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Comparative perspectives on environmental accounting elements in France and the United Kingdom

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The aim of this paper is to provide a comparative perspective on the output of environmental accounting systems. For the purpose of the analysis, the methodological focus was set on monetary elements included in the annual financial and sustainability reports. Following the tradition of accounting literature, two accounting cultures were selected for their paradigmatic opposition: the British and the French financial reporting systems. Using a sample of 100 companies, half extracted from each country, the environmental elements expressed in monetary terms were subsequently content-analyzed, following a relevant regulatory benchmark: the UK generally accepted accounting principles (GAAP), the French chart of accounts, the European recommendations on account preparation and corporate reporting, and the International financial reporting standards (IFRS). We also provide empirical evidence for a phenomenon called “reporting inertia”, which refers to a certain approach to corporate environmental reporting, where companies are using prefabricated phrases and paragraphs to report almost the same monetary elements year after year, for long periods of time. Finally, we discuss the mixed results in the distribution of accounting elements between the two accounting cultures. This investigation is novel in that there is no previous study offering a very detailed classification and analysis of several environmental accounting elements, in a European context.

Key words: Environmental accounting, European companies, international financial reporting standards (IFRS), comparative studies.

INTRODUCTION

“Green accounting” describes the effort of researchers, accounting standard setters, professional organizations, and governmental agencies to get corporations to participate proactively in cleaning and sustaining the environment and, moreover, to describe fully and forthrightly their environmental activities in either their annual reports or in stand-alone environmental disclosures. In this respect, Elkington (1998) coined the phrase “triple bottom line” (TBL) to suggest that financial reporting should expand beyond traditional bottom-line income as a measure of success which should also include information about social and environmental performance.

Since the late 1980s, in a number of countries worldwide, companies have been required to provide some

level of environmental reporting in the annual reports. Nearly all of this additional disclosure has focused on the impact of environmental issues on a company’s financial results and position, requiring separate inclusion of such items as expenditures for pollution and prevention, cleanup costs, actual and contingent liabilities for environmental remediation from past operation, and assets related to environmental protection. In addition, some countries also require disclosures on resource consumption and pollutant emissions in annual reports, in managerial statement (Fleischman and Schuele, 2006).

Environmental accounting is not only part of a reporting system. It is also a very effective communication tool, since all environmental remedial strategies implemented by the managers must be accompanied by disclosure to have any effect on external parties. That is, information is necessary to change perceptions. Remedial action which is not publicized will not be effective in changing

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perceptions (Cormier and Gordon, 2001). This perspective, as provided by legitimacy theory, highlights the strategic importance of corporate disclosures, such as those made within annual reports and other publicly available documents. The public disclosure of information through annual reports can be employed by an organization to counter or offset negative news, or may simply provide information to stakeholders about attributes of the organization which were previously unknown. In addition, organizations may draw attention to their achievements, for instance environmental awards won, or safety initiatives that have been implemented, while sometimes neglecting or down-playing information concerning negative implications of their activities, such as pollution or workplace accidents (Deegan, 2002).

The aim of this paper is to provide a comparative perspective on the output of environmental accounting systems. For the purpose of the analysis, the methodological focus is set on monetary elements included in the annual reports (that is, the notes to the consolidated accounts and the environmental management report). The second methodological choice shall be related to the selected sample. Following the tradition of the accounting literature, two accounting cultures will be selected for their paradigmatic opposition: the French and the British financial reporting systems. The largest listed companies on the London and Paris stock exchanges, 50 companies from each country, shall provide observations for the four-year panel used in our analysis, after eliminating those firms operating in industries with trivial environmental impacts.

Using content analysis, the environmental elements expressed in monetary terms shall be classified in accordance with the relevant accounting policies, as to create a comprehensive picture of financially quantifiable environmental impacts disclosed in the corporate annual reports for the 2008/2009 financial year. The comparative outlook shall be subsequently extended to include the previous three financial years (2005/2006, 2006/2007 and 2007/2008).

A phenomenon called "reporting inertia" shall be documented through a series of statistical tests on the proportion of environmental accounting elements present in the annual reports of sample companies over the whole period of analysis.

As the relevant regulatory benchmark, four separate accounting frameworks shall be used: the French chart of accounts, UK generally accepted accounting principles (GAAP), the European directives and recommendations on account preparation and corporate reporting, and the International Financial Reporting Standards (IFRS).

Building on the traditional separation of accounting into two paradigms – Continental European (French) versus Anglo-Saxon (British) – we will test the hypothesis that the quantity of environmental elements in the annual reports of French companies does not significantly differ from the quantity of environmental disclosure exhibited by UK

companies.

Finally, a detailed discussion shall complement the presentation of results, along with a review of possible limitations of our research. The final conclusions shall be addressing issues such as the voluntary nature of environmental reporting, the barriers to efficient standard-setting in this area and the lack of uniformity regarding the disclosure of financially quantifiable environmental impacts, in the form of environmental accounting elements.

PERSPECTIVES ON ENVIRONMENTAL ACCOUNTING

A general framework

Accounting provides a very selective yet powerful symbolic representation of the corporate entity. The language of "assets", "liabilities", "costs" and "profits" define the operational and ontological limits of the enterprise and provide a technique which configures the organizational autonomy and sensitivity to environmental disturbances (Gray et al., 1995).

The term "environmental accounting" has been used to describe attempts to determine environmental costs and benefits to the organization. The main focus is internal, including the costing of energy use and waste disposal, and quantifying the benefits from the sale of environmentally benign products or from environmental subsidies. External impacts on the natural environment relate to the organization's use of resources and generation of emissions and waste. These impacts can be measured, for example in terms of tones of carbon dioxide emitted, but also in monetary terms, such as through the costs for acquiring certificates for greenhouse gas emissions. Environmental accounting is usually involved in several areas, such as: energy accounting; waste accounting; environmental criteria in capital expenditures; target setting for efficiency improvements (Wycherley, 1997).

The entire concept of an accounting transaction is bound to the notion of "private cost". The result is that many social costs in the form of polluted air, water and soil, and the large palette of ecological damage are not recognized by the accounting process (Bedford, 1970, cited in Fleischman and Schuele, 2006). The environmental accounting system is part of a larger corporate environmental policy, which aims to prevent and reduce environmental impact, through life-cycle analysis, integration of environmental values into the supply chain, eco-design of products and services and environmental monitoring and auditing (Dragomir, 2008). Therefore, the purpose of an environmental accounting framework is to provide a general fit over the area regulated: (a) to raise awareness of environmental issues; (b) to develop guidelines to assist identification of environmental issues and evaluation for reporting purposes; (c) to provide education programs across disciplines focused on

environmental issues and their accounting treatment; and (d) to develop practices of environmental accounting, with recommendations on best practices.

There are clear limits to the use of environmental accounting. There are practical difficulties in terms of operations such as complex and highly interdependent manufacturing processes or office locations. The costs of collecting accounting information may outweigh its value in some cases. Moreover, it is very difficult for accountants to prepare meaningful estimates of the business benefits of adopting a green strategy (particularly concerning such intangibles as a good public image or selling benign products) (Wycherley, 1997).

Technical aspects of environmental accounting

Environmental financial accounting integrates corporate environmental and business policies designed to analyze environmentally related costs and benefits, contributing to the recognition of capital and operating expenses for pollution control equipment, environmental taxes and fines, environmental subsidies and other similar elements. A complementary step in developing an environmental financial accounting system is the setup of a dedicated cost accounting. The latter is defined as the use of accounting records to directly place costs on every environmental aspect, as to determine the cost of all types of related action. In this respect, environmental actions include pollution prevention, environmental design and environmental management. Past approaches on environmental impacts were mainly based on environmental cleanup costs and product disposal (Yakhou and Dorweiler, 2004).

The main component to consider for environmental accounting is that of environmental costs. The U.S. Environmental Protection Agency (1996) defines environmental costs as those costs that have a direct financial impact on a company (internal costs), and costs to individuals, society and the environment (external costs). The type of costs included in an environmental accounting system ultimately determines the scope of the system. Environmental data can be captured using generalized scientific models to estimate emission levels and resource consumption. In cases where resources are purchased from suppliers, direct measurement by technical instrumentation is possible. For example water meters record consumption at the source, as do electricity meters. In many cases the sampling method is the only cost effective method of data capture due to the excessive cost of measuring all emissions and natural resources consumed (Lamberton, 2005).

An environmental cost accounting system is a flow-oriented system which is based on a systematic cause-and-effect analysis. Especially output-related costs, for example, emissions, waste disposal and waste water are assigned correctly to the inputs which cause them.

Environmental costing contributes to an internal pricing system which evaluates inputs, processes and products with their real costs. This procedure creates both a decision-oriented information base for the environmental management system and for the planning, control and supervision of material and energy flows (Lethmate and Doost, 2000).

Internal costs may include conventional costs, potentially hidden costs, contingent costs and image or relationship costs (Environmental Protection Agency, 1995). Conventional costs include costs of capital equipment, raw materials and supplies. Hidden costs refer to the results of assigning environmental costs to overhead pools or overlooking future and contingent costs. Contingent costs refer to environmental costs that are not certain to occur in the future but depend on uncertain future events, for example, the costs involved in remediating future spills. Image and relationship costs are less tangible costs because they are incurred to affect subjective perceptions of management, customers, employees, communities, and regulators. This category can include the costs of annual environmental reports and community relations activities and costs expended voluntarily for environmental activities such as tree planting. The costs themselves are not intangible, but the direct benefits that result from corporate image expenses often are (de Beer and Friend, 2006).

External costs include: (1) environmental degradation for which firms are not legally liable and (2) adverse impacts on human beings, their property and their welfare that cannot always be compensated for through legal systems (de Beer and Friend, 2006). External costs usually arise from specific attributes of natural resources. Some of these exhibit private good characteristics. Fossil fuels, minerals, agricultural and some forested land would be examples of such resources. Private markets for the allocation of such resources tend to develop and function reasonably well. Environmental problems, by contrast, are often associated with resources which exhibit public good characteristics, where markets are either incomplete or nonexistent. For such resources (for example clean air and water, ocean fisheries and natural areas), incomplete markets create a danger of exhaustion from misuse (Milne, 1991).

European perspectives on environmental accounting

Accounting can be seen to perform a role of providing an organization with stability in the face of uncertainty and rapid change. Sometimes, this stability may have unwanted consequences, as illustrated by the case of a company where the accountants were driven by the accounting year to delay the planting of seeds by two months, resulting in a complete failure of the management aim to produce a recreational area. The inability of accounting to be flexible enough to account for the seed

in the ground as an asset at year-end was a direct cause of having to do the planting all over again the following year (Wycherley, 1997).

The failures of accounting may be endogenous, as in the aforementioned case, or exogenous, when the limitations are attributable to the differences between national accounting systems, traditions and techniques. Comparative accounting research has attempted to capture those elements of international convergence or divergence that lead to incomparability between financial reports issued by companies in different parts of the world. This lack of comparability arises from the architecture of accounting systems having uneven levels of development and sophistication, or simply relying on incompatible paradigms. Some of these elements will be discussed in the following paragraphs, in the context of the European Union accounting directives, national accounting systems and the application of the international financial reporting standards (IAS/IFRS) for listed companies.

In the European Union, the fourth directive (78/660/EEC) of 25 July 1978 coordinates member states' provisions concerning the presentation and content of annual accounts and annual reports, the valuation methods used and their publication in respect of all companies with limited liability. Together with the fourth directive, the seventh directive (83/349/EEC) of 13 June 1983 belongs to the family of "accounting directives" that form the arsenal of community legal acts governing company accounts. The latter defines the circumstances in which consolidated accounts are to be drawn up. Any company (parent company) which legally controls another company (subsidiary company) is under a duty to prepare consolidated accounts. Beginning January 1, 2005, all European Union companies having securities listed on an EU exchange have been required to prepare consolidated (group) accounts in conformity with the International Financial Reporting Standards (IFRS), issued by the International Financial Standards Board (IASB). Thus, the analysis of how certain IFRSs can be incorporated into national legislations represents an important avenue for research, mostly because controversial issues, such as environmental accounting, are not recognized by many national standard setters and professional accounting bodies.

The aforementioned European directives do not make reference to any type of element to be associated with environmental accounting. Thus, in the dawn of the IFRS era in Europe, the European Commission acknowledged two problems regarding environmental accounting (European Commission, 2001): that any or all of the different stakeholder groups (regulatory authorities, investors, financial analysts and the public) could feel that the disclosures were insufficient or unreliable and that there was a low level of voluntary disclosure, even in sectors which have a significant impact on the environment. The lack of harmonized guidelines may also lead to investors and other stakeholders not being able to

compare companies or adequately assess environmental risks affecting the financial position of the company. In spite of issues of sensitivity or confidentiality, users of financial statements need information about the impact of environmental risks and liabilities on the financial position of the company, and about the company's attitude towards the environment.

The Commission (EC, 2001) further formulated the complaint that the international accounting standards board (IASB) had provided only little guidance directly related to such matters and that no specific international accounting standard was solely focused on environmental issues. The recommendation took as a source of reference several international accounting standards (IAS), which were of specific relevance to environmental issues, in particular IAS 36 on impairment of assets, IAS 37 on provisions, contingent liabilities and contingent assets and IAS 38 on intangible assets. Balance sheets should contain details of provisions and environmental liabilities and the notes to the annual accounts and consolidated accounts should contain details of valuation methods applied to environmental issues, extraordinary environmental expenditures, details relating to provisions in the balance sheet as well as details about contingent environmental liabilities and costs incurred as a result of fines and penalties for non-compliance with environmental regulations and compensations paid to third parties.

Whereas "environmental costs" is a pivotal concept for management accounting, the financial reporting systems are usually concerned with such elements as "environmental liabilities" and "environmental capital expenditure". According to the European Commission's recommendation on the recognition and disclosure of environmental elements in the annual accounts (EC, 2001), liabilities can be seen from a double perspective: either as a legal / contractual obligation to prevent, reduce or repair environmental damage, or as a constructive obligation arising from the enterprise's own actions, when the enterprise has committed itself to protect the environment. Environmental liabilities are strongly tied to specific costs, since an environmental liability is recognized when a reliable estimate of the costs derived from the obligation can be made. The term "provisions" refers to environmental liabilities which are uncertain either in terms of their due date or in terms of their amount to be settled.

Finally, financial accounting, as well as capital budgeting, is concerned with environmental expenditure and associated procedures, such as depreciation and impairment. Environmental expenditure should be capitalized (that is, recognized as an asset for use on a continuing basis) when that expenditure is intended to extend the life, increase the capacity or improve the safety or efficiency of other assets owned by the enterprise. All the above elements should be disclosed in the annual report to the extent that they are material to the financial performance or the financial position of the

reporting entity.

Comparative perspectives: International financial reporting standards (IFRS) and national accounting standards

The debate surrounding international convergence is often focused on the fundamental traits of accounting systems. Explicitly, researchers eventually find themselves discussing the implications of one national system belonging either to the “Anglo-Saxon” or to the “continental” paradigm (Alexander and Archer, 2000). The most homogenous group is believed to be formed of countries belonging to the continental system, mainly due to the incorporation of EU directives; especially Germany, France, Austria and Belgium can be looked upon as representing the nucleus of the Continental group. On the other hand, the term “Anglo-Saxon accounting” is used to refer to an approach to financial accounting and reporting that is supposedly common to the UK and Ireland, the USA and other English-speaking countries including Canada, Australia, and New Zealand (d’Arcy, 2001). However, since the process of European accounting harmonization started in 1978 with the fourth directive, and culminated with the adoption of IFRS for all publicly traded companies, the “Continental vs. Anglo-Saxon” classification is increasingly losing ground (Ding et al., 2007). Some authors even argue, with strong evidence, that this classification is simply a myth: within each group and between these groups there are similarities and differences which should be treated on a piecemeal basis (Street and Gray, 2002).

On the topic of environmental accounting, the IASB considers that environmental reports presented outside financial statements are not within the scope of IFRS, even if many companies operate in industries in which environmental factors are significant. However, there are several international accounting standards (IAS) containing guidelines on the recognition and measurement of financial elements connected to environmental protection (EC, 2008):

- (1) IAS 16 recognizes items of property, plant and equipment acquired for environmental reasons. Such items qualify for recognition as assets because they enable an entity to derive future economic benefits from related assets;
- (2) IAS 37 recognizes obligations in the form of penalties or clean-up costs for unlawful environmental damage. Similarly, an entity should recognize a provision for the decommissioning costs of an oil installation or a nuclear power station to the extent that the entity is obliged to rectify damage already caused;
- (3) IFRIC 5 recognizes that the purpose of decommissioning, restoration and environmental rehabilitation funds, is to segregate assets to fund some or all of the

costs of decommissioning plant (such as a nuclear plant) or certain equipment (such as cars), or in undertaking environmental rehabilitation (such as rectifying pollution of water or restoring mined land).

For the purpose of this paper, two countries have been selected: France and the United Kingdom. They occupy the second and the third place, respectively, in a classification on nominal Gross Domestic Product (in market prices) in 2008 in the European Union (Eurostat, 2010). In terms of market capitalization, Euronext Paris (index Euronext 100) and the London stock exchange (index financial times stock exchange (FTSE) 100) occupy the first and the second place, respectively, on a list of largest stock exchanges in the European Union for January 2009 (WFE, 2010).

France is a EU Member State. Consequently, French companies listed in an EU securities market have followed IFRS starting with 2005. The national accounting system is compliant with the European directives, and relies on the French chart of accounts (plan comptable général – CRC Regulation n°99-03, with subsequent revisions). The chart of accounts has been amended to include provisions inspired by IFRS, concerning the recognition, measurement and recording of assets, impairments, provisions, and similar elements (Stolowy and Ding, 2003).

Regarding environmental accounting in the annual accounts of French companies, the chart of accounts (CRC, 2007) recognizes only the fixed assets acquired for reason of environmental protection. Although not directly increasing the future economic benefits related to a particular existing asset, they are recognized as assets if they are necessary for the entity to obtain future economic benefits from its other assets. For example, a chemical manufacturer may need to install some new processes for handling chemicals to comply with environmental regulations on production and storage of hazardous materials. Improvements to facilities are recognized as corresponding assets, because without them the entity would be unable to manufacture or sell its chemicals.

The United Kingdom is a EU Member State. Consequently, British companies listed in an EU securities market have followed IFRS starting with 2005. At a domestic level, all accounting standards developed by the financial reporting council (FRC) since 1990 have been issued as financial reporting standards (FRS). These standards are in compliance with the European directives, but bear profound similarities with the international accounting standards (IAS), mainly due to their common ancestry and shared paradigm (Cairns, 2004; Christensen et al., 2007).

Regarding environmental accounting in the annual accounts of British companies, the FRSs recognize elements in a similar fashion to IFRS (that is the recognition and measurement of capitalized environmental

expenditure). However, there are several points of interest within this corpus of standards (ASB, 2010). For example, FRS 12 considers that an entity should recognize a constructive obligation to rectify environmental damage, even if that particular UK Company operates in a country where there is no environmental legislation. If the entity has a widely published environmental policy in which it undertakes to clean up all contamination that it causes, the entity is bound to recognize this obligation in its annual accounts. FRS 30 imposes the recognition of "heritage assets", which can have historical, artistic, scientific, geophysical or environmental qualities. FRS 5 stipulates that, if the operator is obliged to meet any liabilities as a result of a contract (for example, environmental clean-up costs), these should be recorded separately, within liabilities. SSAP 13 considers that the outcome of a research and development project should be examined for its ultimate commercial viability in the light of factors such as, *inter alia*, consumer and environmental legislation.

In the European Union, national accounting standards are in compliance with the European Directives, which are also compatible with IFRS (Dragomir and Ilcu, 2008). Nevertheless, environmental accounting is largely outside the scope of international accounting convergence, since the national and international standard-setters have not found a way to link environmental cost accounting with the financial system of the enterprise. Even if environmental accounting relies on the identification, allocation and analysis of material streams and their related money flows to fairly reflect environmental impacts, their associated financial effects remain unidentified and undisclosed to the public. Moreover, the Council Recommendation on environmental accounting matters (EC, 2001) has found little echo in the national regulatory frameworks of France and the United Kingdom.

METHODOLOGICAL ASPECTS

The formulation of hypotheses

The present study uses a mixed design methodology. A mixed model design is a research which uses both quantitative and qualitative data in one or two stages of the research process, so that the mixing of quantitative and qualitative approaches happens in every stage of a research. From a qualitative perspective, the main research hypothesis is based on the literature review, and is formulated as follows: Since there are no regulatory constraints on the financial recognition of environmental elements, the output of environmental accounting is largely voluntary.

A corollary will be demonstrated using content analysis: the voluntary disclosures regarding environmental impacts are quantitatively reduced, and qualitatively obscure or insignificant. From a quantitative perspective, a balanced panel (that is, the same number of companies for the entire time span of four financial years) will be used to conduct statistical tests on the following two hypotheses:

(1) There is a certain "reporting inertia" leading to time invariability in the reporting behavior of sample companies;

(2) National accounting culture exerts a certain influence over the amount of environmental disclosure, in a direct relationship with the degree of regulatory pressure exerted by national standards.

Sample selection

The present study uses hand-collected panel data on environmental accounting elements disclosed over multiple time periods for the same European corporations. The target sample was set to include 100 companies: half British companies listed on the London stock exchange, half French companies listed on the Paris stock exchange. The tool available at Euroland.com was used to sort the list of companies by their market capitalization (access date 31 December, 2009). A complete list, with an indication of primary stock exchange and sector of activity, is presented in Appendix 1.

The sample collected for financial year 2008/2009 is considered to be the reference sample, consisting of 100 observations (that is, companies), each of them having issued at least the annual financial report for that year. Our purpose was to extend the analysis to include several prior years of environmental disclosure. Thus, we took the list of companies from the reference sample, and collected data for another three financial years (FY): 2005/2006, 2006/2007 and 2007/2008. Financial year 2005/2006 was considered to be the first year of relevant data, because annual reports of European companies have become comparable since January 1st, 2005, due to the adoption of IFRS for all listed companies on European stock exchanges.

However, the initial dataset was an unbalanced panel. Some of the companies belonging to the reference sample did not issue annual reports for periods prior to 2008; mainly because they were formed in 2006 to 2007 after a merger between other companies (for example this is the case of ArcelorMittal, GDF Suez and CGG Veritas, which did not exist as such in 2005 to 2007). The descriptive statistics in Table 1 describes the reference sample of 2008/2009 and the incomplete sample data collected for the prior three financial periods, back to 2005, the year of passage to IFRS. The financial years are expressed as 200X/200Y because each firm is allowed to issue its financial statements for 12 months ending at a certain date of choice (for example, for financial year 2008/2009, 72% of firms have 31 December 2008 as their fiscal year-end, 12% have 31 March 2009, and the rest between 12 September 2008 and 30 June 2009).

The largest group companies were extracted from the indexes of the respective stock exchanges, excluding those belonging to the following sectors (Euroland's denominations): banks, life and general insurance, financial services, real estate investment trusts, business support services, security and alarm services, internet software and services, wireless communications services, computer and consulting services, engineering and industrial software, internet service providers, property investment and management, TV, radio and diversified media, advertising, publishing, medical technology and supplies, travel services, engineering and architectural services.

It is apparent that the activities specific to the excluded sectors have only trivial impact on the natural environment. For the purpose of our analysis, it means that these economic activities, mostly providing services to end consumers, do not interact with the natural environment in a significant manner: specifically, they do not have direct greenhouse gas emissions, they use only indirect energy (that is, they do not produce electricity for their own needs), and they have negligible quantities of waste. Furthermore, a pilot study conducted on the annual reports of several such companies revealed that no environmental accounting elements were disclosed in the notes to the annual accounts. Hence, the inclusion of these companies would have distorted the analysis.

The selected companies were grouped by industry to emphasize the economic environment that has been targeted in the process of

Table 1. The reference sample and the comparative perspective for the prior financial years (FY).

County of incorporation	FY 2005/2006 (No. of firms)	FY 2006/2007 (No. of firms)	FY 2007/2008 (No. of firms)	Reference sample FY 2008/2009 (No. of firms)
United Kingdom	47	47	49	50
France	46	47	48	50
Excluded companies	Alcatel Lucent ArcelorMittal CGG Veritas ENRC Fresnillo GDF Suez Suez Environment	ArcelorMittal CGG Veritas ENRC Fresnillo GDF Suez Suez Environment	Fresnillo GDF Suez Suez Environment	-

Table 2. An overview of the reference sample, with the 100 companies grouped by country and industry.

Euroland industry	UK	France	Total
Aerospace and defense	4	2	6
Autos and transport equipment	0	3	3
Chemicals	1	1	2
Construction and materials	0	6	6
Consumer products - food, beverages	6	2	8
Consumer products – non-food	1	4	5
Entertainment and leisure	3	2	5
Health and pharmaceuticals	2	3	5
IT, Information technology	0	1	1
Manufacturing	1	4	5
Mining and metals	11	3	14
Oil and gas	6	3	9
Retail	6	3	9
Telecom	3	4	7
Transportation	0	5	5
Utilities	6	4	10
Grand Total	50	50	100

sample selection. A detailed view of the target sample (financial year 2008/2009) grouped by country and industry is presented in Table 2. In this analysis, 16 main industries (Euroland's denominations) have been selected as to create a statistically significant sample for those British and French companies which disclosed financially quantifiable environmental elements in their corporate annual reports. The data in Table 2 shows the distribution of the companies in the respective industries; more than one quarter of the sample (24 observations) is active in three environmentally-sensitive industries: Mining and Metals, Utilities and Chemicals. This is convenient, since extractive industries (for example minerals and precious metals, production of steel), utilities (for example, electric, gas and water utilities) and chemicals (for example paints, catalysts and technologies for chemical processes) usually have an incontestable footprint on the natural environment.

RESULTS AND DISCUSSION

The heterogeneous data collected from the corporate

annual reports of the companies have been synthesized in order to create a general classification of financially quantifiable environmental elements. This classification has been used to organize all the environmental elements expressed in monetary form, in accordance with the international financial reporting standards (IFRS). The following would be discussed: environmental assets and investments (based on IAS 16), provisions for decommissioning and restoration (based on IAS 16 and IAS 37), other environmental provisions for environmental protection and litigation (based on IAS 37), environmental expenditure (based on regular disclosure in the income statement), and environmental taxes, fines, donations and sponsorship (based on regular disclosure in the sustainability reports). The following aspects would be discussed in this paper in relation to the results of the content analysis regarding monetized environmental

disclosure in corporate annual reports, followed by a statistical analysis of the reporting trend for our panel data, and the national accounting differences between the sample firms.

A presentation of environmental accounting elements extracted from financial reports

Using content analysis, the environmental elements expressed in monetary terms are hereafter summarized, to create a comprehensive picture of financially quantifiable environmental impacts presented in the corporate annual reports for the 2008/2009 financial year. However, as noted in the following; environmental assets and investments; environmental provisions for decommissioning, dismantling and restoration; other environmental provisions and liabilities; environmental expenditure; donations, sponsorship, taxes and fines.

These elements are quasi-identical for prior periods, as there is a certain "reporting inertia" which influences the presentation of environmental accounting assets. In other words, even if the extracted elements have a cross-sectional appearance, the results can also be extrapolated to other periods, due to a reporting pattern, with low variability and poor informational content.

Environmental assets and investments

Environmental assets and investments are recognized in accordance with IAS 16 property, plant and equipment, indicating that some fixed assets may be acquired for safety or environmental reasons. The acquisition of such elements, even in the absence of future economic benefits, may be necessary for the uncompromised use of other operating fixed assets. In this case, it is clear that the acquisition of environmental assets is outside the scope of the general definition of an asset. This derogation is based on the fact that future economic benefits may be compromised in the absence of certain environmental assets, even though the latter are only accessories to the main operation. As an example, the standard presents the case of a chemical plant which is forced to introduce new substance manipulation processes, in order to conform to current legal obligations; the operational improvements are capitalized as environmental assets, since the firm would not be able to produce and sell its chemicals without these processes.

A selection of environmental assets:

- (1) Anglo American: environmental rehabilitation trusts, recorded in the balance sheet and recognized as long-term assets;
- (2) Antofagasta: investments incurred in the group's mining operations in reforestation, environmental monitoring, archaeology and wildlife management plans;
- (3) APPR: investments in operating motorways to reduce environmental impacts and decrease risks related to

- water, noise, rubbish, biodiversity and landscape;
- (4) AstraZeneca: investments in laboratories to improve the facilities for the evaluation of the environmental fate and persistence of pharmaceuticals;
- (5) BP: capital expenditure on the prevention, control, abatement or elimination of air, water and solid waste pollution;
- (6) Imperial tobacco group: investments for reducing energy consumption by replacing a steam-driven vacuum chamber with an electrical-driven vacuum pump;
- (7) Kazakhmys: commissioning of an acid plant for reducing emissions; other investments on precipitators at air turbines for improving the air quality;
- (8) Scottish and south energy: development of an offshore wind farm. It involves installation of wind turbines and turbines in water depths; investments in refurbishing and developing hydro-electric schemes;
- (9) Severn Trent: investments to build modern sewer network, to improve the infrastructure and to prevent sewer flooding;
- (10) Tesco: investments to install solar panels, wind turbines and one store installation for solar generation;
- (11) United utilities group: capital investments including infrastructure renewals expenditure comprising water services and waste water services;
- (12) Vallourec: the group invested in projects directly related for environmental compliance (fume and dust filters and collection systems), safety improvements (fire protection systems, gas systems), and improvements in working conditions (lighting, heating and ventilation), noise abatement and water recycling;
- (13) Vedanta resources: capital expenditures to improve operational efficiency, to modernize older plants to meet company's environmental goals; installation of a cleaner tail gas treatment plant in order to reduce SO₂ emissions and results in zero waste;
- (14) Xstrata: investments to develop improved methane capture techniques.

Environmental provisions for decommissioning, dismantling and restoration

This type of environmental provisions is recorded for environmental long-term assets in accordance with IAS 16. The provisions for decommissioning and dismantling are made for the value of costs relating to the decommissioning of plant or other site restoration work, and are incorporated into the value of the fixed asset. Environmental restoration provisions are recorded when the company has obligations to undertake restoration, rehabilitation and environmental work, when environmental disturbance is caused by the development or ongoing production at the companies' sites. These costs are estimated at the beginning of the asset's useful life, and are assimilated to a provision in compliance with IAS 37.

Provisions for environmental clean-up and remediation

costs are based on current legal and constructive requirements, technology, price levels and expected plans for remediation. Actual costs and cash outflows can differ from estimates because of changes in laws and regulations, public expectations, prices, discovery and analysis of site conditions and changes in clean-up technology. The future expenses with dismantling and site restoration may also be derived as a consequence of the continuous use of an asset whose environmental impact is not negligible. However, PriceWaterhouse Coopers (2004) considers that, whenever environmental degradation is outside the industrial parameters for the use of a certain asset, the supplementary expenses should be incurred immediately. Provisions for dismantling and clean-up costs are persistent elements, that is, they are recognized at one point in time and may be found unaltered for several financial years in the balance sheet.

A selection of environmental provisions for decommissioning, dismantling and restoration:

- (1) Anglo American: obligations to undertake restoration, rehabilitation and environmental work when environmental disturbance is caused by mining property;
- (2) ArcelorMittal: environmental provisions linked to dismantling of steelmaking installations and soil treatment of sites;
- (3) BG Group: provision of decommissioning related to the end of the producing lives of fields;
- (4) EDF: provisions for long-term radioactive waste removal and storage of radioactive waste resulting from decommissioning of regulated nuclear installations; long-term and direct storage of spent fuel that cannot be recycled on an industrial scale in existing installations; plutonium or uranium fuel derived from enriched processing;
- (5) Eramet: provisions for restoration of mining sites, for dismantling facilities and replanting sites;
- (6) France Telecom: provisions for decommissioning and rehabilitation of sites for restoring mobile telephony antennae, dismantling telephone poles, management of waste electronic equipment;
- (7) GDF Suez: provisions for dismantling nuclear facilities and provisions for nuclear fuel reprocessing and storage; provisions for rehabilitating land on which former gas production plants were located: construction of infrastructure (biogas recycling facility, installation of leachate treatment facility) and demolition of installations used;
- (8) Morrison Supermarkets: property provisions comprise onerous leases provision, petrol filling station decommissioning reserve and provisions for dilapidations on leased buildings;
- (9) Rio Tinto: close down and restoration expenditures incurred at the end of the relevant operation.

Other environmental provisions and liabilities

This category is recorded in accordance with IAS 37

Provisions, contingent liabilities and contingent assets. IAS 37 proposes a definition for several elements which are intimately linked with the prudence principle in accounting. A provision is a liability whose value and date of payment are uncertain and which is recognized whenever: (a) the company has a current obligation (example of an environmental nature) from a past event; (b) an outflow of future economic benefits is to be expected in this circumstance; and (c) a good estimate can be provided for this obligation. Unlike ordinary liabilities, the standard defines a constructive obligation as an uncertain liability imposing the recognition of a provision. For example, a company conducts its extractive operations in a country with no environmental legislation. However, the company has publicized its environmental policy, which states that any remediation expenses arising from polluting activities will be supported by the firm. In case such incidents occur, the company has a constructive obligation, and implicitly a provision, for the best estimate of these future expenses. However, the standard does not provide any details on the type and magnitude of an event that is deemed to trigger a constructive obligation.

Environmental expenditures that relate to current or future revenues are expensed or capitalized as appropriate. Environmental liabilities are recognized when environmental assessments or clean-ups are probable and the associated costs can be reasonably estimated. The amount recognized is the best estimate of the expenditure required. Where the liability will not be settled for a number of years, the amount recognized is the present value of the estimated future expenditure. Environmental provisions and liabilities are persistent elements, that is, they are recognized at one point in time and may be found unaltered for several financial years in the balance sheet.

A selection of other environmental provisions:

- (1) Air France-KLM: estimates of future costs related to regulations concerning noise resulting in the alteration of take-off and landing procedures and in flight path diversions to avoid densely-populated areas around Schiphol airport;
- (2) ArcelorMittal: environmental provisions relating to remediation of former coke plant sites and the capping and monitoring of landfills or basins previously used for residues and secondary materials; Environmental provision to clean pond water and to meet the requirements of the Luxembourg Environment Administration regarding discharges in the water and also maintain sufficient cold water reserves to permit the production of degassed steel in warmer months;
- (3) AstraZeneca: provisions for the estimated costs of future environmental investigation, remediation and operation and maintenance activity beyond normal ongoing expenditure for maintaining the Group's research and development and manufacturing capacity and product ranges; it is probable that such costs will be incurred

and can be estimated reliably.

(4) Renault: provisions that concern environmental compliance costs for industrial land that the Group intends to sell and expenses related to the EU directive on end-of-life vehicles;

(5) Schneider: environmental provisions set aside to cover reclamation costs;

(6) Vallourec: provisions for environmental risks that cover the costs of soil treatment at industrial sites;

(7) Wolseley: provisions related to asbestos litigation involving certain Group companies. Asbestos related litigation is covered by insurance and accordingly an equivalent insurance receivable has been recorded in other receivables.

Environmental expenditure

This category comprises current operating expenditures (immediately recognized in the income statement) carried out by companies in relation with environmental protection and amelioration. This type of expenditure includes environmental insurance, R and D, studies, training, and obtaining ISO 14001.

A selection of examples concerning environmental expenditure:

(1) Aeroports de Paris: expenditures to reduce the negative environmental impact and consists of land-scaping, the treatment of surface runoff and collection of elimination of non-hazardous and hazardous waste;

(2) Air France-KLM: environmental expenditures that involve both soil and groundwater decontamination of diverse traces of hydrocarbons, solvents and metal deposits;

(3) Alstom: R&D programs for development of CO2 capture technologies and for the AGV, the last generation of very high speed trains;

(4) APRR expenditure committed to mitigate the environmental impact of the construction of a new motorway: acoustic protection, water protection, waste processing, landscaping;

(5) Bouygues: R&D programs that include energy efficiency for both new and existing buildings, optimization of the overall lifecycle cost, energy consumption commitments based on thermodynamic and eco-neighborhoods;

(6) Danone: costs for reducing atmospheric emissions and costs of waste treatment;

(7) EDF: R&D expenditures for environmental protection relates to: nuclear, fossil-fired, hydro, energy eco-efficiency, research into renewable energies, local impact of climate change, other studies furthering knowledge of environmental issues (biodiversity, water quality, noise reduction);

(8) Legrand: Programs to raise employee awareness of environmental issues;

(9) LVMH: Operation environment expenses related to protection of the ambient, air and climate; waste water

management; protection and clean-up of the soil, underground water and surface water; protection against noise and vibrations; protection of biodiversity and the landscape; protection against radiation;

(10) Saint-Gobain: salaries and other payroll expenses for environmental officers; ISO 14001 and EMAS environmental certification and renewal costs – this includes all certification related expenses and charges for outside consultants, internal and external training, the development and upkeep of EMS and ISO 14001 systems, audits, and meetings on the topic of certification coordination and review;

(11) Veolia Environment: compensation paid in execution of legal decisions concerning the environment and actions taken to repair environmental damage;

(12) Vinci: Expenditures for environmental protection: soil remediation, cleaning and decontaminating structures; maintenance of natural spaces; premiums for insurances cover of environmental risks;

(13) Wolseley: expenditures for reducing emission from copper and lead smelters.

Donations, sponsorship, taxes and fines

This category consists, on the one hand, of voluntary environmental donations and sponsorship showing the companies' commitments toward the community and the natural environment. On the other hand, the fines and taxes paid for environmental purposes are disclosed in a manner that demonstrates extreme attention for the company's public image. These payments are mandatory for improving the companies' public perception.

A selection of environmental donations, sponsorship, fines and taxes:

(1) Accor: Environmental expenditures for organizing the second Earth Guest Day, launching the Plant for the Planet reforestation program, enhancing reporting systems and supporting partnerships;

(2) Air France-KLM: Expenditures incurred to support Good Planet/WWF project against deforestation in Madagascar; tax paid to finance sound-proofing for homes situated near airports and exposed to aircraft noise;

(3) Associated British Foods: Nine environmental fines in relation to failure to meet effluent standards, uncontrolled releases to air and emissions of noise and dust;

(4) BT Group: a prosecution by the Environment Agency resulted in fines and costs to erecting five telegraph poles within a flood defense in UK;

(5) Cadbury: Expenditures incurred in respect with charitable purposes: education and enterprise, environment, health and welfare;

(6) Casino Guichard: eco-packaging tax and eco-contribution on promotional brochures;

(7) Eurasian Natural Resources: The environmental authorities in the Republic of Kazakhstan conduct regular

- inspections at site operations; fines and penalties paid;
- (8) GDF Suez: 53 complaints and eleven fines relating to environmental damage;
- (9) Johnson Matthey: a violation related to the selective screening of wastewater samples for compliance analysis ended with fines paid;
- (10) Peugeot: the Group launched a host of initiatives with local partners concerning topics as road safety, the environment and assistance to victims of natural disasters.
- (11) Reckitt Benckiser: two environmental fines for exceeding the wastewater discharge quality.

DISCUSSION AND LIMITATIONS

All aforementioned elements are a selection of a larger quantity of monetary environmental disclosures within the annual reports of British and French corporations. The presentation of results has omitted irrelevant pieces of information and identical elements to be found in the financial notes of several companies. However, the reader should be aware that the level of detail for the extracted data is mostly the same level of detail relative to the data source. That is, the content analysis in the methodology was intended to capture the unaltered wealth of information (or lack thereof) from the annual accounts, in order to validate the two hypotheses of this paper. Just as a reminder, the primary hypothesis was referring to the voluntary aspect of environmental accounting, while the corollary was addressing the dubious quality of monetary environmental disclosures.

The voluntary aspect is in the middle of a theoretical controversy. The philosophy behind IFRS induces the idea that all reported elements should be material, in that they should have an attached value above a certain monetary threshold. The users of financial information will never see the materiality principle in action, just its effects. Therefore, no external user can be reasonably certain that some environmental elements of particular importance have not been left out due to the application of the materiality principle. This reasoning applies to the first two paragraphs of our analysis, concerning the environmental assets and the provisions for dismantling and decommissioning, which are usually included into the cost of property, plant and equipment. For example, an element such as "investments to develop improved methane capture techniques" (Xstrata, FY 2008) cannot be reasonably assessed by any external user, since there is no additional information on the nature of the asset, its useful life, its estimated benefits or the materiality threshold for the recognition and disclosure of such investments as long-term assets.

The dubious character of environmental disclosure in monetary terms is particularly significant for such elements as environmental protection expenditure and other related costs. The very specific character of

environmental contingencies, current expenditure and related payments is a direct consequence of the implementation of an environmental management system, including the dedicated cost accounting. However, the users of financial statements cannot be truly assured that all relevant environmental expenditure was classified as such, or that the environmental risks have been provided with reasonable estimates based on past experience. Moreover, there are several types of expenditure which are not neutral from a reputational point of view: for example, fines and taxes carry an inherent negative connotation, while donations and sponsorship are perceived as evidence of environmental responsibility. Prior literature (Adams, 2004) has showed that some "qualitative" monetary elements are usually omitted when reputational costs are exceeding the benefits from the exercise of transparency.

Reporting inertia – an overview of monetary disclosures in environmental accounting

"Reporting inertia" is a phenomenon which accounts for a lack of variability in the corporate disclosure quality and/or quantity over longer periods of time. Our study proposes a time span of four years, between financial year 2005/2006 and financial year 2008/2009. From a regulatory point of view, the accounting disclosure requirements for this period were relatively stable, but the reader must be aware that the beginning of the period was right after the introduction of IFRS in Europe. Beginning with 1 January 2005, companies listed on European Union stock exchanges were required to provide a complete set of financial statements in accordance with IFRS, besides their individual financial statements in compliance with national accounting standards. For many companies, this has been a first encounter with IFRS and their disclosure requirements, and that is why we would have expected an increasing trend in corporate reporting. For the purpose of this statistical analysis, we have used the following abbreviations for the five classes of accounting elements, as determined by content analysis.

- (1) Environmental assets and investments – EAS;
- (2) Environmental provisions for decommissioning, dismantling and restoration – DRP;
- (3) Other environmental provisions and liabilities – OEP;
- (4) Environmental expenditure – EXP;
- (5) Donations, sponsorship, taxes and fines – DST.

As indicated in the methodological aspects, we are interested in testing the following hypothesis: The quantity of environmental disclosure pertaining to a specific class of accounting elements has a low variability over time, that is, the frequency of reported accounting elements stays approximately the same over the four financial years.

Table 3. The frequency of environmental accounting elements present in the annual reports of European companies.

Environmental accounting elements (count)	FY 2005/2006 (93 companies)	FY 2006/2007 (94 companies)	FY 2007/2008 (97 companies)	FY 2008/2009 (100 companies)
EAS	29	31	32	35
DRP	26	25	25	32
OEP	31	29	32	29
EXP	35	37	37	42
DST	23	20	29	31

The presence of environmental accounting elements expressed in monetary form was coded in five binary variables, corresponding to the five classes of accounting elements. In other words, the dichotomous variables do not capture environmental reporting quantity, but the mere presence of the five types of environmental accounting elements in the annual reports. One company may have several elements of environmental expenditure in one year's report, but their presence is coded only once within the binary variable. For the entire sample, the counts in Table 3 indicate the frequency of environmental accounting elements, for each financial year. This cross-tabulation is used only for descriptive purposes, as the quantitative procedures described hereafter were conducted on a reduced dataset.

The statistical analysis employed here would only be viable when applied on a balanced panel, which required the elimination of 7 companies which had no annual reports for at least one financial year. Thus, as mentioned in the sample description, the final dataset contains 93 companies, with a total of 372 observations.

The "reporting inertia" hypothesis was tested using a nonparametric test for related samples, Cochran's *Q*, which tests the hypothesis that several related dichotomous variables have the same mean. The null hypothesis for the Cochran's *Q* test is that there are no differences between the variables (Sheskin, 2004). If the calculated probability is low ($p < 0.05$) the null-hypothesis is rejected and it can be concluded that the proportions in at least two of the variables are significantly different from each other. In our case, the related dichotomous variables are observations of a certain type of environmental accounting elements, for each financial year. This means that there are four related variables (that is one for each financial year), for each of the five types of environmental accounting elements (that is environmental assets and investment).

The descriptive statistics presented in Table 4 are frequencies of environmental accounting elements present in the annual financial and sustainability reports of the sample companies. The last two columns present the results of the nonparametric Cochran's *Q*, where an asymptotic significance larger than .05 indicates that we cannot reject the null hypothesis that there is a "reporting inertia", that is a lack of variability in the environmental reporting practices of our sample companies.

Overall, the results presented in Table 4 indicate that we cannot reject the null hypothesis of pronounced similarity between the reporting practices of sample companies over the four financial years. Therefore, the afore statistical analysis presented suggests one important aspect of environmental accounting: there is no significant temporal dimension of this type of disclosure. Environmental reporting does not improve over time, mainly because it possesses an "inertia" which firms are reluctant to overcome. This inertia may be due to three factors, which often work in conjunction:

(1) Firms have a fixed reporting pattern. Content analysis has revealed that annual financial and sustainability reports do not change in their informational content from year to year. Each firm has developed its own reporting format, which is used for a long period of time (more than five years, as our sample suggests), updating only the financial numbers and other numerical indicators. In some cases, some vague assertions – for example "GSK and its heritage companies have spent more than £100 million cleaning up more than 50 sites in the US over the last 20 years" (GlaxoSmithKline, FY 2008) – are retained for a number of years, in each subsequent report. For the purpose of providing descriptive statistics regarding environmental accounting elements, we have included such financially quantifiable items in the count presented above, even if some are only pseudo-examples of environmental accounting.

(2) Corporate environmental protection activities are scarce or the environmental management system does not produce sufficient information to indicate otherwise. Firms belonging to certain environmentally-sensitive sectors are sometimes caught in a posture of weak environmental reporters, mainly because their management systems do not produce relevant financially quantifiable environmental information. This is not surprising, since we have demonstrated that environmental accounting standards are not as well developed or reliable as they should be, in order to force the creation of a specialized environmental accounting department within each company. In other cases, however, environmental protection is a peripheral activity whose results are not deemed worthy to be internally quantified, and which is only mentioned briefly in some annual financial and sustainability reports.

Table 4. Descriptive statistics and the results of Cochran's Q for testing the "reporting inertia" hypothesis.

Environmental accounting elements	The frequency of environmental accounting elements for each financial year				Value of Cochran's Q	Asymptotic significance
	2005/2006	2006/2007	2007/2008	2008/2009		
EAS	29	31	30	34	3.5	.321 > .05
DRP	26	25	25	29	5.16	.16 > .05
OEP	31	29	31	27	3.47	.324 > .05
EXP	35	37	36	40	1.78	.618 > .05
DST	23	20	28	28	7.48	.058 > .05

Note. Sample size: 372 observations for 93 companies. There are 93 observations for each financial year. The significance level for Cochran's Q is 0.05. The tests are two-tailed.

(3) The persistent character of some accounting elements, for example, provisions for decommissioning, dismantling and site restoration. This type of provisions is recorded at the beginning of the useful life of an asset, and remains intact throughout the whole period, which is presumably long-term. These accounting elements may not have increases or decreases for many years, yet they are presented each year in the notes to the annual accounts. The same applies to other environmental provisions (example for legal risks), which may not be used until definitive court sentences have been given on environment-related cases against the firm. These elements are also part of the "reporting inertia" phenomenon, although these elements are persistent by nature, and cannot be altered until some external event triggers an expenditure to settle an existing obligation (example for environmental protection, or for dismantling of assets).

A major limitation of this type of analysis – and of the corresponding statistical results – is that the researcher cannot actually determine which of the above scenarios is actually explaining the scarcity of environmental accounting information in corporate annual reports. The researcher can at most find proof of a "reporting inertia" which may last even for a decade, but cannot pinpoint the exact causes for this inertia. On the other hand, the

researcher cannot exclude items of environmental disclosure from one year's report, simply because they were present in a quasi-identical form in prior annual reports. Therefore, we can conclude that the "reporting inertia" is distorting the results of content analysis, whenever we try to add a temporal dimension to environmental accounting disclosure. In other words, the temporal dimension appears to be irrelevant to this type of qualitative analysis, even if it had appeared promising in discovering the evolution of corporate disclosure in connection with radical changes in the international accounting context (that is, the adoption of IFRS for use in the European Union for listed companies).

An analysis of national differences relative to environmental disclosures

The reviewed literature has proposed a discussion on national differences regarding accounting cultures. We have advanced the idea that the two countries selected for our study also stand for two contrasting accounting paradigms, that is, the Continental (French) vs. the Anglo-Saxon (UK) accounting culture. Therefore, a logical extension of our research would be to seek whether these differences actually exist when it comes to

environmental disclosure, and to quantify the magnitude of these differences.

We are relying on the same classification of environmental accounting elements: environmental assets and investment (EAS); provisions for dismantling and decommissioning (DRP); other environmental provision and liabilities (OEP); environmental expenditure (EXP); and donations, sponsorship, taxes and fines (DST). Using the same balanced panel of 93 companies (372 observations), we simply split the sample according to their country of incorporation (France – 46 companies and 184 observations; UK – 47 companies and 188 observations), and used these two samples for group comparisons.

The most appropriate statistical tool for comparing two independent samples with binary responses is the Mann–Whitney *U* test, which is one of the best-known non-parametric significance tests. The null hypothesis would be that the quantity of environmental elements in the annual reports of French companies does not significantly differ from the quantity of environmental disclosure exhibited by UK companies. The test involves the calculation of a statistic, usually called *U*, which can be approximated using the normal distribution for larger samples (such as the present one).

The results presented in Table 5 are based on

Table 5. The frequency of environmental accounting elements, with a comparison between the two countries

Environmental accounting elements	The quantity of environmental disclosure within the two groups, for the whole period (4 years)		Non-parametric significance test: Mann-Whitney <i>U</i>		
	France (184 obs.)	UK (188 obs.)	Statistic <i>U</i>	Z	Asymptotic significance
EAS	66	58	16428	-1.025	0.305 > .05
DRP	38	67	14704	-3.206	0.001 < .05
OEP	66	52	15876	-1.699	0.089 > .05
EXP	95	53	13242	-4.612	0.001 < .05
DST	24	75	12652	-5.821	0.001 < .05

Note. Sample size: 372 observations for 93 companies. The significance level for Mann-Whitney *U* is 0.05. The tests are two-tailed.

the frequency of environmental accounting elements present in the annual reports of companies from the two countries. Whenever the significance of the *U* statistic is below the 0.05 threshold, we can reject the null hypothesis and confirm the fact that the two accounting paradigms are divergent in respect to environmental accounting.

As indicated by the results in Table 5, the differences between national accounting cultures are not equally visible for the whole spectrum of environmental accounting elements. We will therefore discuss the magnitude of these differences in relation to the previous presentation of national standards regarding environmental accounting. The national accounting regulations, both for France and the UK, are the main drivers for the configuration of a national accounting culture. The underlying assumption, as proven by the literature (Feleagă et al., 2010), is that national accounting culture has a significant influence of the recognition and measurement of accounting elements, even in supposedly uniform reporting environments, such as the IFRS. In other words, national standards exert a strong influence on the presentation of annual financial statements and reports.

The following discussion will attempt to provide an explanation for the differing patterns of environmental disclosure with reference to the national accounting standards regarding environmental reporting,

The recognition of environmental assets and investments (EAS) appears not to be influenced by national accounting culture, since we cannot reject the null hypothesis ($p = .305$). This fact can be explained by an overall compatibility between national regulation and IFRS (that is, more specifically IAS 16) on the recognition and treatment of environmental assets. The relevant accounting policies regarding the capitalization of environmental protection expenditure have been implemented by the French and British standard-setters in a similar manner to that of the IFRS, indicating a successful accounting convergence process on this specific topic.

The treatment of environmental provisions for decommissioning and site restoration (DRP) is part of an established accounting policy within the Anglo-Saxon

paradigm.

The results indicate that UK companies have recognized significantly more elements of this type in their financial accounts ($p < 0.001$), suggesting that, even if French companies were also reporting in compliance with IFRS, national accounting culture was a strong barrier to the recognition of such elements. It is also worth mentioning that several British accounting standards are an almost identical version of the respective International Accounting Standards (here including IAS 16 and IAS 37), and that the philosophy of IFRS has had the best means to penetrate the British accounting culture.

The frequency of other environmental provisions (that is for environmental litigation and various environmental costs) is slightly more reduced for British companies, but not enough to generate a significant difference between the two national accounting cultures ($p > 0.05$). However, this phenomenon can be explained by the pronounced conservatism within the Continental accounting paradigm (Feleagă et al., 2010). The literature has proven that companies from Continental European countries have a propensity towards recognizing provisions for risks and charges, even in excess of the demands of IAS 37.

Environmental expenditure (EXP) and sponsorship, taxes and fines (DST) are accounting elements to be found in the income statement, and which immediately affect the financial performance of a firm (that is, the bottom line figure). The results indicate that there are significant differences between companies from the two countries, but we cannot find a consistent pattern for the recognition of these elements. We propose the following explanation: all these expenditure elements (environmental protection costs, taxes, fines, sponsorship and donations) are explicitly or implicitly connected with the regulatory environment. The government and non-governmental organizations may demand environmental actions and commitments from these companies. Companies may conform to these requirements, and therefore record environmental protection expenditure, or may be indifferent to such request, and thus be forced to pay fines and taxes for non-compliance. In other words, we suggest that these two categories of environmental

element may be complementary and in an inverse relationship: more of one means the less of the other. A certain balance regarding the recognition and occurrence of such elements is mainly due to an external regulatory context, which acts as an arbiter between the types of environmental expenditure a company records in its annual accounts.

A limitation of this type of analysis is that the profiles of the companies from our sample are not perfectly matched. The discussion so far has speculated on the significant influence exerted by national accounting culture. However, we have to admit that there are other factors which could modulate this influence. For example, the industrial sector of each company may impose specific requirements regarding the type of environmental expenditures, the optimal degree of conservatism (through the recognition of provisions), or the existence of environmental assets and capitalized environmental expenditure. It is perfectly natural for firms in some sectors not to record a certain type of environmental accounting element (for example, provisions for decommissioning and site restoration), while for others to be explicitly required to recognize such elements (for example respectively, for firms in the mining sector). On the other hand, the maturity of a company in its sector may also influence its sensitivity to the existence of such environmental elements. Older and more prudent firms may find it extremely useful to recognize and accurately measure provisions for environmental litigation, while younger firms may prefer to immediately expense such elements. The accounting policies recommended by IFRS are flexible enough to accommodate all these options, while admitting that this regulatory regime does not necessarily insure comparability between economic entities.

National accounting standards, which are compulsory for all companies irrespective of size, are generally not supportive of environmental accounting. In either France or the UK, the implementation of European Commission's recommendation on environmental accounting elements (EC, 2001) has been unsatisfactory. Moreover, the IFRS do not specifically address such issues as environmental expenditure or investments. A significant amount of environmental accounting data (that is, specific costing allocated to products and processes) is produced through an environmental management system; the rest can be extracted from financial accounting documentation, especially regarding those elements under the auspice of IFRS (that is, environmental provisions). However, these two information systems are not decoupled from one another. Environmental risks are also taken into account by corporate policies, while environmental costing should be eventually reflected into such indicators as operational expenses or turnover. It is very difficult to assess the separate influence of individual factors (such as the national accounting standards, or the existence of a specialized management system) on the quantity of environmental disclosure present in the annual accounts

of European corporations.

Conclusions

The contribution of this study is three-fold: firstly, we have devised a qualitative assessment of environmental accounting elements to be found in the annual financial and sustainability reports of 100 European companies; secondly, we have provided quantitative evidence on the existence of a phenomenon called "reporting inertia", which produces a time-invariant quantity of environmental accounting elements; thirdly, we have conducted statistical tests aiming to describe the magnitude of the influence national standardization has on the accounting policies chosen by French and British companies.

The results of the qualitative inquiry through content analysis of annual reports have revealed that companies have low levels of environmental reporting in monetary terms. Some elements of environmental accounting are compulsory through the application of the international financial reporting standards (IFRS), while others are not in the least regulated by generally accepted standards. A classification of environmental accounting elements was provided based on the relevant international standards and accounting policies: environmental assets and investments; provisions for decommissioning and site restoration; other environmental provisions; environmental expenditure; and environmental donations, sponsorship, fines and taxes. The qualitative inquiry indicates that managers and accountants have a significant amount of discretion when it comes to what environmental elements to recognize and how to measure and report them. Sector differences, maturity of the firm and reputation issues may add to the complexity of this picture, which can be eventually described as lacking detail and relevance to external stakeholders.

The "reporting inertia" is a phenomenon which has never been linked with environmental disclosure before. However, both from the qualitative side of our inquiry and from the quantitative evidence, this phenomenon appears as extremely relevant for environmental accounting. "Reporting inertia" refers to a certain approach to corporate environmental reporting, where companies are using prefabricated phrases and paragraphs to report almost the same monetary elements year after year, for long periods of time. Clearly, this type of environmental reporting does not answer the informational demands of stakeholders, since it is almost impossible for external environmental challenges to be as immutable as corporate reports present them. Using inferential statistics on a balanced sample of 93 firms (372 observations), we have proven that there are no significant differences in the proportion of environmental accounting elements extracted from the sample companies' annual financial and sustainability reports for a period of four financial years.

In the last stage of our analysis, we wanted to test

whether the two contrasting accounting paradigms – the Continental European versus the Anglo-Saxon paradigm – are truly opposite when it comes to environmental reporting in monetary terms. Using 46 companies from France (a country implementing the former paradigm) and 47 companies from the UK (representing the latter), we used our previously created balanced sample with observations for four years to conduct group comparison tests on all five categories of accounting elements. With regard to environmental assets and other environmental provisions, we have found no significant differences between the two groups of companies, therefore suggesting that the international accounting convergence process was successful. On the matter of environmental provisions for decommissioning and site restoration, which traditionally belongs to the Anglo-Saxon paradigm, companies in the UK disclose significantly larger quantities of information than their Continental counterparts, while on the matter of diverse environmental costs, the reporting patterns are divergent (that is, French companies report significantly more environmental expenditure, while UK companies recognize more elements classified as donations, sponsorship, fines and taxes).

The contributions of this paper and the discussions presented indicates that the comparative perspective on environmental accounting should not be neglected. Environmental reporting standards are more difficult to develop than financial reporting standards, considering that the external stakeholder groups (for example, governmental agencies, ecological organizations, the investors, the communities or the public) have diverse information needs. In the current context, where most environmental reporting is voluntary, companies are able to experiment with format and content, with a goal of providing information to satisfy the greatest number of stakeholders. Furthermore, multiple reporting formats allow for the identification of best practices which could serve as useful input for the development of standards. However, the voluntary nature of environmental reporting leads to specific “window-dressing” and “greenwashing”, when opting only for good news or misleading information, such as by presenting cost cuts as reductions in the use of resources. The introduction of standards into a system of voluntary reporting would serve to level the playing field. Finally, in the absence of relevant and detailed standards, independent verification of environmental reporting is problematic.

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APPENDIX**Appendix 1.** The sample companies (100 items).

EL - (PAR)Accor	Ut - (PAR)EDF	CP - (LSE)Reckitt Benckiser
Tr - (PAR)Aeroports de Paris	CM - (PAR)Eiffage	ATE - (PAR)Renault
Tr - (PAR)KLM -Air France	MM - (PAR) Eramet	MM - (LSE)Rio Tinto
Ch - (PAR)Air Liquide	(LSE) .Res .Eurasian Nat - MM	AD - (LSE)Royce -Rolls
TI - (PAR)Alcatel Lucent	TI - (PAR)France Telecom	OG-(LSE)Royal Dutch Shell
Mf - (PAR)Alstom	MM - (LSE) Fresnillo	CPf - (LSE)SABMiller
MM - (LSE)Anglo American	Ut - (PAR)GDF SUEZ	TI - (PAR)Safran
AntofagastaMM - (LSE)ta	HP - (LSE)GlaxoSmithKline	Rt - (LSE)Sainsbury
Tr - (PAR)APRR	Tr - (PAR)Groupe Eurotunnel	CM - (PAR)Gobain -Saint
MM - (PAR)ArcelorMittal	CP - (PAR) .Hermes Int	HP - (PAR)Aventis -Sanofi
CPf - (LSE)Foods .Brit .Assoc	Imerys MM - (PAR)	Mf - (PAR) .Schneider El
AstraZeneca (LSE) - HP	CPf - (LSE)Imp Tobacco Gr	Ut - (LSE) .En .South&.Scot
AD - (LSE)BAE Systems	EL - (LSE) .InterContinental H	TI - (PAR)SES FDR
OG - (LSE)BG Group	Ut - (LSE)Power .Int	Severn Trent (LUt - (SE
MM - (LSE)BHP Billiton	HP - (PAR)Ipsen	AD - (LSE)Smiths Group
HP - (PAR) bioMerieux	Ch - (LSE)Johnson Matthey	EL - (PAR)Sodexo
Tr - (PAR) Bollore	MM - (LSE)Kazakhmys	IT - (PAR) .STMicroel
CM - (PAR)Bouygues	(LSE)Kingfisher - Rt	Ut - (PAR) .Suez Environ
OG - (LSE)BP	CM - (PAR)Lafarge	OG - (PAR)Technip
CPf - (LSE)Tobacco .Am .Brit	Mf - (PAR)Legrand	Rt - (LSE)Tesco
TI - (LSE)BT Group	MM - (LSE)Lonmin	AD - (PAR)Thales
TI - (LSE)Wireless &Cable	L'Oreal (CP - (PAR	OG - (PAR)Total
CPf - (LON)Cadbury	CP - (PAR)LVMH	OG - (LSE)Tullow Oil
OG - (LSE)Cairn Energy	Rt - (LSE)Spencer &Marks	CPf - (LSE)Unilever
Rt - (PAR)Carrefour	ATE - (PAR)Michelin	Ut - (LSE)United Utilities
Casino Guichard - (PAR)d	Rt - (LSE) .Morrison	Mf - (PAR)Vallourec
Ut - (LSE)Centrica	Ut - (LSE)National Grid	MM - (LSE) .Vedanta Res
OG - (PAR)CGG Veritas	Rt - (LSE)Next	Ut - (PAR) .Veolia Environ
CP - (PAR)Christian Dior	CPf - (PAR)Ricard -Pernod	CM - (PAR)Vinci
CM - (PAR)Ciments Francais	OG - (LSE)Petrofac	TI - (LSE)Vodafone Grp
AD - (LSE)Cobham	ATE - (PAR)Peugeot	EL - (LSE)Whitbread
EL - (LSE)Compass Group	Rt - (PAR)PPR	Mf - (LSE)Wolseley
CPf - (PAR)Danone	Randgold Res. MM - (LSE)	MM - (LSE)Xstrata
AD - (PAR)EADS		

The primary stock exchanges are: LSE – London stock exchange; PAR – Paris stock exchange; The abbreviations for the industries are the following: Aerospace and defense – AD; Autos and transport equipment – ATE; Chemicals – Ch; Construction and materials – CM; Consumer products - non-food – CP; Consumer products - food, beverages – CPf; Entertainment and leisure – EL; Health and pharmaceuticals – HP; IT, Information technology – IT; Manufacturing – Mf; Mining and metals – MM; Oil and gas – OG; Retail – Rt; Telecom – TI; Transportation – Tr; Utilities – Ut.