

The Impact of Incentive Schemes on Quality and Efficiency

Problems of Building up Quality Standards in the Social Sector

Preliminary version – please, do not quote

1. Introduction

One of the major debates in the field of social work of the last years concerns the problem to maintain the production of services characterized by certain quality standards. The discussion mainly focuses on the implementation of quality management systems. There is, however, a missing link in many considerations, because usually it is not taken into account that the success of quality management systems does not solely depend on the appropriate implementation of a system within organizations but also on the competitive environment which is dominated by re-numeration systems fixed by the government. In this paper it will be shown that inappropriate incentive schemes might be a main reason for an erosion of quality despite the fact that organizations employ reasonable quality management systems.

The contents of the paper are as follows: I will begin with some very preliminary remarks concerning the main methodological approach of economics - the famous (or notorious) homo economicus concept and related efficiency considerations. This might be useful to avoid some misunderstandings because economic reasoning and modeling is commonly perceived by non-economists as a little bit unusual, sometimes as even strange. After that I like to point to some regulatory innovations of the last decades in Germany concerning quality of social work. According to these regulations, deciding on quality and on systems of quality management is not solely a voluntary act carried out by organizations. In addition, they are forced to sign agreements with authorities of the public sector that the organizations will use quality management systems, and they have to render an account of the results of

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quality management. I like to point to some severe problems due to those innovations. Mainly using theoretical considerations I aim to show that the overall success of quality management does strongly depend on the payment systems in use, so that in a worst case scenario quality management will fail completely on a social level even if all managers internally make an excellent job.

After a survey regarding the relationship between quality and re-numeration systems I will focus on two main problems, both dealing with consequences of asymmetric information. Asymmetric information means that one party in a contractual relationship has private information. A seller might have better knowledge about the contents of her products compared to the buyers. Workers know better their effort than employers, physicians and social workers often know better the usefulness of diagnoses, concepts of work or therapies than the patients or clients.

These examples indicate that asymmetric information is a very common feature of production and exchange. Nevertheless, it may cause severe problems of maintaining high quality. It will be shown that in the social sector including health services the chosen incentive schemes are to a large extent dysfunctional, so that the problem of quality erosion due to asymmetric information cannot be solved satisfactorily.

2. Economic Reasoning and the homo-economicus assumption

In a preliminary remark a very rudimentary description will be outlined of how most economists are reasoning. Economists are using a very much debated behavioural assumption. This concerns the famous homo economicus, an individual who aims to rationally maximize his / her utility (for an overview and critique see KUBON-GILKE 1996). Usually it is assumed, that the utility increases when the individuals get more income or when they have more goods and services for consumption. Firms and organizations, too, are supposed to be utility maximizing entities. The utility of a firm is supposed to be equal to the firm's profits. Of course, these assumptions cannot be supposed to describe *real* behavior. It may be asked, why economists are yet using them. The answer is that in a wide range of economic questions it is not nec-

essary to deal with real human behavior. What economists want to know is not why individual A likes to live in the countryside and why she actually decided to buy a wonderful flat in a small village or why individual B likes expensive cars with convertible tops but does not buy one. And economists are fully aware of the fact that both individuals won't deliberately calculate any utility function and they won't choose their consumption accordingly.

Homo economicus can be justified instead by analytical convenience. Economists are interested in the results of competition, mainly market competition. For this purpose, it can be shown that a vast range of individual motivations and behavioral rules will lead to identical results if the behavior gets co-ordinated by competition. The easiest way to model these results is to make use of the homo economicus assumption (see ALCHIAN 1950). Of course, there are a lot of problems and some limits of this approach. However, with regard to the questions discussed here, the results of the analyses have been confirmed by empirical work. Theoretical considerations, too, support the use of this approach (see BREYER/ZWEIFEL 1997).

A last remark regarding concepts of economic theory might be added. The term efficiency is to some extent ambiguous. Efficiency concepts differ between the sciences, so it has to be noted what efficiency means in economic theory.

Efficiency as used in economics has to do with an optimal trade-off between two goals (FRANK 1994; WEISE 2002). The most prominent - but also debated - efficiency concept is that of Pareto efficiency. A situation or an allocation is called efficient, if it is not possible to enhance the utility of one person without reducing the utility of at least one other individual. Note that Pareto-Efficiency does not say anything about just distributions. If individual A has no goods at all and individual B possesses all goods of a society, then this is a Pareto-optimum, because any re-allocation usually increases the utility of A but decreases the utility of B. So, of course, the political and ethical question remains which one of the multiple Pareto-efficient allocations should be achieved in a society.¹

¹ In addition, it can be shown that in a system of incomplete markets justice indeed may be a precondition for achieving efficiency (see KUBON-GILKE 2002).

In a Pareto-inferior situation, we have no optimal trade-off because it would be possible to simultaneously improve the economic welfare of all people. In the sense of the Pareto-concept this cannot be an optimum.

The Kaldor-Hicks-criterion of efficiency is even more debated. It says that the sum of aggregate producer surplus and aggregate consumer surplus reaches its maximum. The producer surplus equals the profits of the firms minus the fixed costs; the consumer surplus is the difference between the willingness to pay (demand) and the actual price summed up for all buyers. This criterion, too, does not say anything about just distributions. It solely focuses on the sum of all surpluses. This means that a slight reduction of the utility of one individual is justified if the utility of another individual increases considerably. Then it would yet be *possible* to compensate the loser.

3. Coordination Rules in the Social Sector and the Problem of Monitoring

The rules of production and distribution of social services are different from most rules used in other sectors. Among all the differences there is a striking one with regard to the demand for social work. Individuals who get the services usually do not pay for them. Whether you call these people buyers, customers or clients seems to be of minor importance. It should be noted, however, that there are third-party payers, often authorities of the public sector. These authorities have to secure that the quantity and the quality of the programs fixed by democratic processes will indeed be produced.

This task entails the problem of monitoring and control. As mentioned before, in Germany there are many new ideas how to perform this task. In many parts of the social sector quality management is forced by law. If an organization does not sign an agreement on quality management the authorities are not allowed to order services from these organizations.

Of course, there are a lot different systems of quality management. Total quality management and standards or norms (DIN) borrowed from standardization policies of the industrial sector are most important. Each organization has to decide which systems to use internally. In addition, there are some

options of choosing quality management systems with regard to the agreements with the authorities.

A specific problem arises if the organization itself is interested in quality management, but is not interested in giving all relevant information gained by the quality management system to the authority. This might lead to the implementation of two systems of quality management, one for internal purposes and the other in order to fulfil the quality contract. The solution to the problem of two purposes to be achieved by one measure is equivalent to the implementation of two partially independent accounting systems in firms. These doubled cycles of getting access to information for internal and for external purposes increase cost. In addition one has to wonder about the value of information gathered by the authorities. By the way, very similar problems arise with respect to other evaluation systems. Despite the fact that the literature on managerial practice emphasizes evaluation as a valuable tool, economic theory recommends caution to this respect. This is due to problems that evaluation supports influence activities by the individuals whose performance will be evaluated - which in turn generates influence costs. In addition, there are strong incentives for individuals who are doing the evaluation job not to report truthfully because of the impact of the reports on their own result when being evaluated. The conclusion of economic reasoning is that evaluation systems should be very carefully chosen. Certainly it might be helpful to evaluate new employees, but it might be in the interest of the firm to refrain from frequently evaluating workers who have a lot of firm-specific knowledge because it is very unlikely that working contracts with experienced workers will (or can) be terminated.

4. The Dependence of Quality on Incentive Schemes

Consider now the main problem to be discussed here, the dependence of quality on incentive schemes. In the following a short survey of the problem will be given and then I will focus on two important topics.

In order to tackle the whole problem, in a first step it has to be clarified what do people and sciences mean when talking about quality. Individuals often

equate quality with something in mind like properties of excellence of a service or a good.

In economics and other social sciences, however, the term is used differently. Quality does not entail value judgements but just describes all the properties of a good or service. In this sense quality is identical to a chosen standard of production. Quality with regard to social work or health care can be understood similarly. The following survey is intended to show the complexity and multidimensionality of problems to be dealt with to decide on and to maintain quality standards.

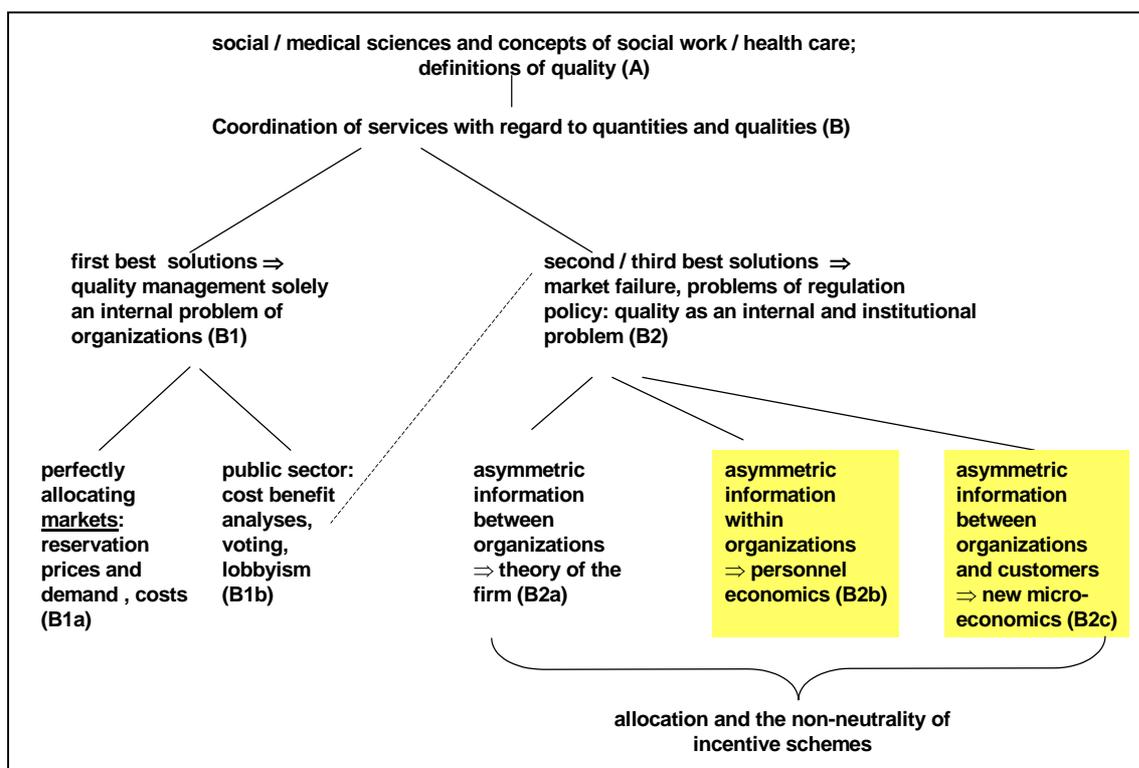


Figure 1: Quality and Incentive Schemes: Survey

If we like to know more about the quality of social work in a first step we have to regard the results of scientific reasoning and practical experience in the field of social work (A). Concepts have to be developed and discussed in order to evaluate, how the concepts are supposed to work and how services might be standardized. It is not very reasonable to believe that social work will come to an unanimous solution regarding this task, because it is not very likely that in this respect the different scientific paradigms will merge. Of course, economists can't say anything about the presumed success of pro-

grams, but they are able to calculate the probabilities of *successfully executing* programs characterized by standardized propensities agreed upon.

So, in a second step (B), an economically very interesting problem remains. Since we are not living in a land of milk and honey, services have to be produced and usually it is not possible to produce *all* the services proposed as desirable by social scientists. Each society has to face an allocation problem. It has to be decided which goods and services should be produced subject to the availability of resources. This leads to a coordination problem. Typically, the solution is accompanied by some kinds of rationing.

If a society is characterized by perfect solutions to the allocation problem (B1), e.g. by perfect markets (B1a) or perfectly informed, benevolent, and foresighted administrative authorities (B1b), then the problem of maintaining quality remains purely a problem to be solved within firms. If all partners of a transaction are well informed about the efforts of an organisation, about the performance and the supposed results of a program, then in markets prices will form with respect to demand and supply. Suppose, a firm has to choose the quality of a service. Producing quality level A costs 200 € and yields 300 €. Producing quality level B costs 400 € and yields 460 €. A profit maximizing firm chooses A. If there are other firms which are able to produce B with considerably lower cost or which have intrinsic interest in B, they will choose quality level B. *Ceteris paribus* the more firms decide to enter a certain market the more the price will decrease. In equilibrium, all quality levels will be produced as far as the marginal willingness to pay of the buyers exceeds the marginal cost of production. Rationing occurs because no further goods or services will be produced if the costs exceed the willingness to pay. A better solution to the allocation problem is indeed not feasible.²

If it is not possible to get information about the willingness to pay using the price mechanism, because of third-party payers for instance, the government and its administrative authorities have to do the same job and have to calcu-

² Of course, there are a some preconditions to be met and there a some problems connected with the evaluation of market solution regarding efficiency, for instance, because the willingness to pay of the buyers may depend on the distribution of wealth and income. With respect to these problems there are some other measures of efficiency in addition to the Kaldor-Hicks criterion (e.g., the concepts of equivalent variation and of compensating variation) but all of them also are due to some methodological problems (see MAS-COLELL / WHINSTON / GREEN 1995, chapter 3).

late the costs and overall benefits of each program. Then it has to be decided on the programs and on the payment of the services. In both cases - perfect markets or perfect regulations - each organization has nothing more to do than to choose the utility maximizing quality level. There just remains the problem of the firm to secure, that the promised quality, the payment depends on, indeed will be produced at low cost. This is purely an internal problem. Systems of quality management aim to serve this purpose to make sure that the chosen quality is produced at least cost. The cost problem just mentioned incorporates the problem of appropriate monitoring and control. This task can be solved by using appropriate systems of internal quality management. Theoretically this problem is a trivial one, even if it is, of course, by far not easy to implement such systems in practice.

Under these circumstances of perfect allocation payment systems do not interfere. Most quality management systems are indeed explicitly designed to solve this internal cost-minimizing problem subject to the chosen level of quality.

Things are changing dramatically, however, in case of market failure and problems of regulation policy (B2). Now maintaining quality does not remain a solely internal problems of organizations (see KUBON-GILKE 1997, chapter 3). It should be noticed that there are a lot of reasons why markets do not perform well. Here, only asymmetric information as one of the most important problems will be considered.

In the following one of the main topics of the so-called agency will not be considered in detail. This concerns the theory of the firm (B2a) (for an overview see TIROLE 1988; HOLMSTRÖM/TIROLE 1989; KUBON-GILKE 1997). The theory of the firm deals with optimal sizes of organizations and with the efficiency of internal structures and hierarchies of firms, for example with the efficiency of vertical and lateral integration (see GROSSMAN/HART 1986) or with optimal rules regarding control rights of heads of departments (see HOLMSTROM/TIROLE 1991). It is emphasized that the size and the structure of a firm matters with regard to its efficiency due to asymmetric information and incomplete contracts. In addition, it is supposed that firms compete on an institutional level. Those firms with appropriately chosen or well adapted

structures will be more successful, so that in the long run all firms in the market will favor efficient structures. If this competition in the social sector just is in the beginning, it is not very probable that the organizations already would have been able to finish the restructuring. Under these circumstances second best solutions with regard to the quality problem might be prevented because of transaction problems between organizations (lateral and vertical). In turn, this might lead to suboptimal quality in the social sector, due to “old-fashioned” and inappropriate firm structures subject to the politically chosen new forms of competition.

This short description of problems of asymmetric information between organizations might have been very abstract. The next two problems - asymmetric information within firms (B2b) and asymmetric information between organizations and customers (B2c) will be presented in more detail in order to clarify the main argument regarding the impact of institutions and incentive schemes on quality and efficiency.

5. Asymmetric Information Within Firms

Consider the problem of asymmetric information within organizations (B2b). This concerns primarily private information of the employees. Monitoring of the work is costly and partly even impossible. Employers aim to make sure that the employees will choose a high level of effort. However, how can they do so if they are not able to use cheap monitoring devices?

One possibility is to use monetary incentives for high effort. A typical labor contract, however, is an incomplete one. The work to be done usually is not specified in every detail so that it is not possible to formulate sophisticated contractual penalty clauses. Instead, the firm has to implement an appropriate wage structure to encourage high effort. Unfortunately, in this respect there may be some severe trade-offs to be dealt with.

A straight salary, e.g. a fixed wage per month, serves an insurance function. If workers are risk averse and firms are risk neutral than it would be profitable for both sides to sign a labor contract using a straight salary scheme. A straight salary, however, may be disadvantageous because this wage scheme gives no strong incentives for high effort. Often we find some kinds

of a compromise. Typical wage contracts mainly use only parts of variable pay. It is interesting that variable pay is *not* widely used to determine the complete wage. This seems to be due to motivational problems and the danger to destroy intrinsic motivation by variable pay (see KUBON-GILKE 1990; FREY/BOHNET 1995). In addition, a problem of multi-tasking has to be tackled (see HOLMSTROM/MILGROM 1991). Consider a worker who has to perform two tasks. Task 1 (producing high quantities of output) can be easily monitored, task 2 (maintenance of machines) can't be monitored at all. If the firm pays a wage according to the output, then the worker might reduce her effort with regard to task 2 what may be very disadvantageous for the firm. So it might be better not to use strong incentive systems in order to maintain high effort with respect to tasks which can't be easily monitored. Both the incentive effects due to multi-tasking as well as motivational consequences of strong incentive schemes lead to the conclusion that payment in accordance to output might be to some extent disadvantageous regarding productivity and firms' profits.

In literature about personnel management (see e.g. LAZEAR 1998) one can read a lot about wage systems which will serve the purpose to encourage high effort. Maybe surprisingly, e.g. seniority based wages (the longer you are employed by a firm, the more money you get) turn out to be a valuable incentive system if combined with the possibility of terminating wage contracts. It may also be a little bit surprising, as mentioned before, that most economists are very critically with regard to evaluation just because of the problem of costly monitoring due to behavioral effects of evaluation systems (incentives and motivational consequences) especially with regard to the reliability of the results.

A very similar problem compared to implementing suitable labor contracts for workers arises with respect to managers. In the last century, many big joint-stock companies evolved accompanied by the possibility of gaining access to large amounts of equity. The shareholders, however, have to face a severe threat of deception. The managers are much better informed about the firm than the shareholders. So it has to be prevented that managers act in accordance to their probably existing empire-building motives instead of maximizing the firm's profits. It has also to be make sure that managers are not able

in case of successful firms to “take the money and run”, that means they should not be easily able to bring about a fraudulent bankruptcy. Here, too, the incentive scheme plays a crucial role (see HART 2001; HART/MOORE 1989, HART/MOORE 1991). Wage systems, hierarchies and control rights of managers, rules of accounting as well as the structure of corporate finance are influencing the possibilities of managers to commit themselves to profit-maximizing behavior in the long term.

A look into industrial sectors and its firms, respectively, reveals that there are often wage systems for workers in use which can be characterized by some forms of generosity. Many firms pay higher wages than the minimum wages fixed by collective wage agreements. Additional incentives like seniority based wages, bonuses, profit sharing, guaranteeing cheap credits or insurances, and others are used frequently. Despite of the costs of these measures the to some extent generous incentive systems just considered obviously turned out to be profitable because of considerable increases of productivity. The conclusion is that a firm's success depends on an appropriate wage system. In microeconomics it is assumed that institutional competition selects incentive schemes and hierarchies with respect to their impacts on productivity. It has to be noted that these *forward looking wages* (from the firms' point of view) reduce turnover, act as discipline devices, enhance motivation, and therefore increase productivity.

The dark side of this result, however, concerns the labor market. The productivity enhancing wages paid by the firms are higher than market clearing wages. This implies that labor supply exceeds labor demand. So, this "friendly" kind of profit maximizing behaviour of the firms is a main reason for the increasing mismatch of labor supply and labor demand in many sectors and finally for the increasing unemployment (for an overview see KUBON-GILKE 1990).

Unemployment of social workers is not a very severe problem in Germany. Many social organizations, however, employ rather old-fashioned and rigid wage systems which cannot prevent high turnover rates and which to not retain the vanishing of motivation. Inappropriate wage systems thus are responsible for unsolved problems of maintaining high productivity and good

quality, which is an even more severe problem in the social sector than in other areas of the economy. It should be noted that this cannot be repaired by using quality management systems without simultaneously restructuring the incentive systems within social organizations. And notice a very strange consequence: Social organizations usually adopt by far less generous wage systems. In this sense, other firms implement more internal social policy than social organizations, so that social organizations appear to be less social with respect to employees than many profit-maximizing firms of other sectors.

6. Asymmetric Information Between Organizations and Customers

The second topic concerning market failure due to asymmetric information deals with private information of sellers (B2c). The producers are supposed to know the quality of their goods and services, the buyers are supposed to have considerable lack of information. The article “The Market for Lemons”, written by George AKERLOF (1970), has been most influential for modern microeconomics. Last year AKERLOF and two other economists – Michael SPENCE and Joseph STIGLITZ, who had been politically very influential as vice-president of the World Bank and formerly as the main economic consultant of president Clinton - had been awarded the Nobel Prize for new insights about vanishing quality due to asymmetric information.

The main idea can be outlined by a very simple example. Consider a market for used cars. The sellers know the quality of their cars, the buyers have no access to these informations. Suppose further that there are just two types of cars: 50 % of all cars are good cars characterized by a solid quality, worth €6 000 and 50 % of all cars are so-called lemons, worth only €2 000. If buyers and sellers had the same information there would exist two markets, one for the good cars and one for the lemons. Of course, the prices in both markets would differ considerably.

Suppose now that the buyers do not know the quality of the offered cars. They buy a good car with the probability of $\frac{1}{2}$, but it is similarly probable to buy a lemon. A risk neutral buyer would calculate his willingness to pay as $\frac{1}{2} \cdot 6\,000 + \frac{1}{2} \cdot 2\,000 = 4000$. However, if buyers offer a price of €4 000 the owners of the good cars would refuse to sell their cars. The buyers will an-

ticipate that only lemons would be sold in the market, and their willingness to pay will further decrease to € 2 000. The consequence is, that only lemons will be sold. Provided that potential buyers and potential sellers have different preferences with regard to the cars so that both parties would be better off if an exchange would take place, this is a highly inefficient result because the market for good quality cars doesn't exist at all and no buyer or seller can realize any surplus on a market for used cars characterized by good quality. This phenomenon concerns many markets especially for services where it is extremely difficult for buyers to decide, whether the promised quality has been delivered or not.

In the social sector and the health sector this problem seems to be even more complicated because of third-party payers. There are even more parties involved, and there are multiple problems of asymmetric information markets or authorities have to deal with.

Many of these problems, however, turn out to be less severe in equilibrium because there are some *institutional solutions* to the market failure so that second-best or third-best solutions can be reached. These solutions imply that sellers are able to build up some forms of reputation so that buyers may trust sellers regarding the promised quality of the goods or services. The institutions in question partly arise *endogenously* due to institutional competition. Some of the most important solutions can be described as follows (for an overview see KUBON-GILKE 1997, chapter 3).

- Premiums for high quality like monopolistic prices. High prices may prevent incentives for firms to choose low quality while promising high quality. This will be the case if these firms had in turn to face the problem that they had to switch to a low price market in the long run when cheating on quality.
- Guarantees impose costs of deception on the seller so that she has an incentive to announce the correct quality of her product.
- Expensive advertising signalizes that a firm is interested in maintaining a certain quality because the costs of advertising cannot be recovered when switching to a low price market in the long run.

- Non-profit organizations are characterized by a very sophisticated special legal structure. If there are any profits, it is not allowed to distribute them among the managers or owners. Since the managers cannot get any personal profit if they deceive on quality, they mostly will be honest, so that it will be more likely that buyers trust the promises concerning quality.
- Defining and enforcing minimum standards of quality. In this respect there are both endogenous solutions as well as regulatory measures at work. It can be shown that some legal structures like franchising systems might serve the purpose of maintaining quality. In addition, certain forms of certification might be helpful. Authorities of the government like the bureau of standards (UK: office of weights and measures) or safety standards authorities also might prevent a complete failure of markets.

All institutional solutions have one thing in common: they help to build up a reputation that firms will keep the promises with regard to quality. In this case buyers may decide to pay higher prices according to the quality announced by the sellers, and markets for high-quality goods at least will not vanish completely. It has to be noticed, however, that the solutions are costly. Usually it is not possible to reach first-best allocations.

All of these solutions can be understood as specific incentive schemes. Maintaining efficient high quality needs certain amounts and structures of prices as well as other institutional designs. With regard to efficiency it is relevant, how prices get actually determined and what firms actually have to perform in order to get money. If we are looking for appropriate incentive schemes for the social sector, it is useful to keep in mind that there exists a multitude of feasible re-numeration systems for social services and health care. The following payment systems can be interpreted as the main forms of incentive schemes (see BREYER/ZWEIFEL 1997, chapter 7):

- **fee for services:** there is a price for each single service, for instance a price for feeding of handicapped people and another price for dressing. The whole product 'care' has been divided into a lot of parts of single services and the authorities are fixing a price for each part;

- **cost reimbursement:** producing services is costly. A very common payment system recovers these costs, usually by paying prices for the necessary inputs of production;
- **number of cases system:** in the health sector the most prominent example is the sophisticated DRG system. Diseases and injuries have to be classified by hospitals according to a complex scheme and a hospital gets money according to this classification system. One case might be a broken leg, another some form of cancer. For social services, too, it is at least possible to implement such a system;
- **capitation fee:** A supplier gets money according to the number of persons she serves. This might be the actual number of persons or a potential number according to an enrollment list of people who have the right to use the services of a supplier;
- **reference price:** it is also possible that the payment depends on nothing at all - like a straight salary. The supplier just gets a certain amount of money per year and she has to do the work the payer wants her to do;
- **fixed salary:** the fixed salary system is very similar compared to the reference price system. In this case the social workers would be employed by the administrative authorities and they would be public servants who earn a straight salary.

Now, a question arises concerning the impact of these payment systems on efficiency and quality. As mentioned above, economic efficiency (Kaldor-Hicks criterion) deals with the sum of surpluses. There are two main preconditions to be met in order to reach economic efficiency. So, three levels of efficiency can be differentiated:

- level A efficiency is reached if the production of each service with a quality determined in advance will be a least cost production, it has to be noted explicitly that cost minimizing is always subject to the chosen quality standard;
- level B efficiency concerns the bundle of services. The optimal bundle of single services should be chosen. Consider for instance medical treatment. Level A efficiency calls for low cost of X-raying, level B efficiency af-

fords that X-raying should only be used if necessary so that it should be a dedicated service regarding the whole process of treatment. A and B are preconditions for the next level C;

- Level C efficiency at least is called economic efficiency. Services should be carried out whenever the overall benefits of the services are greater than their (minimal) costs due to the Kaldor-Hicks criterion.

Especially levels A and B reveal a strong connection between efficiency and quality. If we do not reach level A it would be possible to produce higher quality or more services at the same costs. If B fails, the bundles of services like care are of suboptimal quality. Waste occurs because of inappropriately composed services.

The next task is to calculate whether the incentive schemes systems described above serve efficiency and quality or not. Unfortunately, these considerations are rather complex, so that it is helpful to use a simple model (see BREYER / ZWEIFEL 1997, chapter 7), even if this leads to a to some extent technical presentation.

The model aims to analyze the efficiency impacts of incentive schemes. Remember that payment systems simultaneously influence the quality supplied. In order to make the calculation as easy as possible it is assumed that a certain social service as a whole just consists of two parts: some kind of consulting (M_1) and some kind of therapy (M_2).

$$M_i = f_i(t_i, x_i); \quad \frac{\partial f_i}{\partial t_i} > 0, \quad \frac{\partial f_i}{\partial x_i} > 0 \quad (i = 1,2)$$

The production of both services (M_i) depends on the working time of the supplier (t_i) and on the amount of another factor of production (x_i). x might be labour of an employee or another input like a personal computer. More inputs yield higher output. This is indicated by the signs of the partial derivatives. If a supplier uses x , she has to buy it. Renting a flat or hiring of employees is, of course, to be understood as special forms of buying. The price of x_i is w , for instance the wage for an working hour, an interest rate or a leasing rate.

In addition, it is necessary to make assumptions regarding the consequences of the services for the genuine purposes of social work. In this model, the success (G) of the measures depends on the amounts and the combination of both services. So, G is considered as a function of M_1 and M_2 .

$$G = G(M_1, M_2);$$

BREYER and ZWEIFEL (1997, chapter 7), who introduced this model for analysing efficiency impacts of re-numeration systems in the health sector, assume special properties of this function:

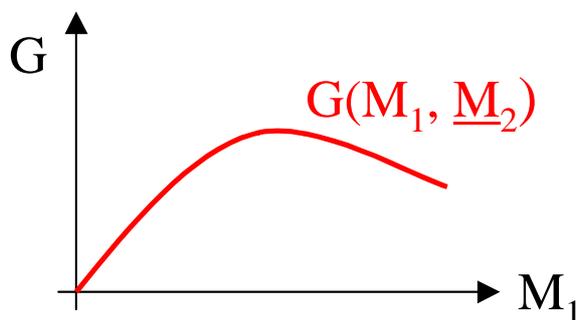


Figure 2: Dependence of G on M_1 (M_2 fixed)

First, G increases in M , but after reaching a maximum G decreases. This means that it might indeed be possible to do too much social work. Social services all around the clock with a whole troop of social workers treating an individual might be problematic. In case of medical treatment it is also obvious that services up to some optimal level might be harmful.

The utility of the supplier of the services is assumed to depend on her income, her working time and on the anticipated success of the treatment.

$$u = u(Y, t, G) \quad (u_y > 0, u_t < 0, u_G > 0)$$

Notice that it is assumed here that the supplier is *not* solely interested in income and leisure. So, this is a rather nice and to some extent altruistic homo economicus. Nevertheless, it is supposed - as indicated by the signs of the partial derivatives - that the utility increases with higher income, more leisure (less working time) but also with more success of the services.

The supplier is assumed to maximize her utility function (due to the competition argument mentioned above). She has to face three restrictions:

- the whole working time (t) equals the sum of hours she is working for each service:

$$t = t_1 + t_2$$

- the complete income y consists of income from other sources (Y_0) like capital income, plus the income E according to re-numeration scheme (for instance the system of fee for services or a cost reimbursement system) minus the costs for the input x :

$$Y = Y_0 + E(\cdot) - w(x_1 + x_2)$$

- the third restriction is the function G where the functions f_i can be substituted for M . This function indicates that the success G depends on the services M_i and both M_i in turn depend on the working time and the quantity of the other input:

$$G = G[f_1(t_1, x_1), f_2(t_2, x_2)]$$

The three restrictions have to be substituted into the utility function. We get the following extended function:

$$u = u\{Y_0 + E(\cdot) - w(x_1+x_2), t_1 + t_2, G[f_1(t_1,x_1), f_2(t_2,x_2)]\}$$

As an example for the remuneration rule E consider the cost reimbursement rule. Both inputs (working time of the supplier and the other input) are costly and the authority pays a price (h) for each input, denoted by h^t and h^x :

$$E = h^t(t_1 + t_2) + h^x(x_1 + x_2)$$

This function, too, has to be substituted into the utility function. This leads to the following function:

$$u = u\{Y_0 + h^t(t_1 + t_2) + h^x(x_1 + x_2) - w(x_1+x_2), t_1 + t_2, G[f_1(t_1,x_1), f_2(t_2,x_2)]\}$$

Looking for the maximum of this utility function with respect to t_1 , t_2 , x_1 , x_2 (these are the quantities of inputs the supplier has to fix) requires to calculate the corresponding partial derivatives and to equate them to zero. The results can be seen in the equations 1 and 2.

$$(1) \quad \frac{\partial u}{\partial t_i} = u_Y \cdot h^t + u_t + u_G \cdot \frac{\partial G}{\partial M_i} \cdot \frac{\partial f_i}{\partial t_i} = 0$$

$$(2) \quad \frac{\partial u}{\partial x_i} = u_Y (h^x - w) + u_G \cdot \frac{\partial G}{\partial M_i} \cdot \frac{\partial f_i}{\partial x_i} = 0$$

Equation 1 shows the results of the partial derivation of u with respect to the working time. The first term is the partial derivation of the utility function with respect to the income times the partial derivation of the income function with respect to the working time according to the composite-function rule, also called chain rule. The second term is the partial derivation of u with respect to t , and the third term – also according to the composite function rule - is the partial derivation of u with respect to the success G times the partial derivation of G with respect to the service M_i times the partial derivation of the production function with respect to the working time. The third term answers the question what will be the effect of a slight increase of t on M , what then will be the effect of a slight alteration of M on G and what will be the effect of a slight alteration of G on the utility u .

The second equation is calculated accordingly. It is noteworthy to point to one severe inefficiency as a consequence of condition (2).

For this it is helpful to have a closer look on condition (2). Subtracting the second term on both sides leads to the following equation with a rather strange result.

$$(2) \quad \frac{\partial u}{\partial x_i} = u_Y (h^x - w) + u_G \cdot \frac{\partial G}{\partial M_i} \cdot \frac{\partial f_i}{\partial x_i} = 0$$

$$\Leftrightarrow u_Y (h^x - w) = -u_G \cdot \frac{\partial G}{\partial M_i} \cdot \frac{\partial f_i}{\partial x_i}$$

Remember that it is assumed that the utility increases with higher income ($u_Y > 0$), that the utility u increases with more success of the services ($u_G > 0$) and that the production increases with more inputs ($(\partial f_i / \partial x_i) > 0$). Since all these derivatives are positive, the following problem arises. If h^x is greater than w (this means that the authority pays a higher price for the input than the supplier had to pay herself) then the term $(h^x - w)$ is positive and condition

(2) can *only be fulfilled* if the partial derivative of G with respect to M is negative! In this case the chosen t_i and x_i will lead to an amount of M with G already decreasing. The unfortunate consequence will be, that with respect to efficiency and to the success of the services, too much costly services will be produced. The marginal service *reduces the success of the treatment*. If, on the other hand, the authority reimburses less than 100 % of the costs, the supplier will incur losses and will not be able to produce at all. Concerning quality this a very bad result because in the extreme the services might be missing, useless or even harmful.³

If the utility depends only weak on the success G , then the overproduction becomes very peculiar and problematic. It is only the own interest of the supplier in the success of the services which prevents a disaster. Even if she is an altruistic and intrinsically interested supplier and even if she is mainly interested in the non-pecuniary success of the services, the supplier would face severe problems due to competition because competition *strongly* supports the inefficient increase of M . In a worst case scenario an altruistic and quality-oriented supplier may be forced to drop out of the market or to adopt strategies of quality reducing overproduction.

As shown by just one example, accordingly all payment rules can be substituted into the utility function and the efficiency impact of each rule can be analysed respectively. The main results are as follows:

- Cost reimbursement is the most inefficient system. None of the three efficiency levels - A, B nor C - can be reached.
- Fee for services works slightly better. Obviously, there is an incentive to produce each service at least cost. However, level B usually will not be

³ There are striking examples of similar phenomena with regard to regulation policies of other sectors, for instance the very inefficient production of energy in many countries due to cost reimbursement rules. The example of the energy sector shows that there might be other cost reimbursement rules than the rule considered above which also lead to inefficient results. In Germany, for a long time energy prices had been approved by the government subject to cost reimbursement and a guarantee of reasonable returns with respect to the capital in use. This regulation rule obviously favors inefficient high costs because a firm gets more profits when choosing a high cost production. Accordingly, level A efficiency cannot be reached. Accompanied by the development of informational economics a growing literature on regulation problems is looking for feasible and efficient rules of regulation (see, for instance, LAFFONT/TIROLE 1993). This relates to the question raised in this paper concerning appropriate incentive schemes.

reached. Take for instance the bundle of services called "care". If a supplier gets a high price for washing, a low price for feeding and nothing for listening and communicating: what will competition support? It is to be feared that there will be a lot of washing but insufficient communication.

- Capitation fees or number of cases systems are more likely to be efficient, but the whole systems have to be chosen very carefully in order to avoid unnecessary waste of resources. These systems have to be accompanied by a lot of additional rules like regulating the possibilities of refusing clients or customers, organizing related processes efficiently (it is, for instance, necessary to accompany the implementation of a DRG system in the health sector with regulations regarding subsequent care outside hospitals), and to regulate the whole competitive environment .
- A fixed salary only works if all suppliers and employees are highly intrinsically motivated. Most economists are rather sceptical about this. Nevertheless, this system at least will work better than cost reimbursement.

Looking at the incentive systems in use, it is obvious that there are many inefficient rules at work. The incentive schemes adopted by an authority often contradict efforts to maintain quality by forcing quality agreements. Most organizations aim to produce high quality but many incentive systems render this rather impossible.

Unregulated markets without institutional support usually do not perform well. However, even under very problematic circumstances some endogenous solutions might evolve (like health maintenance organizations) dealing with multiple problems of asymmetric information regarding for instance insurance, quality and quantity of output. Even these solutions, however, are by far not able to reach efficiency.

7. Conclusion

There is a lot of theoretical and empirical evidence that the use of highly inefficient incentive schemes brings forward an erosion of quality standards *despite* of quality management within organizations. The more quality man-

agement is forced and the more inappropriate incentive schemes will be used the more severe the trade-off will turn out.

Institutional equilibria of industrial sectors, comprising certain wage systems, optimal sizes of organizations or, for instance, special forms of corporate finance are far from being reached in the social sector. This means that efficiency problems due to asymmetric information remain. This strongly impedes the production of high quality services.

What can be done? Managers of social organizations face a problematic situation. Of course, quality management might serve internal purposes. However, if there won't immediately start a restructuring of incentive schemes within organizations and between organizations and the authorities in charge, overall quality of the work might further vanish. One of the most striking examples of the disastrous impact of inappropriate incentive schemes on efficiency and quality concerns caring in Germany. It is to be feared that this problem will remain for a long time. Social work as a whole must be politically more active in order to point effectively to severe deficiencies of the regulating policy, and the representatives of social work should work more closely together with economists. In addition, forming associations, using scientific work and practical experiences to improve lobbyism seems to be unavoidable, even if this supports some risks that interests of small and well-organized groups may dominate.

A last remark shall be added. A growing number of economists like the former Clinton consultant Joseph STIGLITZ are of the opinion that most politicians and even their economic advisers do not capture the far-reaching consequences of the new paradigm of informational economics. STIGLITZ (2002) argues that the World Bank and western governments are responsible for severe political mistakes of the last decade. Decisions regarding the financial crisis in South-East Asia or regarding the transformation process of formerly socialist countries had been chosen without taking into account the role of institutions and of appropriate incentive schemes. In this paper, just a non-market sector had been analyzed, but the arguments also indicate that the success of whole market economies strongly depend on appropriate institutional and regulatory structures.

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