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Determinants of environmental accounting and reporting practices in Portuguese local entities

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Abstract

Purpose – The purpose of this paper is to develop environmental accounting and reporting practices (EARPs) by Portuguese local entities and their determining factors.

Design/methodology/approach – Data were obtained through a postal survey. In order to measure the degree of development of environmental accounting and reporting practices index was developed, which reflects the extent to which a set of eight EARPs have been implemented by the 69 Portuguese local entities included in the sample. Three variables are considered in this study as possible factors that drive the development of environmental management practices (EMPs) by local entities, namely, size of entity, accounting framework, degree of development of EMPs.

Findings – Results indicate the degree of development of EARPs in Portuguese local entities is low. Additionally, accounting regulation and the degree of development of EMPs are explaining factors of the degree of development of environmental accounting practices in Portuguese local entities.

Originality/value – This study adds to the international research on environmental accounting in public sector by providing empirical data from a country, Portugal, where empirical evidence is still relatively limited.

Keywords Local governments, Environmental reporting, Environmental accounting, Environmental management

Paper type Research paper

Introduction

Since the Rio Earth-Summit in 1992, environmental issues have become increasingly important to private and public sector organisations, regulators, environmentalists and society in general. 20 years later, the green economy was one of the themes for the United Nations Conference on Sustainable Development held in Rio de Janeiro in 2012 (or Rio+20). The green economy has been seen an important tool for sustainable development, because that is inclusive and can drive green growth (United Nations Department of Economic and Social Affairs, 2012).

The green economy “designates a set of activities associated with research, technologies and industries, which are directly geared to improve environmental outcomes, reduce pollution, conserve energy and protect natural resources […]” (Organisation For Economic Co-operation and Development (OECD), 2012, p. 24).
The concept of green growth “is closely related to that of sustainable development, but with more emphasis on growth and on mitigating climate change, which is widely perceived as the major long-term challenge to sustainability” (Bowen, 2012, p. 11).

Public organisations have been submitted to different pressures in order to achieve a balance between economic growth and environmental preservation. According to the European Environment Agency (2011, p. 5), “the green growth, in the long term, it is the only way to sustain economic growth”. The public sector plays a key role in supporting the development of green growth, by linking environmental goals to broader social equity goals, in a sustainable economic development strategy, at the local level (OECD, 2012).

The transition to a green economy poses many challenges for local authorities, because municipalities operate closest to the people and can place green economy policies in a tangible context (Federation of Canadian Municipalities, 2011).

During the last decades many local entities have undergone a number of initiatives to become environmentally friendly by reducing resources consumption and wastage and promoting policies and actions aimed at achieving the sustainable development within their geographical area (Emilsson and Hjelm, 2004). However, the Association of Chartered Certified Accounts (Ball, 2002) argues that the public sector’s inability to make progress towards achieving the objectives of the sustainability agenda can be explained by the lack of an environmental project for the public sector.

In this matter, it is possible to emphasise one of the first initiatives at European level to stimulate the introduction of the Environmental Accounting in the public organisations, that correspond to the Parliamentary Assembly of the Council of Europe, which in 2004 published the Recommendation 1653 (2004), “Environmental accounting as a sustainable development tool”, elaborated based on the report of the Committee on Environment, Agriculture and Territorial Questions. This recommendation considers important that the States Members of the UE become familiar with the concept of Environmental Accounting and begin (or continue to) apply to all levels of administration, particularly at the local level[1].

In fact, the use of advanced environmental management practices (EMPs) (e.g. environmental auditing, environmental management systems, etc.) poses the need of more environmental information, and consequently, the public organisations’ accounting system will have to respond to such informative needs by providing environmental information. The underlying assumption is that accounting can contribute to environmental management process providing information about the organisation’s environmental impacts and the results of the initiatives developed to reduce them (Wilmshurst and Frost, 1998; Bouma and Wolters, 1999).

According to Sulaiman and Ahmad (2006), “environmental matters are now regarded as strategic issues that go beyond mere compliance of environmental regulations. Thus, integrating environmental accounting into mainstream corporate accounting is essential”. In this regard, the potential value of accounting and accountability in promoting sustainability in public sector organisations has been stressed (Guthrie et al., 2010).

Public entities are expected to lead by example in reporting publicly and transparently on their activities to promote sustainability. Nevertheless, environmental and/or sustainability reporting by public entities is still far from the level of development reached in the private sector (Centre for Public Agency Sustainability Reporting (CPASR), 2005).
The extent to which an organisation develops environmental reporting practices is associated with several factors. These factors have been explored in the context of the private sector (Gray et al., 1995, 2001; Deegan et al., 2002; Frost, 2007; Stanny and Ely, 2008). So far, there has been little research on the drivers for public sector organisations to disclose social and environmental information. However, they can differ from those of private companies, and therefore, they require greater consideration (CPASR, 2005). Another under-explored subject in literature has been the extent to which local public entities’ accounting systems are involved in issues associated with environmental management and reporting.

The aim of this paper is to twofold. First, it intends to present a descriptive picture of the current state of environmental accounting and reporting practices (EARPs) in Portuguese local entities. Second, this study aims to examine whether such practices are related to some factors that have been previously found to explain the adoption of environmental and accounting practices by public entities in other countries.

The rest of the paper is organised as follows: following the literature review, three hypotheses are constructed on the impact of several of factors on the extent to which local entities adopt EARPs. The research design is described in the fourth section, including sample selection, research methodology and variables. Results are presented and discussed in the fifth section. It includes both descriptive analysis and the testing of the hypotheses. The final section summarises the main conclusions of the study with a brief discussion on its implications for future research.

**Literature review**

Most research on EARPs has been centred on private corporations (Mathews, 2004; Parker, 2005; Milne and Gray, 2007). As regards public sector organisations, little research has been carried out on them (Ball and Grubnic, 2007; Ball and Bebbington, 2008; Farneti and Guthrie, 2009; Gray et al., 2009; Guthrie et al., 2010).

A review of literature reveals that research into EARPs undertaken by public entities has been headed by Anglo-Saxon countries, mainly the UK and Australia. The majority of empirical studies have focused their attention on the examination of environmental disclosures in annual reports as well as their evolution over time (Gibson and Guthrie, 1995; Burritt and Welch, 1997; Cormier and Gordon, 2001; Frost and Seamer, 2002; McElroy et al., 2005). Recently, the focus of attention has been broadened to include the examination of sustainability reporting practices and their motivations (Guthrie and Farneti, 2008; Farneti and Guthrie, 2009; Sciulli, 2009, 2011; Lodhia et al., 2012; Moneva and Martin, 2012; Mucciaroni, 2012). Overall, these studies found that the social and environmental information disclosure level increased over time, although in comparison with private companies the social and environmental information level disclosed was low. Other studies analysed the adoption of environmental accounting practices by public entities obtaining evidence from postal survey (Frost and Toh, 1998b; Frost and Seamer, 2002) and through case studies (Ball, 2003, 2005; Moore, 2008; Qian et al., 2011). They observed a limited adoption of environmental accounting practices by public entities.

Out of the Anglo-Saxon context, Marcuccio and Steccolini (2005) examined social and environmental disclosures made by 19 Italian local entities as well as their main motivations for disclosing that information and Larrinaga-Gonzalez and Bebbington (2001) studied the adoption of environmental accounting procedures in a Spanish electricity utility. With regard to sustainability reporting, based upon data obtained from a postal survey and informal discussions, the CPASR (2005) analysed sustainability
reporting practices across a sample of 82 public organisations from different countries. Findings suggest an increase of sustainability reporting over time and that such practices appeared to be driven internally.

The motivating factors of the development of EARPs were also a matter of interest in some studies (Frost and Toh, 1998a; Cormier and Gordon, 2001; Frost and Seamer, 2002; McElroy et al., 2005; Qian et al., 2011), which examined a number of organisational attributes and other factors that could potentially lead public entities to adopt such practices. Usually, it has been found that the regulatory context (specifically, the existence of compulsory environmental reporting guidelines, standards or regulations) and those characteristics related to political visibility (mainly entity size and environmental sensitivity of entity’s activities) have an influence on the development of EARPs by public sector entities (Frost and Toh, 1998a; Frost and Seamer, 2002; Qian et al., 2011). Other internal and external factors were also found to influence the extent to which public entities develop EARPs, including variables such as location of the entity (McElroy et al., 2005), source of funding (Burritt and Welch, 1997; Frost and Seamer, 2002), management attitudes towards environmental protection (Frost and Toh, 1998a), community’s expectations regarding local entity’s environmental performance (Qian et al., 2011), the development of EMPs (Frost and Seamer, 2002) and the complexity of environmental management operations (Qian et al., 2011).

From a theoretical standpoint, several theories have been used to explain the motivations for adopting EARPs. Amongst the theories employed by the majority of studies on this subject are included the stakeholder theory and the legitimacy theory (Thomson, 2007; Monteiro and Aibar-Guzman, 2010b; Qian et al., 2011). The achievement of legitimacy plays an essential role in these theories. They share the view of legitimacy as an aim to be reached by organisations through actions and behaviours which conform, or appear to conform, to social beliefs and values (Qian et al., 2011). Nevertheless, their focus differs. On the other hand, Qian et al. (2011) combined the theoretical arguments of institutional theory and contingency theory to explain the motivations of local governments for adopting environmental management accounting practices and found that both theories can be used in a complementary way.

Within the Portuguese context, very little evidence is available relating to EARPs. To date, the only attempt to investigate the EARPs in Portuguese public entities is Ribeiro and Aibar-Guzman’s (2010) study, which examined 62 local entities. They found that entity size and the degree of development of EMPs had an impact on the extent to which those entities implement environmental accounting practices.

Hypotheses

Previous literature on determinants of EARPs has identified several variables that could explain the extent to which such practices are implemented by an organisation. In this study, three of those variables have been considered as potential factors that drive the development of EARPs in Portuguese local entities. The following discussion relates to the construction of the hypotheses on the influence of those variables on the degree of development of such practices.

Size (SIZE)

Previous research has frequently considered the influence of organisational size on the use of EARPs by public organisations (Frost and Toh, 1998a; Frost and Seamer, 2002; Ribeiro and Aibar-Guzman, 2010; Mucciaroni, 2012). These studies argue that size plays an important role in the extent to which local entities are able to obtain financial
and technical resources. As Portuguese local entities are concerned, the amount of financial funds that they receive from the country’s general budget depends on their dimension in such a way that it tends to fall proportionally as entity size drops. Therefore, smaller local entities usually lack resources when undertaking environmental accounting initiatives. Consequently, it can be argued that it is more likely that larger entities implement EARPs than smaller ones.

Size also influences the extent to which an organisation is visible in its stakeholders’ eyes. Frost and Seamer (2002) consider that larger public entities are more “politically visible”, and therefore, they are more likely to be scrutinised by stakeholders than smaller entities. According to these authors, large entities face greater public pressures relative to the way in which they respond to environmental concerns. Thus, they argue that, presumably due to visibility concerns, the tendency towards the adoption of EARPs will be higher in larger public entities compared to smaller entities.

Moreover, because of their organisational size, larger local entities are more likely to have higher environmental impacts (resources consumption, waste production, etc.). As a result, they tend to be more proactive about the implementation of environmental management and accounting practices than smaller ones (Emilsson and Hjelm, 2002). Therefore, a positive relation is predicted between organisational size and the extent to which an organisation develops such practices. This hypothesis is formally stated as follows:

\[ H1. \text{The level of development of EARPs is positively related to the entity size.} \]

**Accounting framework (ACC)**

Previous studies found that environmental disclosure practices are influenced by the existence of environmental accounting standards (Holland and Foo, 2003; Larrinaga et al., 2002; Criado-Jiménez et al., 2008; Monteiro and Aíbar-Guzman, 2010a; Lodhia et al., 2012). In this regard, the absence of environmental accounting guidelines has been considered as one causal factor that explains the limited adoption of environmental accounting practices (Moore, 2008). The underlying assumption is that there could be a link between the existence of environmental accounting standards and the use of environmental accounting practices by those organisations subjected to such regulation. In order to examine this proposition, some features from the Portuguese accounting regulatory framework are explained.

The Portuguese Accounting Standard Commission is the Portuguese accounting standards setter. Portuguese city councils have to comply with the accounting principles, valuation rules and mandatory models of financial statements set in the Local Government Official Accounting Plan (LGOAP). Alternatively, the accounting standards and the general accounting principles to be followed by Portuguese companies (both private businesses and municipal companies) are compiled in the Accounting Standardisation System (ASS), which is comprised of several standards focused on particular matters. With regard to environmental information, there is an accounting standard – the Accounting and Financial Reporting Standard 26 (AFRS 26): Environmental Matters, which came into force in 2010. The AFRS 26 replaced the first Portuguese accounting standard on environmental matters, the Accounting Standard 29 (AS 29), which had been issued in 2002 (although it came into force in 2006).

The AFRS 26 obliges all Portuguese companies subjected to the ASS to disclose environmental information and regulates the required disclosures. Thus, municipal companies have to comply with the AFRS 26’s requirements, whereas there
are no mandatory environmental accounting standards for the inclusion of environmental matters in city councils’ financial statements. According to Monteiro and Aibar-Guzman (2010a), the absence of mandatory reporting requirements on environmental matters in Portugal hindered the integration of environmental concerns in the Portuguese companies’ accounting information system. Consequently, it is expected that the entities subjected to the ASS, and therefore, to the environmental reporting requirements established by the AFRS 26 will disclose more environmental information than those organisations subjected to the LGOAP. This suggests that the type of accounting framework that is applicable to an entity can be considered to be a potential determining factor of the degree of development of EARPs by that entity. Thus, the following hypothesis was formally stated:

\[ H_2. \text{ The level of development of EARPs is related to the type of accounting framework which is applicable to an entity.} \]

**Degree of development of EMPs**

According to Frost and Seamer (2002), there is a two-way relationship between environmental reporting and the level of development of EMPs. On the one hand, Moore (2008) and Qian et al. (2011) highlight the importance of environmental accounting practices for an adequate environmental management. Moreover, environmental reporting can contribute to improve environmental management process (Wilmshurst and Frost, 1998; Frost and Seamer, 2002; Qian et al., 2011). Indeed, the interest in disclosing environmental information can motivate an organisation to implement advanced EMPs that allow it to obtain successful environmental performance results which will be disclosed.

On the other hand, the environmental reporting function requires an informative basis which can be provided by the information produced by environmental management systems and other environmental management tools (Frost and Seamer, 2002). Therefore, it is more likely that those entities that are more forthcoming about the implementation of EMPs disclose environmental information and develop EARPs.

Thus, a hypothesis concerning the influence of an organisation’s degree of development of EMPs on the extent to which that organisation develops EARPs can be put forward as follow:

\[ H_3. \text{ The degree of development of EARPs is positively related to the degree of development of EMPs.} \]

**Research design**

**Sample**

The study is focused on Portuguese local entities. A representative sample was chosen which consists of medium-sized and large size city councils and the municipally owned companies belonging to those municipalities. This choice is justified by the fact that the scarcity of financial and technical resources is a common problem in the local public sector (Emilsson and Hjelm, 2004). This means that, often, local entities cannot afford to spend their limited resources in implementing environmental management and accounting practices. As stated earlier, both financial resources and functional organisation of Portuguese local entities depend on their dimension: the greater the number of inhabitants of a municipality, the greater its financial and technical resources. Therefore, it can be argued that larger entities are more likely to implement environmental management and accounting practices than smaller ones.
City councils’ size was defined by the number of inhabitants of their municipalities. Such a criterion was selected because it has been widely used in previous studies on local entities (Frost and Seamer, 2002; McElroy et al., 2005; Emilsson and Hjelm, 2005). Moreover, as far as Portuguese city councils are concerned, the number of inhabitants of municipalities is the main determinant of both their functional and political organisation and the amount of funds that they receive from the country’s general budget (Carvalho et al., 2012).

Carvalho et al. (2012) classified Portuguese city councils into three groups – small, medium and large – according to their number of inhabitants. Small city councils have 20,000 inhabitants or less; medium-sized city councils have a population greater than 20,000 and fewer than 100,000 inhabitants, and finally, large city councils have more than 100,000 inhabitants. In total, in Portugal there are 129 city councils which can be classified as medium-sized and large. This study concentrates on such entities.

The sample also includes the municipally owned companies belonging to the selected city councils. There are several reasons why such companies were included in the sample. First, because there is a strong relationship between them and city councils since the latter own all or most of their capital. Moreover, city councils can delegate the provision of some public services (such as waste management, water supply, sewerage, etc.) to the municipal companies owned by them. Second, municipal companies are part of the wide range of organisations that make up the public sector. Finally, in contrast to city councils, municipally owned companies have to comply with the environmental reporting requirements established by the AFRS 26. Accordingly, their inclusion within the sample could provide some interesting insights regarding the impact of accounting regulation on the development of EARPs.

The target population comprised 205 entities in total, 129 of which were city councils and 76 municipally owned companies. A letter was sent to each selected entity explaining the purpose of the study and requesting participation. A positive answer was obtained from 69 entities. Therefore, the final sample consists of 69 entities, which represents 33.7 per cent of the initially selected entities. Table I presents the distribution of the target population and the final sample by type of entity and shows the proportion of the target population represented by the final sample.

### Methodology

A postal survey was used to collect data. This method was chosen because it generates a high quantity of data that can be easily measured. The questionnaire was developed based on the research questions and previous research on environmental practices. To reduce the response bias, the questionnaire mainly consisted of closed questions. Most of them were dichotomous. There were also some multi-choice questions as well as others that sought to measure the extent to which respondents agreed upon a set of statements. Some open questions were also included to allow respondents to express their opinions.

<table>
<thead>
<tr>
<th>Type of entity</th>
<th>Number of entities (population)</th>
<th>%</th>
<th>Number of entities (sample)</th>
<th>%</th>
<th>% Sample over population</th>
</tr>
</thead>
<tbody>
<tr>
<td>City councils</td>
<td>129</td>
<td>62.9</td>
<td>56</td>
<td>81.2</td>
<td>43.4</td>
</tr>
<tr>
<td>Municipal companies</td>
<td>76</td>
<td>37.1</td>
<td>13</td>
<td>18.8</td>
<td>17.1</td>
</tr>
<tr>
<td>Total</td>
<td>205</td>
<td>100.0</td>
<td>69</td>
<td>100.0</td>
<td>33.7</td>
</tr>
</tbody>
</table>

Table I. Distribution by type of entity
The questionnaire consisted of three groups of questions. The first was concerned entities' features. Thus, city councils were asked about their number of inhabitants, annual budget, number of employees, total assets and location, whereas municipal companies were asked about their type of activity, the percentage of their capital owned by the city council, number of employees, total assets, revenues, etc. The second group of questions consisted of 19 questions chosen to obtain an overview of the general environmental management work developed by the entities. Finally, the third group of questions contained ten questions concerned EARPs as well as the extent to which the accounting department was involved in environmental issues.

Before being sent out, the questionnaire was tested on managers belonging to the area responsible for the environmental management in some local entities in order to assess its understanding by its potential respondents. The manager who was in charge of environmental issues in each entity was considered the most appropriate person to fill in the questionnaire because her/his overall knowledge of the environmental practices carried out by the entity.

The questionnaires were sent in June 2012, enclosing a letter explaining that they had to be completed by the environmental manager or her/his equivalent. In December 2012, those entities that had not answered were contacted again, first by post and later by phone. The deadline was 31 March 2013. At that date 69 valid answers were obtained generating a 33.7 per cent return rate. This response rate is lower than the rate obtained by previous studies (Frost and Seamer, 2002; Emilsson and Hjelm, 2002). However, it is similar to Ribeiro and Aibar-Guzman’s (2010) and can be considered acceptable taking into consideration the current situation of Portuguese local entities.

**Variables**

This study employs three variables which have been identified in previous literature as plausible factors influencing the development of EARPs by local entities. In this section, these variables are described. Furthermore, an explanation of the construction of the dependent variable (the degree of development of EARPs) is provided.

**Explanatory variables.** Size. A number of variables are often used for defining organisational size. The proxy adopted in this study was turnover (volume of sales and/or provided services). Even though Frost and Seamer (2002) argued that this proxy should be treated with caution when analysing public sector entities, there are two reasons why it was used in this study. First, the sample selection was focused on medium-sized and large city councils according to their number of inhabitants. Thus, another proxy for city councils’ size has been employed. Second, the sample also includes municipally owned companies, which compete in the market by seeking to improve their sales and obtain benefits. In this study the natural logarithm of the entities' turnover for 2011 was used as the size variable (SIZE).

Accounting framework. This variable (ACC) was defined as a dichotomous variable which assumes a value of one if the entity is subjected to the ASS (and to the AFRS 26), and a value of 0 if it is subjected to the LGOAP.

Degree of development of EMPs. In a previous study, Ribeiro and Aibar-Guzman (2010) developed an index for measuring the procedures and tools implemented by local entities for the purpose of managing their environmental affairs. In this study such an index was used to measure the level of development of EMPs (the index is reported in Appendix 1). In calculating the index, the following criterion was applied: it was assigned a value of one if the entity had implemented the EMP under consideration and
it was assigned a value of 0 in the opposite case. Thus, the value of the environmental management practices index (EMPI) of each entity was calculated as the ratio of the computed total score (which can range from 0 to 16) to the maximum number of points that an entity can obtain (the 16 environmentally related practices that make up the index).

Dependent variable: development of EARPs. The level of development of EARPs was also assessed by using the index developed by Ribeiro and Aibar-Guzman (2010) to measure the extent to which several environmentally related accounting and reporting practices have been developed by local entities. Such an index (named environmental accounting and reporting practices index (EARPI)) is the dependent variable in this study (the index is reported in Appendix 2). The value of the index was calculated by following the same procedure as previously used to calculate the EMPI.

With the aim of identifying the factors that have a significant influence on the adoption of EARPs by local entities, a multivariate analysis was carried out through the following regression model, which predicts a positive relationship between the EARPI and all explanatory variables:

\[
\text{EARPI} = \alpha_0 + \beta_1 \text{SIZE} + \beta_2 \text{ACC} + \beta_3 \text{EMPI} + \epsilon_i
\]

where EARPI, environmental accounting and reporting practices index; SIZE, entity size, measured as the log of turnover for 2011; ACC: accounting framework, variable dummy with a value of 1 if the entity is subjected to ASS (and to the AFRS 26) and 0 if the entity is subjected to LGOAP; EMPI, environmental management practices index; \(\alpha_0\), constant; \(\epsilon_i\), residual.

Results and discussion
In this section, a descriptive analysis of the level of development of EARPs by Portuguese local entities is presented and a snapshot of the EARPs carried out by those organisations is provided. Additionally, the results regarding the influence of the explanatory variables on the degree of development of the EARPs included in the index are analysed and some general insights are drawn.

EARPs in Portuguese local entities
Table II presents the average value of the EARPI. The average value of the EARPI (0.4022) is relatively low, both at global level and for each type of entity. This indicates that the extent to which the environmental issues are integrated in the accounting system of local entities is low. Nevertheless, the average value of the EARPI is slightly higher than the value obtained by Ribeiro and Aibar-Guzman (2010), which indicates a positive evolution of the level of development of such practices in Portuguese local sector.

<table>
<thead>
<tr>
<th>Entity type</th>
<th>n</th>
<th>EARPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Council</td>
<td>56</td>
<td>0.5134 (Minimum: 0; Maximum: 0.91)</td>
</tr>
<tr>
<td>Municipal company</td>
<td>13</td>
<td>0.2073 (Minimum: 0; Maximum: 0.77)</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>0.4022 (Minimum: 0; Maximum: 0.91)</td>
</tr>
</tbody>
</table>
The degree of development of EARPs is much higher in city councils than in municipally owned companies. However, this result could be attributed to the fact that city councils constitute most of the sample. Lastly, it is interesting to note that in both types of entities the minimum value obtained by the EARPI was 0, which indicates that some of the analysed entities did not carry out any of the practices that compose the index.

Table III provides additional insight into the EARPs developed by sample entities. It can be said that the environmentally related accounting practices that are carried out by most of the analysed entities were the allocation of budgetary funds to environmental projects or initiatives (79 per cent), the accounting recognition of environmental issues (74.2 per cent) and the disclosure of environmental financial information in the annual report (61.3 per cent). In contrast, the computation of environmental costs, the disclosure of environmental financial information in reports and means other than the annual report, the elaboration of environmental budgets and the elaboration of environmental management indicators were the practices that showed a lower level of development by the sample entities (8.1, 14.5, 19.4 and 25.8 per cent, respectively).

With regard to the accounting recognition of environmental issues, Table IV reveals that the issues more considered by the accounting system of the analysed entities were operating environmental expenses (66.1 per cent) and environmental investments (54.8 per cent). These results are consistent with Frost and Toh’s (1998b). They analysed 76 Australian public sector entities and found that over half included environmental issues within their capital budgets and expenditure system. Furthermore, it could be argued that the fact that the majority of entities allocate budgetary funds to environmentally related projects (Table III) can be related to the high percentage of entities that carry out the accounting recognition of their environmental investments (Table IV).

<table>
<thead>
<tr>
<th>Environmental accounting and reporting practices</th>
<th>% of entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elaboration of environmental budgets</td>
<td>19.4</td>
</tr>
<tr>
<td>Computation of environmental costs</td>
<td>8.1</td>
</tr>
<tr>
<td>Elaboration of environmental management indicators</td>
<td>25.8</td>
</tr>
<tr>
<td>Allocation of budgetary funds to environmental projects or initiatives</td>
<td>79</td>
</tr>
<tr>
<td>Accounting recognition of environmental issues</td>
<td>74.2</td>
</tr>
<tr>
<td>Disclosure of environmental financial information in the annual report</td>
<td>61.3</td>
</tr>
<tr>
<td>Involvement of the accounting department in the elaboration of environmental reports or sustainability reports</td>
<td>32.3</td>
</tr>
<tr>
<td>Disclosure of environmental financial information in reports and means other than the annual report</td>
<td>14.5</td>
</tr>
</tbody>
</table>

Table III. Environmental accounting and reporting practices developed by Portuguese local entities

<table>
<thead>
<tr>
<th>Environmental matters</th>
<th>% of entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating environmental expenses</td>
<td>66.1</td>
</tr>
<tr>
<td>Environmental investments</td>
<td>54.8</td>
</tr>
<tr>
<td>Environmental incentives that have been obtained</td>
<td>38.7</td>
</tr>
<tr>
<td>Environmental incentives that have been awarded</td>
<td>25.8</td>
</tr>
<tr>
<td>Extraordinary environmental expenses</td>
<td>17.7</td>
</tr>
<tr>
<td>Environmental contingent liabilities</td>
<td>4.8</td>
</tr>
<tr>
<td>Environmental provisions</td>
<td>1.6</td>
</tr>
<tr>
<td>None</td>
<td>19.4</td>
</tr>
</tbody>
</table>

Table IV. Environmental matters recognised by the accounting system
Only a few entities noted that their accounting system considered environmental contingent liabilities and environmental provisions (1.6 and 4.8 per cent, respectively). Finally, it must be stressed that 19.4 per cent of the entities pointed out that they did not carry out the accounting recognition of any environmental issue.

The computation of environmental costs was the environmental accounting practice carried out by the lowest percentage of entities (8.1 per cent). Overall, environmental costs are not estimated but they are charged directly to results. This low percentage could be explained by the fact that only 25.8 per cent of the entities have implemented a cost accounting system. This result contrasts with Frost and Toh’s (1998b) findings, where many entities indicated that they developed accounting procedures to track the costs related to waste and consumption of energy. This finding also differs from the results of Moore’s (2008) case study, where environment-related costs were integrated into direct cost categories.

With regard to environmental management indicators, they were mainly of technical nature and were mostly used for assessing the consumption of natural resources and fuel. In most cases (87.5 per cent) targets connected with these measures were established. Moreover, 75 per cent of the entities disclosed such indicators. Finally, in addition to technical measures, financial indicators are elaborated by 43.8 per cent of entities.

Finally, it can be said that the involvement of the accounting department in the elaboration of the environmental report and/or the sustainability report was low. Indeed, the accounting department was not involved in environmental management and reporting in the majority of analysed entities (67.7 per cent). Moreover, in the remaining entities it played a marginal role in producing such reports. These findings are consistent with previous studies’ results (CPASR, 2005; Moore, 2008; Farneti and Guthrie, 2009), which also observed a limited involvement of the accounting department in environmental management and reporting in local entities.

Determining factors of the development of EARPs in Portuguese local entities

In this section, the testing of the hypotheses regarding the influence of the explanatory variables on the degree of development of EARPs is carried out and the findings are analysed.

Table V reports the results of the Pearson’s correlation analysis among the variables included in the regression model and their significance level. As can be seen, the explanatory variable that is most correlated to the EARPI is the level of development of EMPs. Its Pearson’s correlation is equal to 0.476 and it is statistically significant at 5 per cent level. After the EMPI, the following explanatory variable that is most correlated to the EARPI is the accounting framework (ACC). Its Pearson’s correlation is positive and equal to 0.384. Finally, although the variable size (SIZE) shows a low correlation to the EARPI (its Pearson’s correlation is equal to 0.265), it is statistically significant ($p$-value<0.05).

<table>
<thead>
<tr>
<th></th>
<th>EARPI</th>
<th>SIZE</th>
<th>ACC</th>
<th>EMPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>EARPI</td>
<td>1.000</td>
<td>0.265 (0.028)</td>
<td>0.384 (0.004)</td>
<td>0.476 (0.000)</td>
</tr>
<tr>
<td>SIZE</td>
<td>1.000</td>
<td>0.635 (0.000)</td>
<td>0.361 (0.004)</td>
<td></td>
</tr>
<tr>
<td>ACC</td>
<td>1.000</td>
<td>0.251 (0.051)</td>
<td>0.251 (0.051)</td>
<td>1.000</td>
</tr>
<tr>
<td>EMPI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table V. Pearson’s correlation matrix
The stepwise method was used to estimate the regression model and to determine which of the explanatory variables better explain the dependent variable. Table VI shows the results of the stepwise regression. As can be seen, following that process the first explanatory variable to be introduced into the regression model was the EMPI. The next (and the last) explanatory variable that can be introduced into the regression model was ACC. These two variables provide a statistically significant explanation of the dependent variable. Moreover, the addition of the third-explanatory variable that had been initially considered (SIZE) does not improve the explanatory power of the model.

The results are significant with an adjusted $R^2$ of 0.408, which implies that the final model explains 40.8 per cent of the total variance of the EARPI. Therefore, it can be said that its explanatory power is reasonable. Furthermore, the value of the adjusted $R^2$ of 0.395 is consistent with Frost and Seamer (2002). According to the results showed in Table VI, the estimated final model can be expressed as follows:

$$\text{EARPI} = 0.069 + 0.435 \text{EMPI} + 0.152 \text{ACC}$$

These findings are consistent with the Pearson’s correlations presented in Table V, which gave indications that those variables (EMPI and ACC) would be the explanatory variables in the model, as they had the highest Pearson’s correlation values. The regression results suggest that the level of development of EARPs (as measured by the EARPI) is higher for those entities that have higher values of the EMPI. Additionally, the degree of development of EARPs is related to the kind of accounting framework applicable to an entity.

These results are consistent with the $t$-test results and the $F$-statistic (Table VI). A $t$-test was performed to assess the statistical signification of the hypothesised relations between the EARPI and these explanatory variables. Its results indicate that the differences are statistically significant both for the EMPI and the variable ACC at the level of 0.05. Additionally, the $F$-statistic is significant, validating the model in general terms. Therefore, it can be affirmed that they are important factors in explaining the degree of development of EARPs. According to these findings, the hypotheses concerning the influence of the accounting framework (H2) and the level of development of EMPs (H3) provide an acceptable basis for explaining the extent to which Portuguese local entities carry out EARPs.

With regard to H2, the findings suggest that the development of EARPs by an entity is positively related to the existence of environmental accounting compulsory

<table>
<thead>
<tr>
<th>Model</th>
<th>Non-standardized coefficient</th>
<th>Standardized coefficient</th>
<th>t-statistic</th>
<th>ns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constant</td>
<td>0.151</td>
<td>0.046</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EMPI</td>
<td>0.472</td>
<td>0.091</td>
<td>5.185</td>
</tr>
<tr>
<td>2</td>
<td>Constant</td>
<td>0.069</td>
<td>0.059</td>
<td>1.017</td>
</tr>
<tr>
<td></td>
<td>EMPI</td>
<td>0.435</td>
<td>0.086</td>
<td>4.676</td>
</tr>
<tr>
<td></td>
<td>ACC</td>
<td>0.152</td>
<td>0.068</td>
<td>2.298</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>ANOVA</th>
<th>Squared sum</th>
<th>g.l.</th>
<th>$F$-statistic</th>
<th>ns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>0.852</td>
<td>1</td>
<td>26.993</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>1.870</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.760</td>
<td>68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>1.003</td>
<td>2</td>
<td>17.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>1.729</td>
<td>66</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.730</td>
<td>68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table VI. Results of stepwise regression analysis
standards that it has to comply with. These results are consistent with McElroy et al. (2005) and Qian et al.’s (2011) findings, which found that environmental reporting requirements influenced on the adoption of EARPs by Australian local governments. In the Portuguese context, Monteiro and Aibar-Guzman (2010a) also observed that the AS 29 appeared to have influenced on the increase in environmental disclosures made by Portuguese companies. Nevertheless, Ribeiro and Aibar-Guzman’s (2010) results contradicts the findings obtained in this study concerning the influence of the accounting framework. They did not find empirical evidence supporting the argument that the existence of mandatory environmental accounting standards is positively associated with the level of development of EARPs. A likely explanation of this contradiction could be that, at the time of Ribeiro and Aibar-Guzman’s (2010) study, the AS 29 had been issued but it was not in force, whereas this study has been developed several years after the standard came into force.

The significance of the accounting framework appears to provide two alternative explanations for the degree of development of EARPs in Portuguese local entities. First, as indicated above, the significance of the accounting framework may suggest that it is more likely that entities subjected to mandatory environmental accounting standards adopt EARPs. Second, this result might just be a consequence of the fact that the sample is composed of two kinds of entities, which are not only subjected to different accounting frameworks but also perform activities whose effects on the environment are distinct. Consequently, the strength of the pressures faced by them to reduce the environmental impacts caused by their activities is also different. Accordingly, it could be said that the environmental sensitivity of the entities’ activities could be what is behind this result, as the municipally owned companies that make up the sample apart from having to comply with an environmental accounting compulsory standard also (the majority) carry out environmentally sensitive activities. This argument is consistent with previous studies’ findings (Frost and Toh, 1998a; Frost and Seamer, 2002), which reported that the degree of development of environmental accounting practices by local entities was significantly associated with the environmental sensitivity of their activities.

In summary, although it is possible to appreciate some influence of the AFRS 26 on the value of the EARPI, within the ambit of the sample, this alone does not conclusively prove the argument that the existence of an environmental accounting compulsory standard is an important determining factor of the level of development of EARPs. In consequence, further analysis would be necessary.

The significance of the EMPI variable provides empirical support to H3, which posited that the level of development of EMPs and EARPs are related. This result is consistent with previous studies’ findings (Ball, 2003; Frost and Toh, 1998a; Frost and Seamer, 2002; Marcuccio and Steccolini, 2005; Ribeiro and Aibar-Guzman, 2010), which also found that those local entities which were more forthcoming about the implementation of EMPs showed a higher degree of development of EARPs than the remaining local entities.

Lastly, the hypothesis concerning the influence of organisational size (H1) was rejected by the analysis, since no significant relationship was found between the SIZE variable and the value of the EARPI. Within the ambit of the sample, the size of an entity does not appear to be a determining factor of the extent to which that entity develops the EARPs included in the EARPI. This result contrasts strikingly with previous studies’ findings, which both in Australia (Frost and Toh, 1998a; Frost and Seamer, 2002) and in Portugal (Ribeiro and Aibar-Guzman, 2010) found that larger local entities had a higher degree of development of EARPs compared to smaller ones.
Conclusion
Although several authors (CPASR, 2005; Guthrie et al., 2010) have highlighted the need to understand public entities’ current sustainability reporting practices, little research has been conducted in this field (Ball and Grubnic, 2007; Guthrie and Farneti, 2008; Farneti and Guthrie, 2009). Moreover, understanding the drivers for public sector organisations to adopt EARPs may help to promote the spread of such practices (CPASR, 2005; Qian et al., 2011). This study responds to recent calls for more research on both subjects.

First, this study sought to add to this literature by offering a general overview and analysis of the current state of EARPs in Portuguese local entities. Overall, evidence indicates that the extent to which those entities have developed EARPs is low. The incidence of such practices is lower in Portuguese local sector than in other countries, such as Australia and the UK. Therefore, in can be concluded that Portuguese local entities are lagging behind other countries in the development of EARPs. This result could be attributed to the fact that the implementation of new practices in the Portuguese public local sector usually takes place when required by law and to date there are no environmental reporting requirements that affect city councils (which were in the majority in the sample).

This study also sought to identify the factors that influence the degree of development of EARPs by Portuguese local entities. The empirical findings suggest that two factors, namely, the level of development of EMPs and the accounting regulation, have potential to explain the extent to which those entities have adopted EARPs. Both factors were positively and statistically associated with the level of development of EARPs by Portuguese local entities, supporting two of the advanced hypotheses. Finally, no significant relationship was found between organisational size and the value of the EARPs. Therefore, the hypothesis concerning the influence of the SIZE variable was rejected by the analysis. This result is not consistent with those obtained in earlier studies on both Portuguese private companies (Monteiro and Aibar-Guzman, 2010b) and Portuguese local entities (Ribeiro and Aibar-Guzman, 2010), which suggests that the interplay between the size of local entities and the level of development of EARPs is not clear in Portugal.

This study suffers several limitations, which may influence the findings of this study and have to be considered in their analysis and interpretation. First, the paper only explores environmental reporting, and does not include social or sustainability issues. Second, the sample was mostly composed of city councils, which, in some cases, could influence results. Third, though a postal survey was considered as the most suitable method to gather the data, it has some weaknesses related to the fact that both the questions and the provided answers can be subjectively interpreted. Finally, this study did not analyse other variables that can be important determining factors of EARPs.

As stated previously, little evidence is available relating to EARPs in Portuguese public sector. This paper aimed to contribute to the existing literature by providing knowledge concerning the Portuguese local entities setting, extending the scope of the current understanding of the EARPs and their determinants. Although, this study focused on Portuguese local sector situation, some of its results could be interesting in other countries. Moreover, they provided a descriptive picture of current public local sector EARPs in Portugal as well as some interesting insights into the different factors that influence the degree of development of such practices. This could be especially useful for regulators and policy-makers in order to enhance environmental disclosure. Therefore, a research agenda can be established from the findings of this study.

Determinants of EARPs
It would be interesting to investigate the influence of other factors. Thus, other factors related to the level of scrutiny or political visibility could be analysed. Another potential explaining factor could be the political composition of local authorities since it could lead to different attitudes towards environmental matters (Emilsson and Hjelm, 2005). An interesting idea for future studies would be to adopt a theoretical framework in order to interpret the motivations underlying the adoption of EARPs.

Finally, this paper provides a basis for further research on sustainability reporting ensuring that organisations embrace their performance on three levels: economic, environmental and social. In response to this need, the indexes could be up-dated by adding these issues. Future studies should focus on the Sector Supplement for Public Agencies issued by the Global Reporting Initiative (2005) which contains recommendations on sustainability evaluation based on performance indicators grouped into economic, environmental and social categories.

Moreover, the trend of the future model on reporting is the Integrated Report (IR)[2], a single report that should be the organisation’s primary report. The core objective of the IR Framework is to demonstrate the relationships between an organisation’s strategy, governance and financial performance and the social, environmental and economic context within which it operates.

Notes

1. Internationally, we also highlight the Global Reporting Initiative (GRI, 2006) that promotes some directives towards the elaboration of sustainability reports, and particularly in the public sector GRI has published in 2005 the Sector Supplement for Public Agencies – Pilot version 1.0, meant for the “public agencies” at all governmental levels.

2. The International Integrated Reporting Council is a global coalition of regulators, investors, companies, standard setters, the accounting profession and NGOs. Together, this coalition shares the view that communication about value creation should be the next step in the evolution of corporate reporting (International Integrated Reporting Council, 2013a, b).

References


**Further reading**


**Appendix 1. The environmental management practices index**

- Existence of an environmental department.
- Definition of an environmental policy.
- Definition of plans of environmental actions to be undertaken.
- Implementation of an environmental management system.
- Environmental diagnosis.
Development of environmental control mechanisms.
Training actions on environmental protection.
Development of documentation to support environmental management.
Elaboration of environmental indicators.
Disclosure of environmental indicators.
Elaboration of environmental information.
Disclosure of environmental information.
Elaboration of environmental reports and/or sustainability reports.
Disclosure of environmental report and/or sustainability reports.
Elaboration of environmental information of general scope to be disclosed via the media, brochures, internet, etc.
Disclosure of environmental information of general scope via the media, the organisation’s website, brochures, etc.

Source: Ribeiro and Aibar-Guzman (2010, pp. 412-413)

Appendix 2. The environmental accounting and reporting practices index

- Elaboration of environmental budgets.
- Computation of environmental costs.
- Elaboration of environmental management indicators.
- Allocation of budgetary funds to environmental projects or initiatives.
- Accounting recognition of environmental issues.
- Disclosure of environmental financial information in the annual reports.
- Involvement of the accounting department in the elaboration of environmental report or sustainability reports.
- Disclosure of environmental financial information in reports and means other than the annual report.

Source: Ribeiro and Aibar-Guzman (2010, pp. 411-412)

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