The contribution of environmental, social, and governance disclosure to a sustainable economy

Fortune Ganda · Collins C. Ngwakwe

Received: 6 March 2013/Revised: 3 May 2013/Accepted: 8 May 2013 © Korean Social Science Research Council 2013

Abstract This article discusses ways that environmental, social, and governance disclosure can promote transition to a sustainable economy by paving the way for better business operations. It presents a conceptual analysis and identifies how environmental, social, and governance disclosures actuate corporate sustainability and contribute to a sustainable economy. It also offers a sustainability framework for companies transitioning to a sustainable economy.

Keywords Environmental disclosure · Social disclosure · Governance disclosure · Corporations · Transition · Sustainable economy

Introduction

In recent years, sustainability has received much attention in every area of the economy. Comprehensive disclosure relating to sustainability by companies indicates better business behavior, which enhances the transition to a sustainable economy. Past financial reporting was insufficient to account for appraisals of the impact of environmental, social, and governance (ESG) factors; hence, enterprises must widen their reporting practices (Yongvanich and Guthrie 2006). If ESG practices are encouraged, then organizations and their stakeholders can legitimately estimate risk, evaluate achievements, and establish market prospects that promote a green economy. Therefore, an increasing number of corporations in emerging economies have begun to disclose their sustainability information (KPMG 2011). Consequently, through building sustainability disclosure as a long-awaited, business-standardized exercise, large and

F. Ganda (⊠) · C. C. Ngwakwe Faculty of Management and Law, School of Accountancy, University of Limpopo, Sovenga, South Africa e-mail: fochi555@yahoo.com

C. C. Ngwakwe e-mail: collins.ngwakwe@ul.ac.za

small enterprises worldwide can improve not only their reporting practice but also their quality. In addition, stakeholders are more enlightened on sustainability matters and a broadened scope involving sustainability reporting will be facilitated.

Sustainability reporting ideally measures accomplishments of an enterprise's governance frameworks as well as its operational goals and targets. Additionally, transparency as viewed by stakeholders stimulates businesses to sustain high levels of competence, while sustainability disclosure empowers them to account for their impact on the overall economy. It also adds to development of a green economy. If ESG disclosure is done transparently, it can be an effective tool for achieving sustainable economic development. When most companies do not commit to sustainability, the core objective of ESG disclosure becomes elusive. Therefore, a reemphasis on the role of ESG disclosure in transition to a sustainable economy becomes important in refocusing corporate commitment.

The objective of this article is to examine how ESG disclosure may foster transition to a sustainable economy. The first section examines the research framework along with ESG disclosure. This is followed by an evaluation of how ESG disclosures may enhance transition to a sustainable economy. The policy implications regarding the relationship between government and business on the issue of ESG disclosure are briefly discussed. A model for the transition to a sustainable economy is also presented and discussed.

Research framework and literature review

Stakeholder theory affirms that the major role of an enterprise is optimizing the wealth of its shareholders (Friedman 1962). Waddock (2001) identified the main stakeholders as owners, customers, suppliers, and employees, and secondary stakeholders as communities and governments on which an enterprise relies for infrastructure. The theory relates to enterprise management and ethical considerations through communicating acceptable morals, together with values suitable in running a firm (Phillips and Freeman 2003). Gray et al. (1995) argued that stakeholder theory has two divisions: ethical accountability and managerial theory. Ethical accountability requires that each stakeholder be supplied with vital information about the company's activities (Deegan 2000); managerial theory suggests that key stakeholder concerns are determined so as to foster growth and advancement of the firm (Henderson et al. 2004). As such, it is a moral duty and responsibility of a company's management board to develop a balance on issues that concern stakeholders in handling the company's everyday business operations. Earlier empirical research has identified a positive association between stakeholder management and firm accomplishments (Moore 2001). Thus, improved access in relation to ESG disclosure has been identified as necessary for improving transparency about the organization's operations and ultimately its stakeholders. The "sunlight is the best disinfectant" school of thought supports disclosure demands (Langevoort 2001). In consideration of these views, this article follows stakeholder theory in expressing how ESG disclosure by companies can result in transition to a sustainable economy.

Environmental, social, and governance factors are viewed as the three principal components of evaluating the sustainability and morally acceptable impacts of a business enterprise.

Environmental disclosure

Environmental disclosure relates to firms' reporting of information pertaining to environmental preservation, consumption of resources, and the natural environment. Public environmental disclosures in China have been found to be effective in minimizing pollution, as they induce enterprises to understand more about environmental issues, and firms with low rankings improve their environmental performance (Wang et al. 2004). Outcomes from 871 production enterprises in China indicated that information on the environmental conservation framework was highly publicized, but information on monetary systems related to environmental preservation was low; only heavy manufacturing firms were environmentally conscious; and the bigger the enterprise, the higher the probability of reporting on environmental issues (Zeng et al. 2010). Assessments done on Chinese enterprises suggest that environmental disclosure's economic impact could be minimized as information reported is historic by nature, hence its future effect is hard to ascertain as it lacks forecasted targets and is not a dependable tool to assess firm accomplishments, and its subject matter has been found to be undeveloped and fragmented (Ane 2012). On that account, China's government has made serious interventions to address challenges concerning corporate environmental disclosure.

Zhang et al. (2010) pointed out that when the Chinese government announced the environmental disclosure framework to be adopted in May 2008, ministries and companies showed more public communication and participation still outstanding as well as greater need for independent teams to be incorporated. There was also an increased call for the introduction of laws that would empower these disclosures. On a positive note, more investigations undertaken in China have proven that environmental disclosure activities instituted by the government have improved most companies' environmental achievements and encouraged enterprises to refer back to their past environmental challenges, thereby strategizing optimal solutions (Liu et al. 2010). Besides the government, other important stakeholder pressure has also seen some companies engaging in environmental disclosure as it saves the company from being criticized.

A recent study examined the environmental disclosure records of ten British firms in five sectors from 1974 to 2000. It found that their performance improved on a yearly basis and observed a strong relationship on environmental disclosure and configurational susceptibility involving the five sectors concerning environmental criticism (Campbell 2004). In London, proposals were made that banks, environmental information and disclosure should be assembled in effective ways that would make all stakeholders feel the impact of such approaches, as sell-side analysts (specialists who buy, hold, and sell equity) view environmental reporting as valueless and of no importance (Campbell and Slack 2011).

Evidence also spotlights the influence of companies' stakeholders on environmental disclosure. For example, based on environmental disclosure benchmarks provided by the American Institute of Public Accountants and the Canadian Institute of Chartered Accountants, U.S. enterprises' environmental reporting was found to be substantially higher than that of Canadian enterprises because of increased stakeholder influence in the United States (Ashcroft 2012). To a greater extent, stakeholder authority has created circumstances whereby environmental disclosures indicate how firms are valued. Understandably, evidence from the United States indicates that when a toxics release inventory was instituted by the government, enterprises with no pollution disclosures experienced disadvantaged market responsiveness when compared to enterprises that demonstrated better environmental performance (Freedman and Patten 2004). Studies of European firms have also confirmed that advanced environmental disclosure improves financial analysts' accuracy in anticipating income (Aerts et al. 2008). Clearly, bad sustainability reports about a company from stakeholders may create disadvantages (for example, a reduced market share and low investor confidence), and most enterprises are committed to preserving their image. For instance, an evaluation undertaken in Malaysia found that top corporate management's desire to voluntarily disclose annual environmental information was very high only when negative statements had been broadcast by the media (Elijido-Ten 2011).

Governance disclosure

Corporate governance refers to rules and activities by which a company's management board guarantees accountability, equity, and transparency in its association with stakeholders. Its key features are size of the board, structure of the board, the presence of an audit team, shareholder ownership, director ownership, and chief executive officer (CEO) duality (when the CEO is also chairman). Governance disclosure relates to ways by which corporate governance matters are handled and reported, critically evaluating quality and systems of these structures so as to attain sustainability. This is vital for companies as it promotes investor trust, lessens agency costs, and minimizes information asymmetry regarding companies' sustainability.

Appraisals of emerging and first-world countries from 1994 to 2003 found that the quality of corporate governance improved significantly in some countries that were underperforming, and such improvements had an advantageous impact on gross domestic product and overall economic growth (Laeven et al. 2008). Analysis of Taiwan enterprises found that positive corporate governance has a crucial effect on company performance as good practices generate acceptable economic growth (Chi 2009). In addition, studies of small Canadian firms found their accounting returns as well as financial accomplishments strongly associated with corporate governance (Gordon et al. 2012). Likewise, financial markets benefit companies that show robust disclosure patterns and powerful governance, while they penalize companies with fragile disclosure and weak governance (Akhigbe and Martin 2008). While investor demands have a major role in a firm's disclosures, analysis of corporate governance characteristics indicates that they also have a considerable impact on disclosure.

Corporate governance features include the number of independent directors compared to the total sum of directors on the company's board, the presence of voluntary audit teams, whether the CEO has a dual role, and the number of family representatives on the firm's board. When these four criteria were applied to Hong Kong companies in determining the degree of voluntary disclosure, the existence of audit teams was considerably linked with the degree of voluntary disclosure, and the proportion of family delegates on the board demonstrated denial with level of voluntary disclosure (Ho and Wong 2001). Arguably, the presence of many independent directors and the existence of outside governance and regulatory structures are strongly connected with voluntary corporate governance disclosure (Cheng and Courtenay 2006). A study of Egyptian firms found that the impact of corporate governance disclosure was greatly reduced for enterprises with CEO duality and greater ownership distribution quantified by shareholder component. At the same time, corporate governance disclosure also rises as the number of independent directors in the firm grows and when there is notable company growth (Samaha et al. 2012). Moreover, an independent auditor can influence governance disclosure to a large extent.

Research was undertaken on 283 Australian firms to determine the relationship regarding employee stock option reporting and governance disclosure. The results illustrated that high stock value and independent auditor attributes have a positive relationship with employee stock option disclosure, while a CEO's dual function is linked to lower levels of disclosure (Bassett et al. 2007). A related study examined the influence of outside audit standards on obligatory disclosure in relation to corporate governance in Chinese

firms and found that auditor suggestions, efficient internal governance, and external governmental pressure improve adherence to these requirements (Gao and Kling 2012).

Social disclosure

Social disclosure systems are designed to help companies address challenges to their legitimacy by building positive perceptions by echoing, engaging, and attuning disclosures that influence public opinion about the company and its operations in a positive way. This is vital as it helps companies to be socially accountable by compensating the communities in which they are located for the effects of their business operations and to improve society by accounting social costs and benefits (Hegde et al. 1997). Social disclosure hinges upon important matters of workplace diversity, human rights, community engagement (such as donations and sponsorships), consumer protection, and animal welfare. Diversity in the workplace involves equal opportunity irrespective of gender, ethnicity, and race. Companies that do not effectively promote diversity usually experience lessened productivity, greater absenteeism, and increased turnover, which generate high expenses for the company (Harvey 2012); it is also a priority area for investors and other stakeholders with regard to social disclosure. Companies are empowered to realize distinct innovative capacities once they train and develop the full potential of their employees (Hargadon and Sutton 2000). Training provides solutions to complex challenges (Boons and Berends 2001). Co-operative efforts to promote sustainability require the involvement and full accountability of diverse stakeholders at various levels of the enterprise (UNWCED 1987).

Human rights relate to practices that seek to remove abusive and degrading actions toward the workforce. Preventing slave labor and child labor and providing adequate wages are among the primary focus areas pertaining to social disclosure in relation to human rights. Health promotion by organizations is a core necessity for sustainable social and economic advancement (WHO 2007). Holmqvist (2009) pointed out that health promotion results in a strong and healthy workforce when it has been integrated into the organization's social disclosure initiative, which enables the company to monitor its environment for appropriate human conduct. Kemp et al. (2010) found that, in the mining sector, the use of water in ore and waste treatment procedures and for isolating minerals, cleaning machinery, and suppressing dust had a negative effect on human rights; therefore, better approaches to water management that uphold human rights are desirable for sustainability.

Consumer protection involves various efforts to protect the rights of consumers and reduce the possibility of criminal charges against underperforming companies, which may increase their risk of decreased market share, bad image, and low investor trust. Modern organizations are expected to incorporate and report on community marketing standards that educate all stakeholders on matters of sustainability (Daub and Ergenzinger 2005). Companies should also concentrate on the need to integrate social and organizational transitions that improve consumer understanding on well-grounded consumer conduct (Goodwin et al. 1997).

Moreover, in order to fully protect the consumer, the green movement's opposition to "sin stocks" such as gambling, alcohol, armaments, pornography, and tobacco products has grown, based on religious and ethical considerations. Historically, ethical investors who seriously consider religious views have shunned investing in such products (Lydenberg and Louche 2006). In the United States, such actions were used to promote social transformation through sustainable development movements that resulted in some companies selling their subsidiaries so as to meet disclosure standards (Heese 2005). Sustainable consumption is championed since it is mostly concerned with improving consumer health and quality of life (Cornwell and Drennan 2004).

Animal welfare primarily concerns animal testing, animal products, and the health of livestock that is kept for the food industry. Animal welfare is addressed by organic farming principles regarding the use of land, plants, and domestic animals, including addressing the animals' physiological and behavioral requirements and supplying them with high-quality food (IFOAM 2002). Therefore, legal and scientific documents, along with customer interest in agricultural commodities, have developed significantly in recent years (Frewer et al. 2005). Food quality has also been largely determined by the condition of livestock. Critical issues of concern in the food industry include food safety, environmental sustainability, and livestock health (Van der Vorst 2000). So, the quality and dependability of commodities and production processes are essential attributes of company performance. Hence, better supervision and monitoring policies and reporting and dependable livestock management frameworks are of great importance in addressing societal needs and market requirements (Blokhuis et al. 2003). An increasing number of companies are incorporating and disclosing ethical benchmarks in their quality assurance structures (Waddock and Bodwell 2004).

How disclosure can promote a sustainable economy

There are different schools of thought on whether and how ESG disclosure may help companies transition to a sustainable economy (Table 1).

The diverse literature discussed in this section is synthesized in accordance with ESG disclosure objectives to draw out perspectives that drive enterprises with respect to ESG disclosure, along with the types of companies associated with the disclosure.

Government's role in promoting disclosure

A government defines a framework through which a country is governed. Thus, it defines the ways by which policies are implemented, along with the systems that enhance determination of such policies. On that account, the government has a significant role to play in the transition to a sustainable economy on issues that involve businesses' ESG disclosure. Governments must develop resource-efficient and environmentally friendly models of economic development using prescribed year plans. For instance, the energy/environment policy system in Egypt could result in improved control of local energy resources and help manage businesses' ESG policies, minimize dependence on fossil fuels, reduce the emission of greenhouse gases, promote international co-operation, and enhance diffusion of environmentally compatible technologies to other countries (Ibrahim 2000). Also, policy tools initiated by governments that enhance technological advancement in areas of ecoefficiency are essential, and they may include environmental regulations (including permits and standards), environmental taxation (inducements to innovation so as to minimize costs), and financing of research and innovation (Mickwitz et al. 2008).

Governments should require or encourage all companies, small and large, in both the private and public sectors to produce corporate social responsibility (CSR) reports that embrace comprehensive ESG disclosure frameworks on a yearly basis. Koerber (2010) reported that 80 % of environmental disclosures made by companies showed that these companies used their own CSR frameworks with little or no guidance from universal standards such as the Global Reporting Initiative. Hence, some companies will need better guidance from their governments in order to conduct effective ESG disclosure (Levy et al. 2010).

For disclosure	Against disclosure
Yeoh (2007)	Winston (2008)
Enhances optimal marshaling and organization of the	Usually created in response to a crisis rather than
country's economic resources	cautiously developed for response to potential future
Increases the country's development and sustenance of	crises
balance of payments	May not be appropriate if they disrupt or and delay
Helps minimize government interference in the	market performance
business sector	Consumers are made aware of the quality of
Durmaz et al. (2011)	commodities, so disclosure related to negative
Empowers the company to withstand economic	externalities may cause a company to lose its
recession by creating competitive advantages	positioning and market share
Challenges the company to realize eco-efficiency	Companies already have strong financial inducements
standards	to refrain from producing faulty commodities as they
Propels the company to achieve reliable financial	want to protect their image and manage costs
performance benchmarks	effectively
Develops the organization into a more responsible	Policy makers responsible for developing disclosure
citizen	systems are most often driven by their own economic
Maharaj and Herremans (2008)	evaluations with no involvement of stakeholders such as consumers
Improves the company's image Promotes participation of linked stakeholders, thereby	Jin and Leslie (2003)
supporting transparency	Can only be effective once government assumes the
Streimikiene et al. (2009)	leading role on matters of compliance; otherwise,
Builds relationships in the sector as companies strive to	voluntary disclosure does not stop companies from
build effective sustainability frameworks and	generating negative externalities
yardsticks	Margula et al. (2008)
Results in improved consumption of non-fossil fuels	External, subjective standards may in some cases not
Kumar and Agarwala (2013)	be neutral
Supports development of innovative technologies and	Wiig and Kolstad (2010)
strategies for continual capacity (minimized pollution,	Tends to generate severe problems associated with
reduced carbon emissions, and improved energy	democratic accountability and rule of law if
efficiency)	companies exercise it based on self-interest
Ascui and Lovell (2012)	Lacks universally accepted standards and regulation
Reduces power bases of company experts (accountants	Acquiring operational licenses and contracts from
and financial analysts) by boosting their engagement	governments could be the major motivation for such
in sustainability practices	disclosures
Spence and Rinaldi (2012)	Williams (1999)
Helps companies' top management teams to undertake	Implies that the firms have already given up their
effective decision making, which produces	responsibility and control with respect to their assets
disciplinary effects within the firm and when dealing	to interested stakeholders, which undermines
with its stakeholders	companies' efforts to conduct business in their sole
Cooke (2011) Outlines the evaluation period for firms to devise and	interest
arrange procedures that seek to close all identified	Affects company performance as it is hard to distinguish different types of disclosure issues (for
performance gaps	example, whether they should be defined as financia
Akhigbe and Martin (2008)	or social issues)
Fosters businesses' development of high ethical	Hopwood (2009)
standards	There is a lack of will by regulators to effectively
Financial markets give preference to firms that	manage capital markets so that companies can
demonstrate comprehensive disclosure	completely adopt disclosure measures
Rodriguez et al. (2006)	Lamberton (2005)
Offers a platform from which companies can influence	Becomes pointless when enterprises report issues yet
and associate with worldwide economic and political	do nothing to address them
circumstances	Brown et al. (2009)
Fitzpatrick et al. (2012)	The Global Reporting Initiative, the best known
Gives the company a better understanding of its long-	instrument for sustainability reporting globally, has
term impacts, which is instrumental in advancing	focused more on large corporations and financial
sustainability	entities and offers no assistance to the immature
	foundation criteria regarding subject matter users

Table 1 Arguments for and against environmental, social, and governance disclosure

Sustainability should be a central part of government's policy agenda. The UK government announced its commitment to meeting sustainability objectives by establishing leading ministries that embrace green business practices, incorporating sustainable development goals in its policy, improving transparency and governance, and devising green business plans that organizations can adopt (DEFRA 2011). In addition, increasing stakeholder participation by making use of officially approved communication methods at the national level, along with improved stakeholder access to information (that is, reporting on noncompliant enterprises) is important. In Australia and New Zealand, compulsory energy-savings evaluation markers are now recognized by at least 95 % of consumers, who support energy efficiency benchmarks for many electrical goods (Commonwealth of Australia 2013). Summing up these practices, government involvement with business enterprises requires enlightened leadership that is capable of instituting strategic organizational sustainability policies that result in sustainable consumption (Fernando 2012).

Ideally, governments should also offer resources and establish means by which companies can acquire up-to-date and high-quality ESG subject matter. Governments should identify companies that do not carry out ESG disclosure and encourage them to do so, promote local organizational and consulting capacity on ESG issues, and inspire enterprises to make use of Global Reporting Initiative standards so as to foster dependability and comparability of ESG performance patterns (SIF 2009). In the same vein, Ho (2013) illustrated that development of socially responsible investment in China is crucial in relation to sustainability of companies, as its growth will provide more information on existing studies on corporate sustainability and socially responsible investment standards being employed globally.

Changing stock exchange listing rules to encourage better ESG disclosures can also be helpful. For example, South Africa's Johannesburg Stock Exchange developed the Social Responsibility Index, a tool that helps measure companies' ESG disclosure compliance; it also uses the King III report, which stresses that enterprises must incorporate stakeholder needs in company policy to meet the triple bottom line concerns (JSE 2013). Brazil's BM & FBOVESPA is a securities, commodities, and futures exchange that supports company practices that advance ESG responsibility in the capital markets and within the company itself (BM & FBOVESPA 2012).

Governments should support CSR in every sector of the economy, especially in educational settings, along with courses of study. Taiwan introduced the Environmental Education Act in June 2011; it seeks to improve environmental education by acting as a tool for attainment of sustainable development goals, since learners are equipped with knowledge involving environmental sustainability (Tsai 2012). Supporting this view, Moratis et al. (2006) said that educational institutions that have a vision on CSR must offer management education courses that consider applicability, relevance, and suitability in the communities in which they are located and serve, which also assists in developing future managerial skills in the students.

To build on these resources, this article proposes a model empowered by responsible governments in which companies can progress toward a sustainable economy (Fig. 1).

Discussion

The framework outlined above shows companies' choices on inputs, business practices, and outputs that seek to generate sustainable value over both the short and long term. Figure 1 emphasizes the business in its operating environment being influenced by particular external factors. Within the enterprise itself are its linked mission and vision, which

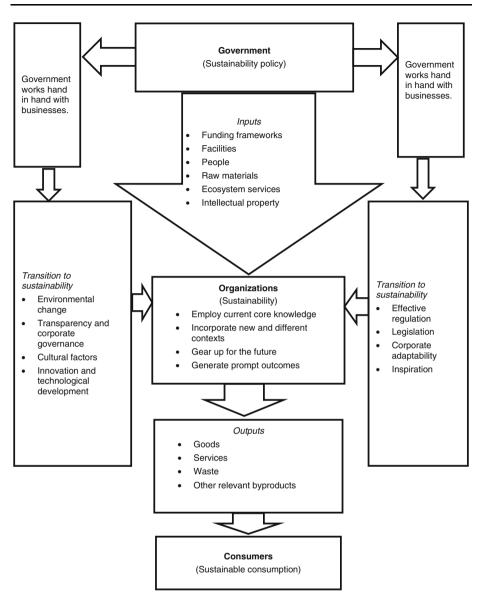


Fig. 1 Model for transition to a sustainable economy

further motivate it to undertake appropriate actions with regard to sustainability. The model is discussed in the text that follows.

Government sustainability policy

Government sustainability policy represents government's vision and strategy for sustainable development. Barry (1998) demonstrated that unsustainable practices can largely be reduced by employing top-down strategies that are spearheaded by a green government. So, governments must use sustainable development as the main determinant in designing policies, conducting operations, and acquiring commodities.

Inputs

Inputs define a company's resources, along with the capital upon which it depends. These include funding frameworks, facilities, people, raw materials, intellectual property, and ecosystem services. Funding mechanisms are sources of finance for the company, which may be its operations and investment practices. In order to promote sustainability disclosure in funding systems, companies should produce their funding frameworks. Facilities are physical objects that companies use to manufacture commodities, including buildings, machinery, and infrastructure. It is critical for companies to disclose how these components realize operational and productivity efficiency, support safety, and promote environmental stewardship. People have competency, expertise, and experience in executing given tasks. Indeed, for long-term sustainability, training and development of employees should be championed. Raw materials are all exhaustible and non-exhaustible environmental stocks that are used to produce goods and services. Ecosystem services take place through natural processes in the environment, including carbon sequestration and nutrient cycling. They have the potential to create material risks as well as opportunities. If such services are likely to improve or diminish the company's value, steps undertaken to address them should be reported during sustainability disclosure. Intellectual property includes tacit knowledge, models, processes, and codes of behavior and can be protected by various instruments including copyrights, licenses, and patents. Since intellectual property is intangible and hence cannot be disclosed, it is critical for companies to describe how it produces sustainable value for the organization.

At the organizational level

At the organizational level, an enterprise transforms inputs to produce outputs. Activities associated with this level include formulating plans, creating designs, and producing commodities with strong bias toward achieving sustainability. Companies must use current green knowledge and incorporate new and different green contexts with respect to their production, marketing, and distribution. They must embrace strategic ways to better their capacity on matters that involve ESG disclosure. Some important aspects enterprises must adhere to are transparency and corporate governance, corporate innovation and technological development, environmental change, effective regulation, legislation, corporate adaptability, cultural factors, and inspiration.

Transparency and corporate governance

There is a need to establish strong governance structures in enterprises as well as to develop better decision-making procedures at the organizational, national, and international levels. A significant contribution pertains to increasing investigation in some countries on the subject of corporate governance expectations, together with exercise (Erakovic 2007). For instance, the OECD regulation relating to multinational firms calls for firms to report their social, environmental, and governance procedures, principles of behavior, governance systems, and stakeholder relations (OECD 2000). Thus, enterprises can develop occasional sustainability perspective reports that gather unrelated information

about firms in various locations and assess the information in integrated forms, build sustainable growth policies and strategies, and deliberate on building a universally accepted sustainability administrative body. Such practices will enhance governance, consistency, and accountability on sustainability matters regarding corporate performance.

Corporate innovation and technological development

Innovation propels transformation in the ways companies use resources, which is crucial for sustainability. Thus, innovative frameworks give policymakers greater opportunities to determine particular processes and constituents of specific frameworks where intervention is necessary (Jacobsson and Bergek 2011). Business enterprises must understand that sometimes they must adopt skills being used in other areas and apply them to realizing their green agendas. Supporting this argument, Parrish (2007) suggested that a procedural understanding involving entrepreneurship relate to deliberate courses of action that result in generation of opportunities by different frameworks with reference to organizing. Consequently, greater emphasis should be placed on how an enterprise works and how it interacts with the environment, which gives further insight on how to upgrade the current skills level to advanced sustainable standards. By managing sustainability, enterprises are better positioned to develop methods that further optimize their performance and add their input to sustainable growth. Studies undertaken in Asia have proven that sustainability experiments are capable of producing innovations that are fundamental to generating green development frameworks as well as enhancing diffusion of this technology to many countries across the globe (Berkhout et al. 2010).

Environmental change

Company policy and strategy in handling environmental metrics regarding carbon, energy, waste, and water must be embedded in its sustainability disclosure on an ongoing basis. These metrics can develop implementation structures concerning the firm's strategy as well as champion the idea that value can be determined (Melnyk et al. 2004). They also serve to evaluate companies on important business practices such as how quality can be enhanced and performance can be improved. Metrics are useable in assessing and supervising a company's resource competence, communicating its performance to interested partners, and locating performance gaps, thereby helping the company to design strong and sustainable operational frameworks. In that way, metrics nurture and develop strategic harmonization on production decisions as well as other company strategies (Skinner 1969). Management boards can make better decisions through improved reporting on environmental indicators (Bacallan 1998). Thus, business areas that need intervention are examined and corrective steps are undertaken; market opportunities are also created and exploited, and cost-effective techniques are developed and implemented.

Effective regulation

Corporate sustainability reports must be designed in ways that make them easy to implement. They must be compatible with present financial reporting demands. Such an exercise provides the clearness and direction required to generate value as well as advance toward sustainable growth by eliminating ambiguity and vagueness in reported information. Research done on Chinese companies has highlighted the need for modernized green

business frameworks, since such models effectively embedded sustainable development agendas (Birkin et al. 2009). To enhance sustainable business practices, non-executive directors who have sufficient experience should be put in charge, since their autonomous decisions and positive comments can further support sustainability (Jodwana 2007). When enterprises undertake ESG disclosures on their own, they generate legitimacy (Hoog-hiemstra 2000). Thus, social values and norms and business practices are in agreement.

Legislation

Sustainability efforts should be guided by diversified laws governing climate change disclosure, accounting, and financial services, as well as environmental, labor, and business laws. Evidence suggests that CSR reporting in South Africa has grown significantly as a result of legislation and industry charters (Hinson and Ndhlovu 2011). Sustainability focused legislation empowers and encourages managers to identify areas that need to be changed in their business activities, and it supplies the instruments that are required to accomplish such actions (Paterson and Ward 2011). Furthermore, legislation can assist corporate sustainability by removing imperfect voluntary disclosures, supporting comparability of reported information, regulating markets, ascertaining legal positions, achieving reduction in costs, and promoting standardization in sustainability disclosure (MHC International 2012).

Corporate adaptability

Sustainability disclosure in enterprises must not specify rules or directions concerning particular dimensions government should adopt, but the state should be given the opportunity to select the appropriate approach depending on overall economic performance. Fundamental processes that result in companies achieving sustainability include comprehending the company's impact on the environment, devising and implementing strategies that reduce that impact, identifying opportunities that ensure complete company sustainability, and continually improving sustainability standards (EPA 2009). On that account, emerging and growing firms can begin at a basic level and then upgrade and improve quality. Already established organizations can improve their sustainability disclosures in specific malfunctioning areas they identify by using compatible frameworks obtained from acceptable standardized structures that are meant to improve sustainability on an ongoing basis.

Cultural factors

Companies exist in a cultural context. Their organizational foundation, system, and operations are influenced by their country's culture. Sustainability efforts by enterprises should not go against the culture of the society in which they are located, because culture symbolizes society's identity and hence sustains its integrity. The conduct of enterprises is largely influenced by the pervasive culture (Levy et al. 2007). Societal values, norms, and beliefs grow into emotional connections that exercise a crucial role in people's choices when they present themselves as customers (Pachauri 2001). Therefore, in some cases, it may be advisable for enterprises to create sustainability reporting frameworks that are geared to local cultural practices and that suit the "relevant publics."

Inspiration

Sustainability leadership involves creating a vision that collectively motivates all people to work toward achieving its goals, addressing any changes or problems that may be experienced during that process (CPSL 2013). Corporate sustainability disclosures must show productivity, stimulation, and creativity in the process of change toward a green economy. This will motivate stakeholders to take up sustainability roles they were previously reluctant to assume. Clearly, sustainable business practices are propelled by thought leaders and executives who engage their company's operations in ways that go beyond mere words (Urlaub 2013). Superior CSR reports, green businesses, stakeholder engagement, and eco-actions are among the issues that must inspire companies.

Outputs

Outputs are major commodities that a firm manufactures, along with waste and byproducts that enhance or erode the firm's value. They are identified as goods and services that provide income to the firm. With regard to materiality, outputs can also be included in the business disclosure.

Consumers

Consumers are the final users of outputs produced by business enterprises. Businesses can enhance the sustainable consumption of these products and services and add customer value by improving quality of life and encouraging independent consumer behaviors that result in transformed futures. Cohen et al. (2005) demonstrated that consumers are surrounded by and included in diverse norms, values, and beliefs which in practice tend to affect and limit their decisions. Thus, customer conduct usually changes when aspects such as motivation, ability, and opportunity have been appropriately handled.

Conclusion

This article focused on a subject about which there has been very little research: the ways in which ESG disclosure can promote corporate sustainability and foster transition toward a sustainable economy. Environmental disclosure supports better reporting of environmental metrics, which promote investment, determine companies' market responsiveness, enhance creation of low-carbon environments, and champion development of green innovation. In pursuit of sustainability, social disclosure addresses workplace diversity, human rights, community engagement (such as donations and sponsorships), consumer protection, and animal welfare. Companies compensate communities in which they work for the results of their business operations. Corporate governance disclosures foster stakeholder confidence, improve the quality of sustainability reports, and create better relationships between shareholders and the company's top management, thus lessening information asymmetry.

Environmental, social, and governance disclosure has also supported the transition to a sustainable economy, though the perspectives that drive the companies with respect to ESG disclosure, along with the type of companies that are associated with the disclosure, must be evaluated. Governments must develop resource-efficient and environmentally friendly models of economic development, ensure or provide incentives for all companies to

embrace ESG disclosure, and make sustainability their central policy agenda. Governments should also offer resources and establish means by which companies can acquire up-to-date and high-quality ESG subject matter, and change listing rules on major stock exchanges so as to encourage ESG disclosure. They must also promote CSR, including in educational settings. The model proposed in this article can further augment corporate transformation toward a sustainable economy by directing future growth patterns involving sustainable advancement at the basic and implementation level.

References

- Aerts, W., Cormier, D., & Magnan, M. (2008). Corporate environmental disclosure, financial markets and the media: An international perspective. *Ecological Economics*, 64, 643–659.
- Akhigbe, A., & Martin, A. D. (2008). Influence of disclosure and governance on risk of US financial services firms following Sarbanes–Oxley. *Journal of Banking & Finance*, 32, 2124–2135.
- Ane, P. (2012). An assessment of the quality of environmental information disclosure of corporation in China. Systems Engineering Proceedia, 5, 420–426.
- Ascui, F., & Lovell, H. (2012). Carbon accounting and the construction of competence. *Journal of Cleaner Production*, 36, 48–59.
- Ashcroft, P. A. (2012). Extent of environmental disclosure of U.S. and Canadian firms by annual report location. Advances in Accounting, Incorporating Advances in International Accounting, 28, 279–292.
- Bacallan, J. J. (1998). The case for corporate environmental indicators. Business and Environment, 14(4), 9–12.
- Barry, J. (1998). Rethinking green politics: nature, virtue and progress. London: SAGE Publications Limited.
- Bassett, M., Koh, P., & Tutticci, I. (2007). The association between employee stock option disclosures and corporate governance: Evidence from an enhanced disclosure regime. *The British Accounting Review*, 39, 303–322.
- Berkhout, F., Verbong, G., Wieczorek, A. J., Raven, R., Lebel, L., & Bai, X. (2010). Sustainability experiments in Asia: Innovations shaping alternative development pathways. *Environmental Science & Policy*, 13, 261–271.
- Birkin, F., Cashman, A., Koh, S. C. L., & Liu, Z. (2009). New sustainable business models in China. Business Strategy and the Environment, 18, 64–77.
- Blokhuis, H. J., Jones, R. B., Geers, R., Miele, M., & Veissier, I. (2003). Measuring and monitoring animal welfare: Transparency in the food product quality chain. *Animal Welfare*, 12(4), 445–455.
- BM & FBOVESPA. (2012). Sustainability. São Paulo: Author. Retrieved March 14, 2013, from http://ir.bmfbovespa.com.br/static/enu/sustentabilidade.asp?idioma=enu.
- Boons, F., & Berends, M. (2001). Stretching the boundary: The possibilities of flexibility as an organisational capability in industrial ecology. *Business Strategy and the Environment*, 10, 115–124.
- Brown, H. S., Jong, M., & Levy, D. L. (2009). Building institutions based on information disclosure: Lessons from GRI's sustainability reporting. *Journal of Cleaner Production*, 17, 571–580.
- Campbell, D. (2004). A longitudinal and cross-sectional analysis of environmental disclosure in UK companies—A research note. *The British Accounting Review*, 36, 107–117.
- Campbell, D., & Slack, R. (2011). Environmental disclosure and environmental risk: Sceptical attitudes of UK sell-side bank analysts. *The British Accounting Review*, 43, 54–64.
- Cheng, E. C. M., & Courtenay, S. M. (2006). Board composition, regulatory regime and voluntary disclosure. *The International Journal of Accounting*, 41, 262–289.
- Chi, L. (2009). Do transparency and disclosure predict firm performance? Evidence from the Taiwan market. *Expert Systems with Applications*, 36, 11198–11203.
- Cohen, J., Comrov, A., & Hoffner, B. (2005). The new politics of consumption: Promoting sustainability in the American marketplace. Sustainability: Science, Practice & Policy, 1(1), 17.
- Commonwealth of Australia, Department of Climate Change and Energy Efficiency. (2013). *The E3 programme—Improving our energy efficiency*. Canberra: Author. Retrieved March 18, 2013, from http:// www.energyrating.gov.au/.
- Cooke, P. (2011). Transition regions: Regional-national eco-innovation systems and strategies. Progress in Planning, 76, 105–146.

- Cornwell, B., & Drennan, J. (2004). Cross-cultural consumer consumption research: Dealing with issues emerging from globalisation and fragmentation. *Journal of Macromarketing*, 24(2), 108–121.
- CPSL (Cambridge Programme for Sustainability Leadership). (2013). What is sustainability leadership? Cambridge: Author. Retrieved 17 March, 2013, from http://www.cpsl.cam.ac.uk/About-Us/What-is-Sustainability-Leadership.aspx.
- Daub, C., & Ergenzinger, R. (2005). Enabling sustainable management through a new multi-disciplinary concept of customer satisfaction. *European Journal of Marketing*, 39(9/10), 998–1217.
- Deegan, C. M. (2000). Financial accounting theory. Sydney: McGraw-Hill.
- DEFRA (Department for Environment, Food and Rural Affairs). (2011). Mainstreaming sustainable development—The government's vision and what this means in practice. London: Author. Retrieved March 18, 2013, from http://sd.defra.gov.uk/documents/mainstreaming-sustainable-development.pdf.
- Durmaz, V., Ateş, S. S., & Duman, G. (2011). CSR as a tool to cope with economic crises: the case of TEI. Procedia-Social and Behavioral Sciences, 24, 1418–1426.
- Elijido-Ten, E. (2011). Media coverage and voluntary environmental disclosures: A developing country exploratory experiment. Accounting Forum, 35, 139–157.
- EPA (Environmental Protection Agency). (2009). Smart steps to sustainability: A guide to greening your business. Washington, DC: Author. Retrieved March 18, 2013, from http://www.epa.gov/osbp/pdfs/ smart_steps_greening_guide_042101.pdf.
- Erakovic, L. (2007). Corporate governance. In R. W. Kolb (Ed.), *Encyclopedia of business ethics and society* (Vol. 1, pp. 471–481). Thousand Oaks, CA: Sage.
- Fernando, R. (2012). Sustainable globalisation and implications for strategic corporate and national sustainability. Corporate Governance, 12(4), 579–589.
- Fitzpatrick, P., Fonseca, A., & McAllister, M. L. (2012). Sustainability reporting among mining corporations: A constructive critique of the GRI approach. *Journal of Cleaner Production*. doi:10.1016/j. jclepro.2012.11.050.
- Freedman, M., & Patten, D. M. (2004). Evidence on the pernicious effect of financial report environmental disclosure. Accounting Forum, 28, 27–41.
- Frewer, L., Kole, A., van der Kroon, M. A., & de Lauwere, C. (2005). Consumer attitudes towards the development of animal-friendly husbandry systems. *Journal of Agricultural and Environmental Ethics*, 18, 345–367.
- Friedman, M. (1962). Capitalism and freedom. Chicago: University of Chicago Press.
- Gao, L., & Kling, G. (2012). The impact of corporate governance and external audit on compliance to mandatory disclosure requirements in China. *Journal of International Accounting, Auditing and Taxation, 21*, 17–31.
- Goodwin, N. R., Ackerman, F., & Kiron, D. (1997). The consumer society. Washington, DC: Island Press.
- Gordon, I. M., Hrazdil, K., & Shapiro, D. (2012). Corporate governance in publicly traded small firms: A study of Canadian venture exchange companies. *Business Horizons*, 55, 583–591.
- Gray, R., Kouhy, R., & Laver, S. (1995). Corporate social and environmental reporting: A review of the literature and longitudinal study of UK disclosure. Accounting, Auditing & Accountability Journal, 8(2), 47–77.
- Hargadon, A., & Sutton, R. I. (2000). Building an innovation factory. Harvard Business Review, 78, 157–166.
- Harvey, C. P. (2012). Understanding and managing diversity. New Jersey: Pearson Education.
- Heese, K. (2005). The development of socially responsible investment in South Africa: Experience and evolution of SRI in global markets. *Development Southern Africa*, 22(5), 729–739.
- Hegde, P., Bloom, R., & Fuglister, J. (1997). Social financial reporting in India: A case. *The International Journal of Accounting*, 32(2), 155–172.
- Henderson, S., Peirson, G., & Harris, K. (2004). Financial accounting theory. Sydney: Pearson Prentice-Hall.
- Hinson, R. E., & Ndhlovu, T. P. (2011). Conceptualising corporate social responsibility (CSR) and corporate social investment (CSI): The South African context. *Social Responsibility Journal*, 7(3), 332–346.
- Ho, M. (2013). Key challenges facing the SRI indices development in China. Society and Business Review, 8(1), 6–17.
- Ho, S. S. M., & Wong, K. S. (2001). A study of the relationship between corporate governance structures and the extent of voluntary disclosure. *Journal of International Accounting, Auditing & Taxation, 10*, 139–156.
- Holmqvist, M. (2009). Corporate social responsibility as corporate social control: The case of work-site health promotion. *Scandinavian Journal of Management*, 25, 68–72.
- Hopwood, A. (2009). Accounting and the environment. Accounting Organizations and Society, 34(3-4), 433-439.

- Hooghiemstra, R. (2000). Corporate communication and impression management—New perspectives why companies engage in corporate social reporting. *Journal of Business Ethics*, 27, 55–68.
- Ibrahim, A. G. (2000). Climate friendly energy policies for Egypt's sustainable development. World Renewable Energy Congress, 6, 1445–1452.
- IFOAM (International Federation of Organic Agriculture Movements). (2002). IFOAM Norms. II. IFOAM basic standards for organic production and processing. Bonn: Author. Retrieved March 19, 2013, from http://www.ifoam.org/standard/norms/ibs.pdf.
- Jacobsson, S., & Bergek, A. (2011). Innovation system analyses and sustainability transitions: Contributions and suggestions for research. *Environmental Innovation and Societal Transitions*, 1, 41–57.
- Jin, G. Z., & Leslie, P. (2003). The effect of information on product quality: Evidence from restaurant hygiene grade cards. *Quarterly Journal of Economics*, 118(2), 409–451.
- Jodwana, T. A. V. (2007). Corporate governance for sustainable development: Implications for nonexecutive directors and the management accounting function (Master's thesis, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa). Retrieved March 18, 2013, from http://dspace. nmmu.ac.za:8080/jspui/bitstream/10948/807/1/JODWANA.pdf.
- JSE (Johannesburg Stock Exchange). (2013). Introduction to SRI index. Johannesburg, South Africa: Author. Retrieved March 18, 2013, from http://www.jse.co.za/About-Us/SRI/Introduction_to_SRI_ Index.aspx.
- Kemp, D., Bond, C. J., Franks, D. M., & Cote, C. (2010). Mining, water and human rights: Making the connection. *Journal of Cleaner Production*, 18, 1533–1562.
- Koerber, C. P. (2010). Corporate responsibility standards: Current implications and future possibilities for peace through commerce. *Journal of Business Ethics*, 89, 461–480.
- KPMG. (2011). Report or explain: Why all big companies should report their sustainability performance, or explain why they don't. Global Reporting Initiative. Retrieved March 18, 2013, from https://www. globalreporting.org/.../ReportOrExplainBrochure.pdf.
- Kumar, R., & Agarwala, A. (2013). Renewable energy certificate and perform, achieve, trade mechanisms to enhance the energy security for India. *Energy Policy*, 55, 669–676.
- Laeven, L., Nicolò, G., & Ueda, K. (2008). Corporate governance quality: Trends and real effects. *Journal of Financial Intermediation*, 17, 198–228.
- Lamberton, G. (2005). Sustainability accounting—A brief history and conceptual framework. Accounting Forum, 29, 7–26.
- Langevoort, D. C. (2001). Seeking sunlight in Santa Fe's shadow: The SEC's pursuit of managerial accountability. Washington University Law Quarterly, 79, 449–490.
- Levy, D. L., Brown, S. H., & de Jong, M. (2010). The contested politics of corporate governance: The case of the Global Reporting Initiative. *Business & Society*, 49(1), 88–115.
- Levy, O., Schon, B., Sully, T., & Boyacigiller, N. A. (2007). What we talk about when we talk about "global mindset": Managerial cognition in multinational corporations. *Journal of International Business Studies*, 38(2), 231–258.
- Liu, X., Yu, Q., Fujitsuka, T., Liu, B., Bi, J., & Shishime, T. (2010). Functional mechanisms of mandatory corporate environmental disclosure: An empirical study in China. *Journal of Cleaner Production*, 18, 823–832.
- Lydenberg, S., & Louche, C. (2006). Socially responsible investment: Differences between Europe and United States. Working Paper 2006–22, Vlerick Leuven Gent Management School, Leuven, Belgium.
- Maharaj, R., & Herremans, I. M. (2008). Shell Canada: Over a decade of sustainable development reporting experience. Corporate Governance, 8(3), 235–247.
- Margula, S., Steurer, R., & Martinuzzi, A. (2008). Socially responsible investment in EU member states: Final report to the EU-High Level Group on CSR. Vienna, Austria: Vienna University of Economics and Business Administration. Retrieved February 27, 2013, from http://www.eurocharity.eu/files/ ec_sri_in_eu_member_states_final_report.pdf.
- Melnyk, S. A., Stewart, D. M., & Swink, M. (2004). Metrics and performance measurement in operations management: Dealing with metrics maze. *Journal of Operations Management*, 22, 209–217.
- MHC International. (2012). CSR and legislation. Retrieved March 18, 2013, from http://mhcinternational. com/monthly-features/articles/113-csr-and-legislation.
- Mickwitz, P., Hyvattinen, H., & Kivimaa, P. (2008). The role of policy instruments in the innovation and diffusion of environmentally friendlier technologies: Popular claims versus case study experiences. *Journal of Cleaner Production*, 16S1, S162–S170.

Moore, G. (2001). Corporate social and financial performance. Journal of Business Ethics, 34, 299-315.

Moratis, L., Hoff, J., & Reul, B. (2006). A dual challenge facing management education: Simulation-based learning and learning about CSR. Journal of Management Development, 25(3), 213–231.

- OECD (Organisation for Economic Co-operation and Development). (2000). OECD guidelines for multinational enterprises. Paris: Author. Retrieved March 18, 2013, from http://www.oecd.org/investment/mne/ 1922428.pdf.
- Pachauri, M. (2001). Consumer behaviour: A literature review. The Marketing Review, 2(3), 319-353.
- Parrish, B. D. (2007). Sustainability entrepreneurship: Design principles, processes and paradigms (Doctoral dissertation, University of Leeds, United Kingdom). Retrieved March 18, 2013, from http://etheses.whiterose.ac.uk/347/1/uk_bl_ethos_485221.pdf.
- Paterson, M., & Ward, S. (2011). Roundtable discussion: Applying sustainability legislation to events. Worldwide Hospitality and Tourism Themes, 3(3), 203–209.
- Phillips, R., & Freeman, E. (2003). Stakeholder theory and organizational ethics. San Francisco: Berrett-Koehler.
- Rodriguez, P., Siegel, D. S., Hillman, A., & Eden, L. (2006). Three lenses on the multinational enterprise: Politics, corruption, and corporate social responsibility. *Journal of International Business Studies*, 37, 733–746.
- Samaha, K., Dahawy, K., Hussainey, K., & Stapleton, P. (2012). The extent of corporate governance disclosure and its determinants in a developing market: The case of Egypt. Advances in Accounting, Incorporating Advances in International Accounting, 28, 168–178.
- SIF (Social Investment Forum). (2009). Corporate sustainability disclosure in emerging markets. Washington, DC: Author. Retrieved March 18, 2013, from http://www.eticanews.it/wp-content/uploads/ 2012/11/REPORT-Corporate-Sustainability-in-EM.pdf.
- Skinner, W. (1969). Manufacturing—Missing link in corporate strategy. Harvard Business Review, 47, 136–145.
- Spence, L. J., & Rinaldi, L. (2012). Governmentality in accounting and accountability: A case study of embedding sustainability in a supply chain. Accounting, Organizations and Society. doi:10.1016/ j.aos.2012.03.003.
- Streimikiene, D., Simanaviciene, Z., & Kovaliov, R. (2009). Corporate social responsibility for implementation of sustainable energy development in Baltic States. *Renewable and Sustainable Energy Reviews*, 13, 813–824.
- Tsai, W. (2012). An investigation of Taiwan's education regulations and policies for pursuing environmental sustainability. *International Journal of Educational Development*, 32, 359–365.
- UNWCED (United Nations World Commission on Environment and Development). (1987). *Our common future*. New York: Oxford University Press.
- Urlaub, J. (2013). Earth Day inspiration—25 green and sustainability Pinterest boards to follow. Golden, CO: Taiga. Retrieved March 18, 2013, from http://blog.taigacompany.com/blog/sustainabilitybusiness-life-environment/earth-day-inspiration-25-green-and-sustainability-pinterest-boards-to-follow.
- Van der Vorst, J. G. A. J. (2000). Effective food supply chains: Generating, modeling and evaluating supply chain scenarios (Doctoral thesis, Wageningen University, 2000).
- Waddock, S. (2001). Integrity and mindfulness: Foundations of corporate citizenship. In J. Andriof & M. McIntosh (Eds.), *Perspectives on corporate citizenship* (pp. 25–38). Sheffield: Greenleaf Publishing.
- Waddock, S., & Bodwell, C. (2004). Managing responsibility: What can be learned from the quality movement. *California Management Review*, 47(1), 25–37.
- Wang, H., Bi, J., Wheeler, D., Wang, J., Cao, D., Lu, G., et al. (2004). Environmental performance rating and disclosure: China's Green Watch program. *Journal of Environmental Management*, 71, 123–133.
- WHO (World Health Organization). (2007). Workplace health promotion. Geneva: Author. Retrieved March 18, 2013, from www.who.int.
- Wiig, A., & Kolstad, I. (2010). Multinational corporations and host country institutions: A case study of CSR activities in Angola. *International Business Review*, 19(2), 178–190.
- Williams, C. A. (1999). The Securities and Exchange Commission and corporate social transparency. *Harvard Law Review*, 112, 1245.
- Winston, C. (2008). The efficacy of information policy: A review of Archon Fung, Mary Graham, and David Weil's Full disclosure: The perils and promise of transparency. *Journal of Economic Literature*, 46(3), 704–717.
- Yeoh, P. (2007). Corporate governance models: Is there a right one for transition economies in Central and Eastern Europe? *Managerial Law*, 49(3), 57–75.
- Yongvanich, K., & Guthrie, J. (2006). An extended performance reporting framework for social and environmental accounting. *Journal of Business Strategy and the Environment*, 15(5), 309–321.
- Zeng, S. X., Xu, X. D., Dong, Z. Y., & Tam, V. W. Y. (2010). Towards corporate environmental information disclosure: An empirical study in China. *Journal of Cleaner Production*, 18, 1142–1148.
- Zhang, L., Mol, A. P. J., He, G., & Lu, Y. (2010). An implementation assessment of China's Environmental Information Disclosure Decree. *Journal of Environmental Sciences*, 22(10), 1649–1656.