
Cost Accounting applications in Local Governments: The case of municipal tariff and price setting in the North of Portugal

Aplicações da contabilidade de custos em governos locais: o caso do estabelecimento de preços e tarifas municipais no norte de Portugal

Teresa do Carmo Salgueiro da Costa

Escola Superior de Gestão - Instituto Politécnico do Cávado e do Ave - Portugal

João Baptista da Costa Carvalho

Escola de Economia e Gestão - Universidade do Minho - Portugal

Resumo

Os governos municipais normalmente deparam-se com falta de recursos para satisfazer as crescentes necessidades locais. Suas principais receitas são provenientes de tarifas e preços. Portanto, é importante analisar as informações que são utilizadas para estabelecer as taxas de serviços e bens. O setor de contabilidade governamental local atendeu a essa necessidade exigindo o uso da contabilidade de custos na identificação dos custos laborais e dos custos incorridos no estabelecimento de preços e de tarifas de serviços e bens. Logo, consideramos pertinente assegurar que o governo local esteja implementando um sistema de custeio e que o mesmo esteja fornecendo informações relevantes para o estabelecimento das taxas a serem cobradas dos consumidores.

Palavras-chave: Contabilidade de Custos, Governos Locais, Estabelecimento de Tarifas e Preços.

Abstract

Local governments currently face a lack of resources to meet the continuous rise of local needs. The revenues in which local governments hold the largest financial leeway come from tariffs and prices. Therefore, it is important to analyse the information that is used in setting the rates to charge to goods and services users. The local government accounting chart answered this need by establishing cost accounting to be compulsory in the identification of the working costs and the costs underlying the setting of goods and services' tariffs and prices. Therefore, we understand that it is pertinent to ensure whether local government is implementing such an accounting system, that it is supplying relevant information for setting the rates to charge to consumers.

Key words: Cost Accounting, Local Governments, Setting of Tariffs and Prices.

1 Introduction

The imbalance in local government accounts is becoming increasingly greater as expenditure continues to grow and income is unable to keep pace with this growth. The main sources of local government funding are transfers, tax income, income from assets, loans and revenue from the collection of rates, tariffs and prices. These latter sources of income are those in which local governments have most leeway, given that their manoeuvring margin in relation to fiscal matters is much reduced. It is thus essential that there are means to justify the value of rates, tariffs and prices charged, as a consequence of the right to information that customers and other internal and external users have in a democratic society, like that in which we live.

POCAL - the official local government accounting chart - by obliging the implementation of cost accounting in these entities, so that costs per function can be calculated as well as the costs underlying the definition of the tariffs and prices of goods and services, has taken on the mantle of a powerful means of justifying the sums charged to customers. Nevertheless, it should be noted that the need to use a suitable cost accounting system to define the cost of goods and services that shall underlie the tariffs and prices used, is not only stipulated by POCAL but is also established by a number of other entities, including IGAE - *Intervención General de la Administración del Estado* - (1994), FASAB - *Federal Accounting Standards Advisory Board* - (1995), AECA - *Asociación Española de Contabilidad y Administración de Empresas* - (1997), IFAC - *International Federation Accountants* - (2000) and also the Portuguese law on local government funding.

In this vein, the purpose of this document is to verify whether local government has already implemented an accounting system of this nature and try to comprehend whether the outputs produced by this system are being used as the basis for setting tariffs and prices.

A further aim is to test a series of hypotheses that correlate the implementation of cost accounting to geographical location, entity dimension and the age group of the interviewees.

This was achieved through the development of a questionnaire, which was sent to all municipalities, services managed at the municipal level and municipal companies in the north region of Portugal.

To achieve the established objectives, the implemented work was structured in two parts. In the first part we performed an analysis of the value of cost accounting in setting tariffs and prices. The second part consisted of the presentation of the results obtained from the empirical study.

2 The value of cost accounting in setting tariffs and prices

One of the most sensitive areas of accounting for public and local entities is analytical or cost accounting. This area is extremely important in aiding the rational

decision-making process by local government managers and directors. It should be noted, nevertheless, that the outputs produced by this branch of accounting are important in making a range of decisions related to the duties allocated to local government. This being the case, the collection of information, so that the data output is pertinent and useful, must be constant and must refer to all the areas existing in the organisation. It must also be adjusted to the continuous demand for relevant data (Mendonza e Bescos, 2001). These data are obtained through traditional financial statements – produced via the asset accounting system – where cost accounting has the role of complementing the information, breaking it down into the component parts according to management requirements. This source of information will provide managers with the data necessary for planning and for the implementation of control functions (Jones e Pendlebury, 1996). Thus a cost accounting or management accounting system is necessary, which provides the information necessary to manage the scarce resources available to local government.

One of the activities of local government is the supply of goods and services for a tariff or price. This being so, the information provided by cost accounting on the cost of goods and services is useful in the setting of municipal tariffs and prices, permitting that an appropriate valuation of the human and material resources necessary for their management can be carried out. In the opinion of IGAE (1994), analytical accounting must provide data with a level of precision that is sufficient to provide grounds for the public prices and rates charged to consumers for the provision of services. The law on local government funding also focuses, though not directly, on the need to use an internal accounting system - article 20 (3) states that “the tariffs and prices (...) must not, in principle, be less than the direct and indirect costs borne with the supply of the goods and provision of the services”.

In addition to the abovementioned use, cost data relative to public and local entities are also essential in the following areas: budgeting; cost control and reduction; performance assessment; program assessment; economic decision making (FASAB, 1995; IFAC, 2000). According to IGAE (1994), an analytical accounting system is essential to improve the budgeting process of the local sector and assessing policies, serving as a yardstick for the assessment of budgetary forecasts and also permitting the quantification of the costs borne in complying with the objectives defined in programmes.

In this context, we believe that this branch of accounting has an extremely significant role to play at the local government level, given that the data it provides permit a number of different aspects to be checked, including the organisation’s compliance with previously established objectives, thereby allowing the necessary corrective measures to be implemented when they are not attained.

In this way, taking into account the elevated usefulness that this branch of accounting can provide to the management of a local government, it is no surprise to us that POCAL established it as compulsory in the calculation of the costs of functions and

the costs underlying the setting of the tariffs and prices of goods and services.

3 Empirical study

3.1 Objectives, methodology and sample selection

Given the non-existence of nationwide empirical studies seeking to ascertain whether the information provided by the cost accounting system used by local governments is useful in the setting of tariffs and prices, we believe that the implementation of a study that permits this calculation will be of extreme importance. In order to provide greater detail to the study, we also sought to scientifically test some of the hypotheses correlating the implementation of cost accounting to geographical location, entity dimension and the age group of the interviewees.

Thus, for our study we decided to analyse all the municipalities, services managed at the municipal level and municipal companies in the north region of Portugal, which amounted to, as sample of the collection data, 101 entities (86 municipalities, 7 services managed at the municipal level and 8 municipal companies). It is appropriate, however, to note that municipal companies are governed by the Portuguese chart of accounts used by private companies and not by POCAL, as the other entities are. Our aim here was to verify whether there are significant differences in the cost accounting systems implemented, taking into consideration that these three organisations can charge the same type of tariffs and prices. We chose just one region so that it would be possible to encompass all of the entities operating in a specified part of the country, with the same geographical and weather conditions, so that we could verify whether large differences existed between the entities in the field under analysis.

In order to achieve the defined objectives we opted for collecting data via a survey in the form of a questionnaire. The questionnaire was sent by mail in March 2005. The questionnaire was divided into three parts. The aim of the first part was to analyse some of the entity-specific characteristics. The second part included questions on the implementation of the cost accounting system and should have been filled in by the head of accounting. The third part consisted of questions on the setting of tariffs and prices, and it was aimed at the heads of the tax and tariff departments.

Of the total of 101 questionnaires sent, 54 replies were received, corresponding to a response rate of 53%. Of these 54 replies, 44 were from municipalities, 5 from municipal-managed services and another 5 from municipal companies.

The data received were processed by SPSS software (Statistical Package for the Social Sciences), version 11.5.

In order to test the study hypotheses, relative to the association between some variables, Pearson's non-parametric independence Chi-square test (χ^2) was used, based on the contingency table for a 5% significance level.

3.2 Study hypotheses

As already referred to, local governments need to develop suitable cost accounting systems that provide information on the cost of goods and services in order to aid in the setting of municipal tariff and price tables.

In this context, the definition of study hypotheses is essential, which we intend to prove or disprove in the course of this empirical study.

In effect, the population of Portugal tends to be more concentrated in coastal regions, which is also where the greatest number of municipalities are located and, therefore, the greatest number of services managed at the municipal level and municipal companies. In turn, if on one hand there are cities with universities and polytechnics that are more likely to have courses that include the subjects of analytical accounting and public accounting, on the other hand there are also more entities in the large cities that are willing to send employees to attend professional training courses in these areas. Thus, we also want to assess whether there is any correlation between the geographical location of the entities in the sample and the creation of cost accounting models. To this end, we established the following hypothesis:

Ä H1: Geographical location is directly correlated to the implementation of cost accounting systems.

Normally, large organisations have more human, material and financial resources, processing a greater volume of funds, and therefore, may be those that most rapidly implement internal accounting systems to control all the funds. In this context, we aim to assess, similar to that which was tested in the study implemented by Montesinos Julve *et al.* (1994) with Spanish firms, whether dimension is directly related to the implementation of cost accounting, through the testing of the following hypothesis:

Ä H2: The size of the entity is correlated to the implementation of cost accounting systems.

In Portugal, subjects related to public analytical accounting are relatively recent. Despite the ongoing debate regarding the need to implement cost accounting in public bodies and to make this coincide with the start of public accounting reform, it was the publication of the official public accounting chart in 1997 that brought with it the compulsory creation of cost or analytical accounting models in general government. Even in relation to services managed at the municipal level, this requirement has only been in force since 1993, and in relation to municipal companies, the implementation of these models was only made compulsory by Decree-Law no. 44/99 - which was amended at a later date by Decree-Law no. 79/03, taking into consideration the drafting of the statement of income per function and, even then, only the largest ones. In this regard, we shall analyse whether the youngest interviewees are more aware of this information. Thus, as a means of assessing whether there is a relationship between interviewee age and the implementation of cost accounting, we tested the following hypothesis:

Ä H3: The age of accounting department interviewees is directly related to the implementation of cost accounting systems.

3.3 Description of Sample

With regard to the characterisation of our sample, we find, as would be expected taking into consideration the fact that it is mainly composed of municipalities, that these account for 81.5% of the institutions that responded. Greater Porto and Douro account for the greatest number of entities in the sample. These entities are mainly small and medium-sized. The majority employ less than 300 workers and possess an income between thirty million and one billion euros.

With regard to the profile of the interviewees, those in charge of accounting, 81.3% have tertiary qualifications. The average age is 35. Noteworthy with regard to the profile of those responsible for setting tariffs and prices, is the fact that 34% do not possess any academic qualifications at all and their average age is 42.

3.4 Analysis of the results

3.4.1 The implementation of cost accounting and the setting of tariff and price tables

In an analysis of the second part of the questionnaire, which specifically refers to the implementation of cost accounting, we find that only 3.7% of the entities possess a full cost accounting system, 37% have already implemented this system, but not fully, and 59.3% of the institutions analysed have still not commenced this process (Table 1).

Thus, it can be concluded that the process of creating a complete cost accounting system is still very much behind schedule.

Table 1: Implementation of Cost Accounting

Level of implementation	No.	%
No	32	59.3
Yes, partially	20	37.0
Yes, fully	2	3.7
Total	54	100

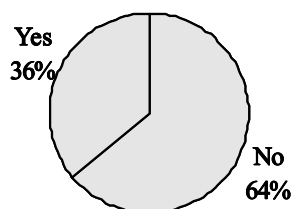
Source: Elaborated for the authors

The most popular reasons for the non-existence of a cost accounting model in the institution were related to the difficulties in practically implementing a system of this

nature and the lack of training of personnel, both of which had a percentage of 62.5%; the next most cited reason was the scarcity of human resources, which had a significant percentage of 59.4%.

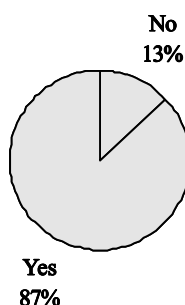
In relation to the third part of the questionnaire and relative to the transmission of information on the cost of goods and services from the accounting department to those in charge of setting tariffs and prices, we found that only 36% of those surveyed (8 entities), belonging to institutions that had already implemented a cost accounting system, stated that this transmission of information effectively existed (Graph 1). Nonetheless, it was possible to ascertain that this exchange of information exists in all municipal companies, whereas the majority of municipalities and services managed at the municipal level still do not perform this task.

Graph 1: Transmission of information from the accounting department to the rates and tariffs department



Source: Elaborated for the authors

Graph 2: The use of cost accounting data in the setting of price and tariff tables



Source: Elaborated for the authors

As Graph 2 indicates, of all the entities that collate cost accounting outputs, approximately 87% used these data as a support tool in the setting of price and tariff tables. Despite the fact that there are still few entities in this position, we were able to ascertain that most of the interviewees recognise the important role that the effective use of cost accounting can play in the calculation of the value to be charged to customers for the use of goods and services. In effect, we found that this result is in line with that supported by a number of other entities, such as IGAE (1994), FASAB (1995), AECA (1997) and IFAC (2000). FASAB (1995) and IFAC (2000) both state, even when these values are defined taking into account social criteria, that the cost does not cease to be significant in the weighing of the tariffs and prices to be used.

3.4.2 Analysis of the study hypotheses

In this section we shall test all of the hypotheses previously established. When the assumptions of the Chi-square test are not met, we ensure that only a simple descriptive analysis is done, and it is not possible to extrapolate to the range of conclusions drawn.

Thus, the due conclusions are drawn for each hypothesis stipulated in this section.

3.4.2.1 Relationship between the geographical location of the entities and the implementation of a cost accounting system

H1: Geographical location is directly related to the implementation of cost accounting systems

The aim of this hypothesis is to ascertain whether there exists a link between the geographical location of those entities included in the survey and the implementation of cost accounting. However, given that the sample is divided between the different NUTS III that were initially considered, we decided to group together the coastal NUTS III (Minho-Lima; Cávado and Greater Porto) and compare them to all the other NUTS III in the north of the country (Ave; Tâmega; Entre Douro e Vouga; Douro; Alto Trás-os-Montes). This separation was due to the fact that the majority of the municipalities are located in the coastal region and, according to Costa Carvalho *et al.* (2005), the majority of the Portuguese population is also concentrated along the coast. Taking into account the fact that the assumptions of the Chi-square test were complied with, obtaining as a result, for a degree of freedom and significance level, 5%, at a significant value (p -value=0.023; $\chi^2=5.178$), it is possible to conclude that this link between geographical location and the implementation of cost accounting exists. Taking into account the fact that the variables analysed are nominal, in order to measure the intensity of this link the Cramer's V- test was used. This test indicated a good link between the two variables (Cramer V-test = 0.31). Table 2 summarises the statistical tests performed.

Table 3 indicates that the coastal NUTS III are the ones in which the cost accounting system has been most implemented; 59.1% of the entities have already implemented this accounting system whereas only 28.1% of the NUTS III of inland areas have done it. Conversely, in all the other NUTS III of inland areas, the percentage of non-implementation is 71.9% as opposed to 40.9% of coastal NUTS III .

Table 2: Statistical tests used to analyse the link between geographical location and the implementation of cost accounting

	Value	Level of Significance
Pearson Chi-square test	5.178	0.023
Cramer V-test	0.31	0.023
Number of valid cases	54	

Source: Elaborated for the authors

Table 3: Implementation of Cost Accounting by NUTS III

Geographical Location			Implementation of Cost Accounting		Total
			Yes	No	
Coastal NUTS III	Cases		13	9	22
	% NUTS III		59.1%	40.9%	100.0%
	Standardised adjusted residual		2.3	-2.3	
All other NUTS III	Cases		9	23	32
	% NUTS III		28.1%	71.9%	100.0%
	Standardised adjusted residual		-2.3	2,3	
Total	Cases		22	32	54
	% NUTS III		40.7%	59.3%	100.0%

Source: Elaborated for the authors

2.4.2.2 Relationship between entity size and the implementation of cost accounting system

H2: There is a link between entity size and the implementation of cost accounting systems

In relation to the link between the size of the entities under analysis and the implementation of cost accounting, we performed, as already referred to, a partial

analysis of municipalities and another of services managed at the municipal level and municipal companies, given that the variable used to measure municipality size was the number of inhabitants and the variable used for services managed at the municipal level and municipal companies was the number of customers. Thus, given that the data are quite scattered and in view of the stipulated initial separation (small, medium and large-sized municipalities), we decided to compare municipalities with more than 60,000 inhabitants with those that have a number of inhabitants below 60,000. In effect, given this new situation, in spite of the fact that the Chi-square test associated to these two variables shows a significance level of 0.03, one of the assumptions relative to its use was not complied with, making the results regarding the existence of a link between the variables inconclusive.

It should be noted, however, that in relation to the municipalities with more inhabitants (above 60,000) the majority already have a cost accounting system in operation. An analysis of the smaller municipalities shows that 76.5% have still not implemented cost accounting as opposed to 23.5% that already have this system operational (Table 4). These results clearly indicate to us that the larger municipalities have a greater propensity to the use of cost accounting models. It would be interesting in future studies to replicate this study solely with large and medium-sized municipalities in order to verify if there are significant differences between them.

Table 4: Implementation of Cost Accounting per number of inhabitants

			Implementation of Cost Accounting		Total
			Yes	No	
Number of inhabitants	Up to 60,000	Cases	8	26	34
		% Number of inhabitants	23.5%	76.5%	100.0%
	More than 60,000	Cases	6	4	10
		% Number of inhabitants	60.0%	40.0%	100.0%
Total		Cases	14	30	44
		% Number of inhabitants	31.8%	68.2%	100.0%

Source: Elaborated for the authors

In relation to services managed at the municipal level and municipal services, the Chi-square test does not allow us, given the small sample size, to draw any conclusion regarding the link between entity size and the implementation of cost accounting. Nevertheless, Table 5 indicates that with regard to the smaller services managed at the municipal level and municipal services, 60% of the entities have already implemented

cost accounting. In larger ones (more than 60,000 customers) all the entities already have an accounting system of this nature in operation. In effect, no great conclusions can really be drawn from this descriptive reading either.

3.4.2.3 Relationship between interviewee age and the implementation of cost accounting systems

H3: The age of accounting department interviewees is directly related to the implementation of cost accounting systems

The analysis of this hypothesis indicates that the conditions for the implementation of the Chi-square test are complied with but the result is not significant (p -value=0.532; $\chi^2=0.390$). It can thus be concluded that there is no link between these two variables, in other words, the null hypothesis, which stipulates that the variables are independent, cannot be rejected.

Table 5: Implementation of Cost Accounting per number of customers

			Implementation of Cost Accounting		Total
			Yes	No	
Number of customers	Up to 60,000	Cases	3	2	5
		% Number of customers	60.0%	40.0%	100.0%
	More than 60,000	Cases	3	0	3
		% Number of customers	100.0%	0.0%	100.0%
Total	Cases		6	2	8
	% Number of customers		75.0%	25.0%	100.0%

Source: Elaborated for the authors

Table 6: Relationship between age group and the implementation of cost accounting

			Implementation of Cost Accounting		Total
			Yes	No	
Age group	Up to 40 years old	Cases	17	18	35
		% Age group	48.6%	51.4%	100.0%
	Over 40 years old	Cases	5	8	13
		% Age group	38.5%	61.5%	100.0%
Total	Cases		22	26	48
	% Age group		45.8%	54.2%	100.0%

Source: Elaborated for the authors

However, the analysis of Table 6 indicates that it is possible to verify that 48.6% of the interviewees aged below 40 stated that they implement cost accounting, as opposed to 51.4% that said they don't. In relation to interviewees aged over 40, the majority stated that in the institutions in which they work cost accounting is still not implemented (61.5%).

4 Conclusions

Thus, it can be concluded that our study provided indication of the utility of cost accounting in many aspects, including the calculation of the cost of goods and services that will be used in the setting of the tariffs and prices to be charged.

Nevertheless, the results of the empirical study allow us to verify that even though almost half of the entities implement cost accounting, only 36% collate the outputs of this system, which should be subsequently used to calculate the value to be charged to customers.

We further ascertained that, in empirical terms, the entities located in coastal regions are those that most implement this branch of accounting. This fact may be the result of the population exodus from inland areas to the coastal regions, which often leads to people with greater knowledge and often greater motivation in living and working in areas with better socio-economic, geographical, cultural and similar such conditions.

Relative to the relationship between entity size and the implementation of cost accounting, we ascertained that the majority of the smaller-sized entities have still not implemented cost accounting, contrary to the larger-sized entities, which have nearly all initiated this process. This result demonstrates that the existence of greater human, financial and material resources in these entities functions as an incentive for the implementation of new systems, an example of which is cost accounting.

Nevertheless, though we may apparently be led to believe that the age group of the interviewees influences the implementation of cost accounting systems, based on the assumption that young people may be more enterprising and open to change, the non-rejection of the null hypothesis, which states the independence of variables, proves that there is no link at all between the implementation of cost accounting and the age group of the interviewees.

It should, however, be noted that despite the fact that we acknowledge the endeavour made up to now, in order to fully implement the objective established in POCAL with regard to cost accounting, we are of the opinion that it is necessary to change the organisational philosophy existing in these entities. On the other hand, we believe, just like Lapsley and Wright (2004), that many public sector decisions, including those related to the setting of tariffs and prices, can and must be based on technical data, but are instead based on political requirements, and this element cannot be ignored

in practical and conceptual analyses.

To terminate, we would like to highlight the main limitations to the study performed and indicate some avenues for future research. Relative to the empirical study, we found that it was often not possible to obtain empirical evidence with regard to the hypotheses formulated due to the limited size of the sample, particularly in relation to the services managed at municipal level and municipal companies.

In relation to avenues for future research, we think that it would be of interest to implement a new study, using the medium and large-sized municipalities and all the services managed at the municipal level of the country with a view to gauging the implementation status of this accounting system and the use of the respective data in setting municipal tariffs and prices.

Thus, our aim is that this study provides an initial start-off point for future research in the field, and we hope that soon the implementation of management accounting in local government becomes a reality, so that more precise data regarding the cost of tasks, goods and services can be obtained.

Bibliography

AECA. (1997): *La Contabilidad de Gestión en las Entidades Públicas*, Documento n.º 15. AECA, Madrid.

Costa Carvalho, J.B.; Fernandes, M.J.; Camões, P.; Jorge, S. (2005): *Anuário Financeiro dos Municípios Portugueses 2003* [Annual Financial Data Book of Portuguese Municipalities - 2003], Fundação para a Ciência e a Tecnologia [Science and Technology Foundation], CTOC, Tribunal de Contas [Court of Auditors], Braga.

Decree-Law no. 54 – A /99, of 22 February – *Approves POCAL*.

FASAB. (1995): *Managerial Cost Accounting Concepts and Standards for the Federal Government*, SFFAS n.º 4, FASB.

IFAC. (2000): *Perspectives on Cost Accounting for Governments – International Public Sector Study*, Study 12, IFAC, New York.

IGAE. (1994): *Contabilidad Analítica de las Administraciones Públicas, El proyecto C.A.N.O.A.*, Intervención General de la Administración del Estado, Madrid.

Jones, R.; Pendlebury, M. (1996): *Public Sector Accounting*, Pitman Publishing, 4th Edition, London.

Lapsley, I.; Wright, E. (2004): “The diffusion of management accounting innovations in the public sector: a research agenda”, *Management Accounting Research*, n.º 15, pp. 355-374.

Law no. 42/98, of 6 August – *Law on Local Government Funding*.

Mendoza, C.; Bescos, P. L. (2001): “An explanatory model of managers’ information needs: implications for management accounting”. *The European Accounting Review*, Vol. 10, n.º 2, pp. 257-289.

Artigo recebido em: Janeiro de 2006 e

Artigo aprovado para publicação em: Abril de 2007.

Endereço dos autores

Teresa do Carmo Salgueiro da Costa

tcosta@ipca.pt

Urb. Qtª da Formiga, Edifício Panorâmico II, Lote 3
Arcozelo - Barcelos - Portugal
4750-117

João Baptista da Costa Carvalho

jcarvalho@eeg.uminho.pt

Campus de Gualtar
Braga - Portugal
4710-057