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**DESIGN OF AN INDICATOR FOR
HEALTH AND SAFETY GOVERNANCE**

**Roberto F. Minguillón
Enrique Yacuzzi**

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DESIGN OF AN INDICATOR FOR HEALTH AND SAFETY GOVERNANCE

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ABSTRACT

Occupational Health and Safety Governance (OHSG) is a branch of Corporate Governance by which the board directs and controls labor risks created by their own enterprise. The OHSG concept is relatively new; unlike Occupational Health and Safety Management, which is mostly related to the work of managerial ranks, OHSG deals with principles, the interests of stakeholders, and the work of directors. The paper defines the new concept, OHSG, develops an original health and safety indicator, and presents possible applications for it; as far as we are aware of, the indicator is the first proactive tool in existence to measure OHS governance. Our work is part of an ongoing research project aimed at improving health and safety standards in industry.

The indicator takes into account—in its structure—the evaluation style of National Quality Awards, as a pattern to measure, by assigning points, a great number of variables. OHS Governance variables included in the indicator are grouped into areas, themes, dimensions and elements, in order to make them operative and measurable. Measurement is performed by means of a questionnaire, reproduced as an appendix. Maximum scores for each question are assigned following multiple attribute decision theory. The article concludes with reflections on the measurement problem in the social sciences and final thoughts on the characteristics of the proposed indicator.

JEL: G30, G39, L20, M11, M12, M14.

Keywords: Corporate governance, health and safety governance, measurement, measurement of health and safety, health and safety governance indicator.

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TERMS AND DEFINITIONS²

For the purposes of this document the following terms and definitions apply:

Accident: undesired event giving rise to death, ill health, injury, damage or other loss.

Continual improvement: process of enhancing the Occupational Health and Safety (OHS) management system, to achieve improvements in overall OHS performance.

Hazard: source or situation with a potential for harm in terms of injury or ill health, damage to property, damage to the workplace environment, or a combination of these.

Incident: event that gave rise to an accident or had the potential to lead to an accident.

Occupational health and safety: conditions and factors that affect the well-being of employees, temporary workers, contractor personnel, visitors and any other person in the workplace.

OHS management system: part of the overall management system that facilitates the management of the OHS risks associated with the business of the organization.

Performance: measurable results of the OHS management system, related to the organization's control of health and safety risks, based on its OHS policy and objectives.

Risk: combination of the likelihood and consequences of a specified hazardous event occurring.

Risk assessment: overall process of estimating the magnitude of risk and deciding whether or not the risk is tolerable.

Safety: freedom from unacceptable risk of harm.

Tolerable risk: risk that has been reduced to a level that can be endured by the organization due to its legal obligations and its own OHS policy.

² See BS8800:1996 (1996).

1. INTRODUCTION

Our aim is to create an Occupational Health and Safety Governance Indicator (OHSG indicator). In the process, we formalize a relatively new concept: Occupational Health and Safety Governance (OHSG), and analyze its components. Our ultimate objective is to integrate results, and study, in a later stage of our research, how OHSG affects health and safety performance.

The indicator systematizes diverse theoretical viewpoints, which become internal and external benchmarks for OHSG. Thus, important variables can be monitored through time. The indicator is an inventory of useful principles and practices that orient organizational learning on OHSG and monitor its development.

The paper defines the concept to be measured, OHSG, and offers a complete list of its elements, which later become pieces of the indicator. The amplitude and variety of elements make of the indicator a checklist of desirable characteristics of OHSG. While checking the indicator's elements, directors and managers are able to consolidate his knowledge of principles and practices of OHSG. In this way, the indicator becomes a learning tool for continuous improvement, and a basis for systematic evaluation of OHSG on the part of third party auditors that focus on quality management systems.

Our OHSG indicator follows in its form, but not in its content, the evaluation method of National Quality Awards, as a pattern to measure, by assigning points, a large number of variables. Variables are operationalized by grouping them in areas, themes, dimensions and elements. Measurement is performed by using a questionnaire. Maximum allowable points are assigned on the basis of a rather advanced application of utility theory. The indicator will be used in case studies in order to check its value as a predictive and OHSG tool.

2. INITIAL RESEARCH QUESTIONS THAT LED TO THE INDICATOR'S DESIGN

In the process of indicator design, we covered the following research areas:

- What is OHSG? We define the concept, differentiate it from OHS management, and justify its relevance and applications.
- How can we measure OHSG? The indicator is aimed at answering this precise question.
- What the practical uses of the indicator could be?

3. THE CONCEPT OF GOVERNANCE AND ITS ADAPTATION TO HEALTH AND SAFETY

Governance is a general concept. Corporate governance is a subset of the general concept; other subsets are public governance and global governance (Apreda (2003)). In this paper, the subset of interest is health and safety governance.

Let us review the general concept of governance.³ In general, it is understood by governance a “field of learning and practice whose main tasks are:

- The search of *principles, rules and good practices* that allow organizations to be efficiently run within the current institutions, at a certain date;
- The design of mechanisms of representation, legitimate modes of wielding power, *enforcement of rules and procedures, accountability, control, incentives and standards of performance* to be applied to organizations;
- The *efficacious pursuit of goals and missions* that stem from the foundational charter and statutes of the organization.” (Apreda (2003), emphasis added.)

The terms in italics are particularly relevant for business organizations, both large companies and small and medium-sized enterprises. No matter the nature of ownership or the kind of board of directors chosen by a firm, rules, incentives, standards, accountability, control, goals, mission, and efficiency are key concepts that the study of governance brings to light. The trend towards a broader definition of governance is shared by authors such as Collin et al. (2004); they claim that corporate governance has to broaden its focus on the listed corporation, and reach other organizational forms, such as the associations, that they study.

We focus now on the business corporation. A large number of definitions of corporate governance have been advanced through the years. The traditional definition is related to the protection of shareholder’s interests (Tirole (2001)) and has roots in the issue of separation between management and control (Berle and Means (1932)). Much more recently, Monks and Minow (1995) (quoted by Apreda (2003)) maintain that corporate governance studies the “relationship among various participants in determining the direction and performance of corporations.” For Kawakami et al. (1994), corporate governance is a generic term that

describes the ways in which rights and responsibilities are shared among the various corporate participants, especially the management and the shareholders. It is a concept of higher order than management, as it is related to setting the firm's objectives and checking that managers are behaving accordingly.

Apreda (2003) gives a working definition of governance that encompasses a number of perspectives. He defines corporate governance as the governance within corporations and nearly alike organizations (including state-owned firms) that brings to focus a number of subjects, displayed in Table 1.

Subjects of Corporate Governance
<ul style="list-style-type: none"> • Ownership structure • Company's founding Charter, by-laws, statutes, and codes of good practice • Board of Directors and Trustees. Allocation and control decision rights • Managers' fiduciary duties towards owners and their management decision rights • Investors' property rights and protective covenants • Conflicts of interests between managers, creditors, owners and other stakeholders • Managers' performance and incentives • Rent-seeking and soft-budget constraints • Production and disclosure of information to markets, regulators and stakeholders • Accountability to regulators, stakeholders and investors • Private, public and global gatekeepers (reputational intermediaries) • National and international institutional constraints (the Judiciary, traditions, regulations, and law enforcement).

Table 1. Main subjects of corporate governance. Source: Apreda (2003).

There are two traditional views to understand the objectives of a firm: The Shareholder Concept and the Stakeholder Concept. The former, rooted in the theory of accounting and finance, is associated with the maximization of shareholder wealth. The management should create as much wealth as possible for the shareholders. The latter, on the contrary, poses a broader range of objectives for a business—profit maximization being one of them—but it also measures the quality of corporate life, manager satisfaction, respect for society and the environment, and a variety of financial indicators.

Businesses are affected by their environment: customers, suppliers, government agencies, families of employees, special interest groups; in turn, the business decisions and actions are likely to affect one or more of these stakeholder groups. The managers of a firm

³ This section is based on Yacuzzi (2005).

should consider their responsibilities to groups other than the shareholders when making decisions. Stakeholder theory suggests that companies can benefit significantly from cooperating with a wide range of stakeholder groups, understanding their needs and making decisions accordingly.

Commentators disagree on the strengths and weaknesses of stakeholder theory. For instance, while Allen et al. (2002) consider that stakeholder capitalism can be superior to shareholder capitalism when markets are not perfect and complete, Heath et al. (2004) provide criticism.

Specifically, our indicator will deal with OHSG, which we define along Acona Ltd (2006). Therefore, our indicator will incorporate the following:

(a) principles, rules and procedures and good practices that allow organizations to get a continuous improvement of its OHS, in the framework of constraints created by its own OHS policy and regulatory frameworks, which are under continuous change and evolution.

(b) the design, implementation, and follow-up of mechanisms for management, commitments and responsibilities, conflicts of objectives, as well as incentives and performance standards for the organization's participants.

(c) the exercise and legitimation of leadership, as well as participation in activities related with prevention of labor risks.

4. ELEMENTS OF OHS GOVERNANCE

The OHS indicator was built to measure the quality of an enterprise's OHSG. It is composed of three areas, 12 themes, 38 dimensions, and 93 elements. All these parts are assembled in Table 2.

As an example of the indicator's organization, let's consider the area "General principles of OHS governance". This area integrates three themes: "Explicit consideration of OHS governance", "OHS information provision", and "OHS director's roles and responsibilities". "Explicit consideration of OHS governance", includes "Documental" and "Organizational" aspects. Finally, "Documental" refers to two elements: "Explicit document on the importance of OHS governance", and "Section on OHS governance in the annual report". In this hierarchical way, the indicator's structure is formed.

Area	Themes	Dimensions	Elements
General principles of OHS governance (200)	Explicit consideration of OHS governance (108)	Documental (22)	Explicit document on the importance of OHS governance 1
			Section on OHS governance in the annual report 2
		Organizational (86)	Adoption of a code of OHS good practices 3
			Degree of stickness to an OHS good practices code 4
			Appointment of a person to follow-up OHS governance issues 5
			Integration of the OHS governance process into the main corporate governance structures 6
	OHS information provision (26)	Transparency criteria (6)	Actualization of measurement criteria 7
		Information on future performance objectives 8	
	OHS directors' roles and responsibilities (66)	Organizational (20)	Appointment of a person responsible for internal and external information provision 9
			Existence of a mechanism to answer inquires from stakeholders 10
		Board of directors (46)	Acceptance of the board's role in OHS leadership 11
			Consideration of OHS implications in all board decisions 12
Individual board members (20)		Acceptance of board members' role in OHS leadership 13	
		Engagement of the workforce in OHS matters 14	
Stakeholders (500)	Shareholders' OHS position (184)	Search for economic benefit (24)	Search for value creation 15
			Search for long term prosperity and future value creation 16
		OHS corporate responsibility (96)	The board is clear about the terms of OHS corporate responsibility contract, with values and standards 17
			Think strategically about OHS Responsibility 18
			Be constructive about OHS regulation 19
			Focus on long term OHS issues 20
			Create an OHS culture of integrity 21
			Use internal controls to secure OHS responsibility 22
		Information transparency to shareholders (24)	Information that goes beyond that required by law 23
			Scope of OHS measurement system and other information 24
		Legal responsibilities, employers' duties (40)	OHS reports requested by minority shareholders 25
			Provide a written OHS policy 26
	Asses risk to employees, customers, and others who could be affected by their activities 27		
	Consult employees about their risks at work 28		
	Ensure they have access to competent OHS advice 29		
	Ensure they have access to competent OHS advice 29		
	Worforce's OHS position (110)	OHS working conditions (48)	Safety and occupational health indicators 30
			Working hours 31
Safety conditions of instalations, equipment and tools 32			
Behavioral safety performance 33			

Table 2. Indicator's dimensions and elements. Numbers between brackets show the maximum score allowed. Numbers in rightmost column refer to the questionnaire's question numbers.

Area	Themes	Dimensions	Elements	
Stakeholders (500) (Cont.)	Worforce's OHS position (110) (Cont.)	Training (30)	Average number of OHS-related training hours per year per employee 34	
			Average number of OHS-unrelated training hours per year per employee 35	
			OHS coaching activities of the workforce 36	
		Information (14)	Existence of OHS information channels for exclusive use of employees: newsboards, newsletters, etc. 37	
			Utilization of OHS information channels: yearly number of informative actions of priority or exclusive interest to employees 38	
			Existence of OHS information channels for exclusive use of employees: newsboards, newsletters, etc. 39	
		Feedback (18)	Degree of utilization of OHS related complaints and opinion system 40	
			Existence of a system to know OHS related employees' opinions 40	
			OHS meetings frequency 41	
	Managers' OHS position (112)	Managers' routines (42)	Observation and feedback activities in plant 42	
			Safety conditions improvement tasks follow up 43	
			OHS indicators monitoring 44	
			Average number of OHS-related training hours per year per manager 45	
		Training and commitment (24)	Average number of OHS activities performed per year per manager 46	
			Utilization of OHS information channels: yearly number of informative actions of priority or exclusive interest to managers 47	
		Information (20)	Existence of OHS information channels for exclusive use of managers 48	
			Existence of OHS information channels for exclusive use of managers 49	
		Feedback (26)	Existence of a system to know OHS-related managers' opinion 50	
			Existence of OHS information channels for exclusive use of customers and others 51	
		Customers' OHS position (10)	Information (10)	Existence of OHS information channels for exclusive use of customers and others 51
		OHS position of banking, creditors and investors (19)	OHS indicators (12)	Director named as an OHS champion 52
	Level of reporting of OHS management systems 53			
	Number of fatalities 54			
Lost time injury rate 54				
Absenteeism rate 54				
Cost of OHS losses 54				
OHS financial and other information (4)	Broad, updated, transparent 55			
	Possibility for creditors to participate as observers at meetings 56			
Complaints and lawsuits (3)	Existence of OHS complaints and lawsuits against the firm 57			

Table 2 (Cont.). Indicator's dimensions and elements. Numbers between brackets show the maximum score allowed. Numbers in rightmost column refer to the questionnaire's question numbers.

Area	Themes	Dimensions	Elements
	Contractors' position (46)	Contractual conditions (20)	OHS issues included into contract terms 58 Search for a long-term relationship 59
		Information (10)	OHS policy includes contractors' personel 60 Training of contractors to improve safety 61
		Feedback (12)	Existence of OHS information channels for exclusive use of contractors 62
		Complaints and lawsuits (4)	Existence of OHS complaints and lawsuits against the firm 63
	Position of government (19)	Facilitating government action (10)	Adequate supply of information requested by government organs 64
			Facilitation through publicity campaigns of government actions aimed towards general welfare (for example, towards health care) 65
		Information (5)	Provision of information to authorities on health and safety 66
		Enhancing OHS transparency (4)	Supply OHS information to improve safety in industry 67
Board's OHS work (300)	Board's OHS routine (120)	OHS agenda in meetings (60)	OHS meetings frequency 68
			Presence of top management at OHS meetings 69
		Existence of fix rules on OHS meeting call, agenda distribution, preparations, etc. 70	
	Division of labor (36)	Appointment of a board health and safety 'champion' 71	
		Division of OHS labor between the board and the CEO 72	
	Evaluation and follow-up (24)	Existence of rules on evaluation and follow-up of the board's OHS decisions 73	
Existence of annual evaluation of the board's OHS work 74			
Existence of evaluations of the board's OHS work after each meeting 75			

Table 2 (Cont.). Indicator's dimensions and elements. Numbers between brackets show the maximum score allowed. Numbers in rightmost column refer to the questionnaire's question numbers.

Area	Themes	Dimensions	Elements
Board's OHS work (300) (Cont.)	Best practice principles for OHS governance (180)	Directors' competence (28)	Clear understanding of the key OHS issues and continuous development of their skills and knowledge 76
			Familiarity with industry's OHS conditions 77
		Directors' roles and responsibilities (30)	Understanding of their legal responsibilities and their role in governing OHS matters 78
			Preparation for board meetings on the part of directors 79
			OHS compromise during board meetings 80
			Support to managers for implementing decisions on OHS 81
			Ratification of decisions taken by managers on OHS 82
		Culture, standards & values (26)	The board searches for OHS strategic information by itself, in addition to that received from top management 83
			Definition of the board's vision about OHS; establishing the right OHS culture, values and standards across the organization 84
		Strategic implications (44)	Chairman's role in establishing a culture of openness and drive for better OHS performance 85
			Board's responsibility for establishing OHS strategy, driving OHS agenda, understanding OHS risks and opportunities 86
		Performance management (26)	Consideration of OHS implications in all board's decisions 87
			Board's responsibility for setting out the key objectives and targets for OHS management 88
			Establishment of the management OHS performance framework 89
			Incentive structure for OHS management 90
		Internal controls (26)	Existence of a board's agenda on the evaluation of the OHS management 91
			Board's responsibility for insuring that OHS risks are managed and controlled adequately 92
Monitoring of decisions on OHS 93			

Table 2 (Cont.). Indicator's dimensions and elements. Numbers between brackets show the maximum score allowed. Numbers in rightmost column refer to the questionnaire's question numbers.

5. APPLICATION OF RESULTS

The indicator will allow to determine the level of OHS performance in organizations. It could be used for evaluation and internal benchmark among diverse areas of the same company or of different companies. Moreover, it could be useful at the time of designing new management structures or the modification of existing structures.

Another important application of the indicator is related to the financial arena of OHS management. It could serve to define priorities in safety investment. Given that the greater value of the indicator implies better safety and hygiene, projects with the greatest impact on the indicator could be sorted out and chosen. In this way, OHS governance becomes an important tool for a better use of the organization's financial resources.

A further application of the OHS governance indicator is related to its impact on OHS systems. Continuous improvement in all areas of the firm is checked through periodic audit, both internal and external. As a result, non-conformities are generated and, once the problems that give origin to them are solved, the level of the system performance improves. And here is where the benefit of the indicator becomes clear: different scenarios can be calculated and the resulting score, calculated. The indicator would serve to assign priorities to the implementation of corrective actions, according to its impact on OHS performance.

Finally, the OHS governance indicator would be an excellent proactive indicator of the level of prevention of labor risk, since it will allow evaluating ex-ante the safety performance of an organization on the basis of several areas: governance principles, stakeholders and board's OHS work.

6. DETERMINING THE QUESTIONNAIRE SCORES⁴

Let us analyze with greater depth questionnaire scores. Even if every question were perfect and free from measurement errors (impossible features), and even if all important dimensions and elements were included, and irrelevant ones excluded, we still would have to deal with the hard problem of assigning importance to each question and to the sections in which questions cluster. In other words, in designing a measurement instrument, proper weight must be given to score graduation.

In this work we calibrate maximum scores in each section by using a preference function with multiple attributes. Even though this method does not completely eliminate arbitrary scoring decisions, it is based on systematic questioning to decision makers and governance experts about their preferences. The objective of the indicator is, in the last instance, to establish a hierarchical order among firms, according to the quality of their governance. The order is established on the basis of scores assigned to each firm.

⁴ This and the following sections have been adapted from Yacuzzi (2008).

Let us consider the three major areas that define the concept of governance: principles of OHS governance, stakeholders, and the board’s work. We must determine the weight of each area and, to that end, a preference function is built. At this stage we aim at finding weights for each of the three areas; later, we will find weights for themes, dimensions, and elements in Table 2.

Maximum scores assigned by the questionnaire to each area depend on the values assigned in a preference function. This function will finally establish the hierarchical ordering of firms on the basis of their governance quality. The basic procedure to determine this preference function is described, and then it is applied to the assignment of scores to our questionnaire.⁵

Step 1. Preference function determination

Preference function P is assumed additive, with the form:

$$P(v_1, v_2, v_3) = w_1v_1 + w_2v_2 + w_3v_3 \quad (\text{Equation 1})$$

where P is preference, the v_i are the values that the governance expert assigns to the areas of the questionnaire, and the w_i , importance weights for each area. Weights and value functions are scaled in such a way that

$$\sum w_i = 1, \quad 0 \leq w_i \leq 1 \quad \text{and}$$

$$v_i(\text{best level}) = 1$$

$$v_i(\text{worst level}) = 0, \quad \text{for } i = 1 \text{ to } 3, \text{ where } i \text{ is the area.}$$

A frequent doubt is related to the legitimacy of this additive model. We believe that it is sufficient to check the *difference independence* condition for each area. This condition establishes that the magnitude of the difference in the intensity of the preference between two levels in area i does not change when fixed levels in other areas change. Let us assume, for instance, that a decision maker is given two values, $v_1 = 0.1$ and $v_1 = 0.7$, where values 0.1 and 0.7 are taken from a 0-1 scale that measures the value assigned to the strength of the area “principles of OHS governance” in a firm; 0.7 is higher than 0.1. The decision maker is asked to answer if the intensity of her preference to go from 0.1 to 0.7 is influenced by the fixed

⁵ The procedure follows in general that described by Buffa et al. (1987), with minor changes in the way to calculate unidimensional values.

levels at other areas. (In other words, she is asked whether she would be conditioned, in choosing a firm with better governance principles, by the levels of areas “stakeholders” or “board’s work”.) If the levels of other areas do not affect the first area considered, then this area is considered *difference independent* from the rest.

If the area does not pass the test, we can choose a model that takes into account interactions among areas, or else areas can be redefined so that *difference independence* is achieved. In our work, we follow the criteria of just one expert (the authors), and the rationale to justify *difference independence* follows.⁶

“In the first place, let’s look at the relationship between the areas “principles of OHS governance” and “stakeholders”: a firm with good governance must have solid principles of OHS governance, regardless whether it adopts an attitude favourable to its shareholders, employees, creditors, etc. In the second place, let us examine the relationship between the areas “principles of OHS governance” and “board’s work”: the board could function properly, regardless of the existence of (explicit) solid principles of OHS governance. In the third and last place, let us consider the relationship between the area “stakeholders” and “board’s work”: a board could function properly, be involved with its work and follow a reasonable routine of control and networking, regardless of how the firm, by its philosophy of governance, considers the position of stakeholders.”

Even though this reasoning is preliminar and could be confirmed by better qualitative and quantitative análisis, Buffa et al. (1987, p. 702) maintain that additive preference functions are quite robust and, in most situations, will produce small errors, even when there is a moderate interaction among areas.

Step 2. Construction of unidimensional value functions

An important problem is that of assigning values to governance areas, themes, dimensions, and elements. In what follows, we introduce a method to evaluate the value function v_i belonging to area i . Similar reasoning would allow us to study value functions for themes, dimensions, and elements of the concept. It is common to establish a 0-1 scale, where 0 indicates the worst level, and 1, the best level. These values emerge from utility functions that will depend on each decision maker or, in the case of a general use indicator, on the

consensus of the community of governance experts at a given moment and place. For this work, we propose the utility functions shown in Figures 1, 2 and 3.

The utility function of “general principles of OHS governance”, shown as table and graph in Figure 1, was built so that it reflects the decision maker’s way of thinking. For the lower degrees of principle consolidation, the utility (or value) increases linearly, at a rate that is higher than that for upper degrees; for upper degrees, the growth rate flattens. This implies that (relatively speaking) the decision maker values more small efforts towards OHS governance than more advanced enhancements. The meaning of different degrees of principle consolidation is shown in Table 3. This table is important, since it provides some objectivity to the search for a preference function.

Degree of principle consolidation	Degree, in number	Assigned value
Null	0	0
In development	1	0.4
Partial	2	0.7
Total	3	0.9
Level of excellence	4	1

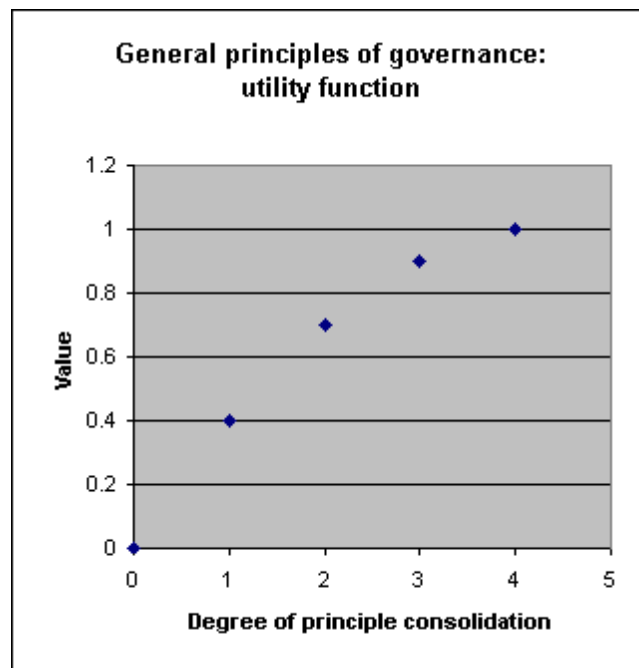


Figure 1. General principles of OHS governance: utility function.

Figure 2 shows the utility function for the stakeholders area. It is a linear function, that so reflects a “democratic” perspective concerning the importance of stakeholders: all

⁶ Future versions of this indicator should include opinions of a qualified group of governance experts.

stakeholders are important, and the questionnaire scores add value whether they are assigned when considering shareholders or any other stakeholder. The meaning of the degree of consideration of stakeholders is presented in Table 4.

Degree	Meaning
Null consolidation	OHS Governance principles are unknown or they are not mentioned at the firm. There are no references to them in director's or manager's daily discourse; at the most, there are isolated references.
Consolidation in process of development	The topic of OHS governance principles starts to be developed, at least with some systematic order. For example, ad-hoc documents are issued, or some people are trained in OHS governance themes, or responsible persons are assigned to OHS governance issues, or the organization works on a code of OHS good practices. Information management and directors' representativeness are given explicit attention.
Partial consolidation	There are evidences of a significative degree of implementation in all themes and dimensions of the OHS governance concept. For example, search for a person to follow-up OHS governance issues has started, a code of best practice principles for OHS governance has been enforced and an OHS expert has been contracted for advice to the board on OHS matters.
Total consolidation	The company displays knowledge and application of solid OHS governance principles at all levels. Internal and external documentation related to OHS governance is up-to-date and available. The board functions with efficiency and effectiveness in its OHS governance.
Excellence level	The company has not only totally consolidated its OHS governance principles, but it can also exhibit its achievements to the industrial community, thus becoming a national and international model. In order to maintain OHS governance principles, methods similar to those of continuous improvement in quality management are applied.

Table 3. Meaning of the degree of consolidation of general principles of OHS governance.

Finally, Figure 3 exhibits the utility function for the board's OHS work. The first points are not too highly valued: after all, there are certain routines that all boards, no matter how shallow its work, must adhere to. However, values growth with greater slope when the percentage increases, in order to highlight the importance of a board that performs tasks that go beyond the minimum practice. Table 5 shows the meaning of the degree of effectiveness of the board's work.

Figures 1, 2 and 3, show then three different functional forms, corresponding to the criteria of a decision maker or governance expert. On the basis of these utility functions, the expert can build tables and assign values. Other decision makers might have other criteria, and these could become explicit in other different utility functions.

Degree (Scope) of considered stakeholders	Degree, in number	Assigned value
Null	0	0
Minimum	1	0.25
Medium	2	0.5
Large	3	0.75
Maximum	4	1

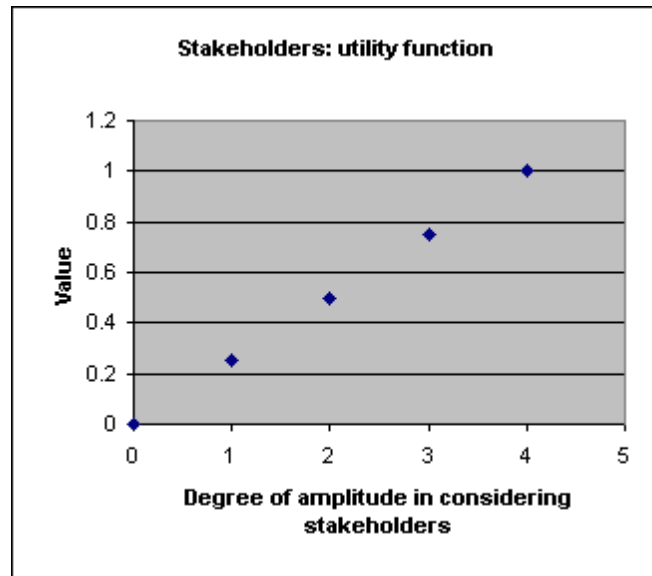


Figure 2. Utility function for the stakeholders area.

Degree	Meaning
Null amplitude	Concern for the shareholders' OHS position holds absolute priority. In spite of that, there is little or none information transparency and little or null OHS corporate responsibility .
Minimum amplitude	Concern for the shareholder holds priority, but other stakeholders, such as employees, managers, customers and contractors, are considered as well. Aside from the shareholder, other <i>stakeholders</i> only get partial attention: for example, employee training is properly performed, but salary considerations or quality of working life are ignored.
Medium amplitude	Several <i>stakeholders</i> receive attention from top management, including shareholders, employees, managers, customers and contractors. In addition, for each <i>stakeholder</i> , one or more dimensions are considered.
Large amplitude	At least five out of seven <i>stakeholders</i> are closely attended to. Attention, in this context, means that, for each <i>stakeholder</i> , at least two or three dimensions are properly taken care of, and, in each dimension, a plurality of elements is considered.
Maximum amplitude	All <i>stakeholders</i> are considered in all dimensions. For each dimension, all elements receive at least some degree of consideration. At all levels in the firm there exists a "culture of <i>stakeholders</i> ".

Table 4. Meaning of the degrees of amplitude in the consideration of stakeholders.

Degree of effectiveness of the board's OHS work	Degree, in number	Assigned value
Null	0	0
Minimum	1	0.1
Medium	2	0.25
Large	3	0.6
Maximum	4	1

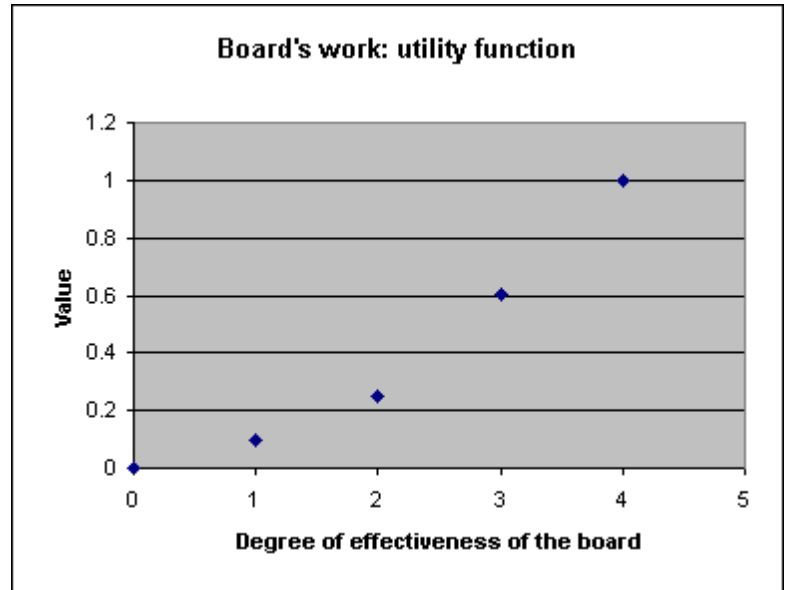


Figure 3. Utility function for the board's work.

Step 3. Determination of importance weights for each area (w_i)

The most important area is identified first. This is an arbitrary decision, although it reflects a philosophical position towards OHS governance; if necessary, the effect of this choice can be evaluated through sensitivity analysis. Let "stakeholders" be our area of greatest importance. In order to evaluate weights we ask the following question: "Consider firm A, with the worst level in its "principles of OHS governance", $v_1 = 0$, and the best level in "stakeholders", $v_2 = 1$. Consider now another firm, B, with $v_1 = 1$, the best level for its "principles of OHS governance". What should be level v_2 for this firm B so that you would be indifferent (as an external expert that evaluates this firm's governance) between choosing A or B?

Assume that the answer is $v_2 = 0.6^7$, i.e, decision maker at firm B is willing to trade-off part of stakeholders consideration in order to have perfect principles of OHS governance. By using equation 1 this situation is presented as:

$$\begin{aligned}
w_1 v_1 \text{ (worst level of principles)} + w_2 v_2 \text{ (best level of stakeholders)} &= \\
= w_1 v_1 \text{ (best level of principles)} + w_2 \times 0.6 & \\
w_1 \times 0 + w_2 \times 1 = w_1 \times 1 + w_2 \times 0.6 &
\end{aligned}$$

Rearranging this expression, we have:

$$0.4 w_2 = w_1 \quad \text{(Equation 2)}$$

Degree	Meaning
Null effectiveness	The board has no OHS work routine. Directors do not even have a clear consciousness about their OHS role. They do not meet beyond what the law establishes and present an insignificant level of ability and compromise for health and safety in the organization. The board does not evaluate management and, even if there are no conflicts of interest, the boards' behaviour is negative or nule. Directors do not perform best practice principles for OHS governance.
Minimum effectiveness	The board understands the importance of its OHS role, but this understanding does not translate into innovative action or control behavior, due to a limited level of best practice principles for OHS governance application. Just one theme of the board's work is treated, albeit insufficiently, in one or two dimensions.
Medium effectiveness	The board is reasonably competent and is involved in three dimensions of the "Best practice principles for OHS governance" theme. In addition, it takes forward a regular routine covering one of two dimensions.
Large effectiveness	All themes related to the board's work are considered: routine and best practice principles for OHS governance. In each theme, in addition, almost all dimensions are covered.
Maximum effectiveness	All themes and all dimensions are properly considered. A culture of continuous improvement is alive, applied to the board's work. There are even written procedures to evaluate the board's effectiveness in OHS matters.

Table 5. Meaning of the degrees of effectiveness in the board's work.

Next we pose an analogous question for the remaining area. "Consider firm A, that has the worst level in its board's work, $v_3 = 0$, and the best level in "stakeholders", $v_2 = 1$. Consider now another firm, B, with $v_3 = 1$, the best level in its board's work. What should level v_2 be for this firm B so that you were indifferent (as an external expert that evaluates this firm's

⁷ This means that $v_2 = 0.6$ emerges objectively from the utility function and the description of degrees in Table 4. Taking intermediate values is legitimate.

OHS governance) between choosing A or B?” If your answer to this question were $v_2 = 0.3$ then:

$$\begin{aligned} w_3v_3 \text{ (worst level in board's work)} + w_2v_2 \text{ (best level in stakeholders)} &= \\ = w_3v_3 \text{ (best level in board's work)} + w_2 \times 0.3 & \\ w_3 \times 0 + w_2 \times 1 = w_3 \times 1 + w_2 \times 0.3 & \end{aligned}$$

Rearranging this expression, we get:

$$0.7 w_2 = w_3 \quad \text{(Equation 3)}$$

The sum of weights must equal unity, i.e.:

$$w_1 + w_2 + w_3 = 1 \quad \text{(Equation 4)}$$

Therefore, with equations 2, 3 and 4:

$$\begin{aligned} 0.4 w_2 + w_2 + 0.7 w_2 &= 1 \\ 2.1 w_2 &= 1 \\ w_2 &= 0.48 \end{aligned}$$

and, as a consequence:

$$\begin{aligned} w_1 &= 0.4 \times 0.48 = 0.19 \\ w_3 &= 0.7 \times 0.48 = 0.33 \end{aligned}$$

From these calculations, importance weights for the three areas are estimated: $w_1 = 0.19$, $w_2 = 0.48$ y $w_3 = 0.33$. Since our procedure is approximate, not much is lost by rounding these values to: $w_1 = 0.2$, $w_2 = 0.5$ y $w_3 = 0.3$.

Step 4. Global values calculation

Equation 1 allows us to calculate our preference for a given firm as a function of its OHS governance quality. We will have, for instance:

$$\begin{aligned} P(v_1, v_2, v_3) &= w_1v_1 + w_2v_2 + w_3v_3 = \\ &= 0.2 \times 0.75 + 0.5 \times 0.70 + 0.3 \times 0.45 = 0.635 \end{aligned}$$

This value is multiplied by 1000 in order to generate an indicator that covers the range from 0 point through 1000 points. This operation is a simple arithmetic step that does not affect comparisons made with the governance indicator.

Step 5. Sensitivity analysis

The previous line of reasoning might be affected by subjectivity. Subjectivity covers both the selection of weights for each area and the assignment of its values. In order to increment confidence in the indicator's performance, sensitivity analysis could be performed. A possible way to conduct this analysis is the following:

- take a set of firms and evaluate its OHS governance with the developed indicator, with the base values;
- establish a ranking for these firms on the basis of the results obtained with the indicator;
- obtain other (or others) indicator (or indicators) by changing values (utility function) and weights in steps 1 through 4 above;
- establish a new ranking of firms with the new indicator;
- compare results. If the comparison is satisfactory and shows consistency, our level of confidence in the indicator will increase; otherwise, it would be convenient to make a more profound study of the philosophy of governance and look for more information, in order to find a more consistent indicator.

Sensitivity to the utility function used could also be measured. A further way to conduct sensitivity analysis is to compare the weights that different decision makers or experts assign to different governance areas, by following steps 1 through 4 above. If weights

are approximately equivalent, our confidence in the indicator will increase. Important differences would reflect different understandings of OHS governance.

7. APPLICATION TO QUE QUESTIONNAIRE

In the previous section we have shown how weights can be systematically assigned to the three areas of governance. Something similar can be done to assign weights to different themes in each area; to different dimensions in each theme; and, finally, to different elements in each dimension (although in this work we follow a different way to assign weights to the elements).

The method is applied to weight themes from the stakeholders area. The generalized preference function in Equation 1 will be used, but new subscripts will be added in order to clearly specify weights, values, and percentages of the maximum score for each theme or dimension in the questionnaire. In the following equation, for example:

$$P(v_{11}, v_{12}, v_{13}, v_{14}) = w_{11}v_{11} + w_{12}v_{12} + w_{13}v_{13} + w_{14}v_{14}$$

the first subscripts refer to the area “principles of OHS governance” and the second subscripts refer to the four themes that conform the area: “explicit consideration of governance”, “provision of information”, “directors’ representativeness” and “CEO duality”, respectively. Likewise, in the equation:

$$P(v_{111}, v_{112}) = w_{111}v_{111} + w_{112}v_{112}$$

the first subscripts refer to the area, the second, to the theme, and the third, to the dimensions (“documental” and “organizational”).

Table 6 (a) schematically shows the result of a line of reasoning, similar to that of previous section, conducted to weight themes from the area “stakeholders”. We assume that the most important theme is “position of the shareholders”. This could be different: in Japan many people feel that “the company belongs to its employees”; naturally, this way of thinking would take us to different weights.

Notice that in choosing the value of “ v_{21} necessary for indifference” between firms A and B there exists the implicit idea of a decision maker’s utility function. The reader might want to check his understanding of the reasoning by following one or two lines in Table 6 (a). Table 6 (b) is a summary of the calculated w_{2j} values.

i	Firm A			Firm B			Coefficient that multiplied by w_{21} gives w_{2j}
	Worst level in:	v_{2j}	v_{21}	Best level in:	v_{2j}	v_{21} necessary for indifference	
2	Workforce	0	1	Workforce	1	0.4	0.6
3	Managers	0	1	Managers	1	0.4	0.6
4	Customers	0	1	Customers	1	0.95	0.05
5	Investors	0	1	Investors	1	0.9	0.1
6	Contractors	0	1	Contractors	1	0.75	0.25
7	Government	0	1	Government	1	0.9	0.1

Table 6 (a). Summary of calculations to determine weights for different stakeholders. “Position of shareholders” is assumed to be the most important theme.

Theme	Coefficient	Value	Weight (calculated)	Weight (adopted)
Shareholders	w_{21}	0.37	185	184
Workforce	w_{22}	0.22	111	110
Managers	w_{23}	0.22	111	112
Customers	w_{24}	0.02	9	10
Investors	w_{25}	0.04	19	19
Contractors	w_{26}	0.09	46	46
Government	w_{27}	0.04	19	19
	Total	1.00		

Table 6 (b). Weight calculation results.

At this point we have calculated the weights w_{ij} for the three areas and the seven themes of area stakeholders. The whole set of calculations is available from the authors.

The following criterion is adopted for the elements’ weights: If a dimension is made from just one element, then, the weight of the element is equal to the weight of the dimension;

if the dimension is made from n elements, the weight of each element is $(1/n)$ times the weight of the dimension. We could have calculated each element's weight by using a preference function as we did with areas, themes, and dimensions but, for practical reasons, we chose the laplacian criterion that gives equal weight to each element in a given dimension.

We are now ready to assign points to each element. Following the Nacional Quality Award scoring standard, we assign a total number of points in the range from 0 point to 1000 points. Given the weights of the governance areas, points are assigned as follows:

- General principles of OHS governance: $w_1 * \text{maximum score to be assigned} = 0.2 * 1000 = 200$ points.
- Stakeholders: $w_2 * \text{maximum score to be assigned} = 0.5 * 1000 = 500$ points.
- Board's work: $w_3 * \text{maximum score to be assigned} = 0.3 * 1000 = 300$ points.

In a similar way points are assigned to themes in each area. Calculated values were rounded to the values in parenthesis, without any important loss in relevance. Complete results are shown in Table 2, in each cell and between brackets. Notice, finally, that in this work the concept of utility function is used in two related but different contexts: on the one hand, it is used to assign values (utilities) to the degrees of consolidation, amplitude, or effectiveness of diverse areas, themes and dimensions (see, for example, Figures 1, 2, and 3); this use allows assigning points to the indicator's areas, themes and dimensions; on the other hand, the concept is used in the questionnaire to assign points to different possible answers in questions with five possible answers.

8. REFLECTIONS ON MEASUREMENT⁸

We believe that the technical approach taken to complete our OHSG indicator is appropriate. The final questionnaire is—we have to admit it—rather long. However, our indicator aims at answering a single question: “How good is this firm's HSG governance?” The concept of governance is complex and there are many possible perspectives from which to answer such a question. The structure we propose: areas, themes, dimensions, and elements, is a first step towards clarifying the concept of governance that our indicator tries to measure.

⁸ This section and the next follow Yacuzzi (2008).

Much has been written on measurement. Lord Kelvin, for example, wrote a century ago:

“When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science.”

Let us take now a quotation from Robert B. Laughlin (Laughlin (2007), p. 32, authors’ translation from the Spanish edition):

“We know that measurements are never perfect and that is why we want to know *how* precise a given measure is, which is an adequate practice as it avoids dishonesty and discourages elaboration of reports with no scientific value.”

It can be argued that Laughlin is a physicist that talks about physics, which is true, but his words make even more sense in social research. Our detailed explanation on how the indicator is built helps to understand its precision and increases user confidence. On the other hand, all the technology we used to build the indicator is displayed in this work, so that any reader can construct her own indicator, if she so wishes.⁹ Laughlin (2007) continues:

“When I go to meetings where I meet other physicists and talk with them about things that interest us, one of the topics that always comes to the surface is a conference by Irving Langmuir, the inventor of the tungsten lamp. In that conference, the American scientist talks about pseudoscience and relates cases of scientific falseness and deceptions, but the most important thing is the fundamental message that he conveys: in physics, correct perceptions differ from erroneous ones in that the former become more clear when experimental precision improves. It is a simple idea that captures the physicist’s mind and explains his obsession with mathematics and numbers. By means of precision falseness is shown up” (p. 37, authors’ translation from the Spanish edition).

For us, social researchers, Langmuir’s message is as much valid, or even more, than for physicists. Since we rarely conduct experiments, we must be as rigorous as the physicist in using our measurement instruments, and we must work hard to define in detail the phenomena we try to measure.

The methodology used in this paper oriented our work on a solid basis. At this point it is relevant the thought of Keeney et al. (1976, p. 9) on decisions with multiple objectives: “The spirit is one of Socratic discovery—of *unfolding* what you really believe, of *convincing*

yourself, and of deciding” (italics in the original). Formal analysis has further advantages: it provides “psychological comfort”, facilitates communication, allows persuasion of third parties, systematize concept evaluation, and leads to finding gaps or redundancy in what we measure. These advantages keep their validity even in cases where the evaluation of the quality of health and safety governance is based on intuition.

“You cannot quantify what is not quantifiable” is a much quoted criticism. Let us go back to Keeney et al. (1976, p. 12):

“The question is: *What is quantifiable?* An art expert might be hard pressed to give an objective formula for ranking the quality of paintings; nevertheless, he might be able to rank order these paintings saying, in effect, that given a choice between two paintings he would prefer one over the other. And, where we have rank orders, numbers can’t be far behind. Our artist might even be willing to put a price tag on each painting, thereby quantifying one aspect of his subjective judgement. This sort of quantification is not done by means of an objective formula but by subjective introspection. Is it legitimate to work with such numbers? We do it all the time. As analysts we must learn how to incorporate such soft, squishy considerations as aesthetics, psychic factors, and just plain fun into our analyses. If we don’t, the hard will drive out the soft and efficiency—very narrowly interpreted—will prevail.”

Another source of skepticism is the hypothetical nature of questions posed to managers by experts in order to establish a ranking of preferences. Simple, apparently unrealistic, questions are used to inquire in complex subjects in a complex world. In fact, these questions are simple, but their answers are the fundamental components that allow to calculate, for example, weights in a preference function.¹⁰ Without these simple questions, finding preference functions would be complex.

The elements of our indicator of OHS governance have two key features: they are relevant and they are measurable. Relevant means that, from its knowledge, decision makers have useful information to evaluate some governance dimension. Measurable means that the decision maker can discriminate between different levels of each element.

All the indicator’s elements, taken as a whole, must meet some properties. The set must be complete (the questionnaire must cover all relevant aspects of a theory of OHSG), operative (elements must be measurable), decomposable (governance complexity must be

⁹ Needless to say, interfirm OHS comparissons are meaningful only when a given indicator is widely accepted, but, in principle, any firm could have its own governance indicator.

¹⁰ Questions must be precise and understandable. See Keeney et al. (1976, p. 18).

divided into smaller, more treatable, problems), non redundant (the questionnaire must avoid double accounting) and minimum (to keep the questionnaire within reasonable limits).¹¹ Finally, we add to this list the feature of explanatory power. In-depth knowledge of the concept of health and safety governance will allow causal explanations of the impact that each element has on governance quality.

9. FINAL THOUGHTS

Our indicator is built on 93 questions. Undoubtedly, they are too many questions to be answered by a busy executive, but they are not too many questions for a board willing to evaluate the status of its firm's OHSG and reflect about it.

Who must answer the questionnaire? The first possible answer is: "the board", and, in fact, the board has most of the required information to answer the questions; in addition, it is the board who might benefit the most from the exercise. Another possible answer is: "other stakeholders, perhaps working in team". Another: "people from academia who are studying cases on OHSG". And another: "gatekeepers, who would benefit from an in-depth understanding of OHS governance". And the list could go on.

Ours is not, as we see, an indicator amenable to be automatically estimated with a large data base with economic-financial information. It is rather a quantitative *checklist*, a map for good OHSG. The checklist could be analyzed every year, in the context, for example, of an ISO 9000 program. As the board assigns points to OHSG elements, it learns about them and their relevance to the firm.

Pareto analysis might suggest the possibility to create a more parsimonious indicator, with fewer questions. However, we present three objections against this course of action. In the first place, current scores represent the authors' perspective and they could be modified with other perspectives. On the other hand, if themes and elements with small scores are eliminated, the value of the questionnaire as a checklist of themes and elements of OHS governance is also diminished; its application as a complementary tool of an evaluation of the type performed by National Quality Awards would be limited, and its training value for directors and managers would also decrease. Moreover, governance is an evolving concept

¹¹ These features are taken from Keeney et al. (1976, p. 50) and we deem them valid even though we use them in a different context.

and it is possible that elements that today rank low in the list of maximum possible scores change their relative ranking in the future. Elimination from the questionnaire would deprive them of visibility for future evaluation instances; and it would exclude them from the consciousness plane of a devoted director aiming at having an innovative firm that strives hard to improve its OHS governance.

Finally, we firmly believe that OHSG can, and must, be measured. Through its measurement, managers and directors improve the understanding of their problems, and the organization as a whole learns the meaning and scope of concepts that, at least in its systematic treatment, are new for most members of a firm. Continuous improvement occurs.

APPENDIX I

QUESTIONNAIRE FOR DETERMINING THE OHS GOVERNANCE INDICATOR

Section I. GENERAL PRINCIPLES OF OHS GOVERNANCE

The following questions relate to general principles of OHS governance. Please, indicate the degree of observance that these principles have at your company, using the scales provided. After choosing your answer, write down the score indicated in column “Your firm’s score”, to be added later. In column “Details” you might add additional information to your answer.

N°	Questions	Answers and assigned score *					Your firm’s score
		Strong “No”	Weak “No”	Implementation	Weak “Yes”	Strong “Yes”	
1. GENERAL PRINCIPLES OF OHS GOVERNANCE (200 POINTS)							
a) Explicit consideration of OHS governance (108 points)							
1	Has your company issued some document that explicitly highlights the importance of good OHS governance?	0	4.5	8	10	11	
	Details: _____						
2	Does your company’s annual memory include a section devoted to its performance in implementing OHS governance principles, in addition to the provisions indicated by the regulatory framework?	0	4.5	8	10	11	
	Details: _____						
3	In addition to the principles of OHS governance indicated in the corporation’s chart or internal by-laws, does your company have a code of ethics, or code of behaviour, or best practice principles guide for OHS governance?	0	8,5	15	19,5	21.5	
	Details: _____						
4	Does your company sticks to a best practice principles code for OHS governance?	0	8,5	15	19,5	21.5	
	Details: (For example, what percentage of the total of principles your company sticks to?) _____						

- **Strong “No”:** No, and so far we have not considered the issue.
- **Weak “No”:** No, but we are considering the issue.
- **Implementation:** No, but we are in the process of implementation.
- **Weak “Yes”:** Yes, recently.
- **Strong “Yes”:** Yes.

N°	Questions	Answers and assigned score *					Your firm's score
		Strong "No"	Weak "No"	Implementation	Weak "Yes"	Strong "Yes"	
1. GENERAL PRINCIPLES OF OHS GOVERNANCE (200 POINTS) (Cont.)							
5	Is there a person responsible for checking the introduction and enforcement of OHS governance issues? Details: (Position, to whom does she reports to, etc.) _____	0	8,5	15	19,5	21.5	
6	Is there in place an integration of the OHS governance process into the main corporate governance structure ? Details: _____	0	8,5	15	19,5	21.5	
b) On OHS information provision (26 points)							
7	Are OHS measurement criteria systematically updated in order to improve OHS measurement transparency? Details: _____	0	1	2	2.5	3	
8	Does the management inform expected OHS performance objectives for upcoming years? Details: _____	0	1	2	2.5	3	
9	Does exist in your company a person responsible for providing OHS information to stakeholders? Details: _____	0	3.5	7	9	10	
10	Does exist in your company a mechanism that allows prompt answers to questions from stakeholders about OHS topics? Details: _____	0	3.5	7	9	10	

- **Strong "No"**: No, and so far we have not considered the issue.
- **Weak "No"**: No, but we are considering the issue.
- **Implementation**: No, but we are in the process of implementation.
- **Weak "Yes"**: Yes, recently.
- **Strong "Yes"**: Yes.

N°	Questions	Answers and assigned score *					Your firm's score
		Strong "No"	Weak "No"	Implementation	Weak "Yes"	Strong "Yes"	
1. GENERAL PRINCIPLES OF OHS GOVERNANCE (200 POINTS) (Cont.)							
c) OHS Directors' roles and responsibilities (66 points)							
11	Is there an explicit and formal acceptance of the Board's roles in OHS leadership, such as: to review and agree on OHS strategy; to develop an OHS policy; to receive annual reports on OHS plans; to ensure sufficient resources; and so on ? Details: _____	0	9	16	20,5	23	
12	There exists any document to ensure the consideration of OHS implications in all board's decisions? Details: _____	0	9	16	20,5	23	
13	Have each one of the board members accepted their role in OHS leadership? Details: _____	0	3.5	7	9	10	
14	Does exist in your company a mechanism that allows board's members the engagement of the workforce in OHS matters? Details: _____	0	3.5	7	9	10	

- **Strong "No"**: No, and so far we have not considered the issue.
- **Weak "No"**: No, but we are considering the issue.
- **Implementation**: No, but we are in the process of implementation.
- **Weak "Yes"**: Yes, recently.
- **Strong "Yes"**: Yes.

Section II. STAKEHOLDERS

In this section we inquire about your firm's *stakeholders*: shareholders, workforce, managers, clients, creditors, contractors and government. Please, indicate the degree of validity of each one of the observations at your company, using the scales provided. After choosing your answer, write down the score indicated in column "Your firm's score", to be added later. In column "Details" you might add additional information to your answer.

N°	Questions	Answers and assigned score *					Your firm's score
		TD	D	N	A	TA	
2. STAKEHOLDERS (500 POINTS)							
a) On the position of shareholders at the firm (184 points)							
15	Searching for value creation for the shareholder, based on OHS performance (measured, for example, by productivity increase), is a core motivation for top management. Details: _____	0	3	6	9	12	
16	Searching for long term prosperity and future value creation for the shareholder (measured, for example, by OHS performance or inexistence of OHS lawsuits) is a core motivation for top management. Details: _____	0	3	6	9	12	
17	The board is clear about the terms of the OHS corporate responsibility contract with stakeholders, setting explicit values and standards for the company. Details: _____	0	4	8	12	16	
18	The board thinks strategically about OHS responsibility, designing a business model that promotes it. Details: _____	0	4	8	12	16	
19	The board is constructive about OHS regulation, supporting both self-regulation and government intervention to correct OHS risks problems. Details: _____	0	4	8	12	16	

- **TD:** I am in total disagreement with this statement.
- **D:** I am in disagreement with this statement.
- **N:** I neither agree nor disagree with this statement.
- **A:** I agree with this statement.
- **TA:** I am in total agreement with this statement.

N°	Questions	Answers and assigned score *					Your firm's score
		TD	D	N	A	TA	
2. STAKEHOLDERS (500 POINTS) (Cont.)							
20	The board aligns performance management, rewarding responsible OHS success over the long term, and not just meeting narrow financial targets over the short term.	0	4	8	12	16	
	Details: _____						
21	The board creates a culture of integrity about OHS, setting the right tone at the top and entrenching the right values in the OHS culture.	0	4	8	12	16	
	Details: _____						
22	The board use internal controls to secure OHS responsibility, safeguarding the company's OHS standards with robust internal audit and control systems.	0	4	8	12	16	
	Details: _____						
23	There exist mechanisms for the minority shareholders to freely suggest themes for the board's agenda.	0	2	4	6	8	
	Details: _____						
24	Areas responsible for the preparation of OHS reports report, by management's orders, on the company's OHS situation and its future perspectives with greater scope than that established by law.	0	2	4	6	8	
	Details: _____						
25	Frequently, reports are prepared at the request of minority shareholders.	0	2	4	6	8	
	Details: _____						
26	The board provides a written OHS policy.	0	2,5	5	7,5	10	
	Details: _____						

- **TD:** I am in total disagreement with this statement.
- **D:** I am in disagreement with this statement.
- **N:** I neither agree nor disagree with this statement.
- **A:** I agree with this statement.
- **TA:** I am in total agreement with this statement.

N°	Questions	Answers and assigned score *					Your firm's score
		TD	D	N	A	TA	
2. STAKEHOLDERS (500 POINTS) (Cont.)							
27	The company assesses risk to employees, customers and others who could be affected by their activities.	0	2,5	5	7,5	10	
	Details _____						
28	The company consult employees about their risks at work.	0	2,5	5	7,5	10	
	Details _____						
29	The board ensure they have access to competent OHS advice.	0	2,5	5	7,5	10	
	Details _____						
b) On the workforce's position (110 points)							
30	The company has implemented complete safety and occupational health indicators, including proactive and reactive parameters.	0	3	6	9	12	
	Details: _____						
31	The workforce never exceeds the legal working hours.	0	3	6	9	12	
	Details: _____						
32	Equipment and tools are always in perfect safety conditions.	0	3	6	9	12	
	Details _____						
33	My company has implemented a behaviour based safety process for the continuous safety performance improvement.	0	3	6	9	12	
	Details _____						
34	My company devotes important resources to train its employees in OHS issues.	0	2.5	5	7.5	10	
	Details _____						
35	My company uses an effective learning method focused in OHS procedures.	0	2.5	5	7.5	10	
	Details: _____						

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No.	Questions	Answers and assigned score *					Your firm's score
		TD	D	N	A	TA	
2. STAKEHOLDERS (500 POINTS) (Cont.)							
36	Managers, supervisors and OHS professionals frequently develop OHS coaching activities for the workforce. Details: _____	0	2.5	5	7.5	10	
37	Periodic reports issued by the company have its employees as an important target. Details: _____	0	1.75	3.5	5.25	7	
38	My company regularly publishes OHS news for its employees (newsboard, etc.). Details: _____	0	1.75	3.5	5.25	7	
39	Periodic OHS reports issued by the company have its employees as an important target. Details: _____	0	1.5	3	4.5	6	
40	There exist systems to transmit complaints and opinions from the personnel. Details: _____	0	1.5	3	4.5	6	
c) On the position of our managers (112 points)							
41	Our managers participate in all OHS meetings. Details: _____	0	2.625	5.25	7.875	10.5	
42	Our managers develop safety observations and feedback activities at the plant. Details: _____	0	2.625	5.25	7.875	10.5	
43	Our managers follow-up tasks to promote safety conditions improvement. Details: _____	0	2.625	5.25	7.875	10.5	
44	Our managers develop monitoring of OHS indicators. Details: _____	0	2.625	5.25	7.875	10.5	
45	My company devotes important resources to train its managers in OHS issues. Details: _____	0	3	6	9	12	

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N°	Questions	Answers and assigned score *					Your firm's score
		TD	D	N	A	TA	
2. STAKEHOLDERS (500 POINTS) (Cont.)							
46	My company devotes important resources to OHS activities for its managers. Details: _____	0	3	6	9	12	
47	Periodic OHS reports issued by the company for its managers are very frequent. Details: _____	0	2.5	5	7.5	10	
48	My company regularly publishes OHS news for its managers (newsboard, etc.). Details: _____	0	2.5	5	7.5	10	
49	Periodic OHS reports issued by the company have its managers as an important target. Details: _____	0	3.25	6.5	9.75	13	
50	There exist systems to transmit OHS opinions from the personnel. Details: _____	0	3.25	6.5	9.75	13	
d) On the OHS position of ours customers (10 points)							
51	Periodic OHS reports issued by the company have its customers as a target. Details: _____	0	2.5	5	7.5	10	
e) On the OHS position of banking creditors and investors (19 points)							
52	Our company has named to a director as an OHS champion. Details: _____	0	0.5	1	0.75	2	
53	Our company has a complete OHS information system for reporting. Details: _____	0	0.5	1	0.75	2	
54	Our company has a complete information system for reporting OHS indicators, including number of fatalities, injury rates, absenteeism rate and cost of OHS losses. Details: _____	0	0.5	1	0.75	2	

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		TD	D	N	A	TA	
2. STAKEHOLDERS (500 POINTS) (Cont.)							
55	Our OHS financial information is broad and available in Internet to our creditors. Details _____	0	0.5	1	1.5	2	
56	Our creditors are allowed to participate as observants in our OHS meetings. Details _____	0	0.5	1	1.5	2	
57	There are no OHS complaints and lawsuits against the firm. Details _____	0	0.75	1.5	2.25	3	
f) On the OHS position of contractors (46 points)							
58	Our company always pays its contractors according to OHS contract terms and industry practices. Details _____	0	2.5	5	7.5	10	
59	Our company makes every possible effort to guarantee our suppliers a long-lasting relationship. Details _____	0	2.5	5	7.5	10	
60	Our OHS policy includes our contractors' workers. Details _____	0	1.25	2.5	3.75	5	
61	We train our contractors so that they can consistently improve their safety performance. Details _____	0	1.25	2.5	3.75	5	
62	Periodic OHS reports issued by the company have its contractors as an important target. Details _____	0	3	6	9	12	
63	There are no OHS complaints and lawsuits against the firm. Details _____	0	1	2	3	4	

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2. STAKEHOLDERS (500 POINTS) (Cont.)							
g) On the position of government (19 points)							
64	Our company always issues timely reports demanded by law (for example, those related to environmental variables). Details _____	0	1.25	2.5	3.75	5	
65	Facilitating the job of government at all levels is a core concern of our firm. Details _____	0	1.25	2.5	3.75	5	
66	Our company offers all required industrial health-related information to the public and health authorities. Details _____	0	1.25	2.5	3.75	5	
67	Our company collaborates with government to strengthen transparency in our industry, even beyond what the law demands. Details _____	0	1	2	3	4	

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Section III. THE BOARD'S OHS WORKING STYLE

In this section we inquire about your company's board working style in OHS matters. Please, indicate the degree of validity of each one of the observations at your company, using the scales provided. After choosing your answer, write down the score indicated in column "Your firm's score", to be added later. In column "Details" you might add additional information to your answer. In the final page of the questionnaire you can make a summary of partial and total scores of your company's OHS governance.

No.	Questions	Answers and assigned score *					Answers and assigned score *
		TD	D	N	A	TA	
3. THE BOARD (300 POINTS)							
a) Board's OHS routine (120 points)							
68	The board develops OHS quarterly meetings.	0	5	10	15	20	
	Details _____						
69	The board's OHS meetings include the presence of top management.	0	5	10	15	20	
	Details _____						
70	The board's OHS meetings are organized based on a set of fix rules for meeting call, agenda distribution, preparations, etc.	0	5	10	15	20	
	Details _____						
71	Our company has appointed a board health and safety 'champion'.	0	4.5	9	13.5	18	
	Details _____						
72	Our company has established the division of OHS labor between the board and the CEO.	0	4.5	9	13.5	18	
	Details _____						

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No.	Questions	Answers and assigned score *					Answers and assigned score *
		TD	D	N	A	TA	
3. THE BOARD (300 POINTS) (Cont.)							
73	In our company there exists a set of rules on evaluation and follow-up of the board's OHS decisions. Details _____	0	2	4	6	8	
74	In our company there exists an annual evaluation of the board's OHS work. Details _____	0	2	4	6	8	
75	In our company there exist evaluations of the board's OHS work after each meeting. Details _____	0	2	4	6	8	
b) Best practice principles for OHS governance (180 points)							
76	All the directors have a clear understanding of the key OHS issues and strive for continuous development of their skills and knowledge. Details: _____	0	3.5	7	10.5	14	
77	All our directors have a great familiarity with OHS conditions in industry and at our company. Details: _____	0	3.5	7	10.5	14	
78	All our directors have a complete understanding of their legal responsibilities and their role in governing OHS matters. Details _____	0	1.25	2.5	3.75	5	
79	Directors are always well prepared for board OHS meetings. Details _____	0	1.25	2.5	3.75	5	
80	Directors are always committed to their duties during board OHS meetings. Details _____	0	1.25	2.5	3.75	5	
81	Directors always support managers for implementing decisions on OHS. Details _____	0	1.25	2.5	3.75	5	

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		TD	D	N	A	TA	
3. THE BOARD (300 POINTS) (Cont.)							
82	Directors always ratify the decisions taken by managers on OHS. Details _____	0	1.25	2.5	3.75	5	
83	Directors always search for OHS strategic information by themselves, in addition to that received from top management. Details _____	0	1.25	2.5	3.75	5	
84	The board has clearly defined its vision about OHS, establishing the right OHS culture, values, and standards across the organization. Details _____	0	3.125	6,25	9.375	12.5	
85	Our chairman plays his role in establishing a culture of openness and drive for better OHS performance. Details _____	0	3.125	6,25	9.375	12.5	
86	Our board establishes an OHS strategy, sets agenda and evaluates risks and opportunities. Details: _____	0	5.5	11	16.5	22	
87	Our board always considers OHS implications of its decisions. Details: _____	0	5.5	11	16.5	22	
88	The board fulfills its responsibility for setting out the key objectives and targets for OHS management. Details _____	0	1.625	3.25	4.875	6.5	
89	The board has established management's OHS performance framework. Details _____	0	1.625	3.25	4.875	6.5	

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No.	Questions	Answers and assigned score *					Answers and assigned score *
		TD	D	N	A	TA	
3. THE BOARD (300 POINTS) (Cont.)							
90	The board has established an incentive structure based on OHS performance for the management level. Details _____	0	1.625	3.25	4.875	6.5	
91	The board has an agenda on OHS management evaluation. Details _____	0	1.625	3.25	4.875	6.5	
92	The board fulfills its responsibility for insuring that OHS risks are managed and controlled adequately. Details _____	0	3.25	6.5	9.75	13	
93	The board fulfills its responsibility for monitoring its decisions on OHS. Details _____	0	3.25	6.5	9.75	13	

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TOTAL RESULTS

COMPONENT	Answers and assigned score					Your firm's score
COMPONENT 1: General principles of OHS governance	0	77	140	180	200	
a) Explicit consideration of OHS governance	0	43	76	98	108	
b) On OHS information provision	0	9	18	23	26	
c) Directors' roles and responsibilities	0	25	46	59	66	
COMPONENT 2: Stakeholders	0	126.75	250	372.25	500	
a) On the OHS position of shareholders in the firm	0	46	92	138	184	
b) On the OHS position of the workforce in the firm	0	27.5	55	82.5	110	
c) On the OHS position of managers in the firm	0	33	66	99	112	
d) On the OHS position of customers	0	2.5	5	7.5	10	
e) On the OHS position of banking and investors in the firm	0	4.75	9.5	13.75	19	
f) On the OHS position of contractors in the firm	0	11.5	23	34.5	46	
g) On the position of government	0	4.75	9.5	13.75	19	
COMPONENT 3: The board	0	75	150	225	300	
a) Board's routine	0	30	60	90	120	
b) Best practice principles for OHS governance	0	45	90	135	180	
TOTAL SCORE	0	278.75	540	777.25	1000	

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