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The Intellectual Capital – Environmental Practices, Performance and their Relationships in the Romanian Banking Sector

*Panayiotis H. Ketikidis[1,2]
[1]CITY College – International Faculty of the University of Sheffield
13, Tsimiski Street
54624 Thessaloniki
Greece
E-mail: pketikidis@seerc.org

Cristina Bulata
CITY College – International Faculty of the University of Sheffield
13, Tsimiski Street
54624 Thessaloniki
Greece
Email: cbulata@city.academic.gr

Lambros Lazuras[1,2]
[2]South East European Research Centre
Research Centre of the University of Sheffield and CITY College
24, Proxenou Koromila Street
54622 Thessaloniki
Greece
E-mail: llazuras@seerc.org

* Corresponding author

Structured Abstract

Purpose – This paper reviews the knowledge assets that can be capitalized for successful Green Supply Chain Management (GSCM) implementation in the Romanian banking industry. GSCM is defined as the company's ability to understand and manage the environmental risks along the Supply Chain (SC) (Carter and Rogers, 2008). Banks are very much members of the SCs (McKenzie and Wolfe, 2004), called to integrate the environmental management into both operational and core commercial activities and to manage the environmental risk in their supply chain (FORGE Group, 2000; International Finance Corporation, 2006; UNEP Finance Initiative, 2009a). Intellectual capital, or the 'stock' of knowledge-based equity firms hold, is recognized as a key contributor to their competitiveness (Bontis et al., 1999), which may act as a driver of environmental pro-activeness (Bernauer et al., 2006; Wu et al., 2007), as well as an obstacle in the process to design and implement GSCM (Post and Altman, 1994; Baresel-Bofinger et al., 2007), while organizational learning is seen as the key component in overcoming the organizational obstacles to environmental changes (Post and Altman, 1992; Post and Altman, 1994; Anderson and Wolff, 1996).

Design/methodology/approach – This research paper describes the empirical results of a cross-sectional design employed in a sample of 41 banks operating in Romania with the purpose a. to explore the stage of designing and implementing GSCM practices in the Romanian banking sector; b. to determine which GSCM practices tend to be followed the most, c. which are the bank managers' perceived benefits from implementing GSCM practices, as well as perceived obstacles in GSCM implementation in the banking sector; and d. what is the relationship between the aforementioned variables. For these purposes several statistical analyses were used, including both descriptive and inferential statistics.

Originality/value – This is the first study looking for GSCM issues in the Romanian banking industry. The results of this research provide insights into what extent knowledge assets could be capitalized for successful Green Supply Chain Management implementation in the Romanian banking industry. Furthermore, it is increasing the ecological awareness, the theoretical and managerial insights for an effective implementation of GSCM practices in the banking sector. The analysis reveals that GSCM practices (especially practices in the immaterial flow) are strongly and significantly correlated with perceived benefits and pressures. However, this should be addressed in future research because the present study offers only correlational data and cannot establish causation. The study also concludes that bank's size and foreign/Romanian ownership do not influence at all the level of GSCM practices implementation and related perceptions (pressures, obstacles, benefits) in the Romanian banking sector.

Practical implications – The findings of this paper point to the conclusion that the banking sector in Romania is at a somehow advanced stage of ecological adaptation in the physical flow and at an early stage in the immaterial and commercial flows. Based on the literature and study's findings, regarding the role that the management of intellectual capital and knowledge flow plays, several recommendations are proposed for enhancing the implementation process of GSCM practices in the banking industry in Romania.

Keywords – Green supply chain management, banking, green innovation, knowledge assets, intellectual capital.

Paper type – Academic Research Paper

1 Introduction

The literature points to the businesses' need to be highly aware of the emerging dynamic of environmental responsibility, as a well integrated part of a related business strategy. Visionary companies that understand and pro-actively respond to the environmental pressures will be better positioned than the companies that decided not to take action yet (Baresel-Bofinger et al., 2007). However, the complexity of the environment - business relationship makes it difficult for companies to effectively tackle the environmental concerns and forces them to innovate and to develop specific knowledge assets, competences and capabilities on how to easily and effectively respond to the environmental pressures and opportunities. The supply chains (SCs) may be the scenes of experimenting with new collective and collaborative initiatives by promoting openness in the innovative processes that may unleash new competitive advantage leading through innovation capabilities (Rigby and Zook, 2002; Chesbrough and Appleyard, 2007); one such innovative initiative is the green supply chain management (GSCM). Financing and purchase of financial services, which are also stages of SC, make the banks very much members of the SCs (McKenzie and Wolfe, 2004). The banks play a double role in greening the society: directly - through their physical flows, and indirectly - through their immaterial and financial flows (Lundgren and Catasús, 2000). The banking industry's responses to the need for environmental sustainability lead to some voluntary initiatives (Gardiner, 2001; Peeters, 2003), however it has proved slower than expected and demonstrated by the developments in other economic sectors (Thompson, 1998a; Lundgren and Catasús, 2000; McKenzie and Wolfe, 2004; de la Cuesta-Gonzáles, 2006; Sahoo and Nayak, 2007; Laukkanen et al., 2008). The banking industry is considering itself an ecologically friendly sector, with a limited green impact; however, the banks' customers may have a huge impact on the natural environment (Lundgren and Catasus, 2000; Peeters, 2003). Managing the environmental risks of the investment activities undertaken by the banks through lending activities is becoming a major responsibility in banking. McKenzie and Wolfe (2004) noticed that banks tend to assess only their borrowers' environmental risks. They fail to look at the entire borrower's SC and assess its general creditworthiness, and, in particular, its green risks exposure. Moreover, the banks are not forward looking at the opportunities provided by the greening of the industry, are placing too much emphasis on the reputational risk, while the credit risk is insufficiently addressed (Thompson, 1998a; McKenzie and Wolfe, 2004). Instead, banks make green steps mainly in their physical flow of resources and almost ignore the financial and immaterial flows, although they may achieve better social and ecological impacts by greening the latter flows of resources rather than the physical one (Lundgren and Catasús, 2000).

Intellectual capital, or the 'stock' of knowledge-based equity firms hold, is now recognized as a key contributor to their competitiveness (Bontis et al., 1999). It acts as a driver of environmental pro-activeness, through green capabilities and innovativeness (Bernauer et al., 2006), and the size of the intangible assets, especially in research and development (Wu et al., 2007). Improper skills and knowledge may hamper the process to design and implement GSCM (Post and Altman, 1994; Baresel-Bofinger et al., 2007), while organizational learning is seen as the key component in overcoming the organizational obstacles to environmental changes (Post and Altman, 1992; Post and Altman, 1994; Anderson and Wolff, 1996).

The present study intends to fill in a gap in GSCM research in the banking industry of Romania and to provide some conclusions on what the situation is in this highly influential sector of the economy. The banking industry was chosen for the need to explore new possible improvement directions in terms of financial and immaterial flows (Lundgren and Catasús, 2000), also to explore if banks are targeting green borrowers or leading environmental performers (Thompson, 1998a) and how the banks have adapted their lending policies in order to take into account the ecological issues (Thompson, 1998b); finally, for the banks' high degree of exposure to changes in environmental regulations, market attitudes and high compliance needs (including on environmental aspects). Research interest in Romania, one of South-East Europe's transient economies, has been very limited so far. While the country stands far behind other European countries in terms of adopting GSCM practices, intellectual capital and company performance (Baresel-Bofinger et al., 2007), it remains into the political focus of many latest initiatives of the European Commission for the improvement of sustainability issues, such as the 'Operational Programme South East Europe for 2007-2013' (European Commission, 2007). Statistics on GSCM in the banking sector in Romania is missing. No member of the Romanian banking sector is on the list of institutions that have adopted the Equator Principles. Only one Romanian bank (out of 41 at the end of 2008) is a signatory of the United Nations Environmental Programme (UNEP) Finance Initiative statement. Otherwise, the Romanian banks' adherence to the environmental guidelines of Equator Principles and UNEP Finance Initiative are indirect, through their parents: 9 - Equator Principles; 19 - UNEP Finance Initiative (Equator Principles Financial Institutions, 2009; UNEP Finance Initiative, 2009b).

This paper describes the empirical results of a survey among the banks operating in Romania. The purpose was to explore the stage of designing and implementing GSCM practices in the Romanian banking sector, to determine which GSCM practices tend to be followed the most, which are banks' managers perceived benefits from implementing GSCM practices, as well as the perceived obstacles in GSCM implementation in the banking sector, and which is the relationship between the aforementioned variables.

This paper has two main aims. First, it reviews the literature related to GSCM: GSCM concepts, GSCM strategies and practices, benefits from GSCM implementation, drivers and obstacles to implement GSCM, with a focus on the banking industry. The role of intellectual capital within the GSCM framework is also discussed in this section. Second, it describes the methodology employed: sample selection, measures and results. A wrap-up of the paper's objectives and findings, limitations of the study and suggestions for further research are presented in the concluding part.

2 Green supply chain management

The GSCM roots are to be found in the literature addressing the relationship between the SCM and the natural environment and it is generally accepted as integrating the green thinking into supply chain management (SCM) (Hervani et al., 2005; Srivastava, 2007). Different scholars have assigned different scopes to the GSCM definition, in line with the purpose of their research (Hervani et al., 2005; Zhu et al., 2005; Baresel-Bofinger et al., 2007; Srivastava, 2007). According to Srivastava (2007), GSCM includes the product design; selection of suppliers and purchasing;

manufacturing processes; final product delivery; management of the product end-of-life. As per Sarkis (2003), GSCM consists of the product life cycle (environmental design, process improvement, reverse logistics - RL); operational life cycle (purchasing, production, product distribution, packaging, RL) and green conscious practices (reducing, reusing, remanufacturing, recycling, disposal). Baresel-Bofinger et al. (2007) suggest a more broad GSCM definition, as a managerial approach to create the link between the green consciousness and all stages of the SC, through the material purchasing and management; design of products and processes; production; inbound, outbound and RL. The main influential fields in GSCM are, according to Srivastava (2007), green design of products and processes, and green operations. Risk management is increasingly recognized lately as part of companies' sustainability, and therefore connected with SCM. From this perspective, GSCM is defined as the company's ability to understand and manage the environmental risks along the SCs (Carter and Rogers, 2008).

The design and implementation of GSCM are highly complicated tasks, with influence from multiple directions (company's internal functions, external suppliers and distributors, end-user customers) spread across multiple geographical boundaries (Hervani et al., 2005). Simpson and Samson (2008) also recognize the difficulties of SCs in finding alignment across all their actors, cultures and goals unless there is a relationship control to justify the investment level for all parties involved and guarantee the investment implementation.

2.1 GSCM in the banking sector

Banks belong to networks of organizations where the input, processes and output of all three flows (physical, financial and immaterial) affect the other organizations and are affected by the other organizations (Lundgren and Catasús, 2000). Managing the environmental risk of their borrowers is therefore a task that banks are increasingly looking for lately (Thompson, 1998a; Thompson, 1998b; Furrer and Hugenschmidt, 1999; Lundgren and Catasús, 2000; McKenzie and Wolfe, 2004; Aintablian et al., 2007; Sahoo and Nayak, 2007). As per Aintablian et al. (2007), banks may be effective monitors of the environmental risk due to their comparative advantage in screening and monitoring the environmental performances of borrowers. In the process of granting credit facilities, banks should also assess the creditworthiness and environmental risks exposure of the entire borrower's SC (McKenzie and Wolfe, 2004). As a consequence, the SC approach is fast gaining momentum in the banking industry, which is called to integrate the environmental management into both operational and core commercial activities and manage the environmental risk in their SC (FORGE Group, 2000; International Finance Corporation, 2006; UNEP Finance Initiative, 2009a).

The literature on green issues in banking concentrates on two ideas. First, it claims that understanding the role of the banking sector in greening the society requires distinguishing the direct impact (of physical material flow - in-house operations) from the indirect impact (of the financial flow - credit policies and immaterial flow - policies, culture, knowledge, information, etc.) of the banks on the environment, although a clear-cut distinction is difficult to make. Secondly, it suggests that both the direct and indirect impacts are to be considered, since the banks play an environmental role in both senses. However, as banks may achieve better social and ecological impacts by greening the financial and immaterial flows of resources rather than the

physical one (Lundgren and Catasús, 2000), most of the studies looked at the environmental impact of the banks' core business activity, respectively how the environmental risk management is factored into the lending decisions (Thompson, 1998a; Thompson, 1998b; McKenzie and Wolfe, 2004; Aintablian et al., 2007; Sahoo and Nayak, 2007).

The literature is therefore grouping the banks' GSCM practices in accordance with their impact on the environment and the resources flows. The practices with direct environmental impact (physical flow) include, as per FORGE Group (2000), the management of waste, energy, facilities, transport (employees/materials), procurement and supply chain. According to Lundgren and Catasús (2000), the practices under the immaterial flow with indirect environmental impact are the on-going public dialogue and engagement, as well as training and awareness rising among employees. Under the commercial (core) activities, the following practices (with indirect environmental impact) linked to the lending products are included by Thompson (1998a): incorporating environmental criteria into credit policy; appraisal of the environmental risk (direct, indirect and reputational) as part of the credit risk assessment; targeting, treating differently from other companies, or in some way preferentially, the green borrowers; avoiding (formally or otherwise) lending to companies operating in certain industries on environmental grounds. Sahoo and Nayak (2007) include under "green banking" the following practices: encouraging lending towards green businesses and businesses that have taken serious green steps, managing the environmental risks and identifying new business opportunities in innovative ecologically oriented products.

According to Thompson (1998a) and Thompson (1998b), the mitigation of the indirect environmental impact, related to the lending activities, implies managing the environmental risk, segmenting the market and exploiting its opportunities, based on environmental considerations. There is no unanimity on the definition of the environmental risk, as shown in the studies by Thompson (1998a), Thompson (1998b), Aintablian et al. (2007), Sahoo and Nayak (2007). The authors have found that bankers are mainly looking for the following three types of environmental risks:

1. the direct financial risk, which is the probability of banks being held liable for the obligations of insolvent borrowers to clean-up the environment contamination they produced. This risk has materialized by now in the United States only. In Europe, it is still limited;
2. the indirect financial risk (the credit risk), occurred when the borrowers' capacity to repay the loans is adversely affected by the costs incurred with fixing the problems generated by environmentally related issues;
3. the reputational risk, which is the probability of banks being associated with environmentally unfriendly borrowers and projects.

The banker practitioners members of FORGE Group have identified and described all the above types of environmental risks defined by the academic literature, as well as opportunities (financial, legal and reputational) for both operational activities, with direct environmental impact, and commercial (core) with indirect impact.

2.2 GSCM strategies

The literature is generally proposing a continuum of environmental strategies, varying from less to greater pro-activity. Henriques and Sadorsky (1999) defines four categories of strategies: "re-active", "defensive", "accommodative" and "pro-active". Kopicki et al. (1993), as cited in Srivastata (2007), defined three categories of green

strategies: “re-active”, “pro-active” and “value-seeking”. As per Wu and Dunn (1995), the business environmental impact cannot be judged any more on a stand alone basis, but from the holistic perspective of the SC. In parallel, the view related to the environmental challenge, has changed from burden to source of potential competitive advantage. Under these contexts, van Hoek (1999) recommends the value-seeking strategy as the most relevant for greening supply chains. If the SC intends to assume the responsibility of the ecological footprint of its multiple players, the integration of the environmental initiatives into the business strategies and a high resource commitment along the entire SC are mandatory.

Zhu and Sarkis (2007) classify the GSCM strategies in line with the institutional pressures that influence the company’s responsiveness to the green challenge, into “normative” (passing the responsibilities downstream by introducing contractual obligations in the agreements with the customers along the SC), “coercive” (passing the responsibilities upstream with the suppliers) and “mimetic” (the company mimics the initiatives and actions undertaken by the successful companies in their industry). In comparison with the other authors, Simpson and Samson (2008) are moving away from the discussions built around reputational and institutional pressures, and propose the following GSCM strategies’ typology, built more around the implications that the relationships, irrespective of being more coercive or collaborative, have on SCM:

- the simplest “risk-based” (risk minimization and reputation increase, involving minimal resources, such as imposing ISO 14001 along the SC), with less competitive advantage benefits to the SC companies;
- “efficiency-based” (suppliers are provided more comprehensive performance specifications and are required to implement environmental practices that improve their operations efficiency), with both economic and environmental benefits;
- “innovation-based” (innovative green design, functionalities, and characteristic solutions for the product and after sales services including recycling, as well as for developing environmentally conscious processes);
- “closed-loop” (the most complex, collaborative approach, referred to as RL in its simplest form, that integrates the environmental performance to the entire SC).

According to Lundgren and Catasús (2000), the banks are mainly trying to reduce their direct impact on the environment by using a risk-based strategy, in relationship with their suppliers and implementing minimum environmental practices, such as resources waste minimization. The indirect impact under the immaterial flow is addressed with green targeted communication and marketing strategies. As for the financial flow, the bank strategies are limited to the lending activities (outflow of financial resources only) and consist of assessing the environmental performance of borrowers. Thompson (1998a) also admits the importance of the role played by the banks through their financial flow (the lending activities), and defines three major strategic approaches in managing the environmental risks of their borrowers. First, banks may play the *policeman role*, scrutinizing if the borrowers are compliant with the environmental standards. Second, banks may engage in *partnering* with different stakeholders, encouraging the borrowers to take green initiatives, assisting them with information and support for managing the environmental risk. Third, they may take a more *pro-active role* by targeting loans to ecologically sound businesses, or even subsidizing such businesses (“green marketing”). As per Thompson (1998a) and Thompson (1998b), the strategies of environmental risk management are meant to mitigate three types of environmental risks (direct, indirect and reputational). The

significance of the lending activities of the banks is also recognized in the study by Sahoo and Nayak (2007), which define "green banking" strategies as encouraging lending towards green businesses and businesses that have taken serious green steps.

Porter and Kramer (2006) claim that integrating CSR into the companies' business agendas requires strategic adjustments in the organizations' structure, reporting and incentive systems. Research in the banking sector confirms this need. Banks demonstrating a pragmatic engagement with the corporate social responsibility agenda are faced with structural changes, which have significant implications for banks' strategies and the financial industry's structure (Decker, 2004). Banks are providers of unpatented products and services that can be easily copied; therefore they have difficulties in identifying the basis for differentiating themselves from the competition. Corporate social responsibility may be one of the banks' differentiator factors along with service quality, image and reputation, on the condition that customers perceive that the use of corporate social responsibility improves the services provided (Ogrizek, 2002). Unfortunately, the literature concludes that banks are not forward looking at the opportunities provided by the greening of the industry, are placing too much emphasis on the reputational risk, while the credit risk is insufficiently addressed (Thompson, 1998a; McKenzie and Wolfe, 2004). Instead, they make green steps mainly in their physical flow of resources (by using a risk-based strategy, in relationship with their suppliers and implementing minimum environmental practices, such as resources waste minimization) and almost ignore the financial flow (the banks strategies are limited to the lending activities and assessing the borrowers' environmental performance) and the immaterial flow (limited to green targeted communication and marketing strategies) (Lundgren and Catasús, 2000).

2.3 Benefits from implementing GSCM

The research of the academic literature on the environmental practices – companies' performance topic reveals controversial findings. Research of Sarkis (2001), Zhu et al. (2005), Zhu and Sarkis (2007) found strong positive relationship between GSCM practices and environmental performance. Although there are studies proving that GSCM may lead to better economic performance and enhanced competitiveness along the integrated green SCs (van Hoek, 1999; Rao and Holt, 2005; Zhu et al., 2005; Baresel-Bofinger et al., 2007; Sheu, 2008), there are still high controversies around this topic (Zhu et al., 2005; Baresel-Bofinger et al., 2007; Markley and Davis, 2007; Simpson and Samson, 2008; Zhu and Sarkis, 2007), as the business performance of the companies that adopted a broad range of GSCM practices lags behind expectations (Sarkis, 2001). The research looking for the relationship between GSCM practices and operational performance is limited; however, it indicates positive relationship between the two variables (Zhu et al., 2005).

Overall, the benefits perceived by banks match those experienced by other industries. Banks that integrate green issues into their business policy, promote a business strategy relying on environmental practices as a differentiating factor and correctly translate the green agenda into their services and marketing activities, may benefit of competitive advantage (FORGE Group, 2000; Ogrizek, 2002; Simpson and Kohers, 2002) and high value borrowers (de la Cuesta-Gonzáles, 2006; Lee and Sharpe, 2006). The risk-based strategy brings both economic and environmental benefits (Lundgren and Catasús, 2000). The environmental risk management mitigate the three types of environmental risks (direct, indirect and reputational) faced in the

banking sector (Thompson, 1998a; Thompson, 1998b; Sahoo and Nayak, 2007), while improving profitability (Sahoo and Nayak, 2007). Undertaking environmental practices in banking brings also benefits to banks' clients (Furrer and Hugenschmidt, 1999; de la Cuesta-Gonzáles, 2006; Aintablian et al., 2007) and the natural environment (Furrer and Hugenschmidt, 1999). The literature review conducted by Peeters (2003) reveals that analysts bring the following arguments in favour of corporate social responsibility spending by financial industry: the "first-mover" advantage; sell the image of good management; create competitive advantage through stakeholder management and reputation; create value by stimulating product innovation and better market knowledge.

2.4 Drivers and obstacles to implement GSCM

The academic literature points generally to the same group of drivers that influence the adoption of GSCM practices. However, in line with its objectives, each research is looking to particular pressures, while the heterogeneity in approaching the subject opens window to some variations to pressures' definitions. The strategic importance of the environmentalism is unanimously recognised as the main driver for the increasing interest for GSCM among researchers, as well as practitioners, followed by business values (Srivastava, 2007); legislative requirements and pressures from clients (Srivastava, 2007; Baresel-Bofinger et al., 2007); competitive pressures and high demand for ethical standards (Baresel-Bofinger et al., 2007).

Zhu and Sarkis (2007) group the GSCM pressures according to the institutional theory (therefore they call them institutional pressures), into the following three categories: a) normative (market), exerted by the external groups or stakeholders with vested interests in the company, the downstream consumers and customers; b) coercive (regulatory), exerted by powerful stakeholders, such as regulators; and c) mimetic (competitive), occurred when the companies just copy the actions of competitors with outstanding results, on the premise that they will also have success. Bernauer et al. (2006) define the following determinants of the green innovations: regulatory (stringency and predictability), market (competitiveness and customer benefit) and firm internal (green capabilities, innovativeness and the firm size). Wu et al. (2007) found that the operational facilities size, the location in special industrial parks and the size of the intangible assets (especially in research and development) act decisively as pressures for GSCM adoption.

The FORGE Group (2000) highlights that the environmental action in the banking sector is driven by risks (financial, legal and reputational), as well as opportunities. However, the main driver is the increasing external scrutiny of banks' performance and commitment to environmental governance (through indices and rankings) against competitors. The scrutiny from both internal and external stakeholders is twofold: the banks' performance in terms of direct (operational) impacts and indirect (core business) impacts that result from the management and delivery of financial services and products.

The process of adopting GSCM initiatives is hindered by significant obstacles. Post and Altman (1994), proposed the classification of these obstacles into:

- *industry obstacles*, such as the environmental investments capital cost, pressure from competition, legislative constraints, lack of information, lack of technical knowledge;

- *organizational obstacles*, such as the employee and management attitude, poor leadership, poor communication and low operational mobility.

The authors conclude that, as opposed to the industry obstacles, the organizational ones really make the difference in advancing towards environmental stewardship. Adjacent conclusion was drawn by Murillo-Luna et al. (2007), on the occasion of their empirical research on the Spanish industrial companies. The obstacles found by the authors have been grouped into *external* (high prices, the competitive pressures, the regulations complexity and rigidity), and *internal* (strategic, financial, organizational), which are almost the equivalent of the industry and organisational obstacles of Post and Altman (1994). Murillo-Luna et al. (2007) looked at the barriers' conditionality and the firms' green strategy pro-activity. They found that the companies' pro-activity is hampered by the internal barriers just from beginning the efforts; while the external barriers count only in the most advanced stages of the ecological adaptation.

According to Baresel-Bofinger et al. (2007) the obstacles in Romania may be looked at from different perspectives, such as conceptual, financial, macro and micro. At *conceptual level*, the obstacles derive mainly from the lack of unanimity on the GSCM concepts, poor green education and awareness, high barriers in communication between the business and academic communities, lack of experience and information, change resistance, lack of integration of the GSCM into the company's strategy. At *financial level*, a high pressure for short-term profits was noted, while the environmental sustainability is assigned low priority levels. At *macro level*, there is a poor coordination and coherence among the policy instruments and their implementation, while at *micro level* there are low organisational capabilities and expertise.

The obstacles perceived by the financial sector generally follow the same patterns observed in the other industries, referring to cultural and organizational structures issues; change resistance; difficulties in balancing the long-term nature of the environmental opportunities and risks with the financial markets' short-term view; poor awareness levels (FORGE Group, 2000). The FORGE Group's toolkit displays two particular difficulties in the banking sector, as per the lessons learned by the UK financial sector: the significance of the indirect environmental impacts over which the financial institutions have limited possibilities to achieve a direct management control and the banks' global reach and impact.

3 Role of intellectual capital within GSCM framework

There is no widely accepted definition of intellectual capital, which makes it difficult for practitioners to wisely manage knowledge (Kocharekar, 2001), and for scholars to analyze the knowledge field without specific, clear statement of their knowledge view (Jakubik, 2007). The tacit nature of the organizational knowledge is recognized and appreciated in academia and practice. Furthermore, the conceptualization of the intellectual capital is made in a set of sub-phenomena and from different disciplines perspectives, from accounting, to human resources and information management, training and development, psychology and sociology, each dealing with particular problems, such as measurement, ROI calculation, codification, building on it, developing minds because of it, balancing power, out of which measuring intellectual capital is recognized as the most important of all (Bontis, 1999). The literature points generally to intellectual capital, respectively the

knowledge (innovation and human intellect) embedded within the organization as a strategic resource within firms, key contributor to the process of value creation and competitiveness (Nonaka, 1991; Bontis, 1999; Bontis et al., 1999; Johnson, 1999; Bontis and Fitz-enz, 2002; Bontis, 2004; Cabrita and Vaz, 2006; Lerro and Schiuma, 2008). The research conducted so far on intellectual capital points to the need for managers to rethink their attitudes towards this intangible resource and recognize that strategically management and measuring of intellectual capital may turn as the most important managerial activity (Bontis, 1999).

The intellectual capital is generally related as comprising the following three elements: human, structural and customer (relational) capitals (Saint-Onge, 1996; Bontis, 1999; Bontis et al., 1999; Johnson, 1999). As per Bontis (1999), the human capital's essence is the intelligence of the human beings in organizations, the structural capital's essence is the knowledge embedded within the organization routines, while the relational capital refers to the knowledge flowing from suppliers, customers, government, other stakeholders external to the organization. Human capital is the source of strategic renewal and innovation; however, the structural capital is the one allowing measurement and development of companies' intellectual capital, while relational capital is the most difficult component of intellectual capital to develop due to its external source. Studies looking for intellectual capital in the banking industry admit the existence of the same three elements of intellectual capital (Saint-Onge, 1996; Cabrita and Vaz, 2006). Depending on the studies' aims and the methodology employed in studying the relationship of intellectual capital with the value creation process in banking, researchers looked either to all three elements (Cabrita and Vaz, 2006), to the human and structural components (Mohiuddin et al., 2006), or to the human capital only (Mavridis, 2004; Mavridis, 2005; Kamath, 2007) and found that intellectual capital's elements positively influence performance in banking.

Chen (2008:275) proposed the green intellectual capital construct, defined as the intellectual capital about green innovation or environmental protection, built on the three elements of intellectual capital. In this context, the author defines the 'green human capital' as the "employees' stock of knowledge, skills, capabilities, experience, attitude, wisdom, creativities, and commitments, etc. about environmental protection or green innovation". The 'green structural capital' is defined as the "stocks of organizational capabilities, organizational commitments, knowledge management systems, reward systems, information technology systems, databases, managerial institution, operation processes, managerial philosophies, organizational culture, company images, patents, copy rights, and trademarks, etc. about environmental protection or green innovation". The 'green relational capital' is the "companies' accumulative interactive relationships with customers, suppliers, and partners about corporate environmental protection or green innovation". The same construct was also adopted by Baharum and Pitt (2009), but within the facilities management organizations context.

According to Bontis (1999), the conceptualization of intellectual capital into the three components suffers of looking at the organizational knowledge only from a static perspective (i.e. a stock of knowledge), while the flow of knowledge should also be dealt with within the organizational learning field by researchers and practitioners. As per the author, the process of managing the organizational knowledge should therefore encompass both the management of organizational learning flow and of

intellectual capital stock. The literature research conducted by Garvin et al. (2008), revealed three main factors essential for organizational learning: a supportive learning environment, learning practices and processes within context, and leadership behavior providing reinforcement. The need for leadership conducting strategic management of the intellectual capital within context is also claimed in studies by Bontis (1999), Bontis (2001), Bontis and Fitz-enz (2002), Smits (2003), as the main element that may use organizations' knowledge resources for both learning and innovation. Other elements are the usage of proper tools to measure and manage knowledge (Bontis et al., 1999; Mentzas et al., 2001; Curado and Bontis, 2007) and treating knowledge according to its life cycle (Birkinshaw and Sheehan, 2002). As per Kianto (2008), the strategic capabilities, knowledge management, time exploitation, connectivity and learning orientation elements add to the leadership element and form the renewal capability of organizations, which is able to insure continuous learning and innovation.

The academic discourse in GSCM research streams has looked to the role and relevance of knowledge resources for designing and implementing of GSCM. One group of studies points to the intellectual capital as a driver of environmental pro-activeness, through green capabilities and innovativeness (Bernauer et al., 2006), and the size of the intangible assets, especially in research and development (Wu et al., 2007). The other group draws on the intellectual capital as obstacle to environmental changes (Post and Altman, 1994), as it is the case in Romania (Baresel-Bofinger et al., 2007) and the organizational learning as the key component in overcoming the organizational obstacles (Post and Altman, 1992; Post and Altman, 1994; Anderson and Wolff, 1996). Recent studies by Chen (2008) and Baharum and Pitt (2009) have referred to the green intellectual capital concept as emphasizing the significance of the environmental strategies in their knowledge components and, moreover positively influencing the companies' competitive advantage.

The contexts used in the process of environmental education of companies may be the natural environment (Heimlich and Ardoin, 2008) and the supply chains, as scenes of experimenting with new collective and collaborative initiatives by promoting openness in the innovative processes that may unleash new competitive advantage leading through innovation capabilities (Rigby and Zook, 2002; Chesbrough and Appleyard, 2007). The innovation that attempts sustainable development, identifying business opportunities among the pressures, institutionalizing the green values in the entire company, systematic measuring of the environmental performance, overcoming the barriers that might inhibit environmental initiatives, is the most advanced phase along "environmental learning curve" (greening the company), according to Post and Altman (1992) and Post and Altman (1994). Green innovation refers to all innovations that induce a beneficial impact on the environment, irrespective of the fact that this impact was the main purpose of the innovation or not (Bernauer et al., 2006). There is limited research on green innovation in the banking sector. Peeters (2003) has looked to the innovative markets and products enhancing the financial industry's role in sustainable development. Particularly in the environmental sustainability area, he found that the banking sector made some accomplishments in micro-financing, social responsible investing, green legislation, green accounting and reporting, green liability.

4 Methodology

4.1 Sample selection

In order to fulfil the aims of the study (to examine the stage of designing and implementing GSCM practices in the Romanian banking sector, which GSCM tend to follow the most, which are banks' managers perceived benefits from implementing GSCM practices, as well as perceived obstacles in GSCM implementation in the banking sector, and which is the relationship between the aforementioned variables), a cross-sectional survey-based study was carried out among banks operating in Romania.

Overall, 41 banks were approached and 28 agreed to participate in the study (response rate = 68.3%). In each participating bank, one person was assigned to serve as a representative in order to complete and return the questionnaire to the researchers. Bank representatives were selected based on specific criteria. In particular, the representative was either a senior level manager, or a medium-level manager working in risk management and/or compliance or relationship management. Participants were informed about the purposes of the study, and reassured about the anonymity and confidentiality of their responses.

4.2 Measures

A 40-item structured questionnaire based on previous research was developed in the Romanian language, and addressed several GSCM themes. Specifically, the questionnaire included themes relevant to GSCM practices of the bank (i.e., physical, financial and immaterial flows based on Lundgren & Catasús, 2000); the perceived benefits from implementing GSCM practices in the banking sector as well as GSCM pressures (i.e., normative, coercive, and mimetic based on Zhu & Sarkis, 2007); and GSCM obstacles relevant to the conceptual and financial perspectives, as grouped by Baresel-Bofinger et al. (2007). Also, several questions were used to obtain data on the bank's size (number of employees), and parent ownership (i.e., Romanian or foreign). The questionnaire was pilot-tested in a group of five bank managers to ensure that there were no problems with the comprehension of the items, as well as with the completion of the survey as a whole.

GSCM practices were measured by means of 14 items describing several environmental practices, including practices in the physical flow with direct environmental impact (e.g., 'does your bank implement waste management measures?'); practices in the immaterial flow with indirect environmental impact (e.g., 'Does your bank engage in on-going public dialogue regarding environmental issues?'); and practices in the commercial flow with indirect environmental impact (e.g., 'Does your bank incorporate environmental criteria into its credit policy?'). Responses were recorded on a 5-point Likert scale (1 = not considering this practice, to 5 = carrying out this practice fully), and internal consistency reliability was high (Cronbach's α = .86).

Perceived benefits by undertaking GSCM practices were assessed by means of six items (e.g., 'Does your bank perceive that undertaking environmental practices improves the cost/income ratio?' and 'Does your bank perceive that undertaking environmental practices improves brand positioning?'). Responses were recorded on a

5-point Likert scale (1 = not at all, to 5 = significantly), and internal consistency reliability was high (Cronbach's α = .94).

Pressures to undertake GSCM practices were assessed by means of six items reflecting normative (market) pressures (e.g., 'Does your bank feel pressures from your bank's suppliers for environmental improvements?'); coercive (regulatory) pressures (e.g., 'Does your bank feel pressures from regulatory institutions on environmental improvements?'); and mimetic (competitive) pressures (e.g., 'Does your bank feel pressures to keep pace with competitors' environmental strategies?'). Responses were recorded on a 5-point Likert scale (1 = not at all, to 5 = significantly), and internal consistency reliability of this scale was high (Cronbach's α = .82).

Perceived obstacles in implementing environmental practices were assessed by means of eight items reflecting conceptual level (e.g., 'Does your bank perceive that the lack of environmental experience and information obstruct the process of implementing environmental practices within your bank?') and financial level issues (e.g., 'Does your bank perceive that the high cost of integrating environment into business process obstructs the process of implementing environmental practices within your bank?'). Responses were given on a 5-point Likert scale (1 = not at all, to 5 = significantly), and internal consistency reliability of this scale was high (Cronbach's α = .82).

Finally, the stage in designing and implementing environmental management and reporting system was assessed by means of four items (e.g., 'Has your bank completed a review to identify environmental impacts?' and 'Has your bank defined environmental related procedures and systems?'). Responses were given on a 5-point Likert scale (1 = not considering this practice, to 5 = carrying out this practice fully), and internal consistency reliability was high (Cronbach's α = .89).

5 Results

Three types of analysis were conducted: descriptive data analysis, bivariate correlation and group comparison. The descriptive data analysis helped in identifying the mean scores for the scales used, as well as their corresponding items. The correlation analysis (Pearson's *r*) assessed the relationship between the scales of the study and several bank characteristics (i.e., size of the bank and the bank's ownership). Finally, the group comparison was conducted using t-tests and ANOVA's with post-hoc comparisons, in order to explore the impact of the bank's size and ownership (Romanian vs. foreign) on GSCM practices, pressures, obstacles, and stage of design/implementation.

5.1 Descriptive data analysis

This analysis reveals that the Romanian banking sector is at an early stage of GSCM practice adoption, especially in the immaterial and commercial flows. The practices in these flows (M = 2.53, SD = 0.94) lag behind the practices in the physical flow, with a scale mean of 3.31 (SD = 0.89; the range of the scales being between 1 = not considering this practice, and 5 = carrying it out this practice fully). The most advanced stages in the physical flow have been reached in waste management (M = 3.79, SD = 0.91) and energy management (M = 3.64, SD = 1.02). Also, among the practices with indirect environmental impact, employee training and awareness raising were the most advanced (M = 3.43, SD = 1.23), while incorporating the environmental

criteria into credit policy (M = 3.14, SD = 1.55) and including the environmental risk appraisal into credit risk assessment procedures (M = 3.14, SD = 1.48) had lower scores. Three practices in the commercial flow (targeting, treating differently companies proving ecological friendly behaviors) lie within the range 'not considering' and 'planning to consider'.

Furthermore, the banks in Romania do not perceive that undertaking environmental practices brings significant benefits. The scale mean is 3.13 (SD = 1.00) on a five-point Likert scale. Brand positioning seems to be most likely to occur (M = 3.46, SD = 1.26), whereas the possibility of new income stream is lower (M = 2.96).

Regarding the experienced pressures to implement GSCM practices, only the pressures from parent/shareholders scored higher (M = 2.64, SD = 1.31 on a five-point scale), followed by pressures from employees (M = 2.25, SD = 1.07), regulatory institutions and competition (both with M = 2.18, SD = 1.05). The pressures from clients and suppliers scored lowest (respectively M = 1.68, SD = 0.77; and M = 1.75, SD = 0.84).

Also, the perceived obstacles' scale mean was 2.87 (SD = 0.74). The biggest obstacle in implementing GSCM practices seems to be the high cost to integrate environment into business (M = 3.25, SD = 1.14).

Finally, the items of the scale 'stage in designing and implementing an environmental management and reporting system' are quite low at means ranging from 2.14 (SD = 1.32; bank has completed a review to identify environmental impacts) to the highest at 2.68 (SD = 1.27; bank has defined environmental related procedures and systems). The scale mean was 2.43 (SD = 1.14).

5.2 Relationship between GSCM practices, perceived benefits, pressures obstacles, and stage of GSCM practice design/implementation

The findings from the correlation analysis are presented in Table 1.

Table 1. Correlations between the study variables

	1	2	3	4	5	
1. Practices in the physical flow with direct environmental impact						
2. Practices in the immaterial and commercial flows with indirect environmental impact	.522**					
3. Perceived benefits by undertaking environmental practices	.340	.709**				
4. Experienced pressures to undertake environmental practices	.489**	.644**	.752**			
5. Perceived obstacles in implementing environmental practices	.148	.119	.349	.189		
6. Stage in designing and implementing an environmental management and reporting system	.451*	.882**	.744**	.665**	.026	
7. Size of the bank in terms of employees	.016	.260	-.014	.034	-.012	.08
8. Major ownership of the bank's capital	-.040	-.135	-.015	.111	.047	-.2

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* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

The key message derived from the correlation analysis is that GSCM practices tend to be strongly and significantly associated with perceived benefits, and pressures to implement GSCM practices. Although it is impossible to establish causation with the present correlations, as well as the cross-section nature of our study, this finding implies that perceiving more benefits from GSCM practices may act as a motivator for the implementation of these practices. In a similar vein, the existence of pressures may also serve as an alternative and potential initiator of GSCM practices in the banking sector.

5.3 Effects of bank ownership and company size on GSCM practices

A series of independent samples t-tests indicated that ownership of the bank (i.e., Romanian vs. Foreign ownership) did not influence the current status of GSCM practices, nor perceptions and expectations regarding the benefits, obstacles and pressures (all p-values > .05). In similar vein, one-way ANOVA showed that the aforementioned variables were not affected significantly (p > .05) by the size of the company.

6 Conclusions

This paper has attempted to fill a gap in GSCM research in the banking industry of Romania and to provide some conclusions on what the situation regarding GSCM implementation is, as well as on the knowledge assets that can be capitalized for successful GSCM implementation in this highly influential sector of the economy. The paper explored the role of the banking industry in greening the society and this industry's response to the need for environmental sustainability, which was found to be slower than expected and demonstrated by the developments in other economic

sectors (Thompson, 1998a; Lundgren and Catasús, 2000; McKenzie and Wolfe, 2004; de la Cuesta-Gonzáles, 2006; Sahoo and Nayak, 2007; Laukkanen et al., 2008).

The paper also provided evidence on the stage of designing and implementing GSCM practices in the Romanian banking sector, which GSCM practices tend to be followed the most, which are banks' managers perceived benefits from implementing GSCM practices, as well as perceived obstacles in GSCM implementation in the banking sector, and what is the relationship between the aforementioned variables. Two key conclusions can be drawn from the paper. First, it has been shown that GSCM practices (especially practices in the immaterial flow) are strongly and significantly correlated with perceived benefits and pressures. This implies that perceiving more benefits is likely to motivate the implementation of GSCM practices; accordingly, perceiving more pressures to follow/respect GSCM issues may lead to better/stronger implementation of GSCM practices. However, this should be addressed in future research because the present study offers only correlational data and cannot establish causation. Second, it can be concluded that characteristics of the banks (i.e., bank size and foreign/Romanian ownership) do not influence at all the level of GSCM practices implementation and related perceptions (pressures, obstacles, benefits) in the Romanian banking sector.

The findings of this paper point to the overall conclusion that the banking sector in Romania is at a somehow advanced stage of ecological adaptation in the physical flow and early stage in the immaterial and commercial flows. It therefore may be concluded that there is potential for green innovation and intellectual capital about green innovation in the Romanian banking sector looking to implement GSCM practices. Based on the literature and study's findings, several recommendations may enhance the implementation process of GSCM practices in the banking sector in Romania: 1. the reconsideration of the banks' role in the sustainable development of the economy and hence in increasing the pace of implementing an EMS in the immaterial and financial flows; 2. the reconsideration of the credit risk importance, by moving the emphasis from the reputational risk more towards credit risk; 3. banks' monitoring of the environmental risk in their borrowers' supply chains; 4. closing the gap between expectations and practices by involving the Romanian Banking Association and the central bank, which may further provide banks with environmental guidelines on how to manage their indirect environmental impact; 5. closing the gap between banks' parents' environmental actions and local banks' actions; 6. the careful consideration of the relationship between the GSCM practices and the GSCM performance, before requiring borrowers to implement green practices, especially under the current economic situation.

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