

Anita Dehne, Peter Friedrich and Chang Woon Nam

## Determination of Fees for Local Services under the Consideration of Public and Management Objectives\*

*determination of fees; efficiency; local services; management; owner of municipal enterprise*

*Regarding municipal service pricing, welfare-oriented literature is primarily concerned with allocation efficiency, assuming that factor efficiency prevails in municipal firms. The relations between local owner and management of municipal enterprises and their consequences are usually neglected. We discuss whether allocation and factor-oriented efficiency are attainable if these relations are considered. In this case the welfare approach leads to pricing rules like marginal cost pricing but the application of such a rule in practice does not accomplish allocation efficiency. The implicit assumption of factor-oriented efficiency does not reflect the real situation either. These are demonstrated in a fee determination model in which a local firm is regulated by cost coverage constraint, while its management has autonomy to determine conditions of production pursuing its own goals. Active bargaining between municipal government and a firm's management is taken into consideration as well: only in exceptional cases does factor-oriented efficiency prevail.*

### I. Introduction

Academic debates on the pricing of public services have recently experienced a renaissance. “Concerns over the distortion effects of tax financing, fairness and a wish to make costs more perceptible to consumers are all factors that potentially support increases in the scope of user charges. [In particular, the OECD] has been critical of low reliance on user charges by various [member] countries in the areas of child care, care of elderly and pharmaceuticals. Trends in these areas suggest that the take-up of free services is booming and that supply-side rationing is considerable. The provision of services free of charge or without making costs perceptible, obviously risks prompting excessive demand and hitting supply constraints, because the social costs of supply are largely irrelevant for the individual. User charges offer the potential of gaining more information about price

---

\* The authors are grateful to two anonymous referees for helpful comments. Responsibility for errors remains the authors’.

sensitivity of demand for services and can potentially render demand pressure directly influential rather than being expressed indirectly and imperfectly through the electoral system. Demand pressures may also be influential on supply-side production conditions. However, user charging will be viable only if the costs of collection and of compensation through the benefit system are low relative to the sums that can be levied and the gains from cost savings that result. Countries that have tried to increase reliance on fees and charges have generally aimed at striking a balance between copayment and maximum contribution to avoid imposing unduly high expenses on some households” (Darby/Mucastelli/Roy 2003, p. 29).

The mainstream literature on fees of public services primarily deals with the determination of optimal fee level emphasising the efficiency aspect, its diversification compared to that required for achievement of specific policy goals and the legally fixed fees, but seldom explicitly describes the way and the process of how such fees get determined in the given institutional and legal framework. In this study we concentrate on fees of local services provided by municipal enterprises. In most local fee determinations revealed in previous research the organisational aspect of such municipal enterprises (including the decision-making structure) has not yet been sufficiently investigated. Quite often local services are delivered by public enterprises, of which organisational structure and characteristics are legally regulated. Otherwise they are organisational units within the municipal authority which enjoy a high degree of autonomy with respect to procurement of inputs, production and delivery of local services. In spite of legal dependence on municipal administration they may have a decision-making structure that allows the management of these economic units to influence fee formation. There are also public firms with their own management bodies which can make decisions on the price of their services without any external intervention.<sup>1</sup> Therefore, we generally have two major parties involved in fee formation: the owning municipality of the local public firm and its management. Both entities have discretionary power and scopes of autonomy. This fact will be the main concern of this study.

This study aims at tackling the following questions:

- How is the efficiency aspect considered in the theory of public enterprises?
- How important is efficiency for applying the welfare-oriented theories of determining fees?
- How can one develop theories of setting fees which are more directly related to the actual behaviour of the above mentioned decision-makers involved in fixing fees?

The agenda of the study is as follows. The second section deals with the notion of efficiency and with welfare-oriented theories of fees and discusses the gap between the recommendations to fix fees and actual problems of fee formation, considering the existence of management of municipal firms. By application of the theory of the public firm, in the third section we discuss whether efficient solutions for fees can be expected. We consider

---

<sup>1</sup> In literature the influence of a board responsible for social welfare (Bös 1985) or of bureaucrats (Wirl 1991; Kühne 1992) is considered in the models but neglecting the specific negotiations between owner municipality and management of public firm.

regulation of a cost coverage constraint and vertical negotiations on fees between municipal government and management of municipal firms. The final section summarises major research findings and draws the reader's attention to other important factors such as political goals and municipal competition that influence fees and their degree of efficiency.

## II. Does Efficiency Matter for Theories of Fee Formation of Local Public Firms?

When discussing issues and problems of public enterprises including fee determination, three concepts are generally applied. The conventional welfare theory attempts to answer the question on how public enterprises should behave to make a contribution to welfare maximisation (see Graaff 1963; Blankart 1980; Bös 1981; 1985). The second school considers local public enterprises as a public policy means to accomplish specific objectives (Thiemeyer 1975; 1990). According to Ritschl (1925; 1970), the third argumentation refers to a dual economy in which the public sector has to safeguard the sustainability of the society and the private sector organises productions with rather limited external effects.

Efficient is an allocation of goods and production factors when, given an optimal income distribution and no fluctuation in economic activities, a welfare maximal situation is obtained. A less strict definition does not additionally claim an optimal income distribution<sup>2</sup> and the absence of fluctuations refers to the first order conditions of a welfare maximum resulting from output and input allocation according to the preferences of consumers in an economy. These efficiency definitions are named as allocation efficiency.<sup>3</sup> Sometimes efficiency refers to the economic principle to achieve a specific objective by a given minimum input value or to realise a maximal goal attainment for a given input value. A more narrow definition refers only to the input in such a way that a given level of output is produced by minimal costs. Such an efficiency aspect deals with the factor efficiency discussed by Leibenstein, whose X-inefficiency describes the losses caused by a failure in realising the minimal cost production solutions in firms (Leibenstein 1978).

How is efficiency related to the concepts of theory of municipal firms and of their pricing theories? The welfare-oriented concept of theory of public firms is explicitly related to allocation efficiency. The welfare maximum conditions usually refer to an oversimplified economy where only consumers and producers – not governments – exist.<sup>4</sup> The social-

2 Such social distribution aspects are of clear political importance, as they may explain the reasons, for example, why fee structures are often set in a more complicated way than just general consumer prices (for example, different fee categories for different income groups, discounts for people in greater need for local services, and ceilings of annual fee payment per inhabitant).

3 Wille (1985) suggests the output-oriented financial efficiency eventually ending up in allocation efficiency, while the financial input efficiency corresponds to the factor-oriented efficiency. Other definitions including qualitative efficiency are also introduced in Bös 1978.

4 The consumption and production functions are constructed based on the falling marginal utilities and marginal productivities, respectively. There are no commonly consumed goods and external effects, and flexibility of outputs, inputs and prices prevail.

welfare maximising optimum fee level is given when the social marginal benefits (or willingness to pay) of a public service are equal to the marginal social costs required for the provision of the same service. If the welfare expression is restricted to consumer surplus and sales revenues subtracted by the related costs, the marginal cost-pricing principle applies for fixing fees of public firms. With increasing marginal costs in a monopoly case, the amount of fee appears to be desirable which satisfies the condition that the fee per service unit is the same as the corresponding marginal costs and, at the same time, allows profits (Lösenbeck 1963; Bös 1981).<sup>5</sup> Consequently, the municipal enterprises with their fee policy fit into a welfare optimum and both allocation and factor-oriented efficiency prevail. Yet, the assumptions made in such a welfare-oriented approach do not reflect the real world situation and the number and size of firms are not considered adequately. A first best solution, to which municipal firms fit as mentioned above and that guarantees the allocation and factor-oriented efficiency, is unlikely to exist in practice.<sup>6</sup> The conventional literature on fees concentrates on the welfare maximisation behaviour of the central government for the entire nation, taking into account the willingness to pay on the part of all the citizens (Friedrich 1971). The welfare maximisation of a sub-state in a federation or a municipality<sup>7</sup> in monetary terms needs a redefinition of sales revenues, consumer surplus and costs.<sup>8</sup> Quite different marginal costs and marginal benefits would emerge and the marginal cost-pricing would lead to somewhat different values than the average fee equal to the state or municipal relevant costs. Allocation efficiency for a local economy has to be redefined before finding an “allocation”-optimal fee. Monopoly situation for determining fees for the supply of municipal services are rare. One more often finds oligopolies.<sup>9</sup> Different marginal cost pricing and allocation solutions are found according to the oligopoly models and solutions applied and the monopoly-oriented concept of allocation efficiency is no longer fully significant in practice. The institutional aspects, including the competition between local governments, are less thoroughly considered when identifying pricing rules for efficient production. In addition, the common assumptions of competitive factor markets differ from reality and the second best solutions with different market forms on the procurement side have not been adequately investigated.

5 In this case the application of peak load-pricing is also possible (Turvey 1971; Bätz 1979; Blankart 1980; Wirl 1991).

6 Since some optimality conditions do not prevail, researchers have also tried to find a second best solution (Lancaster/Lipsey 1956; Timm 1963; Bös 1985). In cases with falling marginal costs, a type of price-setting corresponding to marginal costs leads to losses. To avoid them, the Ramsey-pricing (Ramsey 1927; Bös 1986), the Feldstein-prices considering cost coverage (Wirl 1991) and the péage systems (Allais 1947; Hutter 1950; Boiteux 1951) are developed. They generally assume that factor-oriented efficiency exists. Yet, when applying the marginal cost pricing in practice, this assumption causes problems related to the measurement of marginal costs and the determination of péages. Therefore, allocation efficiency hardly prevails in pricing solutions for municipal firms in a real world, while factor efficiency also often remains unaccomplished.

7 It cannot be easily detected, since prices do not only reflect the willingness to pay of the indigenous population (and consumer surplus, turnover and producer surplus) in the state or municipality investigated but also show the related judgements of non-state or non-municipal residents and commuters.

8 For example, sales to non-residents can be interpreted as exports, while procurements from non-residential citizens and economic units can be classified as imports. A willingness-to-use indicator for export surplus and taxes from other residences may also be developed in this framework (Friedrich 1971).

9 See, for example, convention halls, theatres, swimming pools, municipal garbage plants, municipal banks, or oligopsonies like business promotion agencies (Friedrich 1978; Bös 1981; Beato/Mas-Colell 1984).

All these facts again support the argument that the welfare-oriented allocation efficiency concept appears to be a less-significant concept to determine fees in practice.

In most previous research considering municipal firms as policy instruments, one municipal decision maker is assumed who determines the relevant objectives of public firms (Bös 1980; 1985). Some suggest the importance of municipal goals to be accomplished by local firms when determining their fees. In the context of an analysis of cost effectiveness, fees are set to cover the costs required for the delivery of a maximal output (Friedrich 1969; Krelle 1976). They are also fixed under the consideration of maximising sales revenues and receipts from concessions (Friedrich 1969), employment maximisation (Hansmeyer/Fürst 1968; Bös 1986) as well as regional economic goals (Thiemeyer 1975) and vote maximisation (Blankart 1980; Ziemes 1992).

In particular the influence of management of public firms on fee determination has hardly been tackled. Fee-collecting public institutions like administrative units and public enterprises can have various organisational forms according to the law which also prescribes the different rules for the formation of fees.<sup>10</sup> The municipality as the owner may also try to accomplish gains from public enterprise in the given framework of legal possibilities, of which effort can also be disturbed by the strict legal requirements for cost coverage (Zwehl 1991; Gawel 1995; Gottschalk 1998; Siekmann 1998; Tettinger 1998; Färber 2000; Rehm 2004). However, certain fiscal gains can still result, due partly to the autonomy for selecting the cost-accounting scheme and the consideration of costs not explicitly leading to financial outflows (like imputed cost for depreciation) as well as the application of different cost assessment methods and allocation methods to products (Friedrich 1998; Wienbracke 2004).<sup>11</sup> Consequently, municipalities and a firm's management can also allocate their costs according to their own interests and aims in order to generate a somewhat "manipulated" high or low level of fees according to the actual goals they pursue. If a municipality wants to achieve a hidden profit, it applies these methods to create a high cost base. Higher fees become necessary to achieve a turnover covering these costs. Therefore, legal possibilities for yielding profits prevail, although municipal firms

10 Fees can also be determined by special principal-agent relations with third parties. In the case of contract public-private partnership (PPP), the level of fees strongly depends on the type of contract (made between the local government and the private firm delivering local services) and the cost occurring to the private firm as well as the legal requirements related to public procurement and price-setting between the two parties mentioned above. In institutional PPP in a form of mixed enterprises, the management objectives concerning the joint firm's goal function (utility function of management) may consider high output, labour input and profits. The private owner is more interested in a certain profit tolerated by PPP-contract stipulations than in minimal cost solutions. The public owner may also intend to achieve non factor-efficient goals like higher employment or output.

11 For instance, municipalities are able to control costs within the types of costs accounting, departmental costs accounting, or their own cost unit accounting (Friedrich 1998). Regarding the first item, for example, the municipality can decide whether to include costs like the salary of the mayor or to exclude costs of municipal services delivered to the municipal firm by the city administration. It can choose depreciation methods, interest rates and risks costs. Secondly, there is some freedom to define the organisational size of the institution levying fees. If it is broadly defined as a part of the transport department of town administration, for example, higher revenues from fees are required to cover higher costs. Thirdly, if a public firm charging fees also supplies other services that are free of charge, the amount of costs to be covered by turnovers from fees can be increased and the costs for services provided free of charge can be allocated to the service production financed by fees.

legally underlie cost coverage pricing requirements (Tettinger 1998).<sup>12</sup> Under these conditions allocation and factor-oriented efficiency cannot be identified exactly.

Moreover, various pricing policies are allowed in practice, which range from one type that leads to acceptable (not maximal) profits for public enterprises to the other that causes substantial losses for safeguarding public and/or merit services (like theatres). Many of the local goals to be realised by public firms are not necessarily related to allocation efficiency, which have, for example, environmental and social character. Also a factor-oriented efficiency emerges very seldom in the goal maximisation included: some rules such as preferential employment schemes for handicapped people in public enterprises often disturb the cost minimisation effort of the firm.

The aforementioned third school of thoughts on public enterprises does not deliver rigorous analysis of pricing rules for fees.<sup>13</sup> The central argument is that those firms operating exclusively for general public interests should deliver their services at zero price, while the pricing-principle primarily applies to those firms which supply their services to meet specific needs of clients but still perform under public control (Hirsch 1992). The third approach indicates that when the sustainability of society is in danger due to its conflict with other societies and shrinking population size or need for social peace and establishing a sustainable education system, the allocation or the factor-oriented efficiency aspect would lose its importance when making decisions for public fees.

In most of the previous studies on the issues on fees levied by local governments, managers' influence on the objective determination and their determination of cost bases to be covered by revenues have not been adequately investigated (Bird 1976; Seldon 1977; Grosseckler 1985; Sacksofsky/Wieland 2000). In order to examine such possibilities and to explore under which conditions at least a factor-oriented efficiency is achieved, a "positive" theory for fee levying administrative units and public enterprises appears to be necessary.

### III. Public Goals and Management Preferences Influencing Efficiency of Fees

As mentioned above public administrative units that charge fees (including local government bodies) attempt to realise public goals by providing goods and services for other economic units (businesses and consumers). They quite often possess a long-term stock of production factors and their management should be competent regarding the essential

- 
- 12 Some legal requirements are suggested to limit the number of objectives to be achieved when determining user charges. In Poland and Germany the benefit principle is applied in the form of cost-coverage requirements (Borodo 2003; Bohley 2004). Laws of German states regulate the fee determination of municipalities (Siekmann 1998; Tettinger 1998), while the individual cantons in Switzerland prescribe the way in which municipalities charge for local services. These guidelines partly determine, as restrictions, the scope of goal determination, if the goals are not of very high social importance.
  - 13 The discussion is more on categories of institutions according to their importance for the sustainability of society and the question for which kind of institutions fees are an appropriate means of finance. Sometimes if public services are judged to be crucial for the local society, and the clients are wealthy enough to consume acceptable volumes of such services, their arguments tend to be in favour of adopting the cost coverage principle.

decisions related to production and delivery of goods and services. In a larger number of cases a public firm's performance is not directly connected to the budget planning of government (in different tiers) but shows some similar characteristics to those of a private firm, since their activities are also oriented to sales in the market (Friedrich 1969; 1992; Turvey 1971; Thiemeier 1975; Rees 1976; Blankart 1980; Bös 1981; Mühlenkamp 1994). Public firms are embedded in the principal-agent relations, because municipalities can be classified as owners of legal or organisational units, while the management possesses a limited autonomy in decision making with respect to fee fixing or influencing the basis, such as costs, to which the application of price fixing rules refer. On the other hand, if not legally prescribed, public firms are obliged to accomplish public goals that are fixed by either a government body or a regulatory agency, while some of their purposes are directly determined within the decision-making units of the public enterprise.

In literature it is often assumed that managers and owners of public firms pursue the same goals (Friedrich 1969; Krelle 1976; Bös 1985). This does not correctly reflect reality. Several situations can be discussed. The first case is that the municipality uses a local public firm to achieve goals related to providing services but restricts its influence by a regulation that prescribes cost coverage of the municipal firm. Then the management determines to a large extent how the objective is accomplished through its performance activities and goal interpretations. Another situation implies negotiations of the municipality and the management of the firm on possible profits, losses and goal realisation (Friedrich 1992).

A simple basis model developed in the context of the theory of public firms (Friedrich 1979; 1982; 1988) provides possibilities to integrate the influence of management on fee policies into the model. The objectives and aspirations of management are considered by the formulation of a specific utility function of management. Such a model generally comprises the following (Friedrich 1992; 1998; Friedrich/Feng 2000):

- A utility function  $U$  of the public firm's management depending on output  $X$  and labour input  $L$ .<sup>14</sup>

$$U = U(X, L), \quad \partial U / \partial X = U'_X, \quad \partial U / \partial L = U'_L \quad (1)$$

- A restriction concerning the production function. There are one fixed factor  $A$ <sup>15</sup> and two variable factors of production,  $L$  = labour and  $C$  = materials.

14 Many goals of management are linked to labour input such as personal income of managers, co-determination of employees, worker councils as well as regulations and laws about employment. Other utility functions may be introduced as well: aims such as preferences for capital and profit achievement can be integrated or are implicitly considered in this context (for example, compare Type IV and V of managers in Figure 2).

15 Here the term  $A$  must be large enough to allow for a sufficient production volume which is necessary to satisfy the demand requirements. Otherwise there will be no solution.

$$\begin{aligned}
 X &= A \cdot f(L, C), \quad \frac{\partial f}{\partial L} = f'_L > 0, \quad \frac{\partial f}{\partial C} = f'_C > 0 \\
 &\quad \frac{\partial f'_L}{\partial L} = f''_{LL} \leq 0, \quad \frac{\partial f'_C}{\partial C} = f''_{CC} \leq 0 \\
 \frac{\partial f'_C}{\partial L} = f''_{CL} = f''_{LC} = \frac{\partial f'_L}{\partial C} &> 0
 \end{aligned} \tag{2}$$

- A demand function showing the relationship between price P and volume X of output sold

$$P = P(X), \quad \frac{\partial P}{\partial X} = P' < 0 \tag{3}$$

- The cost function demonstrating fixed cost  $K_A$  and two types of variable cost. The factor price of labour is w and that of materials is i, hence

$$K = K_A + w \cdot L + i \cdot C \tag{4}$$

- A restriction that sales revenue is equal to the total cost is introduced. We assume a self-financing public firm

$$P(X) \cdot X = K_A + w \cdot L + i \cdot C \tag{5}$$

- Utility maximisation of management under the restrictions mentioned above leads to the following Lagrange equation

$$\Lambda = U(X, L) + \lambda \cdot (P \cdot X - K_A - w \cdot L - i \cdot C), \quad \text{where } X = A \cdot f(L, C) \tag{6}$$

The following first-order conditions for utility maximisation are delivered

$$\begin{aligned}
 \frac{\partial \Lambda}{\partial \lambda} &= P(X) \cdot X - K_A - w \cdot L - i \cdot C = 0, \\
 \frac{\partial \Lambda}{\partial L} &= U'_L + U'_X \cdot A \cdot f'_L + \lambda \cdot [P \cdot (1 - \frac{1}{\varepsilon}) \cdot A \cdot f'_L - w] = 0, \\
 \frac{\partial \Lambda}{\partial C} &= U'_X \cdot A \cdot f'_C + \lambda \cdot [P \cdot (1 - \frac{1}{\varepsilon}) \cdot A \cdot f'_C - i] = 0
 \end{aligned} \tag{7}$$

where  $\varepsilon = -\frac{P/X}{P'}$

Equation (7) shows two optimality conditions. One concerns the equivalence of the relation of marginal utilities of marginal factor-inputs to the proportion of respective marginal profits and the other refers to cost coverage of turnover. Consequently



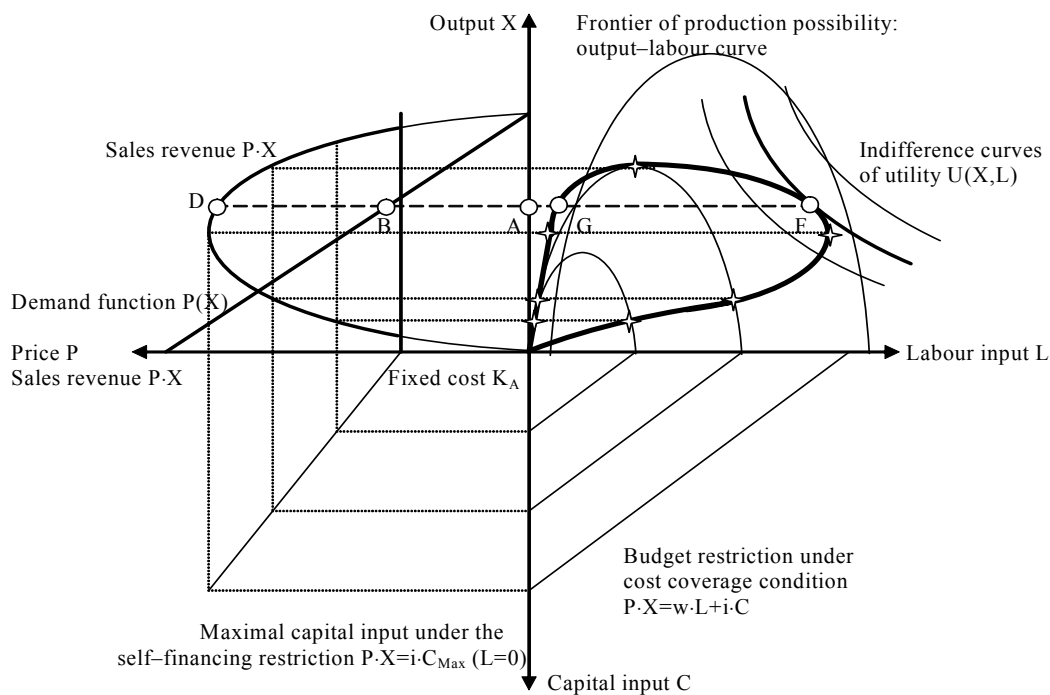
$$\frac{U'_L + U'_X \cdot A \cdot f'_L}{U'_X \cdot A \cdot f'_C} = \frac{w - P \cdot (1 - \varepsilon^{-1}) \cdot A \cdot f'_L}{i - P \cdot (1 - \varepsilon^{-1}) \cdot A \cdot f'_C} \quad (8)$$

and

$$P = \frac{K_A + w \cdot L + i \cdot C}{X} \quad (9)$$

Different cost curves emerge corresponding to the various utility functions. An output-maximising public firm shows the curves of minimal costs. If output and labour are evaluated positively, then a curve of higher costs results. If only labour has a positive weight, the cost curve progresses even less favourably.

The major features of the basic model shown above are illustrated graphically in Figure 1, which enables a systematic demonstration of fee determination processes under the consideration of various public goals and management preferences. The first (upper-left) quadrant demonstrates the sales conditions of the public firm. For each volume of sale (for example, at output level A), the referring financial revenues (D) are generated that are used to cover costs. After deducting fixed cost  $K_A$  a cash flow is available to finance variable costs. The so-called output-labour curve shown as a bold line in the second (upper-right) quadrant illustrates all output labour combinations that can be financed. However, only one production volume X corresponds to each sales volume, therefore only two points on the output-labour curve (G and F) shown in the second quadrant are relevant for the output level A. One production (G) is material-intensive and the other (F) is labour-intensive. For alternative sales revenues and corresponding production volumes a set of output-labour curves and a set of relevant material-intensive and labour-intensive points result. Their connection leads to a frontier of production possibility on the labour-output curve indicated as a thick curve in this quadrant. Introducing a set of indifference curves that correspond to the management utility function – equation (1) – the highest indifference curve that the management can achieve touches the frontier of production possibility on the output-labour curve at point F. This determines the optimal production volume A, the optimal price B and the optimal sales revenue D. Moreover, there is a path of tangency points between alternative possible output-labour curves, which correspond to alternative demand curves of the public firms. They are related to the cost curves mentioned above.



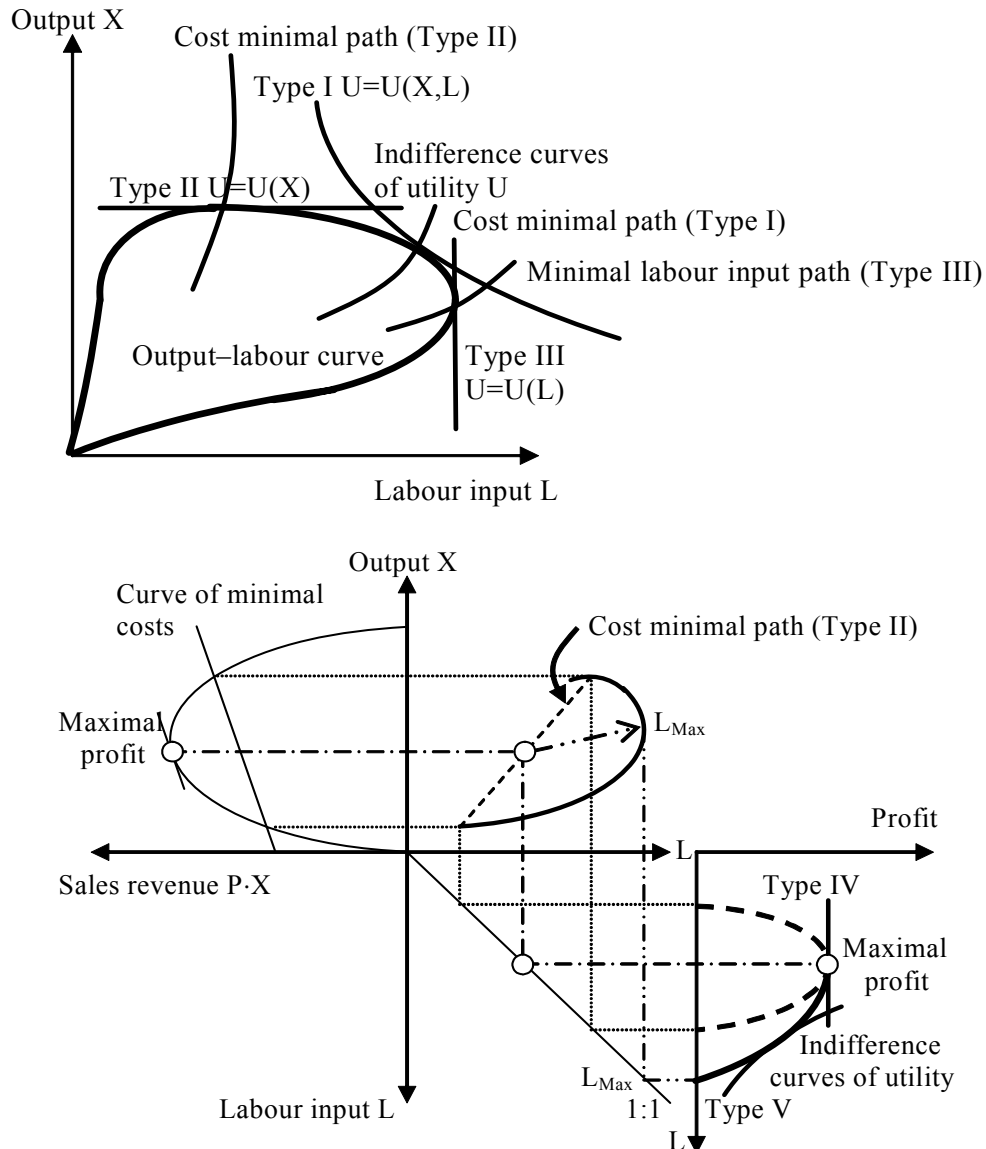
Note: Price and sales revenue which are both plotted in the second (upper-right) quadrant have different units of measurement.

Fig. 1: Theory of public firm pricing

Source: Author's conception

The utility function of management depends on various objectives to be realised. Only if the management utility function coincides with that of the owning jurisdiction traditional solutions follow, as mostly often elaborated in the theory of public firm pricing (Bös 1985). Different solutions are to some extent evolved in cases of conflicting goals of the owning jurisdiction and the management of the public firm. As mentioned above, we take the regulation (for example, cost coverage, or achieving a specified profit or loss) of the owning jurisdiction as given and show how the public firms behave according to the utility function of the management. The utility function is also determined by a bundle of objectives the management wishes to realise (see the objectives corresponding to Type I to V in Figure 2). In Type I and III the influence of labour aspect is relevant as the management has to consider goals resulting from the labourers' codetermination and participation (Münch 1976; Püttner 1984; Ehringer/Niopek 1986), the influence of trade union and workers on the owner by labour organisations and behaviour of voters (Blankart 1980; Bös 1985), the self-interest of management in case of introducing staff size dependent earning schemes, the incentives systems that exist within a management concept applied (Eichhorn/Friedrich 1976), the legal requirements concerning the employment of handicapped workers, labourers' safety and health protection, as well as vocational obligations concerning apprentices.<sup>16</sup> If the management utility function solely depends on

<sup>16</sup> The model can be further extended to include some longer-term perspectives by considering capital assets development or instruments of management to influence desired demand (marketing, business promotion, health and environmental issues), to ensure and develop procurement (vocational training, skilled experts with special attitudes to public service provision) and to ease the financial possibilities.



Source: Author's conception

umes. As a consequence, different management optimal fee levels emerge corresponding to the change of utility function from Type I to III.

If the utility function (1) depends on profit and the restriction made by equation (5) is not binding but just a profit definition, we end up with a maximum profit solution along the cost minimal path (Type IV), as indicated in the lower part of Figure 2. In some cases the municipal authority (the owner of public enterprise) tries to use its public firm to raise local revenues (Friedrich 1998; Friedrich/Feng 2000). The respective solution would, in turn, lead to a higher price and a smaller output than former solutions. A utility function depending on profit and labour (Type V) results in a solution between the profit maximal and the labour maximal price.

Two of the solutions, namely Type II (output maximiser) and Type IV (profit maximiser), reveal factor-oriented efficiency. According to our remarks on the first and second best welfare solutions, it cannot be determined whether the respective outputs include allocation efficiency as well. Often public firms act under competition. Then in the case of Type II and Type IV, the public firm under consideration operates factor-efficiently. However, its production volume can be affected by X-inefficient competitors, for example, private firms of Type V.

The approach shown above considers a more passive municipality that regulates the local firm through a turnover-cost coverage constraint. But the owner of the municipal firm can intervene more actively and negotiate with the management about the fees level. Different solutions are evolved to some extent in cases of conflicting goals of the owning jurisdiction and the management of the public firm in the framework of this principal-agent relation.

Again we use a principal-agent version of our model and refer to the monopoly case. But we introduce a negotiating municipality and valuation of the financial target  $F$  which is expressed by  $g_F$  – see the upper part of Figure 3. The municipality and the local enterprise negotiate about fixing the financial target  $F$  as well as the volume  $X$  to be produced and the fee  $P$  to be charged. The utility of municipality  $U_G$  depends on output  $X$  and its contribution  $F$  to the municipal budget ( $U_G = X + g_F \cdot F$ ). The utility of management of the public firm  $U_U$  depends on output  $X$  and employment  $L$ . Both negotiators want to realise, each for himself, at least a minimum utility level. The situation of the firm shows production, demand, cost and finance functions. Corresponding to the individual financial target level  $F$ , a different utility-maximising output level  $X$  and the related fee result. The bold utility-frontier curve in the upper part of Figure 3 shows the combination between  $X$  and  $F$  of the municipal enterprise. In addition a set of linear indifference curves of the municipality ( $U_G$ ) is also illustrated there.<sup>17</sup> At the point of tangency between  $U_G$  and the bold utility-frontier curve of the municipal enterprise the best solution for the municipal-

17 In Figure 1 the financial contribution  $F$  is assumed to be zero. If  $F$  increases, the bold output-labour curve in this figure shifts inward, since the public firm has to additionally achieve a profit to be transferred to the municipality. In this case the related optimum of the municipal enterprise shows a lower output level accompanied by a higher fee.

ity exists, which is however the worst one for the municipal enterprise. The best solution for the municipal firm results when the financial target is set to be zero.

As derived above an area for possible negotiation solutions referring to financial contribution, the output volume  $X$ , the fee, and the respective utilities of the negotiators are determined. Such utilities ( $U_G$  and  $U_U$ ) are depicted in the lower part of Figure 3. By bargaining according to Nash, a solution is found and the fee is again determined.

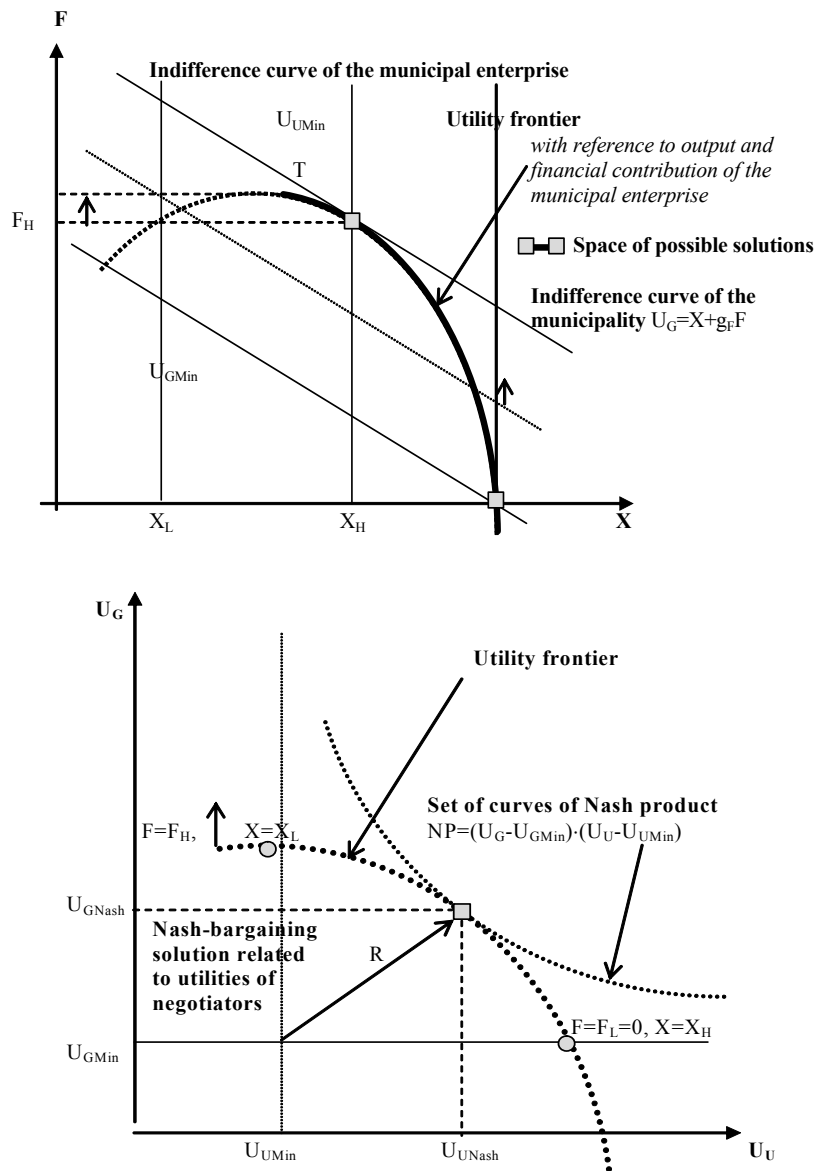


Fig. 3: Fees in case of financial target negotiations

Source: Author's conception

Here factor-oriented efficiency is hardly possible, except for the case that the public firm is of Type II that realises its maximal utility. Another factor-oriented efficient solution may also exist in case of Type II management combined with a municipality that is only interested in the maximal financial contribution from the public firm. Normally no factor efficient solution can be derived, since there are non-factor efficient goals (like preferential recruitment of handicapped people) involved and the compromises between owners

and management of the local firm should be made. This is also true in cases of a turnover cost constraint and achievement of hidden profit (here  $F$ ) through the cost accounting “manipulations” mentioned above. Different fees and outputs resulted deliver a Nash solution of bargaining between municipality and municipal firm (Friedrich 1992; 1998).

## IV. Conclusion

The concerns over the distortion effects of tax financing, fairness and a desire to make costs more perceptible to consumers are all factors that potentially support increases in the scope of user charges. In previous years the issues on fees levied by local governments have not been adequately investigated by public finance experts. Issues of efficiency of fees played a role and have been mostly discussed in the context of the welfare-oriented theory of public enterprises. In particular, achieving allocation efficiency by implementing an appropriate pricing policy has traditionally been the main issue debated. As the conditions to apply a welfare-oriented approach are often not met with respect to municipal firms, allocation efficiency appears to play a less decisive role in municipal enterprise management and fee determination.

In addition factor efficiency also often fails to be achieved. The different aims underlying municipal fee policies signal the dependence of fee formation on the various possible goals. Thus factors determining the level of fees include – apart from those most common ones like a goal function of municipality, consumers’ willingness to pay, sales revenues and costs – organisational and ownership structure of public firms, indicators for success in competition (such as market shares and outputs), other economic indicators (such as employment, factor combination for production and budget sizes), to name a few. Some are not explicitly related to factor efficiency, for instance concerning social assistance and environmental aims. In particular the management of municipal firms influences the goal setting and its realisation process. More precisely our positive-style theory of fixing fees suggests that the preferences and utility functions of management of public firms and local governments lead to different fee levels in the framework of a principle-agent relation. Apart from some special cases factor efficiency is also hardly attainable. Furthermore, pricing policy varies according to market structure.

In some countries the application of a cost coverage principle is legally obligatory in practice but only in part: for example public profit can be obtained but its sum should not exceed 14% of total costs in Germany (Rogosch 1988). On the other hand, losses are allowed for some public firms in order to better pursue environmental, educational or social objectives. Moreover, cost coverage is not a strict principle. As municipalities have organisational autonomy and the laws concerning fee formation are not very clear, costs can be defined in different ways. A kind of profit results because less financial means are needed for other services and fees are higher. According to the goals of municipality or management the reverse can happen. They may reduce the accounted cost-basis if they want to reduce fees, for example, before local elections.

The way that political goals lead to factor-oriented inefficiency is shown by the model developed by Peltzman (1971; 1976) and Ziemes (1992), which can also be integrated into our theory of the public firm (Friedrich/Kaltschütz/Nam 2004). The principal (local government) is interested in vote maximisation, whereas the public firm primarily attempts to maximise management utility. However, this policy-oriented principal-agent model also concerns price policies and tackles price-setting in two markets referring to different voters. For the sake of simplicity a public enterprise that sells in monopolistic markets is assumed (Feng/Friedrich 2004). The management utility of this public enterprise increases with the price reductions until a utility maximum is reached but decreases when price cuts continue further thereafter. Voters dislike high prices for goods or services provided by public enterprises. Indifference curves of votes and of managers' utility are derived. A path of Pareto-optimal combination of prices results for the principal and the agent that delivers either maximal utility at given votes or maximal votes at given utility. On the one hand, there is a best solution for a powerful municipality and a weak management (low fees), and on the other hand, we detect a best solution for the management if the negotiation power of the municipality is weak (fee level depending on the management type). Between these extremes a Nash negotiation solution is found (Friedrich/Kaltschütz/Nam 2004).

Another reason why inefficient solutions could result is the presence of competition among municipalities and/or municipal firms. Integrating our basic model into a duopoly condition, the solution for combining utilities of actors can be found within a competitive framework as well. For one actor the solution is determined for a given fee of its counterpart. Following this assumption, a Launhardt-Hotelling solution can also be elaborated yielding the payoffs. The solutions of the duopolies and municipal competition can also yield other results related to employment, price, output, vote and use of land. Only in extraordinary cases with (i) both competitors of Type II, (ii) one Type II and the other Type IV or (iii) both of Type IV, we can expect efficient solutions. A two-level regional competition among municipalities owning public enterprises and charging fees and the direct competition among the fee collecting municipal enterprises can also be modelled (Friedrich 1998).

To sum up, the research aimed at investigating fee determination should ideally construct the "positive-style" models and consider more thoroughly issues on various objectives of different actors involved in the fee determination process, the respective negotiations of decision makers and their consequences for the fees level. In practice efficiency plays a less significant role for the municipal fee determination processes.

## Abstract

*Anita Dehne, Peter Friedrich und Chang Woon Nam; Bestimmung kommunaler Gebühren unter Berücksichtigung von öffentlichen Zielen und Managementzielen*

*Bestimmung von Gebühren; Effizienz; kommunale Leistungen; Management; Träger von kommunalen Unternehmen*

*Meistens versuchen Autoren im Rahmen wohlfahrtsorientierter Beiträge zur Bemessung kommunaler Gebühren, allokatationseffiziente Gebührenhöhen für Gemeindeunternehmen zu ermitteln. Sie unterstellen, dass Faktoreffizienz in Gemeindeunternehmen herrscht und somit die Unternehmen zu Minimalkosten produzieren. Die Beziehungen zwischen dem kommunalen Eigentümer und dem Management sowie deren Konsequenzen erfahren gewöhnlich keine Beachtung. Wir untersuchen hingegen, ob sowohl Allokationseffizienz als auch Faktoreffizienz erreichbar sind, falls solche Abhängigkeiten Berücksichtigung finden. Wäre dies der Fall, dann führt die Wohlfahrtsmaximierung bei Vorliegen von Monopolen zur Grenzkostenpreisregel. Die Anwendung dieser Regel ruft in praxi jedoch mannigfaltige Schwierigkeiten hervor und die implizite Annahme herrschender Faktoreffizienz reflektiert die wirtschaftliche Wirklichkeit ungenügend. Dieses Ergebnis bestätigt ein Modell zur Bestimmung kommunaler Gebühren, bei dem ein Gemeindeunternehmen mittels einer Vollkostendeckungsvorschrift reguliert wird, das Unternehmensmanagement jedoch sowohl Autonomie über den Einsatz der Produktionsfaktoren als auch hinsichtlich der Bestimmung der Produktionsmengen besitzt und die Möglichkeiten nutzt, die von ihm präferierten Ziele zu verfolgen. Aktive Verhandlungen zwischen dem kommunalen Träger und dem Management werden ebenfalls in einem Modell analysiert. Nur in Ausnahmefällen wird Faktoreffizienz herrschen.*

## References

- Allais, Maurice (1947), Le Problème de la Coordination des Transports et la Théorie Économique, in: Revue d'Economie Politique, vol. 58, no. 2, pp. 212-271.
- Bätz, Klaus (1979), Administrierte Preispolitik öffentlicher Unternehmen, Gebühren und Tarife als Mittel zur Lenkung der Nachfrage nach öffentlichen Leistungen, Baden-Baden.
- Beato, Paulina and Andreu Mas-Coll (1984), The Marginal Cost Pricing Rule as a Regulation Mechanism in Mixed Markets, in: The Performance of Public Enterprises ed. by Maurice Marchand, Pierre Pestieau and Henry Tulkens, Amsterdam, pp. 669-688.
- Bird, Richard (1976), Charging for Public Services, Canadian Tax Foundation, Toronto.
- Blankart, Charles B. (1980), Ökonomie der öffentlichen Unternehmen, München.
- Bös, Dieter (1978), Effizienz des öffentlichen Sektors aus volkswirtschaftlicher Sicht, in: Schweizerische Zeitschrift für Volkswirtschaft und Statistik, 114. Jg., Heft 2, S. 287-314.
- Bös, Dieter (1981), Economic Theory of Public Enterprise, Berlin.
- Bös, Dieter (1985), Public Sector Pricing, in: Handbook of Public Economics ed. by Alan J. Auerbach and Martin Feldstein, Amsterdam, pp. 129-209.
- Bös, Dieter (1986), Public Enterprise Economics. Theory and Application, Amsterdam.
- Bohley, Peter (2004), Die öffentliche Finanzierung, München–Wien.
- Boiteux, Marcel (1951), Le Revenu Distribuable et les Pertes Économique, in: Econometrica, vol. 19, no. 2, pp. 112-133.



- Borodo, Andrej (2003), Aktuelle Probleme der Kommunalfinanzen Polens angesichts der Reformen von 1990 and 1999, in: Wirtschaftsförderung in Polen und Deutschland, hrsg. von Peter Friedrich und Jan Wiktor Tkaczyński, Torun, S. 39-56.
- Darby, Julia, Anton Mucastelli and Graeme Roy (2003), Fiscal Decentralisation in Europe: A Review of Recent Experience, in: Regional Public Finances, ed. by Jan Mønnesland, London, pp. 13-37.
- Detig, Stefan (2004), Die kommunale Anstalt des öffentlichen Rechts als Wirtschaftsförderungsinstitution, Baden-Baden.
- Ehringer, Jürgen und Wolfgang Niopek (1986), Erfahrungen mit der Mitbestimmung in öffentlichen Unternehmen, Baden-Baden.
- Eichhorn, Peter und Peter Friedrich (1976), Verwaltungsökonomie I, Baden-Baden.
- Färber, Gisela (2000), Theorie und Praxis kommunaler Gebührenkalkulation, Speyerer Forschungsberichte, Heft 214, Speyer Hochschule für Verwaltungswissenschaften, Speyer.
- Feng, Xiao and Peter Friedrich (2004), Location Theory of Public Enterprises, Paper Presented at the 2004 Advanced Studies Summer Institute of ERSA, Split.
- Friedrich, Peter (1969), Investitionskriterien für Gemeindeunternehmen, Tübingen.
- Friedrich, Peter (1971), Die Nutzen-Kosten-Analyse als Entscheidungshilfe für Industrieansiedlungsvorhaben aus der Sicht der isolierten Wohlfahrtsmaximierung, in: Nutzen-Kosten-Analyse bei öffentlichen Investitionen, hrsg. von Institut für Siedlungs- und Wohnungswesen, Münster, S. 163-224.
- Friedrich, Peter (1978), Ausrichtung der Preisbildung öffentlicher Unternehmen am Grenzkostenpreisprinzip bei differierenden Marktformen, in: Kosten und Preise öffentlicher Unternehmen, hrsg. von Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft, Berlin, S. 90-129.
- Friedrich, Peter (1979), Zur mikroökonomischen Steuerüberwälzung bei öffentlichen Unternehmen, in: Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen, 2. Jg., Heft 4, S. 365-400.
- Friedrich, Peter (1982), Analyse des Averch-Johnson-Effekts bei öffentlichen Unternehmen, in: Öffentliche Bindung von Unternehmen, Schriftenreihe der Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft, hrsg. von Theo Thieme, Bd. 22, Baden-Baden, S. 139-173.
- Friedrich, Peter (1988), X-Ineffizienz ein ausschlaggebendes Privatisierungsargument?, in: Probleme der Privatisierung, Schriften der Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft, hrsg. von Helmut Brede, Bd. 29, Baden-Baden, S. 235-256.
- Friedrich, Peter (1992), Der vertikale Wettbewerb im Prinzipal-Agent-Verhältnis: Ein Ansatz zur Weiterentwicklung der Theorie der öffentlichen Unternehmen, in: Beiträge zur Theorie öffentlicher Unternehmen, hrsg. von Peter Friedrich, Beiheft 14 der Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen, S. 178-207.
- Friedrich, Peter (1998), Gebührensteuerung mittels geeigneter Kostenrechnung – Ein Analyserahmen, in: Preise und Gebühren in der Entsorgungswirtschaft, Schriften der Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft, hrsg. von Helmut Brede, Band 49, Baden-Baden, S. 181-220.
- Friedrich, Peter and Xiao Feng (2000), The Role of Public Enterprises in Regional Competition, in: Regional Competition, ed. by Peter W. J. Batey and Peter Friedrich, Berlin, pp. 186-201.
- Friedrich, Peter, Anita Kaltschütz and Chang Woon Nam (2004), Significance and Determination of Fees for Municipal Finance, CESifo Working Paper, no. 1357, Munich.
- Gawel, Erik (1995), Die kommunalen Gebühren. Ökonomische, ökologische und rechtliche Ansätze einer gesamtwirtschaftlichen Neuorientierung, Berlin.
- Gottschalk, Wolf (1998), Auswirkungen der Rechtsstellung von Entsorgungseinrichtungen auf die Entgeltbemessung (Gebühren, Beiträge, Preise), in: Preise und Gebühren in der Entsorgungswirtschaft, Schriften der Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft, hrsg. von Helmut Brede, Band 49, Baden-Baden, S. 79-101.
- Graaff, Jan de V. (1963), Theoretical Welfare Economics, Cambridge.
- Grossekettler, Heinz (1985), Options- und Grenzkostenpreise für Kollektivgüter unterschiedlichster Art und Ordnung. Ein Beitrag zu den Bereitstellungs- und Finanzierungsregeln für öffentliche Leistungen, in: Finanzarchiv, 43. Jg., Heft 2, S. 211-260.
- Hansmeyer, Karl Heinz und Dietrich Fürst (1968), Die Gebühren, Berlin.
- Hirsch, Hans (1992), Hans Ritschls Theorie der öffentlichen Unternehmen als Element einer Theorie der Staatswirtschaft im Vergleich mit den von Dieter Bös and Charles Blankart vorgelegten Theorien, in: Beiträge zur Theorie öffentlicher Unternehmen, hrsg. von Peter Friedrich, Beiheft 14 der Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen, S. 20-44.
- Hutter, Roger (1950), La Théorie Économique et la Gestion Commerciale des Chemins de Fer, le Problème Tarifaire, in: Revue Générale des Chemins de Fer, vol. 69, no. 4, pp. 318-332.
- Krelle, Wilhelm (1976), Preistheorie II, Tübingen.
- Kühne, Karl (1992), Firmentheorie und Managertum, in: Beiträge zur Theorie öffentlicher Unternehmen, hrsg. von Peter Friedrich, Beiheft 14 der Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen, S. 157-177.
- Leibenstein, Harvey (1978), General X-Efficiency Theory and Development, New York-London-Toronto.
- Lancaster, Kelvin and Richard G. Lipsey (1956), The General Theory of Second Best, in: The Review of Economic Studies, vol. 24, no. 1, pp. 11-32.
- Lösenbeck, Heinz D. (1963), Die Preisbildung öffentlicher Unternehmen, Berlin.

- Mühlenkamp, Holger (1994), *Öffentliche Unternehmen*, München–Wien.
- Münch, Paul (1976), Mitbestimmung im Blick auf die Ziele öffentlicher und gemeinwirtschaftlicher Unternehmen, in: *Mitbestimmung in öffentlichen und gemeinwirtschaftlichen Unternehmen*, hrsg. von Gesellschaft für öffentliche Wirtschaft, Schriftenreihe der Gesellschaft für öffentliche Wirtschaft, Bd. 12, Berlin, S. 107-115.
- Peltzman, Sam (1971), Pricing in Public and Private Enterprises: Electric Utilities in the United States, in: *Journal of Law and Economics*, vol. 14, no. 1, pp. 109-147.
- Peltzman, Sam (1976), Toward a More General Theory of Regulation, in: *Journal of Law and Economics*, vol. 19, no. 2, pp. 211-240.
- Püttner, Günter (1984), Mitbestimmung in kommunalen Unternehmen, in: *Handbuch der kommunalen Wissenschaft und Praxis*, hrsg. von Günter Püttner, 5. Jg., Bd. 5, Berlin, S. 184-193.
- Ramsey, Frank P. (1927), A Contribution to the Theory of Taxation, in: *Economic Journal*, vol. 37, no. 145, pp. 47-61.
- Rees, Ray (1976), *Public Enterprise Economics*, London.
- Rehm, Hannes (2004), Kommunale Preispolitik, in: *Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen*, 27. Jg., Heft 3, S. 261-287.
- Ritschl, Hans (1925), *Theorie der Staatswirtschaft und Besteuerung*, Bonn–Leipzig.
- Ritschl, Hans (1970), Zur Theorie der Staatswissenschaft, in: *Theorie und Praxis des finanzpolitischen Interventionismus*, hrsg. von Heinz Haller, Lore Kullmer, Charles S. Shoup und Herbert Timm, Tübingen, S. 47-66.
- Rogosch, Josef Konrad (1988), Der verfassungsmäßige Rang des gebührenrechtlichen Kostendeckungsprinzips, in: *Kommunale Steuer-Zeitschrift*, 37. Jg., Heft 1, S. 1-4.
- Sacksofsky, Ute und Joachim Wieland (2000), *Vom Steuerstaat zum Gebührenstaat*, Baden-Baden.
- Seldon, Arthur (1977), *Charge*, London.
- Siekmann, Helmut (1998), Verfassungsrechtliche Grenzen der Entgeltspolitik in der Entsorgungswirtschaft, in: *Preise und Gebühren in der Entsorgungswirtschaft*, hrsg. von Helmut Brede, Schriften der Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft, Band 49, Baden-Baden, S. 47-78.
- Tettinger, Peter (1998), Entgelte in der Entsorgungswirtschaft – Benutzungsgebühren und privatrechtliche Entgelte als normative vorgegebene Grundtypen, in: *Preise und Gebühren in der Entsorgungswirtschaft*, hrsg. von Helmut Brede, Schriften der Gesellschaft für öffentliche Wirtschaft und Gemeinwirtschaft, Band 49, Baden-Baden, S. 17-45.
- Thiemeyer, Theo (1975), *Wirtschaftslehre öffentlicher Betriebe*, Reinbek.
- Thiemeyer, Theo (1990), *Instrumentalfunktion öffentlicher Unternehmen*, Baden-Baden.
- Timm, Herbert (1963), Bemerkungen zu einem fundamentalen Problem der Theorie des Zweitbesten, in: *Probleme der normativen Ökonomik und der wirtschaftspolitischen Beratung*, hrsg. von Erwin von Beckerath und Herbert Giersch, Schriften des Vereins für Socialpolitik, N.F., Bd. 29, Berlin, S. 285-304.
- Turvey, Ralph (1971), *Economic Analysis and Public Enterprises*, London.
- Wienbracke, Mike (2004), *Bemessungsgrenzen der Verwaltungsgebühr*, Berlin.
- Wille, Eberhard (1985), Öffentliche Sachausgaben versus öffentliche Personalausgaben, in: *Produktivitätsentwicklung staatlicher Leistungen*, hrsg. von Karl Häuser, Schriftenreihe des Vereins für Socialpolitik, N.F., Bd. 145, Berlin, S. 11-122.
- Wirl, Franz (1991), *Die Theorie öffentlicher Firmen: Rahmenbedingungen für effiziente Versorgungsunternehmen*, Baden-Baden.
- Ziemes, Georg. (1992), Politik-ökonomische Betrachtungen öffentlicher Unternehmen, in: *Beiträge zur Theorie öffentlicher Unternehmen*, hrsg. von Peter Friedrich, Beiheft 14 der Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen, S. 56-82.
- Zwehl, Wolfgang von (1991), Benutzungsgebühren, eine zentrale Einnahmenquelle der Kommunen in betriebswirtschaftlicher Sicht, *Wirtschafts- und sozialwissenschaftliche Gesellschaft*, Trier.