

Accounting for Sustainability—Could Cost Accounting Be the Right Tool?



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1 Introduction

The last few decades have witnessed the increasing pressures for organizations to behave in a socially and environmentally responsible fashion, and businesses have started to acknowledge the importance of sustainability, embracing the sustainability rhetoric in their external reporting and in their mission statement (Gond et al. 2012; Ditillo and Lisi 2016). In parallel, sustainability accounting research has attracted increasing scholarly attention (see, e.g., Burritt and Schaltegger 2010; Gray 2010; Hopwood et al. 2010; Songini et al. 2013; Bebbington and Larrinaga 2014) with a focus on external reporting (Hahn and Kunen 2013; Thijssens et al. 2016).

One area that has not yet been investigated in depth is related to the capability of existing corporate accounting systems to measure sustainability (Joshi and Li 2016).

In literature, there is a debate about the usefulness and capability of corporate accounting systems to optimally address sustainability. Some authors believe that it is questionable if firms' accounting systems will ever be able to address these broader system sustainability concerns, because of the primacy of the entity concept in accounting; sustainability is an outcome of aggregate and complex effects of actions of many firms and agents, and characterizing and assessing these sustainability effects are beyond the information generation capabilities of firms' financial accounting systems, which are limited by the entity concept and that focus on monetary transactions (Burritt and Schaltegger 2010).

While the chapter is the result of a joint effort of the authors, the individual contributions are as follows: Franco Rubino wrote Sects. 3, 4 and 6; Stefania Veltri wrote Sects. 1, 2 and 5.

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On the other hand, accountants appear to be comfortable with the concept of a going concern, which is similar to the concept of a sustainable organization. Moreover, environmental accounting at a firm level can provide useful information for managerial decision making.

While the debate is going on, sustainability accounting systems will be needed to meet the information needs of external stakeholders, which will increasingly seek information on the environmental and social effects of business operations and, more importantly, to facilitate strategically material internal decisions by managers (Gond et al. 2012; Caputo et al. 2017).

Development of such instrumental sustainability accounting systems will require the accounting profession to step outside its comfort zone and measure and manage external environmental and social impacts. Extending the boundary of analysis beyond the “entity” has implications for both accounting and management control system design.

The chapter intends to intervene in this lively debate about the usefulness and capability of corporate accounting systems to address sustainability optimally by taking into consideration positive and negative positions as regards the sustainability of accounting. It also aims to imagine if and how an accounting for sustainability might emerge and what possibilities could arise for accounting in the light of a sustainability science approach.

The aim of this contribution is to consider the potential of full-cost accounting for sustainability at organizational level, by exploring the theoretical and empirical literature on the potentiality and the use of full-cost accounting to measure and manage sustainability, the same methodology used by Correa and Larrinaga (2015) for the engagement research.

The rest of the chapter is structured as follows. The next section discusses the notion of sustainability we refer to in the chapter. The third section describes the reasons why we hypothesize a possible link between sustainability and (full) cost accounting, while the fourth section illustrates the methodology followed to address the chapter’s aim. Fifth section highlight the results of our review, while the sixth section provides some concluding comments.

2 What We Mean for Sustainability

In the chapter, we refer to sustainability or sustainable development at organizational level. To define sustainability, we refer to Dyllick and Hockerts (2002), who defined sustainability as “meeting the needs of a firm’s direct and indirect stakeholders without compromising its ability to meet the needs of future stakeholders as well.” This definition is an application at corporate level of the definition of sustainable development given by the World Commission on Environment and Development in the Brundtland Report, according to which a sustainable development is a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN WCED 1987, p. 8). We believe that it is important

to underline the differences existing between the concepts of sustainable development, corporate sustainability, and CSR, which are closely related concepts focusing on stakeholder relations management but at different levels of action. Sustainable development is a guiding model at the level of society; corporate sustainability is a sustainable development model at corporate level, while CSR is a management approach for business contribution to sustainable development (Steurer et al. 2005).¹ In more detail, sustainable development is the overarching concept; sustainability is the end point of achieving sustainable development, and organisational sustainability could be understood as the actions that organisations might undertake in accordance with the principles of sustainable development (Bebbington and Larrinaga 2014).

In this context, sustainability and CSR are measured by means of sustainability accounting. Sustainability(-related) accounting thus comprises those information management and accounting methods aimed at the creation of high-quality data supporting internal decision making concerning corporate sustainability and at the internal measurement of organizational sustainability performance (Lamberton 2005). Although sustainability-related accounting and reporting have received increasing importance in business and academia, the focus was on the reporting and only few researches have been carried out on sustainability accounting (Hahn and Kühnen 2013).

At supranational level, the interest toward sustainability and sustainability accounting is testified by several initiatives. Among the last ones, in 2015, United Nations adopted 17 Sustainable Development Goals (SDGs) that are intended to stimulate action over the next 15 years in areas of critical importance for humanity and the planet (UN 2015). While being intergovernmental commitments, the SDGs have rapidly gained attention among a broad range of actors, such as many public sector and private sector organizations and many professional bodies, among which the accountants (Bebbington and Unerman 2018). Furthermore, in 2018, an independent standard setting organization established in 2011, after six years of preparation, issued 77 sustainability accounting standards (SASB) for 77 specific industries, aimed at promoting sustainable development. SASB, including disclosure topics, associated accounting metrics and technical protocol and activity metrics for each industry, could be voluntarily adopted by companies, and by combining industry specificity with financial materiality, they offer investors a tool for comparing the sustainability performance of companies.

¹As regards the differences between CSR and sustainability, CSR is more specific and is determined more heavily by particular stakeholder claims than sustainability is. In addition, the two terms have a varying temporal scope since sustainability is long-term oriented, while CSR is about meeting the demands of stakeholders today in order to secure vital resources for the future performance of the company. Finally, the two concepts are different as regards the historical path that drove both to address the integration of economic, social, and environmental aspects. Sustainability started out from the environmental dimension, while CSR initially emphasized social issues like human rights and working conditions. For a brief review and a graphical snapshot of the evolution of the CSR notion, see Veltri and Nardo (2013). Nevertheless, although these two concepts are conceptually different, the constructs have converged over the years (Hahn and Kühnen 2013). Nowadays, businesses use the terms interchangeably, and this is also the case in the chapter.

Nonetheless, the social and environmental accounting (SEA) literature strove, from both theoretical and empirical points of view, to find how accounting could help organizations to address sustainable development (Correa and Larrinaga 2015).

In the next section, we thus focus on a peculiar existing area of accounting (that of full-cost accounting), exploring how this kind of accounting could address sustainability issues.

3 (Full-Cost) Accounting and Sustainability: The Rationale Behind

In accounting terms, financial accounting is enabled by, and constitutes, the boundary between an organization and its environment (Bebbington and Larrinaga 2014). This framing of the organization, based on the “entity concept,” dictates that accounting should be only interested in some costs (i.e., those borne by the entity) even though this obscures social and ecological effects that arise on a wider scale. By ignoring these wider effects, financial accounting contributes to the construction and maintenance of a bounded organization that ignores its full character (Lohmann 2009). In contrast, external costs are central to full-cost accounting, and hence, it is an approach that addresses the linkages between sustainable development problems and an entity.

In other words, full-cost accounting could be considered a promising accounting tool in dealing with sustainability, as it moves beyond the entity to identify externalities. Furthermore, of the various accounting techniques that have attempted to better expose social, environmental, and economic externalities (at the root of an accounting discourse on sustainability), it has been considered the most promising tool (Bebbington and Larrinaga 2014).

Therefore, in accordance with the two authors, we believe that full-cost accounting could be the potential answer to address sustainable development from an accounting point of view, since full-cost accounting is embedded in the going concern concept of the firm. We also agree with Gray (2010), who highlighted how the baggage associated with conventional accounting is no longer suitable when dealing with accounting for sustainability.

Although full-cost accounting shows potential, it also inherited the limitations of cost–benefit analysis (discussions of which prompted discussions on foundational aspects of post-normal science and ecological economics). These limitations revolve around the extent to which externalities can be defined in multiple ways and are often not easily amenable to ecological, social, or economic modeling (Rockstrom et al. 2009). Several authors accused full-cost accounting of introducing more complexity and being contestable (Niemeyer and Spash 2001; Spash 2007; Söderholm and Sundqvist 2003). It is true, but we believe that this cannot be seen necessarily as a limit, being just a matter of fact that has to be taken into consideration by sustainability accounting. In other words, whether full-cost accounting would contribute to advance sustainable accounting, it should be prepared to deal with uncertain and

contestable measures deriving from the complexity of translating into economic and financial terms diverse (environmental and social) values.

4 Methodology

The section provides the methodological note on the selection of articles discussing the suitability of full-cost accounting for sustainability, from both theoretical and practical points of view. To address the aim of the chapter, that is to consider the potential of full-cost accounting for sustainability at organizational level, the authors selected as a reference the article of Bebbington and Larrinaga published in 2014 in that *Accounting, Organizations and Society*. Articles for the review were selected according to the following steps. First, articles related to the object of our research and quoted in the abovementioned article were considered. Second, we also referenced to the articles related to our research issue cited by the articles quoted in the Bebbington and Larrinaga 2014 article and retrieved. Third, using the bibliographic database Scopus, more recent articles citing papers published in the abovementioned article were also considered. Fourth, from the cited and citing articles, we excluded papers not matching exactly our research aim and only kept those articles that effectively conducted some form of theoretical and/or empirical analysis on the suitability of full-cost accounting for sustainability. Finally, despite the lack of connection through citations, two further papers (Bronzetti and Veltri 2013; Venturelli et al. 2015) were identified and included.

5 (Full-Cost) Accounting and Sustainability: Theoretical Studies and Empirical Applications

Interest in full-cost accounting has its roots in the cost–benefit analysis/externalities valuation literature (Epstein et al. 2011). On the basis of this research, proponents of full-cost accounting suggested that identifying more sustainable ways for obtaining goods and services requires shedding light on the (un)sustainability of activities carried out to produce them, by assigning a value to the use of (otherwise free) environmental and social services. The rationale underlying full-cost accounting is that implicit valuations are already present in decision making (Bebbington et al. 2001).

The first authors searching a link between full-cost accounting and sustainability were Funtowicz and Ravetz (1993, 1994). The two authors underlined the normality of uncertainty in post-modern science. Further, among the more significant piece of work in this stream of literature, we can quote the articles of Atkinson (2000), Bebbington et al. (2007), Bebbington (2009), Figge and Hahn (2004), Frame and Brown (2008), Frame and Cavanagh (2009), and Frame and O'Connor (2011). Atkinson in

his 2000 article argues that one of the keys to understanding corporate sustainability is full-cost accounting. Bebbington and others, in their 2007 article, propose sustainability assessment models as a viable alternative to cost–benefit analysis. The sustainability assessment models that the authors propose (and applied to two case studies) are based on an inter-disciplinary approach that recognizes the need for accountings that facilitate more participatory forms of decision making and accountability. Bebbington, in her 2009 article, explores what possibilities emerge for accounting in light of a sustainability science approach, also illustrating for two cases how a sustainability science approach to accounting could develop. Frame and Brown, in their 2008 article, underline the criticality of stakeholder engagement in sustainability issues for the legitimacy and quality of decisions and the admission of complexity in decision-making and accountability processes. Figge and Hahn in their 2004 article propose a new approach to measure corporate contributions to sustainability called Sustainable Value Added, in which sustainable measures are based on opportunity costs. Frame and Cavanagh, in their 2009 article, illustrate the sustainability assessment model, a full-cost-accounting tool that monetizes externalities, also examining its application in two case studies. Frame and O’Connor, in their 2011 articles, outline the principles and methodology for sustainability assessment, using multi-actor, multi-criteria evaluation practices to articulate competing, un-reconciled, and often irreconcilable claims, such as the impossibility of measurement for quantification of opportunity costs in relation to values to be sustained and the status of stakeholders in sustainability.

As about the empirical application of cost accounting to sustainability, we refer to published cases of entities which tried to assign an economic value to the sustainability by employing the full-cost accounting technique. On this issue, we can refer to the case of Spanish Railways (RENFE), included in the Bebbington and Larrinaga (2014) article, to the case of ANPAS Piemonte, included in the Bronzetti and Veltri (2013) article and to the case of GTS Group, included in the Venturelli et al. (2015) article.²

The Spanish Railways (RENFE), in its 2010 report, disclosed to its stakeholders that it saved 2297 million euros in external costs (owing to the reductions in air pollution, carbon emission, and noise that resulted from the use of this mode of transportation) that would have otherwise have arisen if all rail traffic had moved by road.

ANPAS Piemonte, an Italian regional branch of ANPAS (Associazione Nazionale Pubbliche Assistenze), the largest volunteer federation of associations providing public interest services in Italy, in its Intellectual Capital (IC) report, issued since 2004, disclose among its organizational indicators, the social value of volunteer work in ANPAS (equal for the 2017 year to €21.419.565). This indicator is calculated as the total amount of the costs that Italian Piemonte region would sustain if it managed the

²The GTS Group has also been analyzed to trace the group’s pathway to sustainability integration based on the Gond et al. (2012) framework (Caputo et al. 2017).

118 (emergency) service by itself, minus the costs refunded to the ANPAS associates by the Piemonte region (Bronzetti and Veltri 2013).³

The GTS Group, a family firm organization operating in intermodal transport, has undergone transformation in the area of sustainability, which brought to the publication, in 2014, of its first sustainability report and to receive a number of environmental sustainability-related awards. The Group in 2014, together with a research team, developed a theoretical framework addressed to measure the economic value in terms of sustainability of carrying on a long-term contract with a strategic client. The GTS with the research team followed an incremental cost–benefit approach defining two intermediate results, the first-level CSR margin (turnover minus operational and CSR direct costs) and the second-level CSR margin (first-level CSR margin minus operational and CSR indirect costs) (Venturelli et al. 2015).⁴

These two first cases (RENFE and ANPAS Piemonte) examined dealt with the “calculation” of a sustainable value. On this point, it is important to underline that a single figure accounting for the value of externalities can vary a lot, as it depends on the different assumptions and bases used for the valuation of externalities (Antheaume 2004). The exercise is worthy but, to be also qualitatively effective, it would need that the sustainability costs derive from a shared process between the organization and its stakeholders, as no particular expertise can deliver certainty in full cost accounts (Niemeyer and Spash 2001). As for the third case (the GTS Group), its repositioning process toward sustainability has been based on the stakeholder engagement (Venturelli et al. 2015). The initiative comes out from the need to evaluate the prospective profitability of long-term commercial contract with a key client. To determine the two CSR margins, GTS management firstly had to identify all the CSR direct costs expressly related to the key client (all the costs related to sustainability sustained for the improvements requested by the client), then has attributed to the key client (under the CSR approach) the percentage of CSR indirect costs sustained for GTS. In the GTS case, the quality of sustainability accounting is thus related to the capability to correctly identify (and economically measure) the direct CSR costs related to the key client, then to the capability to identify the adequate cost driver able to correctly attribute to the key client a share of CSR indirect costs sustained for GTS sustainability initiatives.

The three cases highlight that the attention toward sustainability is present in different kinds of organization (being the first a public organization, the second a non-profit organization, and the third a private organization operating in the intermodal transport sector). From the (brief) analysis of the three cases, we draw some evidences. The first is related to the uncertainty which is an inherent feature of each possible technique that could be used to measure sustainability.⁵ This means that the

³ANPAS Piemonte discloses its IC indicators according to the well-known tri-partition of IC into human, organizational, and relational capital.

⁴The incremental approach evaluated the costs expressly related to the strategic client under two approaches: CSR-not-oriented and CSR-oriented approach.

⁵Uncertainty in input information must lead to uncertainty in conclusions (Funtowicz and Ravetz, 1994).

aim of such an approach should not be to return precise numbers, instead it should be to implement quality sustainability accounting. The second is related to the meaning of quality in the sustainability accounting, meaning that a good (quality) process in full-cost accounting terms would be addressed to create context in which stakeholders have an opportunity to debate and discuss the construction of the accounts used in such approach (Frame and Cavanagh 2009).

6 Considering Conclusions

Research into the roles of accounting in fostering sustainable development has expanded, and become more sophisticated, over the three decades since the concept of sustainable development was proposed by the seminal Brundtland Report in 1987 (Bebbington and Unerman 2018).

Social and environmental accounting (SEA) literature until now strove to find how accounting could help organizations to address sustainable development; nonetheless, the increasing importance for both companies and stakeholders of sustainability issues cannot allow dismissal of this research stream. The failure of traditional accounting to account for sustainability could mainly be due to the circumstance that the baggage associated with conventional accounting is not more suitable when dealing with accounting for sustainability (Gray 2010).

In accordance with Bebbington and Larrinaga (2014), we believe that accounting for sustainable development implies a research approach that is distinctively different from that of accounting, environmental accounting, and social accounting.

In the chapter, therefore, we refer to an existing area of accounting (that of full-cost accounting) and explore how that a kind of accounting could be a useful tool for a sustainability accounting science approach.

We selected the full-cost accounting as a suitable tool to deal with sustainability as external (environmental, sustainable) costs are central to full-cost accounting, and hence, this approach could be useful deal with linkages between sustainability problems and an organization.

In other words, we refer to an area of accounting investigation (that of full-cost accounting) which is connected to sustainable development concerns (namely the description of externalities), and we analyzed how this accounting area could help in developing sustainability accounting science from both theoretical and practical points of view. Under the empirical profile, we examined three case studies of firms valuing the economic value of sustainability strategy and initiatives through the cost accounting technique.

Of course, it must be underlined that this accounting area is characterized by an unavoidable uncertainty of information, as environmental and social values are imperfectly translated into economic values, originating contestable information. A possible solution to this problem is linked to the quality of full-cost accounting implemented in the company. For quality, we do not intend the precision of numerical calculations, instead we mean the capability to create a context in which stakeholders

have an opportunity to debate and discuss the construction of an account (Bebbington et al. 2007; Frame and Cavanagh 2009).

Anyway, we agree with Bebbington and Larrinaga (2014) that the contestability of an account is not a limitation, instead it is a reality with which any account must work. If full-cost accounting research and practice is to make a contribution to debates about sustainable development, it needs to work with uncertain and contestable information imperfectly translated into economic terms. In other words, researchers should bear in mind that such a science is inherently uncertain, and that a quality sustainable accounting science, instead of returning precise arithmetical data with the help of sophisticated calculus, should accept to coproduce the knowledge (to construct the costs) with the organizational stakeholders, who know the context in which the entity operates and decisions are taken. Rather than focusing on the generalization of results, the validity of full-cost accounting is related to the quality of information obtained from experiments and to the type of relations that are established between those involved in the context of the problem.

Nonetheless, to pursue a quality full-cost accounting for sustainability raises challenges such as the representativeness of stakeholders participating in the process, the possibility of allowing different forms of valuation beyond monetary evaluation, and the usefulness of linking full-cost accounting experimentation in accounting to cost-benefit analysis (Frame and Brown 2008; Lohmann 2009; Samiolo 2012), and all of these areas could constitute future research directions.

The challenge for future research in this stream will be whether and how full-cost accounting can “make the normative concept of sustainability operational” (Spangenberg 2011). In our opinion, the discipline of accounting has a contribution to make in this area, and we hope that the ideas developed in the chapter could be a useful starting point to reason about whether and how full-cost accounting could be usefully employed to overcome the limitations of the conventional accounting in dealing with sustainability.

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