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**CALCULATING SERVICE PRICE INDEXES?  
IT IS POSSIBLE!**

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The opinions expressed in this paper are those of its author and may not be those of the institution to which he belongs.

This paper is the complete review of a previous draft, using a very recent article published by André BARCET, which was only made available by mid-June. This explains why the study is not as comprehensive as it was intended to be. The author asks to be apologized for this inconvenience; he will try to elaborate more on the subject during the meeting, and to modify the paper subsequently.

## INTRODUCTION

Establishing price indexes for services appear in many cases to be some kind of herculean task. Even when such indexes appear to be straightforward, doubts are raised about the quality, the representativity and the reliability of such indicators. In general, impossibility or criticism reasons are linked to three topics, the numerous criteria needed to describe a service, the difficulty (sometimes, impossibility) to measure correctly those criteria (and their change over time) and the fact that many services include an important human factor which cannot be characterized and measured easily.

Most of these aspects come from the confusion between activity, product and result, concepts which can usually be well separated for goods but which occur at the same time in the case of services. If one makes the effort of separating them, then the establishment of a price index appear to be easier, although all problems are not solved.

A second improvement in the way of thinking for preparing a service price index is to characterize what is expected from a given service. In fact, there are strong links between this operation and the "extraction" of the product-service from the triplet "activity-product-result". A simple but rather powerful classification is of much help for the purpose and is also rather efficient for elaborating on the possible changes of providing a given service over time.

The above considerations will be dealt with in a first part, while in the second part of the paper some practical aspects and problems about establishing service price indexes will be examined. Of course not all questions will be raised and no universal procedures will be provided. Only four important aspects will be examined at large, viz. a *priori* vs. a *posteriori* price indexes, and, for a *priori* indexes, sampling of representative services, quality changes within a firm and quality measure when changing firm sample. When problems are raised, generally some hints for solution are proposed, but not always.

It is the conviction of the author that price indexes can be established for many types of services, including some business services which may appear to be difficult. This faith comes first from the considerations included in this paper and also from discussions with many providers of business services. Some of the latter are even ready to participate in the construction of a general price index for the type of services they provide.

It is hoped that some examples of existing price indexes can be provided for the meeting of the Voorburg Group next year or, more probably, in two years.

## **PART I: TWO CRITERIA FOR CLASSIFYING SERVICES, TANGIBILITY AND OBLIGATION OF THE PROVIDER**

The outcome of an activity may be a good and/or a service. There are differences between the two, which have already been discussed at large. Some of them will be presented here, not for discussion but as a support of the further developments in this paper.

At the same time it is provided, a service results in a change in an object or a person while a good may be kept for further use for changing an object or a person (a good is a potential provider of services). Thus, one important distinction between a good and a service is that, generally, for the former the **activity**, the **product** and the **result** can be separated while, for the latter, the activity, the product and the result come altogether at the same time. As to services, it is then important to distinguish the output, which is the subject of studies on prices, from the activity which has produced it and from the final result.

In general, a good, the output of a production process, is something which is tangible, which can be defined rather easily with **measures** of length, weight, impedance, intensity, etc., as well as other characteristics such as colors, taste, etc.. The quality of a good can be measured, especially if it is reproducible according to certain processes where human intervention takes less and less place. Usually, for reproducible goods, the quality ascertained from a sample can be generalized to the whole set of products from which the sample has been drawn. But even if the good is unique, tests can be designed for evaluating its quality. For example, spatial transporters are not launched unless they have passed tests until the last moment (the post-launching problems are less and less important). As to services, an activity can be measured through the inputs. Usually, criteria exist which permit to measure the results. But the measure of the product itself, i.e. the service provided, presents difficult conceptual problems, in particular because of its situation between the activity and the result and of the fact that all is made at the same moment.

Furthermore, there is always a **risk** taken when a service is provided. This risk may be minor (the hairdresser cut hairs badly) but sometimes it may be of major importance such as a bad advice given to a firm which leads it to bankruptcy.

At last, the problem of measuring the service may be obscured by the fact that the final result comes from a **co-production** between the provider of service and the user.

### **A simple classification of services**

André BARCET [1] has proposed a classification which makes things easier to understand as to the differences between measure and quality of goods and services and as to the distinction to be made between the activity, the product and the result.

Two dimensions are considered:

- the tangibility, which goes from the most tangible (a good, for example) to the less tangible (an advice given by one unique person);
- the degree of engagement of the producer which goes from an engagement limited to means to an engagement on results.

The following table defines four standard situations, which, as always, are only a modelization of a more complex and more continuous reality:

		Type of engagement by the producer	
		on results	on means
Degree of tangibility	Higher	Quality of the result	Quality of the material means
	Lower	Quality of methodologies	Quality of men

1) A high degree of tangibility and an engagement on the results by the producer are the characteristics of the situation of goods, but some highly standardized services the result of which is tangible (services of reproduction of normal documents, for example) can also be classified in the north-west corner of the table.

2) A low degree of tangibility and an engagement on the result by the producer are the characteristics of rather standardized services. The provision corresponds to the application of a methodology, which is widely known and has been tested since a long time. The services covered are those which must come to a specific, practically unique, result using correctly a specific, practically unique, methodology. They include accounting, judiciary act writing, auditing, marketing, job describing services as well as software writing and some transport services.

The quality of the service can be evaluated *a posteriori* by comparing the result obtained by the provider with the standard result to be obtained, but intermediate checks, which can prevent "catastrophs" are also possible. The provider, if not known by the user, may however show some proof of "quality" through diplomas (from Universities or as a recognition by the providers'association). But, in any case, the *a priori* quality is mostly a question of **notoriety**.

It is clear again that the guarantee of the result is not total: failures exist in methodologies and men (even the most knowledgeable) may apply them wrongly. But the risk is rather limited: the methodologies applied are widely recognized since a long time and intermediate tests can be performed.

3) A high degree of tangibility and an engagement by the producer limited to means are typical of providing goods and/or persons to the user who will then perform the service (or have it performed) with these inputs. The service is then to create and to manage a capacity of providing services, but not to provide them. Rentals of goods or of space are typical of the category, but it includes also all rented housing facilities with more or less "surrounding services" such as hotels, camping sites, ... Standard telecommunication services can also be classified here as well as personnel supply services.

When a good is provided by the "renting" company, the quality of the service is measured, of course, by the duration of the "lease", but, also, by the quality of the good itself. When personnel is provided, its qualification is one of the main criteria to

evaluate the quality, along with the performance of the persons concerned according to existing standards.

As for any service, there is a risk involved. But, beyond the fact that some goods may be ill-constructed or that persons may be less qualified as expected, the final risk imputable to the provider is difficult to evaluate since the final product includes risks added by the user who is responsible for providing machinery, material and personnel of his own (in excess from what he has "rented") and for combining the production factors (the provider of computer facility is not responsible for softwares which require more capacity than the one provided).

The difficulty to appreciate the risk results in the fact that the quality of the service, when appreciated *a priori*, relies even more than in the previous case on the notoriety of the provider.

**4) A low degree of tangibility combined with an engagement of the producer limited to means** characterize services for which no recognized methodology exist and then no *a priori* outcome is expected in measured terms. Of course, it is expected that the modification resulting from the service be an improvement but there is even no guarantee in that matter: the problem may be such that the best service provided will not result in an improvement of the situation (some physicians' services fall in this category, for example).

The service itself can be concretized by an analysis of a situation followed by a set of recommendations and, possibly, an evaluation of the possibility of improvement if such or such recommendation is applied. But the decision to apply a recommendation is of the user's responsibility as well as the quality with which it is applied. Once again, the co-production between the service provider and the user results in a risk which it is not possible to separate between the two actors. Furthermore, the final outcome may take some time to come, sometimes more than a couple of years.

When low tangibility combined with an engagement on results was discussed (case n°2), it was said that existing and recognized methodologies were to be applied, which supposed that such methodologies could be taught; the quality of the provider was, in particular, his knowledge of the methodologies and his aptitude to select the most appropriate one for treating a case, which could both be improved by the experience acquired by the provider during his professional life. As to low tangibility and engagement limited to means, there exist also a basic formation but only the accumulation of professional expertise improve the quality of the provider.

If the quality of the provider can be appreciated correctly *a posteriori*, then this is even less possible *a priori*. The notoriety of the provider is the only possible indicator in that latter case.

### **But ... how to enter into the market?**

One would ask in the latter case, when a service provider's quality is recognized *a priori* through his experience and, perhaps, through his credentials (although many final outcomes are not evident or very remote in time), how a new actor can enter into the market? In fact, the question may be raised for all kinds of services and some rough answers can be provided.

As to goods, if one has the ability, the money and the machinery, the access to the market is only a question of price, if the good produced is similar in quality as other existing ones. As to "tangible" services with engagement on results, one can join the market in similar conditions as for goods.

Tangible services linked with engagement on means require more than the ownership of goods for rent or of qualified persons for interim job; they require the recognition of, at the same time, good maintenance, continuous professional training and provision of qualified by-services ; if one wants to enter into the market, there is therefore a need to "prove" the required qualities and/or to present, from the very beginning, an advantage in price which is appealing to potential users (but, after the start of the company, the price advantage is only valid if the quality as described before, is maintained).

The market of non tangible services with engagement on results can be joined through two main channels: (i) a former knowledge of the newcomer (for example, he used to work in an established and recognized company: many computer service enterprises are created by former employees of existing companies) and (ii) a direct establishment with a low price policy but the absence of experience will prevent many potential users to use the services of the newly established provider. A third way of entering into the market can be the purchase of an existing practice; this is quite similar to buying an existing company, with no new creation on the market.

As to non tangible services with engagement on means, it seems that the only efficient way to enter into the market is by presenting a former experience either in a company already engaged in the same type of service or in a company's section where the service is provided for the enterprise and where the newcomer on the market has performed successfully.

Of course, the entrance into the market needs to be promoted, but a good promotional campaign will fail to attract "rational" users if no demonstration of capacity or no credentials are provided.

### **Changes over time in the way services are provided**

An individual who provides a certain kind of services, in the "non tangible " category follows, in general, a certain kind of "cycle " in his professional life. At the beginning, he has a certain academic knowledge of what he has to do (either the knowledge of the methodology or of the field where he is to work). As time goes by because of accumulated experience and increasing competition, one gains, mainly two characteristics: (i) a non-specifiable way of feeling the problems and their possible solutions and (ii) a (formalized or not) methodology to solve recursive problems. Furthermore, the person, if it is possible, updates his basic knowledge to be made aware of new methodologies. But, after a certain time in the same sector, the strength of habit goes against the improvements cited above and, although the service may be continuously of the same absolute quality, this quality may decline relatively to other providers.

A company, employing more than one person, follows a very similar pattern as an individual (with also accrued impact from management requirements). In fact, a well managed company is in a position to fight the bad effects of age, as presented for individuals, by changing regularly its professional staff: this is one of the explanation of the big professional staff turnover ascertained in many business service enterprises.

If both for individuals and societies, services provided fall in the category of untangible and with an obligation of means, one can expect a movement towards obligation of results. The experience acquired over time leads, as stated above, to some kind of formalized or not methodology. If the service provider is performing successfully, then, with the resulting expansion of the market, one can expect that a newcomer may enter it, sometimes using very comparable methodologies (especially when the new comers were part of the original enterprise). Competition implies

reduction of operating costs either through an efficient management or, which is best, through innovation in methods. But when a method is considered to be good, then the reference service gets nearer and nearer to the set of so called services with obligation of results, since the method becomes widespread...

Andrée BARCET, in the same article as cited above, points out that, besides the development described hereabove, there is another one for which goods as well as services are submitted to "individualization, singularity, and refined adaptation to specific demands"; thus, in the case of services, this would imply a development within the category of "non tangible services with obligation on means".

### **Classifications ... classifications!**

The classification of a given service within one of the four categories described hereabove is sometimes difficult and questionable. One of the problem is linked to classifications:

*Example I:* A physician's service is obviously "untangible", but, if in many cases, it can be classified within the category of "obligation of results", because the related disease is "usual" (flu, appendicitis) and can be cured (or operated) in a standard way; there are also many cases where diseases are of specific nature and require non standard cures or operations, with acceptance by the sick person of an absence of result.

*Example II:* As to holiday club services, they may be classified within three of the four categories:

- meals provided are tangible and with obligation of results
- transportation is not tangible with obligation of results
- housing space provision is tangible with obligation of means

The clear cut between goods and services is generally valid; but, as goods may be provided with a certain part of services included (guarantee of repair, for example), the included service would not be classified with the good if provided alone. Therefore, one can say that the separation made above can be put into question. This will not be made here: the classification proposed is only a tool (as to the author, a powerful tool) for guiding the reflexion in the solution of the *a priori* difficult problem of defining price indexes for services.

## PART II: ESTABLISHING A PRICE INDEX

In the preceding discussion, a simple classification of goods and services was provided and several considerations were made from this classification as to the development of services. This is very useful for the establishment of rules governing a price index for various kind of services. In fact, there is no general type of price index which can be applied directly to all types of services, but some specific points can be made in general, provided that they will not be considered as to be applied as such to all products. Hereafter, such considerations will be made on specific subjects and possible solutions based on the "philosophy" presented in the first part will be presented. The paper does not claim for exhaustivity. Furthermore, some practical comportment are presented in another paper prepared for the present meeting.

### A priori or a posteriori Index

One can say, without making a great error, that there is no difference in quality between a good offered on a market and a good actually purchased. As to services, which do not exist before being provided, there is no such comparability. Due to the risk involved, one cannot say that a service described *a priori*, say, on a tariff, is similar in quality to the service actually provided.

If a service price index is to be used as a deflator, say, for the output of a given service industry, then one should take into account the prices actually paid by users and adapt them, for quality differences, to the quality required for a given basket (specified in quantities and qualities) of services. Then, along with the actual prices, one has to know the actual services provided, which may differ, because there is a risk involved in the service provision, from the services actually described in the tariffs.

In order to know what is required about the "quality" of the services actually provided, one should go to every user and determine the exact quality of each service provided to this user, with the provision that all misuses which come from the user must not be taken into account.

Even if the latter provision can be taken care of, it is difficult to imagine that a cheap survey can be carried out from a sample of users with the certainty of finding all types of services, in sufficient occurrences, to compute the price index.

This explains why the computation of a service price index should be made generally by collecting prices from the producers, i.e. by making an *"a priori"* price index, similar to what is used generally for goods price indexes (prices are collected from the producer) but with the difference that the consistancy between the *a priori* and *a posteriori* price indexes be more questionable.

*Remark:* there are cases where the *a posteriori* price index is used successfully; for example, this happens for rents when data are collected directly from renters.

### The bases for calculation of an "a priori" price index

Calculating an *"a priori"* price index for services, is conceptually, not different from calculating a price index for goods. However, in practice, some specific considerations have to be done.



It does not seem necessary to discuss here the various problems of a theoretical price index calculated over the universe of prices, as long as this universe is well defined. The following topics will be discussed:

- sampling of services to be priced;
- change of service provided within a company;
- change of provider.

### **Sampling of services to be priced**

The problem with many services is that they are not exactly similar with one another. The user may have specific needs. The situation for providing a given service differ from one user to another, sometimes slightly, sometimes largely. In a way, a "basket of sampled services" to be priced regularly, must be, at the same time, representative of the services provided during a given period and made of services which can be exactly defined.

This double problem can be solved by defining first a stratification of the various services within a category of products. This stratification will take account of the four types of services described in the first part of this paper (in order to treat better the changes of quality as shown later on), but also other characteristics such as the type of users, the type of specialized material or personal involved, etc...

Stratification leads to several types of services, which can then be presented to providing companies. Among the various prestations provided, each company is requested to select one or two which it feels are typical for each stratum over review. A full description of the service (users, persons and material needed, time necessary to make the service, etc...) is made. The actual services provided make up the sample of operations which are to be priced regularly from the providing companies.

*Remark:* many services are composite, custom made for specific users; this fact should therefore go against the idea of stratification; but, at least in France, the way prices for services are calculated for submission to potential users and, in many cases, the way the services are billed are such that each specific service included in a composite service is billed separately on the invoice; stratification is therefore justified.

### **Change of services provided within a company**

For several reasons there may be a necessity to modify the service sampled for a given company. It is assumed here that a new service is substituted for the same user by the same company.

The measure of the "quality change" may be applied as follows:

- For "tangible services with obligation of result". The change in the service can be the change of technology without changing the service provided (the photocopier is changed, but not the quality of the copy); in that case, there is no modification for the user (new prices are compared directly to old ones). The "quality" of the service provided changes when the good provided changes in quality: the quality change of the service is equal to that of the good provided.
- For "tangible services with obligation of means". The change comes mostly in the supporting goods (improvement of construction, inside improvements of an hotel, etc.) and the treatment of quality change is made from the treatment of the supporting

goods. Many services in this category include also provision of personnel; the quality change is thus measured by the change in the qualification of the personnel.

- For "intangible services with obligation of results", two kinds of quality changes can be envisaged: (i) an improvement of the methodology and (ii) an improvement of the quality of men, because of accrued experience and/or of better education. In fact, for the users, since there is obligation of results, both improvements seem to be senseless and have to be included in totality in the productivity increase of the providing company and/or their traduction is an effective decrease in price. However, one of the main feature linked to improvements of methodologies and/or of men is the reduction of the risk of mistreatment. This has therefore to be taken into account as an improvement of the service provided.

But how to measure "the risk"? The sole answer which can be provided up to now is "discuss it with the provider and have some confidence in what he says!". In fact, the improvement of quality of men because of accrued experience is not a problem for many advanced services; as said, there exist a big turnover in many companies: more experienced persons are offered higher positions in other companies or create their own companies, while they are replaced by newcomers. Experience through better education is also not a problem in the short run since the improvement is slow, but it should be taken care of if the period is longer.

Of course, another quality change comes from the composition of the service requested by the user (or imposed by the law). In that case, it is however generally possible to price the modified service before and after the modification date in order to link two series of prices.

- For "intangible services with obligation of means", only quantitative data about means can be used. Sometimes, the providers have some rules for billing such or such service. However, as time goes by, some of these services leave the "obligation of means" category to go into the "obligation of results" category. This implies a decrease in the risk of mis-treatment. The way quality changes characterized by an increased probability of success through the advises of the provider is left for discussion ...

**Remark :** Many business services are provided on a contract basis, over a given period of time, say, a year. Clauses for automatic revisions of prices are included, which make time-to-time measure rather easy. However, new contracts are often priced differently due to different factors (competition in particular). The sample of operations for a given firm should take into account, at some given moments, of a "reasonable" number of new contracts, in order to measure the price changes due to these new contracts. It seems rather easy, for many service providers, to give a reliable evaluation of the new contracts, using the data of the existing ones. If some control data can be collected, the statistician has also data permitting the check of the results provided by the industry.

### **Changing the provider of services**

An *a priori* price index, as has been said, cannot include the quality of a service effectively provided. As has been said also, this quality includes a certain amount of risk for mistreatment, as well as some "additional services" which can be compared to the services "added to goods" provided by the shopkeepers.

In this connexion, it has been said that the more notorious a company is, the smaller is the "*a priori*" risk of mistreatment or, at least, the higher is the confidence of the user.

When, for some reason, a standard contract is to be observed in a new company, after the prices having been collected for some times in another company, then, even if the contract and the price remain exactly the same, the question of the risk and that of the notoriety have to be raised. But no general answer can be provided here. Only, a proposal can be made to question the most important users on the "notoriety" of the most important providers.

### **Other problems**

Of course, the points treated hereabove do not make a full examination of the problems linked to the calculation of service price indexes.

One can raise the following questions, among others:

- how to obtain weighting patterns among the various strata ?
- how to decide, with the enterprises, that a contract is more "representative" than another?
- how to treat services where the "price" corresponds to a margin, but this margin can only be calculated for the company as a whole (insurance, personal supply services, for example)?

In fact, many responses are made when a given service group is treated, according to the organization of the market, and the type of providers.

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### **Bibliography**

- [1] André BARCET: "Qualité, normes et services" in a "prototype issue" of Synthèse Bibliographique, CNRS, June 1991