

## **The Crowding Effect in the American Theatre Sector.**

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## **Abstract**

The market for financial support is very competitive in the United States and in such a market art institutions have to use their managerial capacities to attract substantial funding from both the private and the public sector. Traditionally arts managers have not devoted much attention to the relationship between government funding and private donations. Art organisations allocate their fundraising efforts in order to maximise donative revenues from both the private and public sector, assuming independence among different funding sources. There is evidence in the literature that this assumption is not correct and that receiving government grants influence the amount of private donations that an organisation is likely to receive. This paper develops an empirical analysis of the public-private relationship using a panel of American non-profit theatres followed for a period of four years. While most previous studies assumed linearity between the two funding sources, the results of this investigation show that while this is true in the case of federal funding, the relationship takes the form of an inverted U shape in the case of local support. Federal funding crowds in private donation. Small amounts of local support stimulate private donations, but after a certain threshold they displace them and a crowding out prevails. This creates conflicting interests between art managers and policy makers at the local level, while no such conflict is envisaged at the federal level. The maximisation of total revenues by art managers and of the impact of government granting programmes by local policy makers do not lead to an unique outcome that is satisfactory for both parties.

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## 1. Introduction

The question “does government support stimulate or inhibit philanthropic donations?” is at the basis of the growing literature on the crowding effect of public support on private donations. The stimulus effect constitutes what is defined as crowding in effect<sup>1</sup> while the inhibiting effect determines crowding out<sup>2</sup>. The literature further distinguishes between “total” and “partial” effects (Clotfelter 1985). A “total” effect describes the situation where a change in government spending produces a proportionate change in private donations. A “partial” effect produces a less than proportionate response in private donations as a result of changes in government spending. Analysing the crowding phenomenon using total and partial effects is not sufficient as a more than proportionate change in private donations is a real possibility. Therefore the use of an elasticity measure to characterise the response of private donations to government spending is more appropriate and will be used in the text. Such measure summarises the information on both the direction and the intensity of the crowding phenomenon, while remaining open to a more than proportionate crowding effect.

Conceptually a distinction needs to be drawn between the micro and the macro level, the institutional and the sectoral crowding effect. At the micro level the institutional crowding effect makes private patrons more (or less) likely to give to organisations that receive public support rather than to others, even if aggregate spending is constant. At the macro level the sectoral crowding effect modifies total private giving to a sector as a consequence of changes in public support, even if recipient organisations are no more likely than others to get funded by private donors (Borgonovi & O'Hare 2002; Kingma 1989).

This paper analyses the institutional crowding effect in the non-profit theatre sector using a unique dataset of a panel of American theatres. The funding mechanism is an important variable in determining the crowding effect (Schiff 1985) and the data allow to test for the separate effects that federal, and state and local support have on private donations. As discussed below a number of reasons support the existence of both crowding in and out

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<sup>1</sup> Also defined as leveraging effect or complementary effect.

<sup>2</sup> Also defined as displacement effect or substitution effect.

effects in the art field and the issue of which effect prevails is essentially an empirical question that this paper aims at answering. The paper also explores whether the relationship between private and public support can cause conflicting interests among theatre managers and decision makers at the government level and whether these can be reconciled. While previous empirical analysis of the crowding effect have considered private donations as essentially coming from individual donors, this investigation attempts to control for factors related to other patrons, namely foundations and corporations.

The exclusion of foundations and corporations from any consideration in previous analyses of the institutional crowding effect has been justified with the prevalence of individual giving over giving from foundations and corporations. Individuals constitute the most important source of contributions in the non-profit sector accounting for 76% of total donations with foundations contributing 12%, corporations 4% and bequests 8% in 2001 (AAFRC Trust for Philanthropy, 2002). Although individuals are still the most important source of funding, corporations and foundations have consistently increased their giving: while individuals accounted for 88% of total donations in 1955, they now represent 75% of the total, while foundation giving jumped from less than 4% to 10%.

Some authors (Schwartz 1970a; Vickrey, 1962; Hochman & Rodgers, 1973) also suggest that the importance of individuals is overstated as a large share of individual giving is a “form of payment for services to religious institutions”. Depurating charitable contributions from gifts to faith-based organisations results in a stark reduction in the weight of individuals. When these contributions are not taken into account, individual giving drops to 77% of total donations in 1955 and only 57% in 1999. Conversely foundations’ contributions increase from 7% in 1955 to 18% in 1999 while corporations remain pretty stable at around 10% of total giving (AAFRC Trust for Philanthropy, various years).

Arts and culture absorb a large share of foundations’ contributions, with 14.9% of total grants and 12% of total contributions (The Foundation Center, 2002). Corporations have reported steady increases in the percentage of their contributions awarded to arts and cultural activities, with 19% going to the arts in 1994 and only 2.8% in 1965 (BCA, 1995; Clotfelter, 1985 p. 181). Table 01 shows how in the performing arts sector the

prevalence of individuals over foundations and corporations is much lighter than in other non-profit areas (even when donations to religious organisations are not considered). Among the performing arts, theatres are the form of art that is least dependent on individual giving, with almost 30% of total donative revenues coming from foundations and 25% coming from corporations.

**Table n. 01 Sources of donative revenues, various sectors.**

	<b>Non-profit sector<sup>a</sup></b>	<b>Non-religious non-profit sector*<sup>a</sup></b>	<b>Performing arts<sup>b</sup></b>	<b>Theatres<sup>b</sup></b>
<b>Individuals</b>	77.1	56.3	48.2	43.1
<b>Foundations</b>	9.1	17.3	22.6	29
<b>Corporations</b>	5.6	10.8	21.3	23
<b>Other</b>	8.2	15.6	7.8	4.9

\* Giving to non-religious activities is calculated subtracting religious giving to individual giving.

**Source:** <sup>a</sup> Giving USA 1998, 1997 data

<sup>b</sup> 1997 Economic Census, U.S. Census Bureau.

## 2. The crowding effect

The prevalent assumption at the basis of the crowding out hypothesis is that public support is the result of market failures (public good and consequent free-riding problems) in a world with many altruists, where the utility altruists derive from donations depends only on the utility of recipients (Boulding, 1962; Vickrey, 1962; Becker, 1974; Warr, 1982; Roberts, 1984; Fullerton, 1991). Recipients are less needy once they receive public funding and as need is at the basis of the desire to donate, patrons will have an incentive to shift their giving and fund organisations not receiving public support. In the presence of simple interdependent utility functions where recipients' utility is the only factor determining donations, the donors' marginal utility decreases as a result of government support because it lowers for recipient organisations the marginal utility of additional donations (Abrams & Schmitz, 1978). In this system the only donations observed are the ones of patrons with a weight attached to recipients' utilities that is higher than the one agreed in the social contract determining levels of public support (Hochman and Rodgers, 1977). If the utility function of donors takes a more complex form and/or if public support is allocated using different formulae, public support will not necessarily crowd

out private donations (Roberts, 1984; Schiff, 1985; Amos, 1982; Khanna, Posnett & Sandler, 1995).

Examples of other factors that might affect the utility function of donors are warm-glow effects (Boulding, 1962; Amos, 1982; Andreoni, 1989; Andreoni, 1993); level of control (Andreoni, 2001); private benefits associated with being a patron (Amos, 1982; Andreoni, 2001); social pressure (Rose-Ackerman, 1986; Rabin, 1997) and aversion for dependent recipients (Borgonovi & O'Hare, 2002). Moreover as patrons derive utility from giving to “needy and deserving recipients”, some potential donors might be impeded because of lack of information on recipients’ suitability and/or lack of screening ability. When government grants are accompanied by monitoring and information activities, the associated decrease in uncertainty can stimulate private giving and offset the negative effect of declining recipients’ need (Rose-Ackerman, 1986). There is also some evidence that the form of support governments use to allocate resources determines the relationship of such funds with philanthropic donations (Schiff, 1985; Day & Devlin, 1996).

An alternative theory views the crowding out effect as the result of reduced fundraising efforts of those organisations that receive government support (Andreoni & Payne, 2000). This model presupposes that the decrease in need following public grants makes organisations less active in looking for private funds, while private patrons donate less as a response to a less aggressive fundraising. The marginal utility of a donation remains unchanged for the donors while it decreases for the recipients that consequently modify spending and increase the amount of resources allocated to core activities.

In the non-art field the evidence on the crowding effect is mixed, with some studies finding a 1 to 1 crowding out effect (Roberts, 1984); others reporting only a crowding out effect that is less than 1 (Abrams and Schmitz, 1978; Abrams and Schmitz, 1985; Steinberg, 1985; Kingma, 1989; Payne 1998; Lindsey & Steinberg, 1990; Jones, 1983); others estimating independence between funding sources (Reece, 1979) and finally some giving evidence that in certain circumstances a moderate crowding in effect can occur (Schiff, 1985).

In the art field the National Endowment for the Arts (NEA) has indeed been very vocal in proclaiming that its form of support determines an increase both in charitable contributions and non-federal public support (Hodsoll, 1984; NEA, 1998). According to the NEA and its supporters, the NEA grant allocation system has been designed to exploit the importance of the structure of the funding method and the way this interacts with perceived uncertainty to induce a crowding in effect (NEA, 1998). The two important features characterising NEA support are: the matching requirements and the use of reputational effects (Borgonovi & O'Hare, 2002). The matching requirements constitute a financial incentive to those patrons that want to maximise the impact of their donations (Schuster, 1989; NEA 1998; NEA, 2002a). On the other hand, NEA funding decisions are based on the recommendations<sup>3</sup> of panels of art experts that use artistic quality as the main criterion to judge merit. Some argue that NEA grants are considered a sort of 'Good Housekeeping seal of approval' that stimulate private giving by reducing the reducing uncertainty and increasing information (Wyszomirsky and Mulcahy, 1995; Mulcahy, 1992).

There are a number of empirical studies on the effect of government funding on private donations in the arts. Most of these studies have been carried out in the United States where art organisations heavily rely on charitable contributions for their survival (Feldstein & Clotfelter, 1976; Baumol & Bowen, 1966). Most of the crowding effect studies in the art are sector specific - *symphony orchestras* (Brooks, 1998, 1999, 2000); *public radio* (Brooks, forthcoming); *dance* (Smith, 2002); *art and history museums* (Hughes & Luksetich, 1997) – but there are a few that analyse the art sector as a homogenous area of investigation (Andreoni & Payne, 2001; Paque', 1982). The evidence that these studies provide is mixed, with some reporting a crowding in effect (Smith, 2002; Paque', 1982), others a crowding out effect (Andreoni & Payne, 2001; Hughes & Luksetich, 1997) and others independence (Brooks, 1998; 1999). Smith (2002) found a crowding in effect of NEA grants on both private and non-NEA public support in the American non-profit dance sector. The study also revealed a leveraging impact of total public support (federal, state and local) on private contributions. Total public support and total private giving are independent in the case of symphony orchestras, while the number of concerts given in a season is negatively related to the amount of

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<sup>3</sup> In reality the panels make the decisions as recommendations have almost never been rejected.

public support an institution receives (Brooks, 1999). Andreoni and Payne (2001) use a different model and test whether public support leverages or displaces fundraising activities, which in turn have an effect on private philanthropic donations. They find a significant reduction in fundraising expenses as a consequence of public support in the American non-profit art field.

Kingma (1989) attributed the inconsistencies present in the literature on the sign and magnitude of the crowding effect to the use of a broad definition of recipients and government support. The review of the available empirical studies in the arts reveals that even when the analysis is restricted to a fairly homogenous recipient category, art organisations, such inconsistencies remain. While discrepancies between studies have often been attributed to differences in the effects among art forms and geographical area, the assumption of linearity of the relationship between public support and private donations could be at the basis of such inconsistencies (Brooks 2000; forthcoming). Brook's findings on the crowding effect for American symphony orchestras and public radio stations show that a non-linear (*quadratic*) specification of public support is indeed more appropriate. The relationship takes the form of an inverted U shape, where initially low levels of public support leverage private philanthropic contributions, but that at high levels displace them. Art organisations with liquidity problems might face a situation where they keep using too high a level of public support to sustain themselves in the short run. In the long run such behaviour prevents the maximisation of revenues due to the crowding-out phenomenon that takes place at too high a level of public support (Brooks, 2000).

This paper analyses whether the Brooks (2000; forthcoming) findings for symphony orchestras and public radios are applicable to the non-profit theatre sector and the implications for policy makers and theatre managers. It also investigates whether there are differences in the crowding effect depending on the type of public support given (*federal or local*). Moreover the paper describes that an inverted U shape determines conflicting interests among art organisations and political decision-makers.

### 3. Data and Methods



The dataset used to analyse the effect of public support on private contributions comes from a total of 82 theatres that are members of Theatre Communication Group (TCG). Since 1974 TCG conducts an annual survey (*Theatre Facts*) on the finances of its member theatres. In 2001 a total of 363 theatres responded, 197 of which completed the full in-depth questionnaire. The panel of 82 trend theatres used in the analysis includes those theatres that completed the questionnaire in the each of the last 4 years (1997-2000 period).

The important feature of the TCG panel is that unlike the data used in previous empirical studies on the crowding effect in the arts, it differentiates public support into federal, state and local. Such a separation is necessary to ascertain the effects that various forms of public support have on the behaviour of donors.

The TCG dataset contains information on a panel of both large and small theatres (total positive incomes range between \$31M and \$200,000) and constitutes an accurate representation of American non-profit theatres. An exploratory analysis was carried out to assess the availability of data for the empirical test of the crowding effect phenomenon, and the TCG dataset turned out to be the most suitable. Alternatives could have been the National Centre for Charitable Statistics (NCCS) Statistics of Income (SOI) dataset - used by Andreoni and Payne (2001) in their analysis of the effect of government support on fundraising efforts - and the 1997 Economic Census dataset. The NCCS SOI dataset includes non-profit institutions with assets of \$10M or more and a sample of smaller institutions and differentiates between donations coming from the private sector and the government and can thus be used for analyses of the crowding phenomenon. The dataset fails to separate government support at the federal and local level and contains only a sample of small institutions that is not constant across time and that is very small in any single year. In 1997 there were approximately 1500 non-profit theatre companies in the United States (U.S. Census Bureau, 2000). This figure includes all non-profit theatres and not just professional non-profit theatre companies. The 1998 NCCS SOI dataset contains 65 theatres (NTEECC code A65) while the 1991 version only 35 theatres. Another possibility was the 1997 Economic Census dataset containing information on tax-exempt theatres. The Economic Census dataset includes all non-profit establishments, but contains a large part of amateur and semi-professional organisations and is restricted to a single year.

The model that the econometric analysis estimates is:

$$(1) \quad D_{it} = \beta_1 + \beta_{21}FD_{it} + \beta_3FDSQ_{it} + \beta_4NFD_{it} + \beta_5NFDSQ + \beta_6INC_{it} + \beta_7DVLOP_{it} + \beta_8CAP_{it} + \beta_9GROSS_{it} + \beta_{10}ASSETS_{it} + \beta_{11}TIME_{it} + \beta_{12}PAYR + \varepsilon_{it}$$

$i=(1 \dots 82)$  denotes theatre

$t=(1 \dots 5)$  denotes year

**Table 2 Description of variables and summary statistics (panel 1997-2000).**

Variable	Definition	Mean (Std. Dev)	Min	Max
<i>D</i>	Total private giving	1237054 (1646805)	4320	1.24e+07
<i>FD</i>	Federal spending	30944.66 (68010.3)	0	552202.6
<i>FDSQ</i>	Quadratic term federal	5.74e+09 (2.89e+10)	0	3.11e+11
<i>NFD</i>	Total non federal (state and city/county) local support	234248.2 (520152.4)	0	5905357
<i>NFDSQ</i>	Quadratic term – local support	3.40e+11 (2.66e+12)	0	3.63e+13
<i>DVLOP</i>	Total development expenses	169620.4 (210031.8)	0	1185584
<i>INC</i>	Total income	4718400 (4510007)	223253	3.16e+07
<i>TIME</i>	Time trend	2.5 (1.119742)	1	4
<i>CAP</i>	Median per capita income	28009.96 (3827.851)	19628	38494.56
<i>GROSS</i>	Gross domestic product	382896.6 (341484.3)	29409	1250499
<i>ASSETS</i>	Total assets	2.11e+07 (2.33e+07)	708696	8.36e+07
<i>PAYR</i>	Ratio of artistic payroll to total payroll	0.413 (0.969)	0.18	0.83

The dependent variable “private contributions” aggregates donations from individuals, foundations and corporations. Public support was disaggregated into federal and local (state and city/county) contributions. Table 2 provides a description of the variables used in the model and summary statistics, while table 3 summarises partial correlation between the model covariates. There is little correlation among all variables except *ASSETS* and *GROSS*, which raises concerns about the effect of multicollinearity on the estimates of these two variables.

**Table 3 Correlation matrix of independent variables included in the model.**

	<i>FD</i>	<i>NFD</i>	<i>DVLOP</i>	<i>INC</i>	<i>TIME</i>	<i>CAP</i>	<i>GROSS</i>	<i>ASSETS</i>	<i>PAYR</i>
<i>FD</i>	1.00								
<i>NFD</i>	0.04	1.00							
<i>DVLOP</i>	0.23	0.27	1.00						
<i>INC</i>	0.35	0.43	0.72	1.00					
<i>TIME</i>	-0.02	0.08	0.09	0.08	1.00				

<i>CAP</i>	0.30	-0.001	0.15	0.13	0.24	1.00			
<i>GROSS</i>	-0.07	-0.03	0.20	0.20	0.05	0.09	1.00		
<i>ASSETS</i>	-0.04	-0.02	0.27	0.24	0.11	0.24	0.86	1.00	
<i>PAYR</i>	-0.03	-0.04	-0.23	-0.28	-0.09	-0.11	-0.07	-0.07	1.00

#### 4. Econometric Analysis and Results

Model (1) cannot be estimated using ordinary least squares. OLS are an inadequate estimation method for panel data and the resulting estimates are likely to suffer from heteroskedasticity and autocorrelation (Greene, 1997). The Breusch-Pagan test indicates that the pooled model is indeed inadequate for the panel of theatres used in this analysis. Fixed effects estimation is used in models (A) and (B), while model (C) presents fixed effects estimate corrected for first order serial correlation.

The Hausman test statistics for both the specification with and without the quadratic term for federal support indicates that the fixed effects model outperforms the random effects. For model (A) the Hausman test is 43.80 ( $p=0.000$ ) with eleven degrees of freedom and for model (B) the test is 47.08 ( $p=0.000$ ) with 10 degrees of freedom. The hypothesis that fixed and random effects coefficient are the same can be rejected at the 1% confidence level. The superiority of the fixed effects specification indicates that theatre specific effects are a determinant factor in explaining variations of private donations across the organisations in the panel. Crowding effect models like the one presented in this study often exhibit another violation of key assumptions of regression analysis, as public funding cannot be considered an exogenous covariate. It is possible to imagine public support as an endogenous variable that determines and at the same time is determined by private contributions (Brooks, 1999). The most widely used technique to address the problem of an endogenous independent variable is to find an instrument that is highly correlated with the independent but not with the dependent variable (Kingma, 1989; Day & Devlin, 1996). Nevertheless the American art field exhibits specificities that suggest using a model based on information lags and view current public support as exogenous rather than using an instrumental variable technique (Brooks, forthcoming; Smith, 2002; Andreoni and Payne, 2001, page 18). While the ability of a theatre to attract private donations is important for its survival and thus the capacity to also compete for public support, the allocation procedure of public funds at both the federal and (*in most*

*circumstances*) local level, ensures this exogeneity. The matching requirements might be ineffective in producing a high level of crowding in effect of government spending on private donations, but they support a univocal relationship between the two.

Table 04 presents estimates for the three models. Model **(A)** uses a non-linear (*quadratic*) function for both federal and local support, as the table shows the quadratic term *FDSQ* is not significant. Both model **(B)** and **(C)** use a linear function for federal support and a quadratic one for local support, but model **(C)** corrects the estimates for first order serial correlation. The correlation is small,  $\rho = .209$ , but when it is taken into account fundraising expenses become significant at the 10% level and the local support variable *NONFD* becomes significant at the 5% level rather than at the 10%. The time trend variable is not significant in any of the models, like the three control variables median per capita income in the State where the theatre is located, State gross domestic product and total assets of grant awarding foundations in the State. The insignificance of the time trend variable suggests that there is no overall trend (either upwards or downwards) that makes private donations increase or decrease over time, other things being equal. Another possibility to specify the time component is to use year dummy variables, this alternative estimation was carried out and all the three year-dummies were insignificant. Total theatre income is highly significant and is positively correlated with private donations.

An unresolved problem of most crowding effect studies is that if the allocation criteria used by private and public donors coincide or are very similar, a positive correlation between the two sources of support will mask a correlation between the two and a separate variable. While fundraising expenses are an indication of the effort and managerial ability to attract donative revenues, artistic quality and its effect on private donations have not been considered by previous crowding effect studies. Lange and Luksetich (1984) use the payroll ratio (ratio of artistic payroll to total payroll) in their estimation of the demand for Broadway performances as a proxy for quality. The hypothesis is that the payroll ratio is an indication of the quality of the production as high quality theatres will invest more in their artistic activity compared to management and other wages expenses. As Throsby's analysis (1983) indicates it is very difficult to measure the overall quality of performances and the wage of performers might not be the

most appropriate indication of either subjective or objective quality criteria. Even though the hypothesis of artistic payroll being an indication of quality might be debatable, this index was constructed for the theatres in the panel and used as one of the covariates.

Intuitively other factors that might determine private contributions are characteristics of the theatre such as attendance, the difference between ticket income and expenditures, and total number of productions or performances. Private donors might provide support to foster attendance of others (Fullerton, 1991), and the more one participates, the more likely she is to donate. Therefore the hypothesis is that the higher the attendance, the higher private donations to a theatre will be. The difference between ticket income and expenditures indicates the need of private support that a theatre has, it represents the shortfall that has to be covered by donative contributions. Brooks (1999) uses performances as an indication of scale of operation and as a tangible measure of the production of art organisations. At the state level the number of theatres present in the state or per capita expenditures by the State Arts Agency can be considered good proxies for competition for private support and at the same time for the presence of a taste for the arts among the population. The higher the number of theatres and per capita state expenditures on the arts, the more “predisposed” to making donations to theatres the population is likely to be and consequently the higher one expects private support at the theatre level. At the same time a higher number of theatres means higher competition for a possibly fixed pie of available funds. All these possible covariates were estimated but none of them was significant.

**Table 04. The crowding effect of government spending on private donations (1997-2000).**

Dependent Variable: <i>D</i>						
	(A) FE		(B) FE		(C) FE adjusted for AR(1)	
Independent Variables	Coefficients	SE	Coefficients	SE	Coefficients	SE
<i>Constant</i>	-809948.6 (-0.38)	2150672	-866983 (-0.4)	2152344	1174892 (0.46)	2573185
<i>FD</i>	4.298* (2.31)	1.864	2.544* (2.15)	1.182	3.710* (2.23)	1.665
<i>FDSQ</i>	-5.69e-06 (-1.22)	4.68e-06	----	----	----	----
<i>NFD</i>	0.468** (1.77)	0.264	0.453** (1.71)	0.264	0.693* (2.23)	0.311
<i>NFDSQ</i>	-1.45e-07# (-3.10)	4.68e-08	-1.44e-07# (-3.07)	4.68e-08	-2.22e-07# (-3.99)	5.55e-08
<i>INC</i>	0.406# (12.15)	0.033	0.406# (12.12)	0.033	0.381# (9.37)	0.040
<i>DVLOP</i>	0.090 (0.18)	0.509	0.127 (0.25)	0.509	1.347* (1.87)	0.719
<i>TIME</i>	-34194.85 (-0.48)	71230.25	-37914.53 (-0.53)	71236.86	-57898.29 (-0.53)	109787.4
<i>CAP</i>	4.953 (0.06)	87.116	5.916 (0.07)	87.20	-43.11 (-0.34)	128.44
<i>GROSS</i>	0.241 (0.14)	1.676	0.444 (0.27)	1.669	-1.010 (-0.34)	2.954
<i>ASSETS</i>	0.005 (0.56)	0.010	0.005 (0.53)	0.010	0.017 (0.98)	0.017
<i>PAYR</i>	-770151.8 (-1.17)	656330.7	-793418.4 (-1.21)	656718.2	-2620274* (-2.15)	1221539

N=328 R <sup>2</sup> = 74.00 F(11, 235)=20.35 corr(u <sub>i</sub> , Xb) = -0.631 Fraction of variance due to FE= .769 sigma_u= 932348.7 sigma_e= 510353.2	N=328 R <sup>2</sup> = 73.15 F(10,236)=22.19 corr(u <sub>i</sub> , Xb) = -0.625 F of variance = .777 sigma_u=954799.7 sigma_e=510871.5	N=246 R <sup>2</sup> = 70.38 F(10,154)=16.88 corr(u <sub>i</sub> , Xb)= -0.683 F of variance = .802 sigma_u = 1109433 sigma_e =549703.4 rho ar .214
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*t* statistics in parenthesis

# Significance greater than 0.01 \* Significance greater than 0.05 \*\* Significance greater than 0.10

Table 04 presents the regression estimates of the crowding effect in the theatre sector. The quadratic term for federal support *FDSQ* is not significant, indicating that the relationship between private donations and federal support is linear. The econometric results also suggest that there is a linear crowding in effect of federal spending on private donations. The relationship between local support and private donations takes the form of an inverted U shape (positive coefficient of the linear term *NFD* and negative coefficient of the quadratic term *NFDSQ*). This determines an initial crowding in effect for low levels of local funding, while a crowding out effect at high levels of local support. When federal and local support are aggregated as in previous crowding effect studies the effect of local support prevails and the findings by Brooks (2000, forthcoming) are confirmed. The relationship between total private donations and total public support is non linear (the beta coefficients are 0.533 for the linear public variable with  $t=2.02$  significant at the 5% level and  $-1.64e-07$  for the quadratic term  $t=-3.43$  significant at the 1% level).

The time trend variable is insignificant in all three specifications, while the coefficient of fundraising expenditures becomes significant only in the model corrected for first order serial correlation. Changes in fundraising expenditures are positively related to changes in private donations as expected and indicated in previous studies present in the literature (see Clotfelter, 1985 for a review of existing studies). Theatre income is highly related to private donations; *ceteris paribus* the higher the income, the higher the absolute level of private contributions. This can equally be the effect of the scale of operation and of the higher ability of large theatres to inform about their programmes, activities and needs. Assets, gross domestic product and per capita income are not significant, while the payroll ratio is significant although in the unexpected direction. This result deserves further investigation and better indices of artistic quality should be developed to take into account an important factor in determining private donations among non-profit organisations.

## 5. Conclusions

This paper estimates the institutional crowding effect in the American theatre sector using a panel of 82 theatres followed for 4 years (1997-2000). While previous studies of the crowding effect in the arts used an aggregate measure of government spending, federal and state & city/county support are analysed separately. The functional form of the relationship between sources of public support and private contributions is discussed and the non-linearity of the crowding effect is tested as suggested by Brooks (2000, forthcoming). While the relationship between state and city/county spending and private donations takes the U shape described by Brooks, federal spending determines a linear crowding in effect as previously illustrated by Smith (2002) for dance companies. The difference in the nature of the crowding effect of the two sources of public support means that theatre managers and decision makers at the political level should clearly consider the mix of not only private vs. public funds, but also the distribution of public support into federal and local. At low levels both forms of contributions leverage private support, but after a threshold is reached, local spending displaces private donations.

At the federal level the objectives of theatre managers and decision makers coincide as increases in federal support increase private donations. In contrast with federal contributions, the inverted U shape that local support takes determines conflicting interests between managers and decision makers at the state and more local level. Theatre managers want to keep attracting increases in local support up to the point where there is a 1 to 1 crowding out effect, while decision makers prefer the peak of the inverted U curve, where the crowding effect equals zero (below the preferred choice of theatre managers).

As in previous studies of the crowding effect, fundraising expenditures are positively related to private contributions, while the “state factors” - per capita median income, gross domestic product and foundations’ assets - are not significant. This might be due to the aggregation of individual, corporate and foundation support in total private donations. Further investigation with disaggregated data is needed to assess the determinants of the different sources of private support. Moreover future developments in the crowding effect



literature should develop more precise measures of income and ability to donate. The evidence suggests that it is predominantly the very wealthy that donate to the arts (Borgonovi & O'Hare 2002). Such ability and propensity to donate does not come from personal "wage income" as measured by the Internal Revenue Service (IRS) or other income surveys, but from wealth. Current studies of the institutional crowding effect use per capita median income, which is inadequate, but also developments using income of the top 5% or 10% of population will not solve this more fundamental shortfall of income measures. A final problem with the income effect is that estimating the distribution and median income of the very wealthy is problematic because most surveys use capped measures of income at 100K or 250K.

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