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The Determinants of Environmental Accounting Practices: Proposal of a Theoretical Model

Les Déterminants des Pratiques de la Comptabilité Environnementale: Proposition d'un modèle théorique

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Abstract

Currently, the environmental accounting is spreading more and more widely among businesses. It is a new form of accounting practice that integrates the principles of sustainable development and social responsibility into corporate management systems. Institutional or social pressures, major environmental problems (pollution, environmental disasters, etc.) and the widening of corporate responsibility towards society explain in large part the emergence of this practice (Renauld 2014, Marquet - Pondeville 2003). While the beginnings of these practices date back to the 1970s in developed countries, notably the United States and Switzerland (Renauld 2014, Christophe 1995, Ricahrd 2013), they are still very recent in Morocco.

This article has two associated objectives: Firstly, it is a question of presenting the environmental concept and its integration in the economic sphere, particularly within a company from an accounting point of view via environmental accounting. Then, the second objective of this article will be to discuss the determinants and/or the explanatory factors of the establishment of environmental accounting practices from a theoretical point of view, while mobilizing the neo-institutional theory, the theory of stakeholders, contingency theory...in order to propose an explanatory model.

Keywords: Environmental accounting; Financial performance; Company; Explanatory factors; Theoretical framework.

Résumé

Actuellement, la comptabilité environnementale se diffuse de plus en plus dans les entreprises. C'est une nouvelle forme de pratique comptable qui intègre les principes du développement durable et de la responsabilité sociétale dans les systèmes de gestion des entreprises. Les pressions institutionnelles ou sociales, les problèmes environnementaux majeurs (pollution, catastrophes environnementales…) et l'élargissement de la responsabilité des entreprises vis à vis de la société expliquent en grande partie l'émergence de cette pratique (Renauld 2014, Marquet - Pondeville 2003). Si les prémices de ces pratiques remontent aux années 1970 aux pays développés, notamment les Etats-Unis et la Suisse (Renauld 2014, Christophe 1995, Ricahrd 2013), elles sont encore très récentes au Maroc.

Le présent article revêt deux objectifs associés : Il s'agit tout d'abord de présenter la notion environnementale et son intégration dans la sphère économique notamment au sein d'une entreprise d'un point du vue comptable via la comptabilité environnementale. Ensuite, le second objectif de cet article sera de discuter les déterminants et/ou les facteurs explicatifs de la mise en place des pratiques de comptabilité environnementale d'un point de vue théorique, tout en mobilisant la théorie néo- institutionnelle, la théorie des parties prenantes, la théorie de contingence…afin de proposer un modèle explicatif.

Mots clés: Comptabilité Environnementale ; Performance financière ; Entreprise ; Facteurs explicatifs ; Cadre théorique.

Introduction

Public concern for environmental issues is the result of a long process of scientific discovery and political and social commitment. Corporations, on the other hand, have been slow to go green. Based on the managerial principles of shareholder primacy, managers have long been content to comply with the laws of the host country and be accountable only to their shareholders (Jackson, 2005).

In the 1990s, this approach gradually evolved towards the integration of all the company's stakeholders, including employees and managers, but also pressure groups, regulatory agencies, shareholders, suppliers, customers, the community and the public. As a result, commitment to environmental issues is becoming increasingly important as companies recognize the economic value of environmental protection measures.

Depending on the company, these efforts are made at both the strategic and operational levels. Taking these new factors into account, the needs of managers and administrators in terms of financial and accounting information on the environment have changed significantly. Environmental accounting has developed from social accounting and is being integrated into traditional accounting systems. It includes various tools to better inform interested parties, both internal decision-makers and the company's external partners (KPMG, 1997).

Consequently, the purpose of this article is to study the determinants of the choice of firms to implement environmental accounting practices. Hence the interest of the central research problem which is formulated as follows: "**What are the determinants and explanatory factors of the implementation of environmental accounting practices in the literature**?"

In order to answer the problem, we will first present the concept of environmental accounting and its practices, then we will expose the determinants of EA practices from the literature and finally we will try to propose a conceptual model.

1. Emergence and practices of environmental accounting

1.1 The emergence of environmental accounting

According to Gendron (2004), the birth of environmental accounting coincides with the development of environmental awareness that began in the 1970s. Gendron distinguishes six phases in the evolution of corporate attitudes towards the environment. During the 1950s, one can easily speak of ignorance, this period was marked by the post-war euphoria and the "trente glorieuses" period. But in 1961 in the United States, the New Yorker published excerpts from a powerful book on the harmful effects of DDT: Silent Spring, by Rachel

Carson, which marked the beginning of a popular awareness that would continue to grow.

During the 1960s, protesters began to multiply to denounce the environmental damage caused by industrial production. In response to this denial, the 1970s saw a real debate on the harmful effects of industrial production, as governments adopted an increasingly imposing body of environmental legislation, and companies were faced with new ecological responsibilities. The implementation of the new body of regulations and the persistence of the environmental issue in society contributed to a growing awareness of the business community at the turn of the 1980s. And it is during the 1990s, with the generalization of ecological awareness that organizations mobilize to contribute to the advent of sustainable development. In 1996, the International Standard Organization (ISO) adopted the ISO 14001 standard, marking the beginning of international recognition of environmental management. From the 2000s, we no longer speak of the recognition of environmental issues, or the environmental commitment of companies, but rather the significant improvement of their environmental performance.

After this brief history, it appears that, before the 90's, the ignorance of the managers regarding environmental issues gave way to denial and debate. Gradually, the attitude of the company evolved towards an environmental awareness and then a commitment to environmental protection. The 2000s are now oriented towards the environmental performance approach.

According to J. Richard (2012), the development of environmental accounting is progressively reflected in the writings and reflections of several economists such as: the Americans Nordhaus and Tobin, the Swiss Müller-Wenk and Schaltegger, the publications of the French Labouze, Christophe, Antheaume and the English Gray and Bebbington. It should be noted, however, that a very important literature has also emerged in Japan and India, but the language barrier plays a dissuasive role.

On the other hand, all the first works of environmental accounting appear as criticism of the failure of traditional accounting, according to Betianu Leontina (2008) Bertrand de Jouvenel was the first author who criticized the methods of traditional accounting, which does not take into account natural resources. In this regard, several models have been developed with the objective of integrating environmental accounting, namely: NAMEA (National Accounting Matrix including Environment Accounts) a system of environmental accounting introduced in (1989-1991), the System of integrated Environmental and Economic Accounting (SEEA) developed by the UN Statistical Division in (1993), triple capital accounting proposed by

Gray in(1994), the Externalities Model developed by Boone and Rubenstein (1997) and the model of Accounting Adapted to the Renewal of the Environment (CARE) designed by J.Richard (2012) makes it possible to apply the principle of depreciation to all assets, whether financial, natural, or human

1.2 Definitions of "Environmental Accounting

As regards the conceptual framework of environmental accounting, Gray, Owen and Maunders (1987) in Great Britain, and Christophe (1989) in France, were the first to propose a definition of this field.

For Gray, 1987, "*social and environmental accounting is a process of communicating the social and environmental effects of an organization's economic actions to specific constituencies in society and to society at large*. According to Gray et al (2000) it offers an alternative way of accountability for significant economic entities. It has the potential to expose the tensions involved in the joint pursuit of profit and social and environmental objectives. It is in this perspective of accountability to change representations, and then practices, that Robert Gray is pursuing his project to define a conceptual framework for social and environmental accounting (Gray 1992, 2000, 2002, 2010; Gray, Owen and Adams 1996). For their part, Bernard Christophe (1989, 1992) proposes a definition that includes both internal and external uses of environmental information. He defines environmental accounting as "*an efficient information system on the degree of depletion of natural elements linked to the company's activity, which can be used to act on this depletion and to inform third parties*.

For Antheaume and Christophe (2006), the term environmental accounting refers to tools that allow:

- On the one hand, to complete what the general accounting "counts" by taking into "account" the physical flows and the costs that the company causes to others because of its actions.

- On the other hand, to extend the categories of actors to whom the company is "accountable".Jacques Richard (2012, p. 236) proposes a vision of environmental accounting that is in line with the definitions proposed by Bernard Christophe, since he indicates in the conclusion of his work that it must serve to "*calculate the means that exist to ensure the capacities of natureand man to exist*.

According to Essid (2009, p.113) environmental and social accounting is now particularly interested in reporting and external dissemination of environmental and social information to different stakeholders. This accounting is more concerned with external evaluation of CSR than with internal steering. In this sense, Crowther (2000) defines this form of accounting as: "*An approach to informing about the activities of the company, which emphasizes the need to identify socially relevant behaviors, to determine those for which the company is socially responsible, and to develop appropriate techniques for measuring and reporting societal performance*" (p.20). Essid (ibid) also points out that the work of formatting and consolidating data, at the level of top management, is little used for environmental management control, as defined by Schaltegger (2011). Rather, it is done for validation purposes, prior to external reporting.

The approach of Burrit, Hahn and Schaltegger (2002) aims more specifically at defining the scope of environmental management accounting. And they define accounting broadly, as a system for collecting and formatting data, both monetary and physical, only some of which is related to environmental aspects. Bennett M., Jan Jaap B. and Teun W. (2002) build on this to show that environmental accounting is seen as a subset of an accounting information system Once the scope of environmental accounting has been defined, Burrit et al (ibid) identify Environmental Management Accounting as "*a system for generating, analyzing, and using financial and non-financial information to optimize the environmental and economic performance of an organization to ensure its sustainability*. Environmental management accounting is defined by its primary users and its primary purpose, which is to provide relevant and useful information to an organization's managers, distinct from external stakeholders, to assist them in carrying out their functions.

This definition moves us away from the frameworks defined by Gray, Owen & Maunders (1987) and Christophe (1989). The proposal of Schaltegger, Hahn and Burritt (2002) focuses on internal users within the company, with a view to eco-efficiency and effectiveness (minimizing environmental impacts per unit of value produced by the company). According to Nicolas Antheaume (2012), this proposal is in line with traditional management accounting and focuses on economic and financial profitability, with the environmental constraint taking second place.

According to our literature search, there are two different currents, the current of authors who link environmental accounting to the dissemination of information, reporting and communication such as Gray and Essid. And the stream of authors who consider ECA as a set of tools that allows to complete the traditional accounting by taking into account the goods and services offered by nature (such as Antheaume, Christophe and Richard...).

For us, environmental accounting is both a process of reporting and communication of environmental information and a set of tools for environmental management control. We can therefore deduce that the latter affects internal flows through the implementation of environmental accounting tools (carbon footprint, environmental dashboard, calculation of costs and green budgets ...) and external flows through the dissemination of environmental information.

Table N°1 : Chronological presentation of environmental accounting definitions

Environmental Accounting Approaches and Definitions	The author
"Social and environmental accounting is a process of communicating the social and environmental effects of an organization's economicactions to specific interest groups in society and to society at large.	Gray (1987)
"The EA is an efficient information system on the degree of depletion of natural elements related to business activity, usable to reduce thisdepletion and to inform third parties."	Christophe (1992)
"Environmental accounting, also known as green accounting, means systematically taking into account facts related to the protection and restoration of the environment. It is about respecting the traditional role of accounting and reporting on environmental flows and risks, in order to be able to communicate a true and fair view of the company to stakeholders."	Mikol (1995)
"An approach to informing business activities, which emphasizes the need to identify socially relevant behaviors, determine those for which the company is socially responsible, and develop appropriate techniques for measuring and reporting societal performance."	Crowther (2000)
"A system for generating, analyzing and using financial and non-financial information to optimize the ecological and economic performance of an enterprise to ensure its sustainability.	Burrit, Hahn
"Environmental accounting is the identification, collection and analysis of the impact of economic activity on the environment and also the recognition and presentation of its damage in accounting practice. Environmental accounting is not only a process of integrating the environment into the accounting system, but it is also a fundamental toolin decision making, ensuring sustainable development of society, examining environmental costs and benefits, contributions to the recognition of high level of environmental taxes, capital and operating expenses generated from the use of pollution control equipment."	Sorina-Geanina STĂNESCU Nicoleta-Cornelia STAN Mihaela Denisa COMAN, (2017)

Source: The authors

1.3 Environmental Accounting Practices and Techniques

According to Jean-Philippe Lafontaine (2003), environmental accounting practices can be considered as new ideas, because they are either recombinations of traditional accounting techniques or original techniques in the accounting world. In the French context, many authors have discussed the different techniques developed in environmental accounting. Theses, books and articles have been devoted specifically to environmental accounting (Christophe, 1989, Pellé-Culpin, 1998, Antheaume, 1999,...) see graph below:

Figure N°1: Graph of environmental accounting practices

Financial	physics	Qualitative
Green Accounts		
Green heading in the balance sheet appendix		
Green costing and budgeting		
Green information in annual reports		
	Ecobalance	
Negative value added		
Environmental report and green scorecard		
Environmental report		
Carbon Balance sheet/ footprint		

- Use rather for management
- Use rather for communication
- Used more for management and communication

Source: Jean-Philippe Lafontaine (p.116-2003)

This classification remains limited, J.Richard (2012) proposed another classification much more exhaustive, according to other criteria of classification and typology of the environmental accountings, namely: the direction of the relation with the environment, the dimension of the environment, the mode of conservation of the capital, the spatial dimension of the information, the degree of detail of the information, the type of valuation of the data and the concept of result.

2. Determinants of environmental accounting practices

Environmental accounting practices are related to a combination of internal and external determinants and/or explanatory factors, which are classified in the table below according to their theoretical logic:

Table N°2: Theoretical logic table of determinants

The determinants		Theoretical logic / explanatory conceptual framework
INTERNAL	Size	Contingency theory
	Financial performance	Positive accounting theory
EXTERNAL	Laws and regulations	Neo-institutional theory
	Sector	Stakeholder theory
	Certification	Neo-institutional theory
	Media exposure	Neo-institutional theory
	Culture	Contingency theory

Source: The authors

2.1 External determinants

2.1.1 Laws and regulations

States have become sensitive to environmental issues. This sensitivity has resulted in pressure being exerted on companies, especially those that pollute, to reduce their impact on the natural environment. With the potential threats of regulatory pressures, companies are obliged to react positively by carrying out environmental actions. Through these actions, companies try to establish a satisfactory relationship with public authorities with the objective of cancelling or at least reducing regulatory pressures. However, the achievement of this objective is not guaranteed since the behavior of public authorities remains unpredictable (Claver & al., 2007).

At the national level, the Moroccan authorities also expressed their commitment to the values of the Environment, in October 2005, on the occasion of the royal message delivered to the participants of the "Intégrales de l'investissement" organized by the Direction of external investment. This commitment finds its concrete extension in a legal framework through the framework law n°99-12 on the National Charter of the Environment and Sustainable Development (B.O. n° 6240 of 18 Joumada I 1435 - 20 March 2014) and the law n°11-03 which sets out the guiding principles of environmental protection and management (M'Hamdi and Trid, 2009). In addition to the legal framework, the government has provided several measures to encourage companies to take an interest in environmental protection. These include the Moroccan standardization and labeling system (such as the CGEM label for Moroccan CSR).

2.1.2 Sector

The sector of activity seems to be an important factor in the implementation of environmental practices within companies and more particularly in the decision to implement environmental accounting practices. According to Cowen et al (1987), it is a concern for visibility on the part of companies belonging to more or less sensitive sectors. A company operating in an environmentally sensitive sector will be subject to special government attention and will attempt to respond to government pressure by providing societal information. It may also be a matter of visibility not at the government level but at the public level for consumer-oriented firms (Cowen et al., 1987). Firms located in public-oriented industries will demonstrate their commitment to environmental responsibility more than other firms by disseminating their societal information and implementing environmental practices. For example, previous research has demonstrated a positive association between the sector of activity of companies reflecting the level of exposure to environmental and social risks and the level of dissemination of environmental and societal information (Adams et al., 1998; Patten, 2002). Based on this hypothesis and the results of these studies, authors have predicted that companies in sectors with greater societal impact are more exposed to societal risks and will have a greater need to manage these risks in order to increase user confidence in the credibility of societal information disseminated (Simnett et al., 2009). For example, Kolk and Perego (2010) cite the oil, gas, and chemicals, utilities, manufacturing, and finance sectors as being most exposed to environmental and social risks. While all of these companies are concerned with environmental practices, those in the industrial sector present a very significant environmental risk. As such, they have often been the first to be targeted and challenged on social and environmental responsibility (C. Germain and S. Gates, 2010).

2.1.3 Certification

The various international organizations seeking to promote good environmental practices and communication have developed voluntary standards in the framework of public voluntary programs, which can be freely implemented by companies that wish to do so. There are essentially two standards for environmental and social communication: on the one hand, the ISO 14000 and 14063 standards and more recently the ISO 26000 standard, and on the other hand, the EMAS standards. The application of these standards is voluntary. However, private principals can impose the implementation of these standards on their subcontractors or suppliers.

Studies have shown that companies that use environmental certification have more developed external constraints (A. Hatchuel, 1999; O. Boiral and I. Dostaeler, 2004). Consequently, these companies certainly make more use of environmental accounting and/or environmental management control systems, especially if stakeholders are oriented towards this type of performance.

At the same time, many environmental responsibility indicators were initially developed around the environmental aspect, as is the case, for example, with the Global Reporting Initiative. Some authors show the influence of Anglo-Saxon accounting standards on this reference framework (Capron and Quairel, 2003; Quairel, 2004; Giordano-Spring and Rivière-Giordano, 2007). The GRI is therefore the product of a technical but also political process. Indeed, companies use these standards to prevent binding regulation of environmental reporting (Capron and Quairel, 2003).

2.1.4 Culture

Some studies hypothesize the influence of cultural factors on environmental accounting practices. Perera and Mathews (1990) suggest that culture is a significant factor that can influence accounting. They point out that "because accounting is a socio-technical activity, it involves dealing with both human and non-human resources and techniques and their interactions. Although the technical aspect of accounting is less culturally dependent than the human aspect, because the two aspects interact, accounting cannot be viewed in isolation from culture" (p. 221). These researchers compare environmental and societal accounting practices (human resources, environment) between Anglo-American countries (United Kingdom and United States) and continental European countries (France-Germany). They rely on the model of culture analysis proposed by Hofstede (1980) and rely in particular on French and German collectivism versus Anglo-Saxon individualism to explain the influence of culture on environmental practices. For these researchers, there are also institutional pressures for the implementation of environmental accounting practices. These pressures originate in culture, since the intensity with which individuals consider that behavior should be governed by a certain number of rules differs from one culture to another.

Buhr and Freedman (2001) also suggest the influence of culture and institutional factors on the environmental practices of Canadian and US firms. The authors point out that while studies in the field of financial and management accounting, which use cultural factors, tend to make little difference on this point between these two countries, there are cultural and institutional differences that may affect the environmental practices carried out by firms in these two countries. Researchers also contrast Canadian collectivism with US individualism in explaining differences in environmental practices.

2.1.5 Media exposure

In view of the studies on the media exposure of companies (Brown and Deegan, 1998; Cormier and Magnan, 2003; Cormier et al., 2004; Aerts and Cormier, 2009), it appears that companies with high media exposure will implement CSR practices and, in our case, the implementation of environmental accounting practices in order to obtain legitimacy. Thus, Neu et al. 1998; Aerts et al. 2006 refer in their study to the intensity of media coverage of the firm as a mechanism for measuring the impact of legitimization forces on the firm. Cormier and Magnan (2003) show the positive link between the media visibility of companies, measured by the quantity of press articles, and the extent of environmental reporting. In the French context, Giordano-Spring (2008) has shown that media visibility, as a proxy for public pressure, influences the quality of societal and environmental information disseminated. She measures media visibility by the number of articles published in the press concerning societal issues. This corroborates Park and Brorson's (2005) statement that one of the factors influencing the implementation of environmental practices is media attention, which challenges the credibility of corporate social and environmental reporting.

Like previous studies, we wish to show that companies pursue a legitimization strategy by implementing environmental accounting practices, in response to the level of media attention that shapes the general public's expectations on societal issues.

2.2 Internal determinants

2.2.1 Financial Performance

According to McGuire, Sundgren and Schneeweis (1988), research on the relationship between environmental responsibility and financial performance is based on different and sometimes divergent theoretical arguments. For example, some studies have hypothesized a negative relationship between environmental responsibility and financial performance. According to this hypothesis, strong environmental and social responsibility induces additional costs for the company and places it at an economic disadvantage compared to other less socially responsible companies. Friedman (1970) notes that "since the environmental and social involvement of companies constitutes a cost, shareholders, when reading the environmental activity report of companies, may conclude that the company's managers are not managing the company in their best interests, since they are not maximizing the income that will be paid to them in the form of a dividend". According to the same hypothesis, "the environmental orientation of the firm may reduce its strategic room for maneuver, [...]" (McGuire et al., 1988, p. 855).

Other studies formulate, on the contrary, the hypothesis of a positive relationship between corporate environmental responsibility and economic performance. The studies of this current maintain, in fact, that the costs associated with a socially responsible behavior of the company are low and that they constitute, at the end of the day, a benefit for the company in terms of well-being of the employees and improvement of their productivity or even in terms of consumer confidence. A responsible company would thus have easier access to financial resources.

Following the logic of the cost-benefit trade-off, the level of financial performance of the firm can be a determinant of whether to implement environmental accounting practices. There are costs associated with implementing these practices (Simnett et al. 2009; Kolk and Perego, 2010). There are two types of costs, costs related to the implementation of environmental practices itself and costs related to the dissemination of this information. According to Oxibar (2003) most studies working on the impact of performance suggest a positive relationship between company performance and environmental commitment.

Companies with good financial performance will have more resources to devote to this type of expenditure (Roberts, 1992). Indeed, Ullmann (1985) and Roberts (1992) state that satisfactory financial performance has a definite influence on the level of support that decision-makers can give to environmental activities. Financial performance is therefore a proxy for the company's ability to bear the immediate or future costs incurred by these practices, and the probability of implementing environmental and societal practices will therefore be greater.

2.2.2 Size

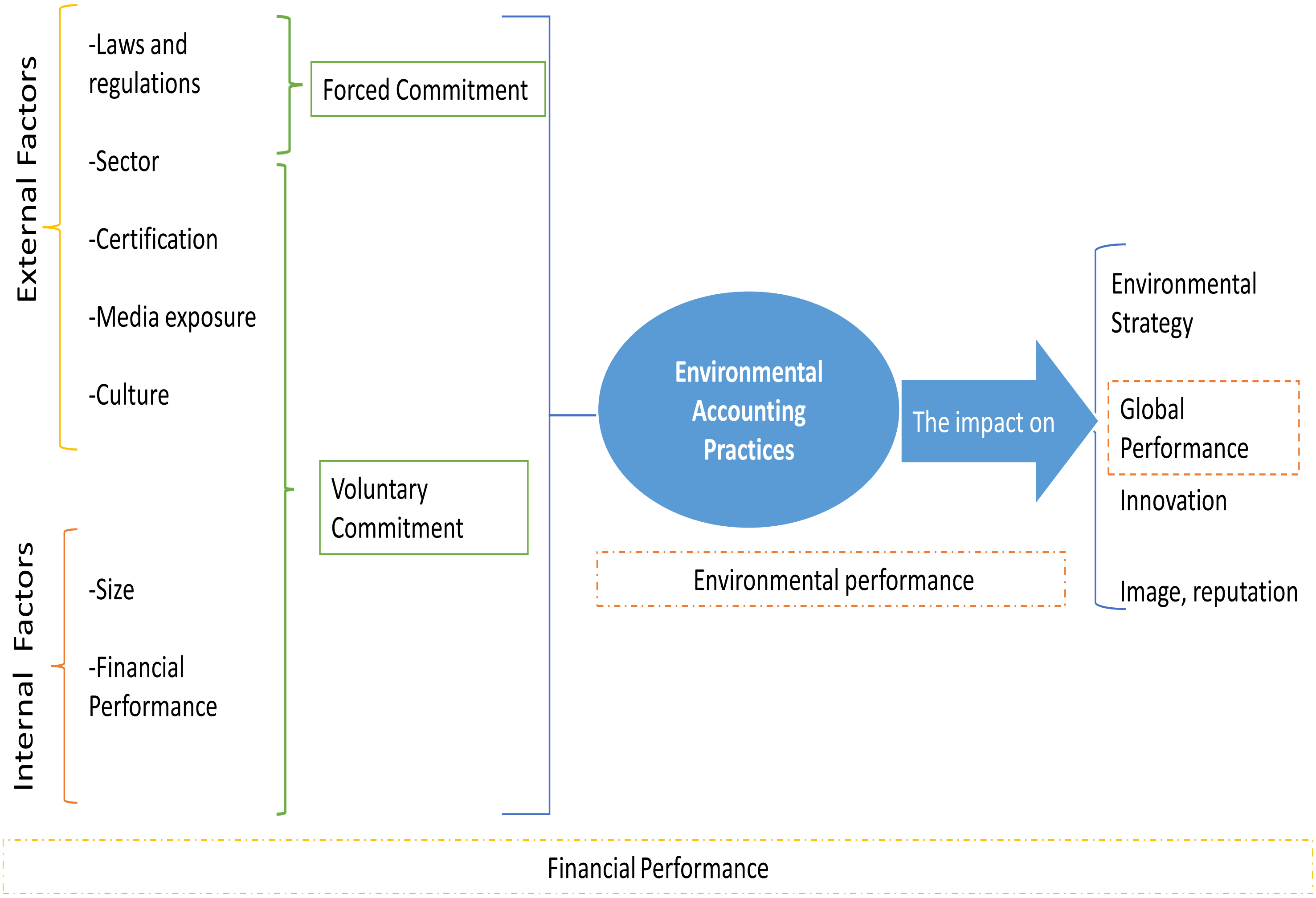
There are several theoretical arguments in the literature that there is a link between company size and the implementation of environmental practices such as environmental accounting. Size being a source of visibility, the larger a company is, the more it will be observed and subjected to public pressure (Cooke, 1992). As Bewley and Li (2000) point out, large companies must behave in an exemplary manner because of their visibility. Because of the special attention given to large firms and in order to maintain their credibility, they have a strong incentive to be transparent. Generally speaking, the size of the company, a source of visibility, encourages companies to put in place practices aimed at demonstrating their environmental and social commitment. This is consistent with the numerous studies on societal reporting that find that because of their increased visibility, large companies are encouraged to implement environmental practices such as environmental accounting (Berthelot et al. 2003; Bewley and Li, 2000; Brammer and Pavelin, 2006; Lee and Hutchison, 2005). Large companies feel more targeted and find it necessary to justify their commitment to CSR, so they try to multiply the means of showing the public their commitment in this area (Damak-Ayadi, 2007). These arguments are taken up in the specific context of the demand for societal auditing by Kolk and Perego (2010). They justify the link between firm size and demand for societal auditing through the environmental accounting and external auditing literature. However, these authors do not find a significant relationship.

In line with this research, and regardless of the arguments put forward, we suggest that the larger the company, the greater the demand for the application of environmental accounting practices.

3 Conceptual model

We present the model of the determinants of environmental accounting practices in the following figure:

Figure N°2: Theoretical model of the determinants of environmental accounting practices



Source: The authors

Conclusion

Environmental accounting is an important tool for integrating environmental issues into financial assessments and decisions on new investments, and is therefore indispensable for the implementation of sustainable development and environmental protection.

The achievement of the general objectives of sustainable development requires the implementation of instruments and practices consistent with the requirements of the environment, economic and social.

As a general conclusion, accounting practices and the environment must coexist harmoniously, accounting instruments related to obtaining profit should not affect the environment, we must morally leave a clean environment for future generations to find an optimal natural resources.

This research work has allowed us to examine the development of scientific research on the theme of the determinants of environmental accounting practices, to propose a theoretical model and a classification of explanatory factors, as well as the possibilities for improving this aspect of the research.

In the end, our review of academic studies showed us that the field of study on EA practices is still young and that it is still in a phase where several theories are developed in parallel on reduced perimeters. Similarly, our theoretical model is still limited by variables from the literature according to theoretical approaches such as the Neo-institutional theory..., so the incompleteness of these variables requires an empirical study. Consequently, we hope to subsequently develop empirical work on other determinants of practice.

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