MEANS:

The SAS System provides numerous procedures to calculate descriptive statistics. PROC MEANS is used for determining the arithmetic mean, standard deviation and maximum and minimum. Following are the results of using the PROC MEANS procedure on the revenue and expenditure data for the Guthrie Theatre.

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
YEAR	10	90.50000	3.027650	905.000000	86.000000	95.000000
SHOWS	10	7.300000	0.674949	73.000000	7.000000	9.000000
MAIN	10	4047500	655214	40475000	3298000	5615800
EDUCREV	10	69900	20137	699000	48200	105300
SUPPORT	10	715430	121706	7154300	582000	955000
SPECREV	10	903910	200889	9039100	567400	1188100
GRANTS	10	3136430	355440	31364300	2515000	3607000
ENDOW	10	1040240	500491	10402400	318000	1690500
TR	10	9913410	1196799	99134100	8288000	12593000
ART	10	2641200	582172	26412000	1763000	3697700
PHYSPROD	10	1835770	385036	18357700	1050000	2515200
PEROPER	10	399560	79930	3995600	328000	592100
EDUCEXP	10	277210	244214	2772100	27000	791000
SPECEXP	10	761690	239612	7616900	374000	1102500
GENERAL	10	568020	134744	5680200	392000	827800
CONCESS	10	578920	205668	5789200	422200	1012000
COMM	10	1201400	136233	12014000	1037000	1481200
DEVEL	10	623600	77305	6236000	506000	738200
FINANCE	10	1094940	228013	10949400	668000	1292400
TE	10	10082430	1153236	100824300	8630000	12778300
SURDEF	10	-169020	208353	-1690200	-582000	98200
PROFIT	10	-169020	208353	-1690200	-582000	98200
MAINPER	10	0.407752	0.033547	4.077521	0.368671	0.457546
ENDOWPER	10	0.101880	0.043485	1.018800	0.037215	0.162267

Theoretical Model:

The primary concern of this paper is to determine whether or not there are significant trends in relevant revenue and expenditure variables for representative regional theatres. The SAS procedure PROC REG was used to estimate and forecast the trend of these variables.

The following regression model was estimated for the Guthrie Theatre data:

$$Y_i = \beta_o + \beta_1 X + \mu_i$$

where: Y_i is total revenue, endowment revenue, mainstage revenue, mainstage revenue divided by total revenue, and endowment revenue divided by total revenue
X_i is Year
μ_i is Random error term with usual properties

An analysis of these regression results will allow us to determine whether or not there has been a statistically significant trend in these important financial variables over the time period of analysis.

ANALYSIS OF EMPIRICAL RESULTS

Model: Mainstage Revenue
Dependent Variable: Main

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	885427760485	885427760485	2.378	0.1616
Error	8	2.9783217E12	372290217439		
C Total	9	3.8637495E12			

Root MSE	610155.89601	R-square	0.2292
Dep Mean	4047500.00000	Adj R-sq	0.1328
C.V.	15.07488		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-5328081	6082484.8866	-0.876	0.4066
YEAR	1	103598	67175.953259	1.542	0.1616

Model: Total Revenue
Dependent Variable: TR

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	9.0776505E12	9.0776505E12	19.044	0.0024
Error	8	3.8132987E12	476662331773		
C Total	9	1.2890949E13			

Root MSE	690407.36654	R-square	0.7042
Dep Mean	9913410.00000	Adj R-sq	0.6672
C.V.	6.96438		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-20106427	6882490.8520	-2.921	0.0193
YEAR	1	331711	76011.349374	4.364	0.0024

Model: Endowment Revenue
Dependent Variable: ENDOW

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	2.1909972E12	2.1909972E12	276.352	0.0001
Error	8	63426342061	7928292757.6		
C Total	9	2.2544235E12			

Root MSE	89040.96112	R-square	0.9719
Dep Mean	1040240.00000	Adj R-sq	0.9683
C.V.	8.55966		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-13708079	887626.10319	-15.444	0.0001
YEAR	1	162965	9803.0871808	16.624	0.0001

Model: Grants
Dependent Variable: GRANTS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	869001565121	869001565121	25.937	0.0009
Error	8	268036495879	33504561985		
C Total	9	1.1370381E12			

Root MSE	183042.51415	R-square	0.7643
Dep Mean	3136430.00000	Adj R-sq	0.7348
C.V.	5.83601		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-6151777	1824703.0524	-3.371	0.0098
YEAR	1	102632	20152.317555	5.093	0.0009

Model: Mainstage Revenue / Total Revenue
Dependent Variable: MAINPER

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	0.00128	0.00128	1.158	0.3132
Error	8	0.000885	0.00111		
C Total	9	0.01013			

Root MSE	0.03326	R-square	1.1265
Dep Mean	0.40775	Adj R-sq	0.0173
C.V.	8.15607		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	0.764337	0.33152598	2.306	0.0500
YEAR	1	-0.003940	0.00366143	-1.076	0.3132

Model: Endowment Revenue / Total Revenue
Dependent Variable: ENDOWPER

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	0.1617	0.01493	57.096	0.0001
Error	8	0.00209	0.00026		
C Total	9	0.01702			

Root MSE	0.01617	R-square	0.8771
Dep Mean	0.10188	Adj R-sq	0.8617
C.V.	15.87072		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-1.115458	0.16118534	-6.920	0.0001
YEAR	1	0.013451	0.00178016	7.556	0.0001

Model: Mainstage Revenue / Total Revenue
Dependent Variable: GRPERTR

Analysis of Variance

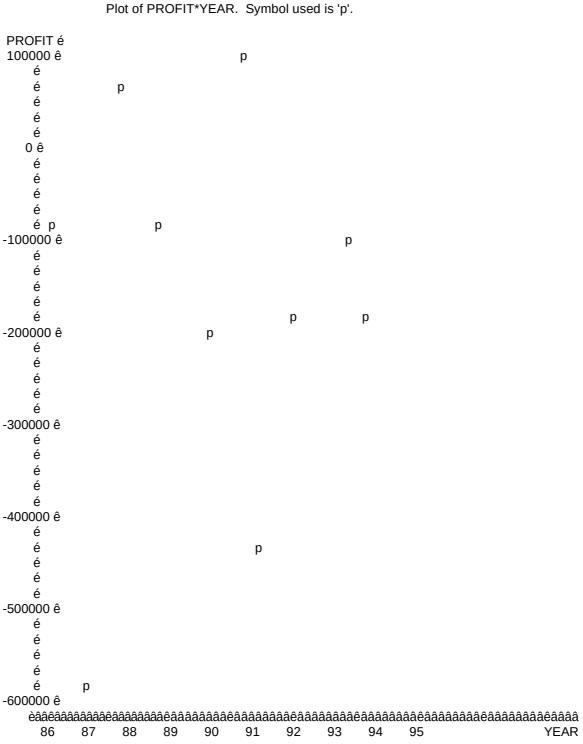
Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	8.1909081E-6	8.1909081E-6	0.018	0.8968
Error	8	0.00366	0.00046		
C Total	9	0.00367			

Root MSE	0.02138	R-square	0.0022
Dep Mean	0.31702	Adj R-sq	-0.1225
C.V.	6.74540		

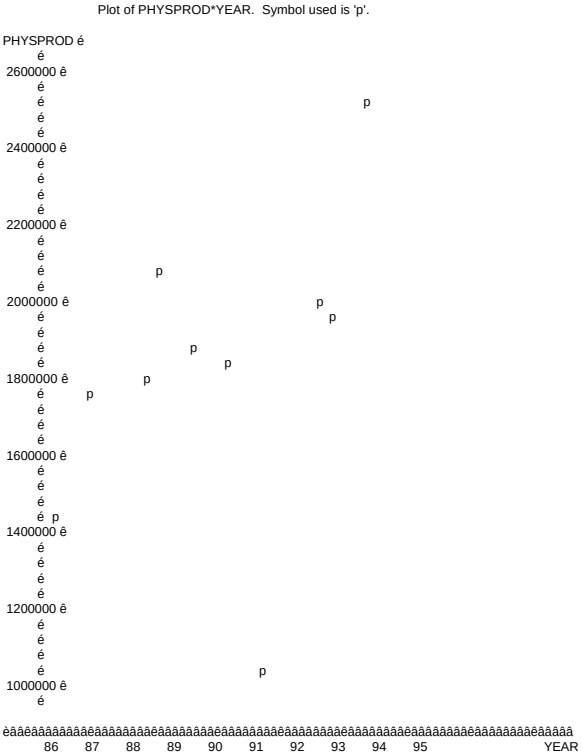
Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	0.288504	0.21317437	1.353	0.2129
YEAR	1	0.000315	0.00235433	0.134	0.8968

The following diagram presents the trend in profit over the time period.



The following diagram illustrates the cost of physical production.



Model: Physical Production Expenditure
Dependent Variable: PHYSPROD

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	2455909228030	245590928030	1.805	0.2160
Error	8	1.0886831e12	136085381621		
C Total	9	1.334274E12			

Root MSE	368897.52184	R-square	0.1841
Dep Mean	1835770.00000	Adj R-sq	0.0821
C.V.	20.09497		

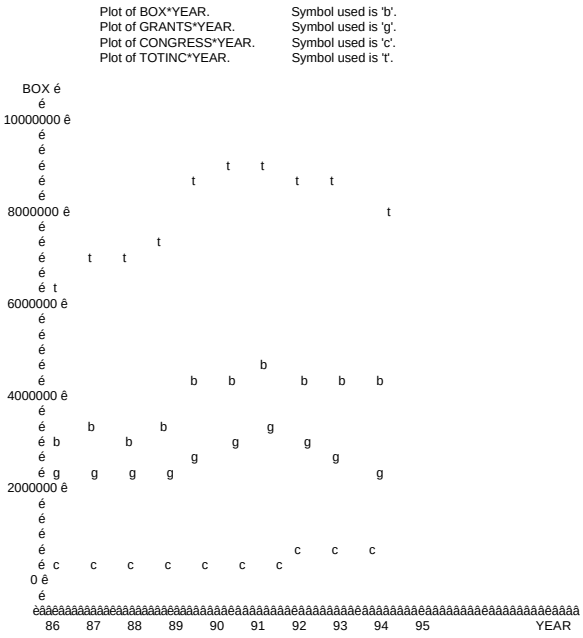
Parameter Estimates

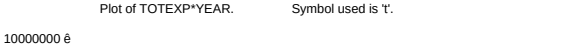
Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-3101965	3677443.1190	-0.844	0.4234
YEAR	1	54561	40614.280459	1.343	0.2160

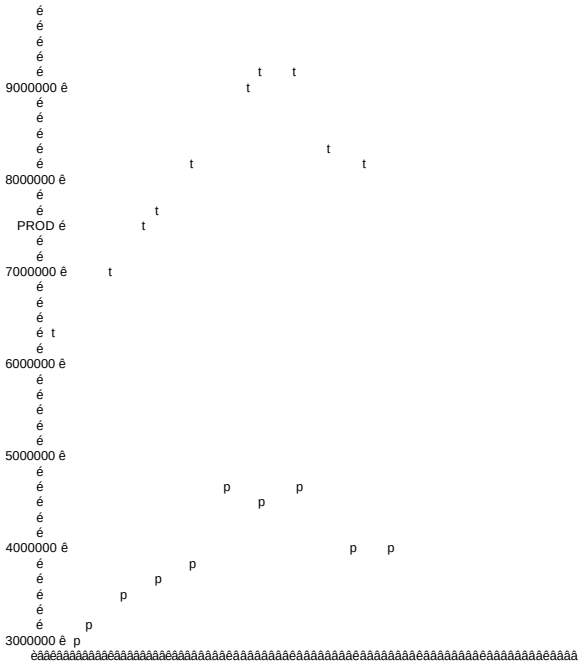
Durbin-Watson D	1.767
(For Number of Obs.)	10
1st Order Autocorrelation	0.021

Analysis of Regional Data using PROC PLOT: Arena Theatre, Washington, D.C.

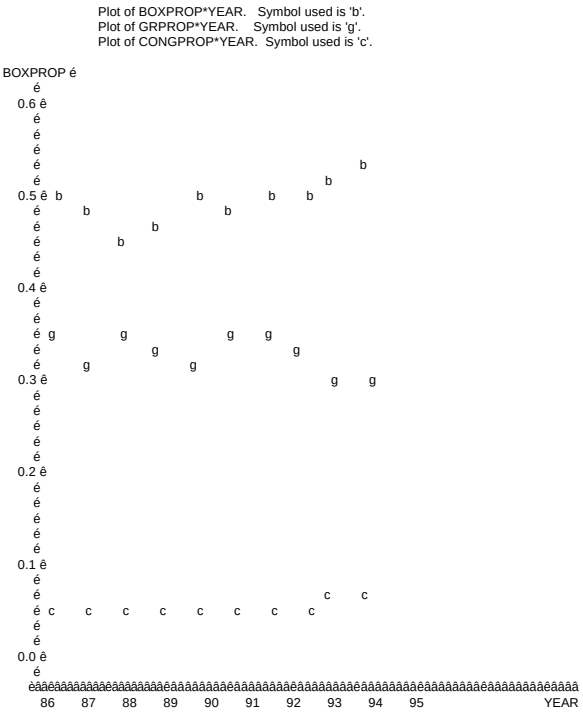
The variables available for analyzing the Arena theatre are box office revenue, grants and gifts revenue, congressional funding, total income, production cost (including salaries), and total expenses. Following are plots illustrating there movement over time.

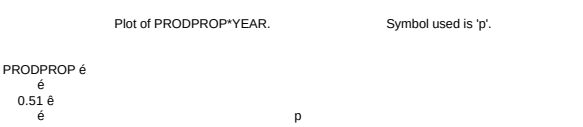


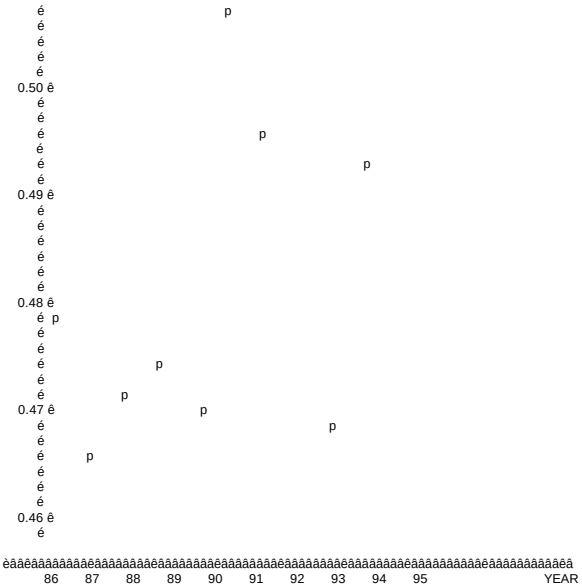




In order to see the proportional relationships over time, box office revenue, grants and gifts and the amount of congressional funding are divided by total income for the theatre. Following are the plots of these variables over time.







Model: Box Office Revenue
Dependent Variable: BOX

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	2.3632102E12	2.3632102E12	20.087	0.0021
Error	8	941181225634	117647653204		
C Total	9	3.3043914E12			

Root MSE	342998.03674	R-square	0.7152
Dep Mean	3942488.80000	Adj R-sq	0.6796
C.V.	8.70004		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-11374478	3419257.9113	-3.327	0.0104
YEAR	1	169248	37762.840996	4.482	0.0021

Model: Grants / Gifts
Dependent Variable: GRANTS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	285630248209	285630248209	2.545	0.1493
Error	8	897876989787	112234623723		
C Total	9	1.1835072E12			

Root MSE	335014.36346	R-square	0.2413
Dep Mean	2614231.50000	Adj R-sq	0.1465
C.V.	12.81502		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-2710819	3339670.7560	-0.812	0.4404
YEAR	1	58840	36883.867496	1.595	0.1493

Model: Congressional Funding
Dependent Variable: CONGRESS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	49622401240	49622401240	54.908	0.0001
Error	8	7229921552.7	903740194.09		
C Total	9	56852322792			

Root MSE	30062.27194	R-square	0.8728
Dep Mean	417386.40000	Adj R-sq	0.8569
C.V.	7.20250		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-1802141	299682.94319	-6.013	0.0003
YEAR	1	24525	3309.7472101	7.410	0.0001

Model: Total Income
Dependent Variable: TOTINC

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	5.1792193E12	5.1792193e12	11.382	0.0097
Error	8	3.6403865E12	455048311788		
C Total	9	8.8196058E12			

Root MSE	674572.68829	R-square	0.5872
Dep Mean	7981018.30000	Adj R-sq	0.5356
C.V.	8.45221		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-14694319	6724639.0771	-2.185	0.0604
YEAR	1	250556	74268.008675	3.374	0.0097

Model: Total Production Cost
Dependent Variable: PROD

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	1.5971915E12	1.5971915E12	9.815	0.0140
Error	8	1.301886E12	162735745106		
C Total	9	2.8990775E12			

Root MSE	403405.18726	R-square	0.5509
Dep Mean	3913835.10000	Adj R-sq	0.4948
C.V.	10.30716		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-8678321	4021441.0296	-2.158	0.0630
YEAR	1	139140	44413.449383	3.133	0.0140

Model: Total Expenditure
Dependent Variable: TOTEXP

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	4.9263308E12	4.9263308E12	12.027	0.0085
Error	8	3.2769059E12	409613231567		
C Total	9	8.2032367E12			

Root MSE	640010.33708	R-square	0.6005
Dep Mean	8076521.00000	Adj R-sq	0.5506
C.V.	7.92433		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-14937298	6380096.0181	-2.200	0.0590
YEAR	1	244363	70462.819043	3.468	0.0085

Model: Ratio of Box Office Revenue to Total Income
Dependent Variable: BOXPROP

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	0.00280	0.00280	7.494	0.0255
Error	8	0.00299	0.00037		
C Total	9	0.00578			

Root MSE	0.01932	R-square	0.4837
Dep Mean	0.49262	Adj R-sq	0.4191
C.V.	3.92202		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-0.034378	0.19260063	-0.178	0.8628
YEAR	1	0.005823	0.00212711	2.738	0.0255

Model: Ratio of Congressioal Funding to Total Income
Dependent Variable: CONGPROP

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	0.00017	0.00017	10.935	0.0107
Error	8	0.00012	0.00002		
C Total	9	0.00029			

Root MSE	0.00394	R-square	0.5775
Dep Mean	0.05208	Adj R-sq	0.5247
C.V.	7.56142		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	-0.077674	0.03925789	-1.979	0.0832
YEAR	1	0.001434	0.00043357	3.307	0.0107

Model: Ratio of Grant Income to Total Income
Dependent Variable: GRPROP

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	0.00076	0.00076	2.249	0.1721
Error	8	0.00272	0.00034		
C Total	9	0.00348			

Root MSE	0.01842	R-square	0.2194
Dep Mean	0.32768	Adj R-sq	0.1219
C.V.	5.62213		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
INTERCEP	1	0.602954	0.18365139	3.283	0.0111
YEAR	1	-0.003042	0.00202828	-1.500	0.1721

Preliminary Conclusions

The following table summarizes the results of using PROC REG with relevant revenue and income variables for the Guthrie and Arena Theatres.

Guthrie Theatre

Variable	Direction of Coefficient	R^2	p-value
Mainstage Revenue	Up	0.2292	0.1616
Total Revenue	Up	0.7042	0.0024
Endowment Revenue	Up	0.9719	0.0001
Grants/Gifts	Up	0.7643	0.0009
Mainstage / total revenue	Down	0.1265	0.3132
Endowment / total revenue	Up	0.8771	0.0001
Grants/Gifts / Total Revenue	Up	0.0022	0.8968
Physical Production expend	Up	0.1841	0.2160
Arena Theatre			
Box Office Revenue	Up	0.7152	0.0021
Grants/Gifts	Up	0.2413	0.1493
Congressional Funding	Up	0.8728	0.0001
Total Income	Up	0.5872	0.0097
Production Cost	Up	0.5509	0.0140
Total Expenditure	Up	0.6005	0.0085
Box Office Revenue/Total Income	Up	0.4837	0.0255
Congressional Revenue/Total Income	Up	0.5775	0.0107
Grants/Gifts / Total Income	Down	0.2194	0.1721

The trend of most of the revenue and expenditure variables associated with regional theatre for the two data sets discussed is upward. The coefficient of determination, R^2, and the p-values are presented in the above table to enable us to determine the statistical significance of the trend.

For the Guthrie Theatre, mainstage revenue relative to total revenue shows a downward trend. This indicates that an alternative source of revenue is becoming more important relative to total revenue such as the endowment draw and grants/gifts.

For the Arena Theatre it is interesting to note that Congressional Revenue, contrary to general belief, has actually increased in absolute as well as a percent of total income.

Notices

References:

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SAS Program for Regional Theatre Analysis

```
option nocenter;
data a;
 input  year shows main educrev support specrev grants endow tr;
cards;

86 8 3893000  51000   829000  939000   2515000  318000   8545000
87 7 3298000  52000   955000  1012000  2598000  373000   8288000
88 7 3766000  54300   636200  1097600  3222400  575200   9351700
89 7 4627300  63500   845400  567400   3155000  854700   10113300
90 7 3898000  89600   672400  1042000  3096300  983500   9781800
91 7 4110900  105300  588600  1188100  3074800  1210400  10278100
92 7 3471700  87000   659900  703600   3172800  1321800  9416800
93 7 3900900  48200   582000  797700   3544300  1475300  10348400
94 7 3893400  62900   690800  701700   3378700  1690500  10418000
95 9 5615800  85200   695000  990000   3607000  1600000  12593000
;

data b;
  input Year art physprod peroper educexp  specexp general
        concess comm devel finance te surdef @@;
cards;

86 1763000 1454000 418000 650000 374000 668000 1012000
1037000 577000 677000 8630000 -85000

87 1827000 1741000 328000 791000 651000 392000 907000
1059000 506000 668000 8870000 -582000

88 2261000 1818000 336500 27000 962200 402400 459100
1257000 605200 1153800 9282200 69500

89 3058500 2064600 466500 122500 475300 486000 557200
1250800 539200 1178800 10199400 -86100

90 2645000 1887700 396100 135800 1013600 528300 505100
1106400 557300 1198700 9974000 -192200

91 2659300 1857300 348000 212300 1102500 489700 507500
1124700 688700 1189900 10179900 98200

92 2658800 1050000 347000 199800 695800 591900 437400
1187100 738200 1150000 9856000 -439200

93 2810800 1993200 366900 175900 740800 827800 422200
1341900 690300 1160500 10530300 -181900

94 3030900 1976700 396500 196200 651700 649100 494000
1168900 679900 1280300 10524200 -106200

95 3697700 2515200 592100 261600 950000 645000 487700
1481200 654200 1292400 12778300 -185300


data total;
  merge a b;
  by year;
profit = tr - te;
mainper = main / tr;
endowper = endow / tr;

        proc plot;
          plot main * year = 'm'
               tr   * year = 'r'
               endow* year = 'e'  / overlay;
        run;
        proc reg;
             model main   = year;
             model tr     = year;
             model endow  = year;
        run;
        proc plot;
          plot mainper * year = 'm'
               endowper * year = 'e' / overlay;
        run;
        proc reg;
          model mainper = year;
          model endowper = year;
        run;

proc print data = total;
run;
proc corr;
run;
proc plot;
   plot tr*year = 'r' te * year = 'e' / overlay;
run;
  proc plot;  plot profit * year = 'p' ;
run;

proc plot;
   Plot physprod * year = 'p' ;
run;

proc reg;
   model physprod = year / p r cli dw;
run;

proc plot;
 plot (shows main educrev support specrev grants endow tr art physprod
peroper educexp specexp general
       Concess comm devel finance te surdef ) * year;

  Run;
proc plot data = a;
  plot grants * year = 'g';
 plot grpertr * year = 'g';
run;

proc reg data = a;
   model grants = year;
   model grpertr = year;
run;
```

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