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ON THE OPTIMAL LEVEL OF THEATRE SUBSIDIES

This article examines public subsidies and ticket pricing in Finnish theatre institutions by using the principal-agent model. The model follows the ideas presented by Prieto-Rodríguez and Fernández-Blanko (2006) in their article on the British museum sector. The idea of this article is to test how well their theoretical model is in line with the data on Finnish theatres.

The aim of this paper to justify the high share of public subsidies to theatre sector and to show that ticket pricing should be in the inelastic segment on the demand schedule. The data on Finnish theatres covers years 2007 – 2011 with 58 theatres subsidised by the law, including the Finnish National Opera.

The results of the empirical examination show that the demand of theatre services is price inelastic. According to the results, an increase in the number of visitors increases also optimal subsidies but less than proportionally indicating that the share of public subsidies should be lower in larger towns where the potential for theatre visits is higher due to a larger population. The article argues that even though using economic approaches in examining arts and culture is not unproblematic, they should be used and further developed.

Keywords: state subsidies, theatres subsidied by law, spectator statistics

Introduction and motivation

This article uses an economic approach to look at public subsidies and ticket pricing in Finnish theatre institutions. The examination follows the ideas presented by Prieto-Rodríguez and Fernández-Blanco (2006) in their article on the British museum sector. They (ibid, 170) used a principal-agent model as a methodological approach to examine the relations between the public administration and the manager of the museum, and to define the optimal pricing and grant policies for museums. The idea of this article is to test how well their theoretical model is in line with the data on Finnish theatres.

Funding of cultural institutions is a key issue in the cultural policy debate. In Finland, a large share of the financing of theatre institutions comes from public support. In 2007, state subsidies ("funding bill") to the theatres were about 47M€ and discretionary support for the Finnish National Opera about 31M€. In addition to this, some minor theatre groups received about 1,5M€ in discretionary state subsidies, and municipalities supported the above-mentioned institutions and groups with about 63M€. (Tinfo, 2008.) In practice, this means that, on average, the income share of state and municipal subsidies was 25 %, and 43 % for the theatres included in the statutory state aid system. On average, just under a third of the revenue (28 %) came from ticket sales. The share of other income (e.g. restaurant sales) was about 5 %.

Research literature presents various justifications for the public support for

culture. Preserving and creating art and culture as a legacy to future generations justifies subsidies. Cultural goods often serve as merit goods yielding collective benefit and positive externalities if consumed. Government actions, e.g. subsidies, are needed to ensure the availability and consumption of these goods. (Heilbrun & Gray, 2010; Peacock, 2006a.) Direct public support is reasonable if there are spillover benefits to consumers and if the support increases the quality of choices (Peacock 2006a). The quality of choices increases welfare, and benefits are more possible if there is public support. Government subsidy could be also seen as a response to market failure. Baumol and Bowen (1966), for example, described how labour productivity progress in cultural sectors, especially in performing arts, is low because live productions are labour intensive. While labour costs of producing a performance increase over time in line with the other sectors of the economy, labour productivity will remain unchanged. Thus, the theatre is inclined to profitability problems. Due to equal treatment culture should be made available to everyone, not only to those who can afford it. Similarly, if, for example, philharmonic orchestras are subsidised then the substitutes for orchestra performances, like theatre performances must be subsidised also. (Heilbrun & Gray, 2010; Throsby 2010.)

In addition to public subsidies, ticket sales are another important income source for the theatres. The demand for theatre performances has been found to be inelastic in various studies (for an overview, see Seaman 2006). The inelasticity of demand means that the change in ticket price does not produce a big change in demand. Various explanations have been presented to explain why most studies report inelastic demand. Throsby (1994) argues that the demand for art performances is inherently price insensitive, because the qualitative characteristics of the service are probably decisive. Another point is that ticket price does not reflect the full price since the opportunity cost of time is not taken into account (e.g. Zieba, 2009).

If an art institution aims to maximise revenues and profits, being located on the inelastic section of the demand curve should guide an institution to increase ticket prices (cf. Prieto-Rodríguez and Fernández-Blanco, 2006, p. 170). However, this is not often the case in theatres or other cultural institutions. This discrepancy is explained, for example, by the fact that, as theatres often operate in a non-profit form, a theatre manager can have other objectives other than profit-maximisation, such as maximising the quality, number of visitors or productions or increasing their budgets (DiMaggio, 1987, p. 206; Luksetich & Lange, 1995).

The aim of this paper is to justify the high share of public subsidies to the theatre sector and to show that theatres' ticket pricing should be in the inelastic segment on the demand schedule. A conventional regression analysis is carried out where the variable to be explained is the number of tickets sold annually and the variables explaining are the average ticket price and the number of performances per year. The hypothesis is that Finnish theatres ticket price demand is inelastic.

The article aims to test the approach presented by Prieto-Rodríguez and Fernández-Blanco (2006) with the data on Finnish theatres. The data covers years 2007–2011 with 58 theatres subsidised by the law, including the Finnish National Opera although it offers somewhat different repertoire. To the knowledge of the author, no such test has been carried out with theatre data.

The next section of the article briefly describes the principal-agent approach

and its cultural policy context where the Ministry of Education and Culture is the principal, and a theatre manager is the agent. Section 3 develops the theoretical model of optimal subsidy scheme. Section 4 presents the empirical examination focusing on 58 Finnish theatres. Finally, section 5 lists the main conclusions.

Theatres and public subsidies

The theatre and orchestra law (705/92) that came into force in 1993 brought considerable changes to theatre financing in Finland. Previously, the state had contributed to the financing of theatres' activities with discretionary state subsidies while the new Act included theatres in the scope of the statutory state aid system (opetusministeriö, 2003, p. 17). According to the current law, the theatres accepted into the system receive an annual subsidy for their operating expenses. The subsidy is calculated by multiplying the imputed number of person-years describing the scope of activities in each institution by the unit price assigned to the person-year (opetusministeriö, 2009, p. 9, 13). As a rule, the state subsidy is 37 per cent of the unit price with certain exceptions.

The principal-agent model is frequently used when one individual has the responsibility for taking decisions in the interest of others in return for some kind of payment (Peacock, 2006; Prieto-Rodríguez & Fernández-Blanco, 2006). In the arts and cultural policy case of this article, the ministry of education and culture in Finland (the principal) has a different target, like maximising the number of theatre attendance in relation to subsidises than an individual theatre manager (agent) who wants to maximise profit given the subsidies from the ministry. The choice is delegated: one theatre has the responsibility for taking decisions supposedly in the interest of the ministry (the whole society) in return for some kind of payment. The theory of principal and agent is designed to apply to a situation where one individual, called the agent must choose some action a from a given set of actions $\{a\}$. The outcome x which results from this choice depends also on a given set of states of the world $\{\theta\}$ which is not known in advance. The outcome x generates utility to the second (the ministry), the principal P. A contract must be defined under which P makes a payment s to the agent. In the principal-agent model, the principal commands the agent to take actions on the principal's behalf motivated by a monetary reward. The environment is uncertain, and the principal and agent have differing information on the aspects of this uncertainty. The uncertainty in the culture sector refers to a situation in which the outcomes are not directly linked to inputs or effort. For example, no matter how much effort a theatre puts in to ensure the attendance and ticket income, no one can know in advance whether a performance is a success in terms of number of visitors (e.g. O'Hagan & Neligan, 2005). The policy effects of cultural policy also differentiate outputs and outcomes. Outputs refers to tangible results of implementation while outcomes are real effects of a policy in social areas. If the manager reports large increases in the number of theatre visitors that does not necessarily mean that the repertoire has been of artistic quality. The principal-agent problem characterises a situation where self-interested managers enter into an implicit or explicit contract with the ministry.

The measurement of the achievement of the cultural institutions is complicated by the presence of goals of different nature. The overall aim of the state subsidy system is to promote the production of artistic theatre activities and to ensure that

all citizens have equal access to cultural events. (Opetus- ja kulttuuriministeriö, 2017.) It is important that there are many visitors, since it has been shown that scale economies exist (Taalas, 1997) and average costs decline, however, it is also important that there are many performances and many different plays since the cultural diversity increases. This in turn can lead to allocative inefficiency. Taalas (1997) proposes that on average in Finland the actual total costs exceeded the minimum cost by some 5 per cent in the 1980's and 1990's. With popular plays a theatre house can exploit economies of scale by reaching out to ample audience. The economies of scale can also be achieved by increasing the average length of run per production. (O'Hagan & Neligan, 2005.) There are studies showing that public support has an impact on theatres' behavior and repertoire choices. In general, the studies suggest that the higher the public subsidisation of a theatre, the more non-conventional its repertoire. Without subsidy, a theatre may be forced to present a more conventional repertoire, because it is appealing to the audience, and, thus, better ensures ticket revenue. (Austen-Smith, 1980; DiMaggio & Stenberg, 1985; Werck et al., 2008.)

A model for optimal subsidy scheme

Principal (ministry) and agent (theatre manager) are maximising expected utility, u and v. The utility $u(n(e^0,\theta))$ depends on outcome n (number of visitors) which in turn is determined by effort e^0 and the state of the world θ. Higher values of θ represent more favourable states. Principal and agent have identical probability beliefs concerning the states of the world, with a density function f(θ). If the ministry is risk-neutral and the theatre manager is risk averse, a typical principal-agent model results in the agent receiving a fixed fee leaving all of the risk of a variable cash flow with the principal (Strong & Waterson, 1990). This is the classic moral hazard case where the theatre manager's incentive is to act at a lower level since the ministry can only observe an imperfect measure of the manager's action. The standard principal-agent model (Rees, 1987) shows how an optimal subsidy (fee) schedule is related to risk aversion of the ministry and the theatre manager. The optimal subsidy schedule exchanges the benefits of risk sharing with the costs of providing an incentive to the theatre manager. The optimal schedule defines a risk-sharing fee $s^*(\theta)$ from the ministry to the theatre. It maximises the ministry's expected utility u for some given level of the theatre manager's utility $\overline{v^0}$ which is determined by the theatre manager's effort e^0 and fee s(θ).

$$(1)\ \max_{s(\theta)} \int_0^1 u\left(n(e^0,\theta)-s(\theta)\right) f(\theta)d\theta \text{ s.t. } \int_0^1 v\left(e^0, s(\theta)\right) f(\theta)d\theta \geq \overline{v^0}$$

The solution $s^*(\theta)$, which specifies the subsidy from the ministry to agent at each, θ is the following

$$(2)\ -u'(n-s^*)+\lambda v_s = 0$$

where λ is the conventional Lagrange multiplier and not a function of θ. If two different states of the world ($\theta_1 \neq \theta_2$) then the first order conditions imply

$$(3)\ \frac{u'(\theta_1)}{v_s(\theta_1)} = \frac{u'(\theta_2)}{v_s(\theta_2)} \Rightarrow \frac{u'(\theta_1)}{u'(\theta_2)} = \frac{v_s(\theta_1)}{v_s(\theta_2)}$$

meaning that the optimal risk sharing is when the ministry's and the theatre manager's marginal rate of substitution of income between any two states of the world (θ) are equal. Differentiating the first order condition (2) with respect to θ results in

$$(4)\ -u''\left(\frac{\partial n}{\partial \theta} - \frac{\partial s^*}{\partial \theta}\right) + \lambda v_{ss}\frac{\partial s^*}{\partial \theta} = 0$$

Using the Arrow-Pratt indices of risk aversion $r_P = -\frac{u''}{u'}$ *and* $r_A = -\frac{v_{ss}}{v_s}$ and recalling that $\lambda = \frac{u'}{v_s}$ the above yields

$$(5)\ \frac{\partial s^*}{\partial \theta} = \frac{r_P}{r_P + r_A}\frac{\partial n}{\partial \theta}$$

Given risk aversion if θ increases, subsidy (s) increases but with a slower rate. This result proposes using a linear subsidy schedule $s^*(\theta) = \frac{r_P}{r_P + r_A}n + \bar{S}$ in which $\bar{S}$ is a constant. However, if the ministry is risk neutral, $r_p = 0$ then $s^*(\theta) = \bar{S}$ and if the theatre manager is risk neutral, $r_A = 0$ then $s^*(\theta) = n - \gamma$ implying that the theatre manager pays a fixed payment γ to the ministry and takes the residual income. The important conclusion here is that a linear subsidy scheme is most optimal.

However, in the case of optimal subsidy it is not enough to relate that only to the managers' and the ministry's risk aversion. We should study how an optimal subsidy is related to demand conditions. Following the ideas of Peacock (2006) and Throsby (2010) both the state and local municipalities are subsidising local private theatres in order to increase the number of theatre visits. Therefore, the public subsidy should depend on the number of theatre visitors and following the standard principal-agent model (Rees, 1987) the schedule is linear. The model below follows the ideas presented by Prieto-Rodríguez and Fernández-Blanco (2006). They are using a more general function while the model below uses a more detailed function form.

The arts ministry wants to maximise the common objective function U_M that includes the number of visitors, n_i but the marginal rate in utility is diminishing, and the public subsidy, $s_i(n_i) = s_i n_i$ that depends on the number of visitors. As the number of visitors increases, so does the subsidy. The objective function is

$$(6)\ U_M = (n_i^{½} - s_i n_i)$$

The utility function of the theatre, *i*, is additively separable with two parts: incomes from ticket sales, $n_i \cdot p_i = \alpha p_i^{-\beta+1}$ and public subsidy, $s_i n_i$ and costs due to using actors and other staff, $v_i(e) = v_i e_i^2$. The ticket revenues, $n_i \cdot p_i$ where n_i is related to price, p_i and other relevant attributes (α) : $n_i = \alpha p_i^{-\beta}$. The price elasticity is $-\beta < 0$. The other relevant attributes include incomes of the consumers and other leisure activities (substitutes, like cinema or sport events).

$$(7)\ U_T = n_i \cdot p_i + s_i n_i - v_i e_i^2 = \alpha p_i^{-\beta+1} + s_i \alpha p_i^{-\beta} - v_i e_i^2$$

A larger level of using actors and staff or simply effort, e, will reduce the overall utility of the theatre manager but it will increase the number of visitors.

The ministry's problem is to

$$(8)\ MAX_{e,s_i,p} \sum_{i=1}^{N} \pi_i(e_i)(\alpha^{½} p_i^{-½\beta} - s_i \alpha p_i^{-\beta})$$

subject to

$$(9) \sum_{i=1}^{N} \pi_i(e_i)[\alpha p_i^{-\beta+1} + s_i \alpha p_i^{-\beta} - v_i e_i^2] \geq \underline{U}$$

where π_i is the probability of getting a certain number of visitors, n_i given the effort, e, of the theatre manager. The Lagrange function connected with this set of problems is

$$(10)\ \mathcal{L}(e_i, s_i, p_i) = \sum_{i=1}^{N} \pi_i(e_i)(\alpha^{½} p_i^{-½\beta} - s_i \alpha p_i^{-\beta}) + \lambda \left\{ \sum_{i=1}^{N} \pi_i(e_i)[\alpha p_i^{-\beta+1} + s_i \alpha p_i^{-\beta} - v_i e_i^2] - \underline{U} \right\}$$

The first order conditions of this programme are:

$$(11)\ \frac{\partial \mathcal{L}}{\partial e} = \sum_{i=1}^{N} \pi_i'(e_i)(\alpha^{½} p_i^{-½\beta} - s_i \alpha p_i^{-\beta}) + \lambda \left\{ \sum_{i=1}^{N} \pi_i'(e_i)[\alpha p_i^{-\beta+1} + s_i \alpha p_i^{-\beta} - v_i e_i^2] - 2 v_i e_i \pi_i(e_i) \right\} = 0$$

$$(12)\ \frac{\partial \mathcal{L}}{\partial s_i} = -\alpha p_i^{-\beta} \sum_{i=1}^{N} \pi_i(e_i) + \lambda \sum_{i=1}^{N} \pi_i(e_i)\, \alpha p_i^{-\beta} = 0$$

$$(13)\ \frac{\partial \mathcal{L}}{\partial p} = \left[-½\beta \alpha^{½} p_i^{-½\beta-1} + \beta s_i \alpha p_i^{-\beta-1} \right] \sum_{i=1}^{N} \pi_i(e_i) + \lambda \left\{ \sum_{i=1}^{N} \pi_i(e_i)[(-\beta+1)\alpha p_i^{-\beta} - \beta \alpha s_i p_i^{-\beta-1}] \right\} = 0$$

From (12) we can observe that the Lagrange multiplier $\lambda = 1$ indicating that the optimal rate in utility increases by one unit as the constraint (9) is relaxed. Using that result ($\lambda = 1$) the optimal subsidy s^* from (13) cannot be solved. However, from (13) we can observe that

$$(14)\ p^{½\beta-1} = \frac{(\beta-1)\alpha}{-½\alpha^{-½\beta}}$$

which states that price is positive only when $\beta < 1$. By assumption we know that $\beta < 0$. Hence price is positive if the price elasticity of theatre performances is inelastic. This result is in line with Prieto-Rodríguez and Fernández-Blanco (2006). Moreover, a more inelastic demand results in higher optimal public subsidy since we assume that inelastic demand results in higher number of visitors and therefore a higher subsidy.

Usually, demand responds to changes in income and prices. The effect of income is usually measured by the income elasticity, which shows the change in demand relative to a given change in income. If income increases by 10 %, for instance, and demand increases by 15 %, the income elasticity is 15 / 10 = 1.5. In this

case, demand is described as income-sensitive since the income elasticity is greater than 1. Non-sensitivity implies an income elasticity between 0 and 1, and good is termed inferior if the income elasticity is less than 0. Price elasticities are measured correspondingly: the change in demand relative to a given change in price. If, for instance, the price of a good increases by 10 % and the demand decreases by 5 %, the own price elasticity is –5 / 10 = –0.5. In this case, the good in question is described as price-insensitive since the own-price elasticity is greater than –1. It is described as price-sensitive if the own-price elasticity is less than –1.

Data and estimation methods

The empirical examination focuses a Finnish data covering 58 theatres during a five-year period from 2007 to 2011. The data has been collected by Theatre info Finland (Tinfo). It has been collecting theatre statistics since 1944. The data includes 56 theatres subsidised by the law, and the Finnish National Theatre and the Finnish National Opera. Most of the theatres are drama theatres, but the material also includes 11 dance theatres. All theatres in the data received subsidies from the state and most also from local municipalities. The share of overall subsidies is approximately 60–70 percent of all incomes of these theatres.

Of the 56 theatres subsidised by law, 11 were public theatres and 45 were private theatres maintained by associations, foundations or limited companies. Moreover, the sample includes the National Theatre and the National Opera. The National Theatre which is mainly financed by the state is a limited company with a foundation as a formal owner. The Finnish National Opera is governed by the Foundation of the Finnish National Opera and about 70 per cent of the funding comes from the state.

Table 1 presents some key indicators of the theatres included in the data from 2007 to 2011. In 2007 the average ticket price was 12,51 € while in 2011 was 14,94 €. The number of performances has been a bit less than 250 per theatre house annually.

Year	Average ticket price (standard deviation in parenthesis)	Average amount of sold tickets (std)	Average number of performances (std)
2007	12.51 (6.55)	46131 (53090)	247 (157)
2008	14.16 (6.65)	44667 (55674)	239 (157)
2009	14.04 (6.56)	43502 (53926)	237 (162)
2010	14.61 (6.44)	52330 (88116)	240 (161)
2011	14.94 (6.90)	42979 (54704)	248 (167)

Table 1: Descriptive statistics of different variables

The result above (equation 14) gives a new explanation why the demand is inelastic. Optimal state subsidies are positive only if the demand is inelastic. Using a Finnish data covering 58 theatres (subsidised by law) during a five-year period from 2007 to 2011 reveals that the price elasticity of theatre performances is inelastic (Table 2 below).

A very simple panel data regression analysis shows that the demand is indeed

price inelastic. The variable to be explained is the logarithm of tickets sold. It is possible that the theatre house has different price categories depending on the seat place and the time of the ticket purchased. Sometimes the last tickets are sold at a discount; however, the average ticket price varies across theatre houses.

Model type	Fixed effects model (FEM)	Random effects model (REM)
Log Average Price	-0.380*** (0.067)	-0.172** (0.058)
Log Performances/year	0.679*** (0.101)	0.936*** (0.079)
Constant	–	5.728*** (0.451)
FIT	$R^2 = 0.461$	$R^2 = 0.938$
Diagnostic tests	**Log likelihood**	**R^2**
Constant term only (1)	-375.650	0.00
Group effects only (2)	-19.941	0.913
X - variables only (3)	-245.762	0.591
X and group effects (4)	27.594	0.938
Test statistics for the classical model	Likelihood ratio test, χ^2	F-test
(2) vs. (1)	711.418***	43.246***
(3) vs. (1)	259.776***	207.966***
(4) vs. (1)	806.491***	59.002***
(4) vs. (2)	95.073***	44.616***
(4) vs. (3)	546.715***	22.547***
REM vs. (3)	301.61***	–
FEM vs. REM (Hausman)	40.41***	–

Table 2: Demand equation: Log (tickets sold/year) = Constant + β Log (average price) + γ Log (Performances/year), Fixed effects and Random effects models. Standard errors in parenthesis.

High values of the Hausman test favours the fixed effects model indicating that the omitted effects (variables) are correlated with the included variables. The simple model leaves out for example the spectators' incomes.

If the subsidy is positive, an increase in the number of visitors also increases the optimal subsidies but less than proportionally, indicating that the share of public subsidies should be lower in larger towns where the potential for theatre visits is higher due to a larger population. Using the same data, the above hypothesis is studied. The share of public subsidies of all income is regressed with the number of tickets sold and three dummies due to special subsidies to opera or theatres to Swedish speaking minority. The dance theatres are separated with a dummy. The results show that the subsidies indeed diminish as the number of tickets sold increases or if the population in the area is higher. Both the pooled regression (OLS) and random effects model (REM) results are presented in table 3 below. The ran-

dom effects model is formulated as follows:

$$(15)\quad s_{it} = constant + x'_{it}\beta + u_i + \varepsilon_{it}$$

where u_i is a theatre specific (n = 58) random element. The results in Table 3 show that the random effects models are preferred over pooled regression models based on the Lagrange multiplier test. The fixed effects model (FEM) is not suitable since there is no variation over time in dummy variables (Svenska, Opera, Dance) In the random effects models the dummy variables for Swedish speaking (Svenska) drama theatres or dance theatres or opera are not significant since the theatre specific random element captures the effect.

The estimated (log) share of public subsidies models				
Model type	OLS	REM	OLS	REM
Log Sold Tickets	-0.112*** (0.020)	-0.109*** (0.016)	–	–
Log Population	–	–	-0.100*** (0.018)	-0.084* (0.038)
Svenska	0.075 (0.064)	0.076 (0.138)	0.237*** (0.066)	0.219 (0.144)
Dance	-0.095* (0.044)	-0.093 (0.090)	0.057 (0.042)	0.047 (0.092)
Opera	0.373** (0.128)	0.368 (0.269)	0.316* (0.126)	0.292 (0.272)
Constant	0.778*** (0.215)	0.752*** (0.175)	0.899*** (0.232)	0.688 (0.500)
R2	0.098	0.111	0.102	0.112
F	8.92***	–	9.23***	–
Lagrange Multiplier test: REM vs. OLS	–	491.40	–	475.66

Table 3: OLS and REM estimation results: 58 theatres, 5 years, standard errors in parenthesis

The results indicate that the share of public subsidies is diminishing in population or in sold tickets. Theatres in more rural locations seem to receive relatively more public subsidies. This is reasonable since rural theatres do not enjoy economies of scale due to lack of population. In rural locations the ticket revenue due to small population is lower than in highly populated cities.

Conclusions

This paper has examined public subsidies and ticket pricing in Finnish theatre institutions by using the principal-agent model and empirical examination with the data on Finnish theatres.

Using the data covering 58 theatres subsidised by the law we can show that the demand of theatre services is price inelastic. This is in line with the principal-agent model that proposes that the theatre managers should use a ticket price that lies in the inelastic segment of the demand curve. According to the results, the optimal subsidy is positive more probably if the price elasticity of theatre performances is

inelastic. Moreover, a more inelastic demand results in higher optimal public subsidy. This result is also in line with Prieto-Rodríguez and Fernández-Blanco (2006, p. 171), who stated that inelastic pricing is an optimal strategy for an art institution when there is a public agency which cares about the number of visitors, and which provides a grant to complement the revenues. The Rees (1987) model captures the idea of having different outcomes with possible states of the world. The second model (Prieto-Rodríguez and Fernández-Blanco 2006) has a finite state of space and therefore the idea is different in relation to the Rees model. However, these are used to justify using a principal-agent model.

A larger budget partially financed by the public subsidies typically leads to higher cast and bigger audience. The results of the principal-agent model and empirical evidence indicate that bigger audience is correlated with inelastic demand. The model also suggests that if the subsidy is positive, an increase in the number of visitors increases also optimal subsidies but less than proportionally indicating that the share of public subsidies should be lower in larger towns where the potential for theatre visits is higher due to a larger population. This result is reasonable from the cultural policy point of view: a big municipality with large population can maintain a theatre even without public subsidies but this might not be true in smaller municipalities. The high share of public subsidies is reasonable since it increases cultural diversity in terms of performances.

Another question is whether the subsidy scheme is optimal or not. Currently the imputed number of person-years is used as criteria for public subsidies. Alternatively, if the ministry were mainly interested in increasing the amount of theatre audience, the subsidies could be related to the number of tickets sold. Public subsidies have an impact on repertoire that directly affects ticket sales and incomes of the theatre house. Emphasising ticket sales as criteria for subsidy could lead to a more conventional repertoire that appeals to the audience and, thus, a reduction in the diversity of performances. However, this is another question and remains open here.

In the cultural policy framework, the results indicate that public subsidies given to private institutions have an important influence on demand as they make services more accessible regionally and economically. Furthermore, support for cultural services often contributes to local economic life, for example through the use of restaurant and transport services and hotel visits (Peacock 2006b). These perspectives must be taken into account in cultural policy planning and decision-making.

This article has examined cultural policy by using the approaches of economics. In cultural policy, conflicting interests and the presence of goals of different nature makes it difficult to determine the appropriate policy actions. In policy making, there is a growing interest in the information provided by cultural economics. Even though using economic approaches in examining arts and culture is not unproblematic and include numerous practical and conceptual challenges (e.g. Doyle, 2010), they should be used and further developed.

It should be noted, that in the article the empirical examination uses somewhat old data. It would be interesting to carry out the analysis with recent data not only including VOS-theatres but also theatres receiving occasional subsidies from the lottery system. Furthermore, in their article, Prieto-Rodríguez & Fernández-Blanco were using a more general functional form while here more detailed functions are used and therefore the results are more limited and cannot be generalised.

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