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ENVIRONMENTAL SUSTAINABILITY AND SOCIAL RESPONSIBILITY: A THEORETHICAL PROPOSAL FOR AN ACCOUNTING EVALUATION

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ABSTRACT *The aim and topic of the paper is to formulate a theoretical accounting model for the measurement and the inclusion of a new intangible asset in the financial statements related to environmental sustainability and social responsibility. To achieve this goal the central part of the paper presents an accounting approach that follows an Italian research project entitled POLIED(RO) (POL Pollenzo, I index, E environmental and economics Design). The accounting model proposed in the study tries to accommodate the main suggestions of the International Accounting Standards and the final result tries to propose an accounting model oriented towards the overcoming of the current neutrality between the results of the traditional accounting models and those derivable from social and environmental reports realised by companies, in which is possible to assume an ideal bidirectional connection between the different accounting approaches.*

KEY WORDS: *Accounting Methodology, Environmental Sustainability, Financial Accounting, Green Accounting, International Accounting Standards, Corporate Social Responsibility.*

INTRODUCTION

The scientific objective of the project is to create an index based on a range of different criteria, combining the various aspects of sustainability with current market demands. The index, entitled POLIED(RO) (transl. POLYHEDRON)[POL Pollenzo (note: Pollenzo is the town which houses the headquarters of the unit research leader, the University of Gastronomic Sciences; for more information see at www.unisg.it; the project period was started in December 2009 and will end in December 2011), I index, E environmental and economics Design] is based on a variety of different aspects, all of which possess the same scientific weight in the index, and all of which have at least one thing in common with the others (Piedmont Region, 2009). The general aim of the index is based on three observations:

1. the fact that existing standards can be difficult to interpret, and the presence of an increasing range of certification without adequate consumer knowledge, has generated confusion for consumers;
2. the demand for a "return to the past", namely consumers' desire to rediscover historic products connected to the traditional cuisine of a given area, representing an innate tourist attraction for the area, but also a cause for greater attachment to the area among those who live there and exhibit an increasing desire to rediscover time-honoured traditions and products;
3. safeguarding the environment and landscape. With reference to the most widely used voluntary certification systems, and product standards in particular, often these are only relatively successful, due to bureaucratic problems and a poor market response.

In order to tackle these demands, which can become pressing in view of the fact that in some cases they prevent the certification mechanism from being effective, and in

order to forge a closer bond with the local area by means of feedback, we underline various aspects (Piedmont Region, 2009):

- the culinary and historic traditions of the product's area of origin. As the work programme shows, using the Piedmont region as an example, this unit will be responsible for supplying "basic tools for studying Regional gastronomy-economic aspects and sociological aspects: these aspects will be analysed by means of two sets of indicators, that will form one side of our 'polyhedron'. The first set is based on the relationship between production/distribution and the local community (acceptance, sharing, participation, collective decision-making), while the second refers to the final consumer's expectations and frames of reference;
- the environmental sustainability of the product in according to the LCA (life cycle analysis) approach, throughout the entire production chain, and by means of the flexible environmental management system specially designed to take into account the various areas that the index intends to include;
- the environmental sustainability connected to design and packaging, which strongly influences the image and eco-efficiency of the entire production chain, even more so in the case of food products;
- the aspects regarding the interaction between business activities and the local area, analysing the environmental/landscape-related sustainability of strategies adopted by the farming and food processing industries.

The methodology applied is the system of environmental/landscape management that was created in the context of a three year project funded by the Environment Department of the Piedmont Regional Council. This system combines the classic priorities of an environmental management system with the landscape issues championed by the European Landscape Convention. This methodology will enable us to start out from the local area and its products, identify the tasks of each partner in the project, and construct an index capable of leading the surrounding area towards a wide-ranging concept of sustainability first introduced in 1987 by the World Commission on Environment and Development (WCED) as "(…) *the economic and social development that doesn't compromise the environment and the natural resources the continuation of human species and the future development depend on* (…)" (WCED, 1987). The potential impact of the project consists in fostering increasing attention to product and local area sustainability among the institutions and the population (Piedmont Region, 2009). The aforementioned bureaucratic problems that standards encounter have often prevented them from being adopted by producers, and even when a certification process is initiated and completed, the widespread lack of knowledge, and sometimes also the costs involved, have prevented the general spread of these standards. The idea is to connect these virtuous, often isolated examples to the local area, by means of a mechanism based on a system to manage the organization of research and resources (which are complementary yet diversified) to arrive at the creation of the index in question (Piedmont Region, 2009).

This will then be returned to the local area, with the application of at least some of the aspects of the environmental/landscape management system. The joint use of these tools, the high degree of flexibility planned for the index, and the multidisciplinary nature of the project from its outset should represent a sort of guarantee of results, in view of the fact that in the organizational process and at the various stages of the project, nothing is left to chance. Moreover, the planned trial of the index in the Piedmont region could come to represent an exemplary point of departure, and a model for other regional areas, in Italy and elsewhere, interested in the index.

The accounting approach followed in the research is explained in the following paragraph.

1. THE ACCOUNTING APPROACH FOLLOWED IN THE POLIED(RO) RESEARCH PROJECT

During the last years, the topics of innovation and measurement of the results is assuming a progressively higher relevance with perspectives of sustainable promotion of the local and regional development and the updated approach oriented toward a sustainable system has produced many world-wide experimentations, starting working on a deep reflection on how to incorporate macroeconomics by environmental and social parameters (Stiglitz et al., 2009; European Commission, 2009). The increasing debate over the process of globalization (and of glocalization) (McLuhan, 1989; Nederveen, 2004; Robertson et al., 2003) and, at the same time some others drivers, like as the awareness of the important role that the innovation can assume in the economic and social development of Italy and the new demands shown by stakeholders (Freeman, 1984; Jones, 1995), have stressed the need, for what pertains the activities related to the food and agricultural compartment, to develop and to use evaluating tools more precise and shared. In this way, the experience of other Countries and the related literature on the aforesaid issues underline that the substantial activation of both evaluating and innovative tools generally bring interesting benefits. Nevertheless it is to underline that such processes, when not properly developed, addressed and understood, can bred distortions on the same assessment activities. Moreover these evaluating activities can shape interesting opportunity to stimulate both the link with the paradigms coming from other disciplines and the process of internationalization of the business studies related with the issue of food and agricultural compartment. In the light of the general objectives of the project, the contribution priority focuses on the economic evaluation sustainability – in general sense – applied on food and agricultural compartment through the work out of a "cause-effect" analysis model of the processes of production, distribution, sale and consumption of the food and agriculture commodities, directed on two profiles of analysis (Piedmont Region, 2009):

1. the sustainability of the process, in different configurations that characterize it: social, environmental, etc.;
2. the responsibility for the action of players (accountability) and the results policy asseveration related (assurance engagement policy).

Under the first profile of research, in an wider and above all in a much more "sustainable" vision of the food and agricultural compartment, the main purpose of the present contribution is, therefore, to identify, systematize and implement into the process of the compartment the informative tools pertaining the model of the Corporate Social Responsibility (CSR) (Carroll, 1979; Sethi, 1975). Under the second aspect of research the main purpose of the model is to define a matrix of common valuing elements, related to the accountability and assurance engagement policies, that can be taken as reference in the sector of the integrated food and agricultural compartment.

Therefore the present model wants to represent one aspect (the one purely business economics oriented), of the wider scientific objective of the whole project, that is to create a multi-criteria index that gathers in its own lay-out the aspects of the sustainability applied to the processes of production, distribution, sale and consumption of the food and agricultural commodities (Piedmont Region, 2009).

The POLIED(RO) index results in fact constituted by manifold field of study, all pertaining to the index with the same scientific weight, all interconnected and having at least one side in common. The aim of the present theoretical study is related to a theory concerning accounting model that can farther reinforce the connection between the different accounting models defined by a mutual exchange process of information flow in which:

- the environmental and social reports can, on one hand, acquire the economic information they need to edit their own documents from the traditional reports;
- on the other hand they can be in a position to reallocate the *environmental* and *social performance* previously got in the traditional final statement, influencing – in a direct way – the accounting results.

In this case the financial statement should become an independent governance instrument used by the company (public or private) to be accountable to its stakeholders of the results of its environmental and social policies realized in a sustainable development perspective: at the present moment several companies use dedicated documents regarding the environmental and social communications, such as e.g., social reports, environmental reports and sustainability reports.

The International Accounting Standards – mentioned above – present an accounting model where the financial, economic and patrimonial information enclosed with the traditional final statement isn't directly influenced by the one enclosed with the environmental and social reports: the main link is that the environmental and social reports use the data produced by the traditional reports. In the environmental report models applied to the private companies (Mathews, 1997; Lehman, 1999) or to the public institutions (CLEAR, 2003; ISPRA, 2009), two different cluster of accounts are expected to be used (Giovanelli et al., 2000):

- the first cluster is called Physical Accounts: e.g. the set of 10 *European Common Indicators (ECI)* (European Commission, 2001) is the most common cluster used at European level and it has the focus of having indicators capable of measuring not a specific phenomenon, but the overall sustainability at a local level;
- the second cluster is called Monetary Accounts: it concerns the money that a company has to invest in the environmental protection.

Only the Monetary Accounts have an accounting derivation because the company fixes them toward a reprocessing of balance (budget plan and/or final balance): this reprocessing is the only one-way link between the two types of reports; equally it is not possible to have a parallel (and opposite) process where the final statement results could be – directly – conditioned by the performance got from the environmental report in a positive way (eco-efficiency) or negative trend (eco-inefficiency).

Similar consideration can be made with reference to the traditional social report models related to the public company (G.B.S., 2005) or to the private sector (G.B.S., 2001): during the last years the Italian Accounting Standards have used the Added Value as a referential quantitative indicator.

For the Italian Accounting Model the Added Value is considered very important in the social report field (Gabrovec Mei, 2002): the Added Value measures the wealth produced by the company with reference its shareholders that participate to the distribution of the wealth itself. Added Value is represented in two different tables (G.B.S., 2001): the table for the calculation of Added Value, identified by comparing interim revenues and costs (see *Figure 1.*); the table for the allocation of Added Value being the summation of the remuneration received by stakeholders within the company and the donations (see *Figure 2.*).

Figure 1. **Schema for the calculation of Added Value**

	YEARS (val./arr.)		
TOTAL ADDED VALUE	(n)	(n-1)	(n-2)
A) Production revenues			
1. Turnover – goods and services revenue adjustments			
2. Variation in work in progress, semi-finished products and finished goods (and merchandise)[5]			
3. Variation in contract work in progress			
4. Other revenues and income			
Revenues from core business			
5. Revenues from atypical business (internal production)			
B) Production cost			
6. Raw materials, consumables and supplies (or cost of merchandise sold)			
7. Services			
8. Use of third party assets			
9. Provisions for contingencies			
10. Other provisions			
11. Other operating costs			
GROSS ADDED VALUE FROM CORE BUSINESS			
C) Ancillary and extraordinary items			
12. +/- **Ancillary items**			
Ancillary revenues			
- Ancillary costs			
13. +/- **Extraordinary items**			
Extraordinary income			
Extraordinary expense			
GROSS TOTAL ADDED VALUE			
Operating amortization/depreciation by similar categories of assets			
NET TOTAL ADDED VALUE			

[5] The income components of merchandise production may also be included according to the sales cost policy, following the statutory financial statements preparation criteria.

(*Source*: G.B.S., 2001: 21)

Figure 2. **Table of the allocation of Added Value**

	YEARS (val./arr.)		
TOTAL ADDED VALUE	(n)	(n-1)	(n-2)
A – Remuneration of personnel:			
Consultants			
Employees			
direct remuneration;			
indirect remuneration;			
profit-sharing schemes.			
B – Remuneration of the Public Administration:			
Direct taxation			
Indirect taxation			
- grants for operating expenses			
C – Remuneration of Borrowed Capital:			
Financial charges for short-term borrowings			
Financial charges for long-term borrowings			
D – Remuneration of Venture Capital			
Dividends (net profit distributed to shareholders)			
E – Remuneration of the Company			
+/- variations in reserves			
(Amortization/depreciation[7])			
F – Donations			
TOTAL NET ADDED VALUE			

[7] Only when looking at Gross Added Value.

(*Source*: G.B.S., 2001: 24)

In the document of the G.B.S., mentioned above, the table for the calculation of Added Value the articulated opposition between the positive and the negative elements involved in the working capital that come directly from the economic – financial accounting system of the company. In both examined cases – the assessment

of the Monetary Accounts in the environmental report and the Added Value determination in the social report – a common accounting derivation of the values is recorded: both of them are determined by a data reprocessing of the final statement of the company, but they can not able to reallocate the environmental and social performance previously found in the final statement of the company.
The central part of the study has the aim of suggesting a theoretical accounting model able to go beyond the informative limit (definable now as one-way informative flows) and where it can be possible to create a bi-directional link between the report models (an environmental and social one on one hand and a traditional one on the other hand): this model should have a reciprocal exchange of the informative flow where the environmental and social reports can acquire the economic information they need from the traditional report, and – then – they can reallocate the environmental and social performance they got in the final balance, directly influencing the accounting results. The most virtuous companies from the point of view of environmental sustainability and social responsibility should deserve an award: a new intangible asset, a new "social-green goodwill" (André et al., 2009; Johnson, E.R., 2010) having in return a net equity increase of the company (Kriström et al., 2003).
The present accounting model, that introduces a new intangible asset in the balance sheet as a reward to the most virtuous companies from the point of view of environmental sustainability and social responsibility (Laufer, 2003), presents the following issues:

1) determining the composition of the board responsible for evaluating;
2) defining the evaluation process phases;
3) evaluating of environmental and social performances.

The aspects mentioned above are outlined below.
1) Determining the composition of the board responsible for evaluating.
About the first point, determining the composition of the board responsible for evaluating, the board may be: a) an internal board; or b) an external board (recommended choice). In the case of an internal board the components are represented by internal employees (or consultants) of the company subject, while in the second case (external board), the model would require:

- to chose an external and independent board in order to avoid the self – reference risk of the process realised by the company;
- to find the auditors in the professional categories having more ability both in the field related to the accounting profession [accountants have to have the *Certification* (or *Asseveration*) of the accounts], or in the field related to the *environmental audits*, that is *"(…) activities intended to quantify environmental performance and environmental position (…)"* (CLEAR, 2003) [auditors have to check the *Environmental Management System* (EMS) of a company (public or private) to see if it has the mandatory requirements asked according to the international standards EMAS or ISO 14001].

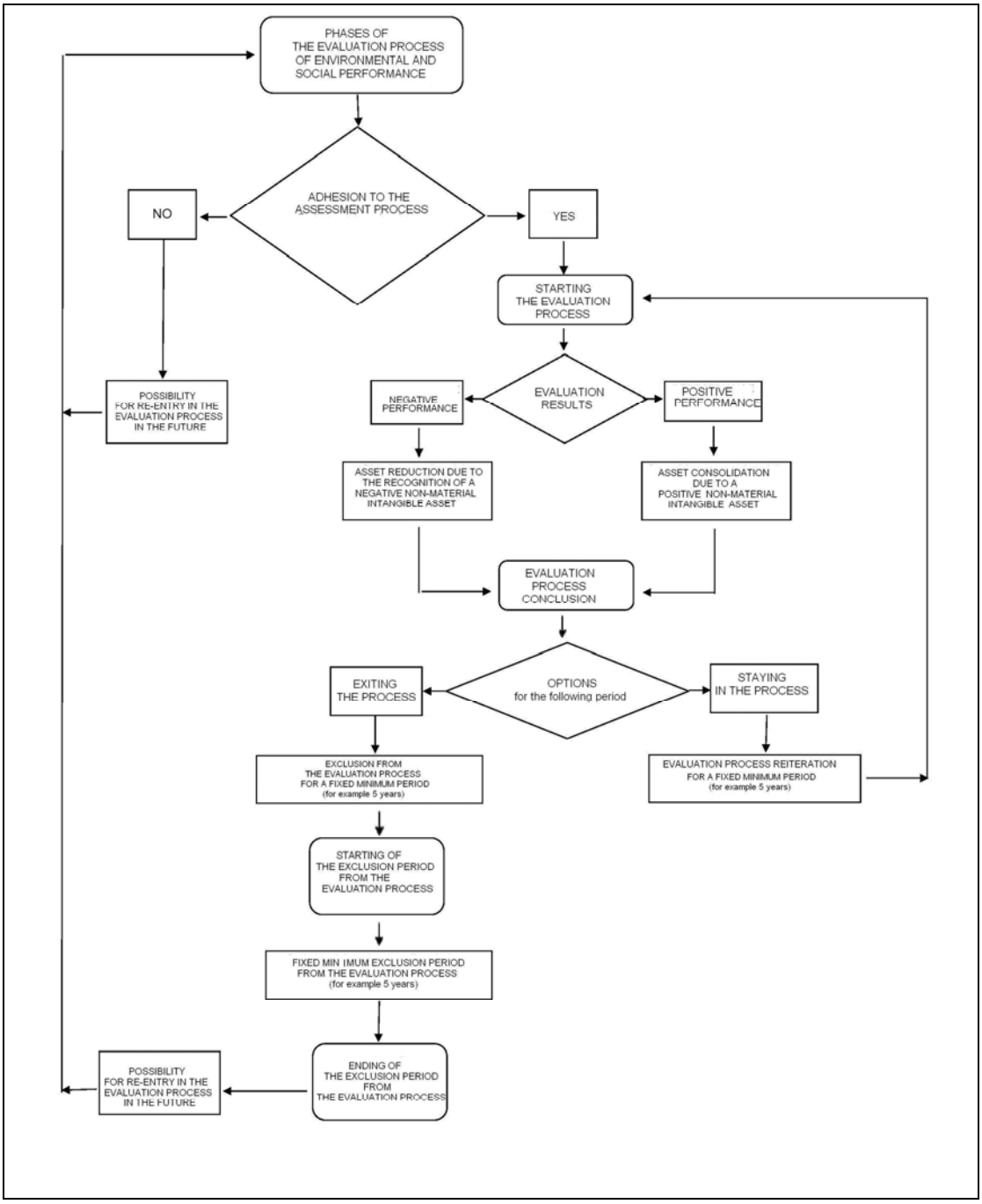
The auditor's opinion should be independent, according to two aspect of the problem.
The first aspect concerns the choice of the target in charge of the evaluation, that shouldn't be the responsibility of the company, but – in order to limit the discretion – should be the responsibility of the central administration (such as the Ministry of Economy or the Ministry of Environment) or of a local administration (such as, e.g., the Court that has territorial jurisdiction, or the local office of the Court of Auditors, etc.). The second aspect regards the ways of payments of the auditors: instead of a direct payment between the company and the auditor, it should be used an indirect way between the central (or local) administration and the auditor (in this case the

environmental fiscal system adopted by the single nation should provide for a correct reallocation of the resources needed to assure the correct payments of the auditor's activities). In both cases mentioned above (evaluation by an internal board or an external board), the model would require a national or regional coordination achieved by a public institution (a central or local administration).

2) Defining the evaluation process phases.

This point concerns the freedom of joining the evaluation process in the early on: the freedom of choice should be limited to the years after the first evaluation accession in order not to enforce the "budget policies" of the environmental and social performances (see *Figure 3.*).

Figure 3. **Theoretical framework of the evaluation process phases**



The adhesion to the evaluation process should be guaranteed by pre-emptively definite cycles (for example three-year cycles or five-year cycles) and the choice of exiting the evaluation process after a cycle should be at least as long as the length of the attended cycle in order to avoid a periodicity adhesion which is convenient to the evaluation process: once the minimum exclusion period is over, the company should be able to join the next evaluation processes of its environmental and social performance, following the same rules above described.
3) Evaluating of environmental and social performances.
The final point – Evaluating of environmental and social performances – can produce, respectively, two kinds of outcomes: a qualitative result or a quantitative result.
A qualitative result – as a qualitative assessment of the company – may be achieved by administering a questionnaire: it is the case realised by an internal board above mentioned (this part of the research is in working progress and is not available at the present moment).
The second case concerns the analysis of the companies from the point of view of environmental sustainability and social responsibility that should deserve an award, a new intangible value, above mentioned as "social-green goodwill". This quantitative value can be analysed alternatively as:

- a non-accounting value (to say not included in the annual balance sheet);
- or an accounting value, a new accounting asset included in the annual balance sheet.

The methodological path to evaluate this new value (like a non-accounting value not included in the annual balance sheet, or like an accounting value included in the annual balance sheet) is shown in the following two paragraphs.

2. THE METHODOLOGICAL PATH FOR EVALUATING THE SOCIAL PERFORMANCE

Looking for a precise methodological path for evaluating the social performance, the model has selected the *Value added distribution plan* mentioned before, created by the G.B.S., an Italian scientific no profit organisation "(…) *having the aim of developing and promoting the scientific research on social balance and the topics related to the stewardship of the companies in order to advance the social responsibility of the company and its use in national and international spheres* (...)".
The plan suggested by the G.B.S. divides the *value added remuneration* in:

a) human resources remuneration;
b) civil service remuneration;
c) payment of loan capital;
d) non distributable value assigned to the preservation and the increase of the asset.

What needs to be rewarded "more" could be found as a real social dynamic charactering the company that has to be evaluated only in point a) called *human resources remuneration*. This happens because:

- point b), *civil service remuneration,*
- point c), *Payment of loan capital,* expresses the outcome of certain fulfilments to contract regulations that connect the company to its financiers;

- point d), *Non distributable value assigned to the preservation and the increase of the asset,* ultimately, relates to the observance of particular statutory or law obligations.

So the only winning factor (in case of socially virtuous behaviours) could be represented by destining the *value added* to the employees that – according to the model proposed by G.B.S. – are subdivided into: *Members of the Administrative Institutions* (politically or administrative eligible); *subordinate employees* (with short term or long term contracts) and *non-subordinate employees and co-workers,* whereas the relative salaries are included in two classes:

- *Direct salaries:* they include all those financial and natural components that contribute to quantify the immediate or delayed economic benefit, that the employee excerpts from the relation with the company. Examples of direct salaries of the employees are: direct payment (including natural payments and excluding refunds); severance pay or other types of funds; company provisions (food, crèche, scholarship, etc.);
- *Indirect salaries:* they include social contributions at expense of the company (costs defrayed for the employees are not part of the salary of the interlocutor, because they convert in benefits obtained in a indirect way for the company that manage the social service) (G.B.S., 2005).

That being stated, in continuing the discussion, the components we need to isolate in order to quantify social policies (Carroll 1991; Levitt, 1958) that are actually virtuous, and therefore winning from the social point of view, should be referable to direct and indirect salaries of the subordinate employees with a long term contract: in the other circumstances, particularly in short term jobs, flexible jobs, etc., the nature of contract relations includes a priori that medium-long term planning so much wished – most of all for new generations – in the contemporary debate about the optimization of welfare models (Carter, 2006). This argument finds solace in the definition made by the European Commission of *social responsibility*, as: "(…) *the voluntary decision of contributing to the progress of society and to the protection of the environment, combining social and ecological concerns in company dealing and in interactions with stakeholders* (…)" (European Commission, 2000): the increasing appeal to flexible job instruments, also in Public Administration and in our specific area of interest, the university, unfortunately doesn't embody that spirit of cohesion and social welfare mentioned several times in the Community document cited before. The reflections done before have the purpose of bringing the attention to a delicate and complex theme, the flexibility in job market, that in our model depicts itself more and more like a physiological board towards a system structurally oriented on precariousness. A thorough reflection about the phenomenon – and about related corrective actions – is therefore appropriate, but is beyond the aim and the contents of this contribution: parallel reflections concern the coupling of these reflections to a model of management control oriented on the fundamental principles of efficiency, efficacy and company inexpensiveness: so the values of the social actions are to be isolated from those made voluntarily, in adherence to the definition of social responsibility realised by the European Commission and above mentioned (E.C., 2000; McWilliams et al., 2001).

After having indentified the voluntary social expenditures from those required by law (note: in the model are relevant only the voluntary expenses), it is necessary to share the voluntary social expenses between current management and asset management: this process is explained in the following points.

1) Assessment of Intangible Value Created by the Relevant Social Performance for Current Management ($IVCRSP_{cm(t;s)}$).

Taking up our approach, the formula related to the quantification in the year (t) of the reward acknowledged for a social relevant behaviour, defined as Intangible Value Created by the Relevant Social Performance for Current Management ($IVCRSP_{cm(t;s)}$) – placed under the assets of Immaterial Immobilizations with counterpart a net equity revaluation (in the case of an accounting asset included in the annual balance sheet) – could be written as:

$$IVCRSP_{cm(t;s)} = \sum_{i=1}^{n} (SC_{i(s)} * r_{(t-s)}) - \sum_{i=1}^{n} (SB_{i(s)} * r_{(t-s)}) \quad (1)$$

where:

- $IVCRSP_{cm(t;s)}$ = Intangible Value Created by the Relevant Social Performance for Current Management ($IVCRSP_{cm(t;s)}$), quantified in the year (t) (year when the evaluation of social performances is realized) and related to the accounting year (s) (year when the Social Costs are paid and the Social Benefits are obtained);
- $\sum SC_{i(s)}$ = Sum of Social Costs (i) concerning the year (s);
- $\sum SB_{i(s)}$ = Sum of Social Benefits (i) concerning the year (s);
- $r_{(t-s)}$ = monetary revaluation rate (r) concerning the period between the accounting year (s) (year when the Social Costs are paid and the Social Benefits are obtained) and the year (t) (year when the evaluation of social performances is realized).

The monetary revaluation rate (r) used in the model, should be defined directly by the related set of rules, or indirectly referring to specific Prices Indexes for monetary revaluation produced by official national institutions (e.g. in Italy the Italian National Institute of Statistics – Istat) or by official international'ones (e.g. in Europe Eurostat).

2) Assessment of Intangible Value Created by the Relevant Social Performance for Asset Management ($IVCRSP_{am(t;s)}$).

The same reflection concerns the social investments (Burke et al., 1996) to isolate in order to quantify social policies actually virtuous, always referable to subordinate employees (like, for example, the capitalization of the costs of education and research, the construction of kindergartens and company refectories, etc.): also in this case, these accounts should be purified from possible subsidies collected in capital accounts for this purpose. In this last case the formula of the quantification in the year (t) of the reward acknowledged for a social relevant company behaviour, definable as Intangible Value Created by the Relevant Social Performance for Asset Management ($IVCRSP_{am(t;s)}$) could be written as:

$$IVCRSP_{am(t;s)} = \sum_{i=1}^{n} (SA_{i(s)} * r_{(t-s)}) - \sum_{i=1}^{n} (SCB_{i(s)} * r_{(t-s)}) \quad (2)$$

where:

- $IVCRSP_{am(t;s)}$ = Intangible Value Created by the Relevant Social Performance for Asset Management ($IVCRSP_{am(t;s)}$), quantified in the year (t) (year when the evaluation of social performances is realized) and related to the accounting year (s) (year when the Social Assets are paid and the Social Capital Benefits are obtained);
- $\sum SA_{i(s)}$ = Sum of Social Assets (i) concerning the year (s);

- $\sum SCB_{i(s)}$ = Sum of Social Capital Benefits (i) concerning the year (s);
- $r_{(t-s)}$ = monetary revaluation rate (r) concerning the period between the accounting year (s) (year when the Social Assets are paid and the Social Capital Benefits are obtained) and the year (t) (year when the evaluation of social performances is realized).

In conclusion, the quantification of the Total Intangible Value Created by the Relevant Social Performance ($IVCRSP_{T(t;s)}$) in the year (t), is determined by the following formula:

$$IVCRSP_{T(t;s)} = IVCRSP_{cm(t;s)} + IVCRSP_{am(t;s)} \quad (3)$$

where:

- $IVCRSP_{T(t;s)}$ = Total Intangible Value Created by the Relevant Social Performance ($IVCRSP_{T(t;s)}$), quantified in the year (t) (year when the evaluation of social performances is realized) and related to the accounting year (s);
- $IVCRSP_{cm(t;s)}$ = Intangible Value Created by the Relevant Social Performance for Current Management ($VCRSP_{cm(t;s)}$), quantified in the year (t) and related to the accounting year (s) (year when the Social Costs are paid and the Social Benefits are obtained);
- $IVCRSP_{am(t;s)}$ = Intangible Value Created by the Relevant Social Performance for Asset Management ($VCRSP_{am(t;s)}$), quantified in the year (t) and related to the accounting year (s) (year when the Social Assets are paid and the Social Capital Benefits are obtained).

3. THE METHODOLOGICAL PATH FOR EVALUATING THE ENVIRONMENTAL PERFORMANCE

Even in this case the values of the environmental actions are to be isolated from those made voluntarily, in adherence to the above definition of social responsibility realised by the European Commission (E.C., 2000): for individualizing the areas of analysis it is possible to follow national standards [e.g. an Italian standard is the framework realised by ISPRA (ISPRA, 2009)] or international standards [e.g. an international standard is the COFOG (Classification of the Functions of Government) classification realised by United Nations (Eurostat, 2007)].

With reference to the last classification, COFOG classification, it includes for environmental analysis these functions: 01 - General public services, 02 – Defence, 03 - Public order and safety, 04 - Economic affairs, 05 - Environmental protection, 06 - Housing and community amenities, 07 - Health, 08 - Recreation, culture and religion, 09 - Education, 10 - Social protection; then for the function n. 05 - Environmental protection - there are included the following sub-sectors of financial analysis: 05.1 - Waste management, 05.2 - Waste water management, 05.3 - Pollution abatement, 05.4 - Protection of biodiversity and landscape, 05.5 - R&D Environmental protection, 05.6 - Environmental protection n.e.c. (residual division).

Our research suggests to use COFOG classification, because the fixed structure proposed by United Nations is more preferable to the IAS'one and defines clearly (not discretionary) the areas of environmental analysis making it easier to compare several results across different cases studies: this represents a competitive advantage for applied environmental research (Rouse et al., 1999).

Also in this case the next steps are:

- identifying the voluntary environmental expenditures from those required by law (note: in the model are relevant only the voluntary expenses);
- sharing the voluntary environmental expenses between current management and asset management: this process is explained in the following points.

1) Assessment of Intangible Value Created by the Relevant Environmental Performance for Current Management ($IVCREP_{cm(t;s)}$).

After we having individualized the environmental values on which we can apply the model, the formula of quantification in the year (t) of the reward to acknowledge, in these case, for an environmental relevant behaviour, defined as Intangible Value Created by the Relevant Environmental Performance for Current Management ($IVCREP_{cm(t;s)}$) – placed under the assets of Immaterial Immobilizations with counterpart a net equity revaluation (in the case of an accounting asset included in the annual balance sheet) – could be written as:

$$IVCREP_{cm(t;s)} = \sum_{i=1}^{n} (EC_{i(s)} * r_{(t-s)}) - \sum_{i=1}^{n} (EB_{i(s)} * r_{(t-s)}) \quad (4)$$

where:

- $IVCREP_{cm(t;s)}$ = Intangible Value Created by the Relevant Environmental Performance for Current Management ($IVCREP_{cm(t;s)}$), quantified in the year (t) (year when the evaluation of environmental performances is realized) and related to the accounting year (s) (year when the Environmental Costs are paid and the Environmental Benefits are obtained);
- $\sum EC_{i(s)}$ = Sum of Environmental Costs (i) concerning the year (s);
- $\sum EB_{i(s)}$ = Sum of Environmental Benefits (i) concerning the year (s);
- $r_{(t-s)}$ = monetary revaluation rate (r) concerning the period between the accounting year (s) (year when the Environmental Costs are paid and the Environmental Benefits are obtained) and the year (t) (year when the evaluation of environmental performances is realized).

Also in this case the monetary revaluation rate (r) used in the model, should be defined directly by the related set of rules, or indirectly referring to specific Prices Indexes for monetary revaluation produced by official national or international institutions.

2) Assessment of Intangible Value Created by the Relevant Environmental Performance for Asset Management ($IVCREP_{am(t;s)}$).

The same reflection concerns the environmental investments (Nehrt, 1996) to isolate in order to quantify environmental policies actually virtuous: these accounts should be purified from possible subsidies collected in capital accounts for this purpose.

In this last case the formula of the quantification in the year (t) of the reward acknowledged for a environmental relevant company behaviour, definable as Intangible Value Created by the Relevant Environmental Performance for Asset Management ($IVCREP_{am(t;s)}$) could be written as:

$$IVCREP_{am(t;s)} = \sum_{i=1}^{n} (EA_{i(s)} * r_{(t-s)}) - \sum_{i=1}^{n} (ECB_{i(s)} * r_{(t-s)}) \quad (5)$$

where:

- $IVCREP_{am(t;s)}$ = Intangible Value Created by the Relevant Environmental Performance for Asset Management ($IVCREP_{am(t;s)}$), quantified in the year (t) (year when the evaluation of environmental performances is realized) and

- $\sum EA_{i(s)}$ = Sum of Environmental Assets (i) concerning the year (s);
- $\sum ECB_{i(s)}$ = Sum of Environmental Capital Benefits (i) concerning the year (s);
- $r_{(t-s)}$ = monetary revaluation rate (r) concerning the period between the accounting year (s) (year when the Environmental Assets are paid and the Environmental Capital Benefits are obtained) and the year (t) (year when the evaluation of environmental performances is realized).

The quantification of the Total Intangible Value Created by the Relevant Environmental Performance ($IVCREP_{T(t;s)}$) in the year (t), is determined by the following formula:

$$IVCREP_{T(t;s)} = IVCREP_{cm(t;s)} + IVCREP_{am(t;s)} \tag{6}$$

where:

- $IVCREP_{T(t;s)}$ = Total Intangible Value Created by the Relevant Environmental Performance ($IVCREP_{T(t;s)}$), quantified in the year (t), year when the evaluation of environmental performances is realized;
- $IVCREP_{cm(t;s)}$ = Intangible Value Created by the Relevant Environmental Performance for Current Management ($VCRSP_{cm(t;s)}$), quantified in the year (t);
- $IVCREP_{am(t;s)}$ = Intangible Value Created by the Relevant Environmental Performance for Asset Management ($VCRSP_{am(t;s)}$), quantified in the year (t).

In conclusion the new immaterial asset can be defined as Global Intangible Value Created by the Relevant Social and Environmental Performance ($IVCRSEP_{G(t;s)}$) and can be determined by the following formula:

$$IVCRSEP_{G(t;s)} = IVCRSP_{T(t;s)} + IVCREP_{T(t;s)} \tag{7}$$

where:

- $IVCRSEP_{G(t;s)}$ = Global Intangible Value Created by the Relevant Social and Environmental Performance ($IVCRSEP_{G(t)}$): the value is determined in year (t) and refers to the activities supported in year (s);
- $IVCRSP_{T(t;s)}$ = Total Intangible Value Created by the Relevant Social Performance ($IVCRSP_{T(t;s)}$), quantified in the year (t);
- $IVCREP_{T(t;s)}$ = Total Intangible Value Created by the Relevant Environmental Performance ($IVCREP_{T(t;s)}$), quantified in the year (t).

The last formula concerns the Global Intangible Value Created by the Relevant Social and Environmental Performance ($IVCRSEP_{G(t;s)}$) determined in year (t) and refers to the activities supported in year (s). At this point it is possible to extend the formula for social and environmental activities supported in a defined year cycle (w) (e.g. a three years cycle or a five years cycle, etc.), with w = 1 … (s) … m. In this case the Global Intangible Value Created by the Relevant Social and Environmental Performance ($IVCRSEP_{G(t;w)}$) – determined in year (t) and referred in a defined year cycle (w) – can be determined by the following equation:

$$IVCRSEP_{G(t;w)} = \sum_{s=1}^{m} IVCRSP_{T(t;s)} + = \sum_{s=1}^{m} IVCREP_{T(t;s)} \tag{8}$$

where:

- $IVCRSEP_{G(t;w)}$ = Global Intangible Value Created by the Relevant Social and Environmental Performance ($IVCRSEP_{G(t;w)}$) determined in the year (t) and referred to the activities supported in a defined year cycle (w), with w = 1 … (s) … m;
- $\sum IVCRSP_{T(t;s)}$ = Sum of Intangible Values Created by the Relevant Social Performance ($IVCRSP_{T(t;s)}$), quantified in the year (t) and referred to the social activities supported in a defined year cycle (w);
- $\sum IVCREP_{T(t;s)}$ = Sum of Intangible Values Created by the Relevant Environmental Performance ($IVCREP_{T(t;s)}$), quantified in the year (t) and referred to the environmental activities supported in a defined year cycle (w).

4. DISCUSSION AND CONCLUSIONS

In the central part of the study we tried to prove theoretically the determination of the new intangible asset attributable to companies virtuous from the standpoint of environmental sustainability and social responsibility (Orlitzky et al., 2011): this new intangible asset can be considered as a new "social-green goodwill" having in return a net equity increase of the company that would work as a "revaluation reserve" (or "revaluation surplus reserve") that is created when the value of an asset becomes greater than the value at which it was previously carried on the balance sheet, increasing shareholders funds.
Adhering to the evaluation process, taking up what we said before, should be guaranteed for defined year cycles (for example three years cycles or five years cycles), and the possible choice of leaving at the end of the cycle should be confirmed for a period at least of the same duration of the one expected for the adhesion, in order to avoid an adhesion in alternation and for the convenience of the evaluation process. Consequently the counterpart created as a revaluation reserve (net equity value) has the function to compensate possible future company losses and it should be used for this aim only just for the part that corresponds to the revaluation related to the current management. All this in order to avoid the creation of potential negative values of this net equity fund showed previously (that, for example, in the case of asset divestment): the potential connection between the new intangible asset [Global Intangible Value Created by the Relevant Social and Environmental Performance ($IVCRSEP_{G(t;w)}$)] and the related reserve is explained in *Table 1*.
Moreover the Global Intangible Value Created by the Relevant Social and Environmental Performance ($IVCRSEP_{G(t;w)}$) is not subject to problems of amortization because the conditions are lacking (like, for example, the use of the economic good, the useful duration defined of new tangibility, etc.), whereas in adherence to the following International Accounting Standards: a) for the Private Sector the main IAS/IFRS documents are:

- IAS 36 Impairment of Assets (it deals with impairment testing for all tangible and intangible assets, except for assets that are covered by other IFRS) (IASB, 2010);
- IAS 38 Intangible Assets (IASB) (IASB, 2009) [for the Public Sector the similar standards are: IPSAS 21 Impairment of Non-Cash-Generating Assets (IPSASB, 2004); IPSAS 31 Intangible Assets (IPSASB, 2010)].

The present contribution – in its essential parts – proposed a purely theoretical model oriented towards the overcoming of the current neutrality, previously defined, in the connection-conditioning (reciprocal or bidirectional) between the results of the traditional accounting and those derivable from social and environmental accounting

of the company, in which is possible to assume an ideal bidirectional connection between the different accounting models (Griffin et al., 1997).

Table 1. **Connection between the new intangible asset and the related reserve**

New intangible asset			Related Revaluation Reserve
Level 1	Level 2	Level 2	Potential use for future coverage of net equity losses
$(IVCRSEP_{G(t;w)})$ = Global Intangible Value Created by the Relevant Social and Environmental Performance	$\sum IVCRSP_{T(t;s)}$ = Sum of Intangible Values Created by the Relevant Social Performance	$IVCRSP_{cm(t;s)}$ = Intangible Value Created by the Relevant Social Performance for Current Management	Yes
		+	
		$IVCRSP_{am(t;s)}$ = Intangible Value Created by the Relevant Social Performance for Asset Management	No
	+	+	
	$\sum IVCREP_{T(t;s)}$ = Sum of Intangible Values Created by the Relevant Environmental Performance	$IVCREP_{cm(t;s)}$ = Intangible Value Created by the Relevant Environmental Performance for Current Management	Yes
		+	
		$IVCREP_{am(t;s)}$ = Intangible Value Created by the Relevant Environmental Performance for Asset Management	No

Therefore is evident that the aspects analyzed and the consequent solutions, need a natural consolidation obtainable through the realization of a comparative benchmarking between the actors of the system (scientific community, public companies, interested professional orders, guarantee institutions of the process, etc.), oriented towards the determination of a scientific method to evaluate a model that is commonly shared by all the subject interested in the process (De Moor et al., 2005).
In conclusion it is meaningful to obtain that if the debate about how to individualize a model of accounting that combines more the traditional accounting evaluations with social and environmental ones, is quick, it is also – nowadays – a far off target: the final wish is that this contribution can, in some ways, stimulate the common interest

towards the definition of an accounting system in which the traditional accounting analysis are more integrated with the complementary ones (social and environmental analysis) (Hooghiemstra, 2000; Laufer, 2003).
Further arguments and widening, combined with an experimentation on the field, will be able, therefore, to allow a useful consolidation of this proposal and favour at the same time a formation process of a new vision of the concept of sustainable development referred to the accounting disciplines.

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