PERFORMANCE DETERMINANTS FOR RESPONSIBLE SUPPLY CHAIN MANAGEMENT IN THE EUROPEAN EMERGING COUNTRIES

Mariana Cristina Ganescu[1*], Mihaela Asandei[2], Andreea Gangone[3] and Camelia Chirilă[4]

[1) 2) 3) 4)] *Constantin Brâncoveanu University of Piteşti, Piteşti, Romania*

Abstract

Starting from the premise that there are numerous institutional and national factors influencing the performance of responsible supply chain management, the present article seeks to measure and quantify performance of the European emerging states by creating an index of performance of responsible supply chain management and to identify the factors that influence responsible supply chain management. The acquisition of this index was based on our own measurement methodology, starting from two classes of determinants for responsible supply chain management, with eight measuring variables, through the content analysis of various reports published by the World Economic Forum. The analysis of the correlation matrix established the intensity of the links between the proposed measuring variables. The application of the regression method on the multifactor econometric model has shown that responsible supply chain management is positively influenced by the GDP per capita, public services to improve business performance, infrastructure quality and performance of environmental actions. The results of the study have revealed that performance of responsible supply chain management depends rather on the national and local policies to stimulate social responsibility practices than on the level of economic development. Most of the time, organizations are concerned with the accountability of responsible supply chain management voluntarily, being aware of the long-term benefits to their business.

Keywords: supply chain, responsible supply chain management (RSCM), index of RSCM, determinants of RSCM, emerging Europe.

JEL Classification: C43, C52, M14, O52, O53.

Introduction

The development of sustainable business receives increased attention from practitioners and researchers in the context of governments, companies and non-governmental organizations give importance to social responsibility of the enterprise. The new world economic order

* Corresponding author, **Mariana Cristina Gănescu** – cristina_ganescu@yahoo.com

imposes organizations to reconsider their operations, their business strategies and guidance on new business models, such as supply chain management.

In addition to their corporate practices, companies are responsible for environmental and labour practices of their partners, suppliers, distributors and supply service providers. In a competitive global environment, organizational performance is also determined by all members' capacity to contribute to the results of supply channels (Naslund and Williamson, 2010).

There are increasingly more papers that investigate the link between corporate social responsibility and supply chain management (Panayiotou and Aravosis, 2011; Seuring and Muller, 2008). Nevertheless, the present paper assumes that a closer analysis of the elements that determine the performance of responsible supply chain management, in the emerging European countries, could provide a different insight into the strategic issues regarding one of the key areas of social responsibility of the enterprise, namely managing supply chains in a responsible manner, at the aggregate level.

The study "Responsible Supply Chain Management", conducted in 2011 in the European Union (Opijnen and Oldenziel, 2011), identified the potential successful factors and challenges to address human rights and other issues of social responsibility of the enterprise in the supply chains of EU-based companies. This extremely valuable study includes a large number of case studies and recommendations regarding the application of responsible supply chain management.

The present study focuses on presenting different views with reference to the meaning of the concept of supply chain, suggesting a number of empirical studies in the field. This aspect analyses the significance of supply chain management, of the elements that compose it and of responsible supply chain management. Then there are presented the objectives and research methodology, respectively the hypotheses of the study and the methods used for the collection of data. Finally, the analysis is accomplished and the conclusions of the study are established.

1. The concept of supply chain

The concept of supply chain presents major interest for practitioners as well as academics and literature has defined it in different ways. The origin of the concept of supply channel is due to many domains (Chen and Paulraj, 2004, p.119). These are considered to be the quality revolution (Dale, et al., 1994), concepts of materials management and integrated supply (Forrester, 1961), a growing interest in industrial markets and networks (Ford, 1990), the concept of increased focus (Porter, 1987) and influential industry-specific studies (Womack, et al., 1990).

In general, a supply chain is considered to be *"the flow and management of resources across the enterprise for the purpose of maintaining the business operations profitably"* (Sehgal, 2009); Schileru has the same vision (2008), which defines the supply chain as "*a very complex process of planning, implementing, and controlling an efficient and effective flow of goods, services and specific information from point of origin to point of consumption so as to achieve compliance with the customer's requirements*"; in addition, the concept refers to *"three or more organizations directly linked by one or more of the flows of products, services, finances, and information from a source to a customer"*

(Mentzer, et al., 2001, p.4); more, we can say that the supply chain represents *"the sequentially-connected organizations and activities involved in creating and making a product available"* (Russell, 2007, p.58); Aitken (2004) defines it as *"a network of connected and interdependent organizations, mutually and co-operatively working together to control, manage and improve the flow of material and information from suppliers to end users"*. In 1998, Christopher defined the supply chain as "*the network of organizations that are linked through upstream and downstream relationships in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer"*. In 1998, Beamon defined the same concept as *"an integrated manufacturing process wherein raw materials are converted into final products, then delivered to customers"*.

Supply chains are divided into two categories: supplier-oriented linkages and customer-oriented linkages (Kotler and Armstrong, 2006). The first category represents all activities aimed at creating the product and obtaining components and resources, or materials, information, capital, expertise. The second component, also known as marketing channel or distribution channel, includes wholesalers, retailers and consumers and it presents a particular interest as it takes products to end users.

In the context of supply chain management, issues such as ethics, diversity, environment, labour force and human rights, fair trade, health and safety, corporate philanthropy were studied in relation to the supply function (Andersen and Skjoett-Larsen, 2009; Maloni and Brown, 2006; Park, 2005). Empirical research on supply chains tried to identify relevant issues that characterize certain industries. For example, Park (2005) analysed the environmental, labour and consumer safety in clothing and footwear industry; Carter (2004) presented the issues related to environment, diversity, human rights, philanthropy, safety in the purchasing decision of consumer goods; Maloni and Brown (2006) presented social responsibilities relevant to food supply chains, including, next to the other elements, the conditions for animals and biotechnology.

2. Supply chain management in the contemporary economy

The term supply chain management introduced in 1982 by Keith Oliver, a consultant at Booz Allen Hamilton (Oliver and Webber, 1992), was used to develop a vision that counteracted the existing one at that time, which separated production, marketing and distribution. The concept was then extended by Houlihan (1985), who presented the benefits and efficiency due to the exchange of information and decision coordination up and down the supply chain. In practice, Wal-Mart is considered by many authors as a pioneer in implementing supply chain management, with the ability to create a worldwide network of distributors, warehouses and shops, which behaved like a single company, with available information almost in real-time (Russell, 2007).

Supply chain management *explains the planning and control of materials and information flow, as well as the supply activity, not only within companies and between companies* (Cooper, et al., 1997; Fisher, 1997). Russell (2007, p. 58) underlines that supply chain management *"seeks utopian performance in commerce: all activities up and down a supply chain orchestrated and coordinated to synchronize supply and demand at all levels, the sharing of information and technologies to increase innovation and to shorten product development cycles, reduction in order cycle time, replacing stocks with flows, effectively*

and efficiently responding to customer demands, reduced costs and increased customer satisfaction".

Some authors consider that supply chain management is a new concept for "integrated logistics". In fact, supply chain management is more than integrated logistics because it also includes manufacturing operations interfering with marketing and finance.

Considering the numerous attempts to define supply chain management, the one belonging to The Global Supply Chain Forum is recommended and used by many authors: *"Supply Chain Management is the integration of key business processes from end user through original suppliers that provides products, services and information that add value for customers and other stakeholders"* (Lambert and Cooper, 2000).

The key elements derived from the studies related to supply chain management are: "customer focus, environmental uncertainty, top management support, purchasing strategy, buyer–supplier relationships, integration and performance" (Karjalainen and Moxham, 2012, p.7).

Numerous empirical studies suggest and test strategic models of supply chain management. A continuous supply chain includes six practices: "supply chain integration, supply chain characteristics, information sharing, strategic location, customer service management and Just-in-time capability" (Tan, 2002). Another study, which combined the previous studies, considers that supply chain management practices in the United States are: "customer and supplier management, supply chain features, communication and speed, information sharing" (Chow, et al., 2008). Acquiring supply chain management is also considered possible by using "technology utilization, internal relationship (participative leadership, manufacturing and supply participation in strategy), external relationship (supplier selection, evaluation and management), product development, transportation and inventory management (inventory control, warehousing and packaging)" (Tracey, Fite and Sutton, 2004).

The key elements that belong to the construction of supply chain management and lead to performance are shown in Figure no. 1.

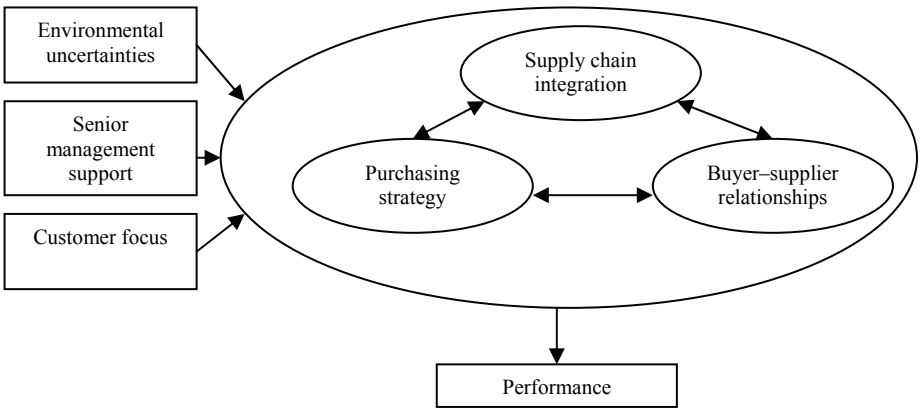

Figure no. 1: Key elements of supply chain management
Source: adapted from Karjalainen and Moxham, 2012

In accordance with this approach, the effective supply chain management operates in three distinct areas, namely the purchasing strategy, the buyer - supplier relationship and the supply chain integration. Additionally, the key driving forces with impact on the supply chains are: the environmental uncertainties, senior management support and customer focus.

Many studies highlight the relationship between supply chain management and organizational performance. Ozturen and Sevil (2009) emphasize the positive relationship between supply chain management practices and business performance in the hotel industry in Cyprus. Also, Frohlich and Westbrook (2001) demonstrated the positive effects of the integration of supply channels and divided in two the benefits of supply chain management: benefits related to productivity (reducing or maintaining costs, increasing the volume of sales) and benefits that are not related to productivity (quality improvement in production).

Literature has attempted to analyse the determinants of a country's supply performance. Gogoneață (2008) proposed a set of macroeconomic variables influencing the quality of a country's supply sector: share of exports of goods and services in GDP, share of imports of goods and services in GDP, share of trade in goods in GDP, share of added value in industry in GDP, share of added value in the services sector in GDP, the gross national income per capita and the growth of GDP.

The development of the global supply chain has called for the evaluation of logistics performance at country level and setting tools to enable comparisons between countries. Thus, the logistics performance index elaborated by the World Bank (Arvis, et al., 2012) enables to identify global transport and logistics centres, placing Romania on a middle position between the analysed countries.

3. Significance and construction of responsible supply chain management

In literature there is not one univocal definition of responsible supply chain management. The International Chamber of Commerce (2008, p.2) states: "*responsible sourcing, also referred to as supply chain responsibility, is a voluntary commitment by companies to take into account social and environmental considerations when managing their relationships with suppliers"*. Effective supply chain management is a way for businesses to build a competitive advantage, especially in sectors where production is largely outsourced, such as clothing, footwear, electronics, or food products. For many companies, working towards improving social and environmental standards in the supply chain has become a natural extension of their commitment to corporate responsibility and, as such, forms part of their overall business model.

The United Nations Global Compact (2010, p.7) takes another angle; the UNGC refers to supply chain sustainability and defines this as *"the management of environmental, social and economic impacts and the encouragement of good governance practices, throughout the lifecycles of goods and services. The objective of supply chain sustainability is to create, protect and grow long-term environmental, social and economic value for all stakeholders involved in bringing products and serves to markets."*

In defining responsible supply chain management, both international organizations emphasize the voluntary nature of corporate effort to make responsible the supply chain which they use.

The expected trends of responsible supply chain management, the potential benefits and the possible barriers to the implementation of corporate social responsibility in the field of supply chain are analyzed in some papers (Panayiotou and Aravosis, 2011). Thus, a responsible supply chain management improves relations with suppliers and quality of products, harmonizes the company offer with customer expectations and requirements, allows attracting and retaining employees, creates new business opportunities, improves company image and provides security and investor confidence.

A literature survey reveals that there are two implications of responsible supply chain management: internal guidelines and external partnerships. The internal orientation characterizes intra-organizational oriented companies, working to create fair labor conditions throughout the supply chain. The external partnership conceptualizes inter-organizational management based on cooperation and collaboration along the supply chain (Park-Poaps and Rees, 2010, p.308).

Figure no. 2: Forces of Socially Responsible Supply Chain Management Orientation

Source: Park-Poaps and Rees, 2010, p. 313

Most commonly used practical applications related to responsible management of supply chains are: "Purchasing Social Responsibility (PSR), sustainable packaging, sustainable warehousing, sustainable transportation and reverse logistics" (Panayiotou and Aravosis, 2011). According to these authors, the forces of socially responsible supply chain management orientation (Figure no. 2) are: "consumers, industry peers, regulations and media" (Park-Poaps and Rees, 2010, p.313).

The key areas where action must be taken to create a responsible supply chain management are: the abolition of child labour, freedom of association and bargaining, decent living standards, preserving biodiversity, fair pricing (Opijnen and Oldenziel, 2011). Some research on responsible supply chain management made in organizations operating in the clothing and footwear industry have also taken into consideration labour issues and human rights, through studies and qualitative analyzes (Emmelhaiz and Adams, 1999; Neef, 2004; Lim and Philips, 2008).

4. Objectives and methodology of research

The purpose of this research is to evaluate the performance of emerging European countries on the basis of the elements that determine responsible supply chain management and

establish a performance index to implement responsible supply chain management. Thus, we have formulated the following objectives:

O1. Identifying the classes of determinants of responsible supply chain management and bringing arguments for their choice.

O2. Elaborating the methodology for calculating the performance index of emerging European countries in implementing responsible supply chain management.

O3. Ranking the countries in emerging Europe according to their performance in implementing responsible supply chain management.

O4. Analysis of the correlation between the determinants of responsible supply chain management and identification of the impact on responsible supply chain management of the following factors: GDP/capita, public services to improve business performance, quality of infrastructure and performance of environmental actions.

The hypotheses of the study are the following:

H1. There is a positive correlation between the determinants of responsible supply chain management.

H2. Responsible supply chain management is positively influenced by the following indicators: GDP/capita, public services to improve business performance, quality of infrastructure and performance of environmental actions.

In our opinion, one can identify two **classes of determinants of responsible supply chain management: organizational determinants and determinants in the reference market.** We further illustrate the determinants of responsible supply chain management in Figure no. 3. The schematic presentation shows the direct relationship between the two classes of determinants, organizational and from the reference market, as well as the responsible supply chain management.

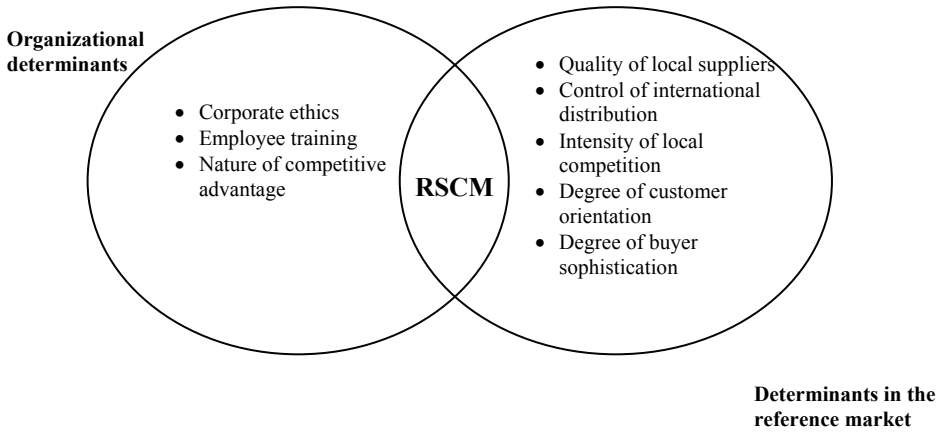

Figure no. 3: Determinants of responsible supply chain management

Source: authors' conception

The class of organizational determinants (OD) presents the most important role in implementing responsible supply chain management as corporate social responsibility practices are fundamentally voluntary, without being stimulated by measures or national legislation, but by the awareness of the benefits that a responsible behavior generates in all activities of an organization.

In the category of organizational determinants one can include many factors, such as: the responsible choice of suppliers and distributors and managing relationships with them, the professionalism of managers, the training of the employees operating in the logistics system and their ability to respect and promote the values of the organization, the promotion and implementation of the codes of conduct and the supply chain standards, the development of good governance practices in the supply chain, the control of the supply chain impact on the environment and local communities.

We consider that the most important determinants of responsible supply chain management are: the ethical behavior of the organizations, the employee training and the nature of the organizational competitive advantage.

Thus, supply chain management accountability involves some form of organizational influence over the component parts of supply chain through the codes of ethics and the standards of conduct, organizational culture, anti-pressure group campaigns and ethical training of the staff (Amaeshi, Osuji and Nnodim, 2008). At the same time, the impact of *corporate ethical behavior* on the supply chain is supported by the RSCM 1.0 widespread model (Thorsen, 2010), whereby organizations develop codes of conduct that establish requirements and expectations for distributors and monitor and audit their activities.

Employee training for those operating in the distribution system, both of professional and ethical nature, supports the maintenance and development of good relationships with distributors, and the promotion of ethical values across the supply chains.

The nature of competitive advantage is measured by means of obtaining sources. Contemporary specialists (Strandskov, 2010) identify three sources of competitive advantage: firm specific advantages, advantages specific localization and relationship specific advantages. According to this approach, a company can gain significant competitive advantage by building sustainable relationships with distributors.

The class of determinants in the reference market (DRM) includes a large number of variables which can shape supply chain management. Thus, *the quality of local suppliers* influences the success of the organizations in implementing responsible supply chains. The more local suppliers accountable to their business partners are there, the higher are the chances to implement responsible supply chain management. The involvement of a large number of local suppliers in *the international supply chain* facilitates the adoption of a set of international responsibility standards in distribution practices.

Local competition is a factor that enhances the organizational actions oriented to the direction of responsible supply chain management. Thus, as local competition is more intense, the organizations must make greater efforts to keep their business partners. In this respect, responsible supply chain management can improve their relationships with partners and maintain them for a long period of time, becoming a source of strategic competitive advantage.

The competitiveness requires organizations to practice responsible supply chain management, in which *the buyer sophistication* appears as a sum of skills involved in the purchasing decision (Green, Zimmerer and Steadman, 1994). On the markets characterized by *the buyer's high degree of sophistication* choosing supply chains is based on a comprehensive analysis of the economic and social performance of organizations.

The degree of customer orientation reflects an organization's capacity to manage customer expectations, facilitating loyalty and investments of any kind. The organizations that responsibly apply the principles of supply chain management provide reliable service to customers, helping them to find the suitable way to satisfy their desires, and seek their feedback to improve the quality of their products and services (Ionaşcu, 2007).

The methodological framework used to **determine the performance index of responsible supply chain management** is based on the content analysis of the Global Competitiveness Report 2012-2013, belonging to the World Economic Forum (Schwab and Sala-i-Martin, 2012).

The paper aimed at analysing performance of the emerging countries in Europe and Western Asia (Eurasia) in the context in which they have been affected by interesting economic developments, and the supply chain management has become more global and integrated in the supply chains of the developed countries.

We have taken a series of steps to obtain the index of performance for responsible supply chain management. In the first stage, we have elaborated the list of the emerging European countries, consisting of 23 states geographically located in Europe or on the boundary of Europe and Asia. Then, we have constituted the database, introducing the indicators to be analyzed for each class of determinants of responsible supply chain management. The values of these indicators were taken from the Global Competitiveness Report 2012-2013, which are presented as scores on a scale from 1 to 7, aggregated and transformed with the min-max method to maintain order and relative distance between the scores of different countries. In step three, we have determined the subindexes for each category of determinants, measuring the contribution of each indicator in the total subindex. To obtain the subindex of the organizational determinants we have used the weighting coefficient of 0.33 and we have chosen the weighting coefficient of 0.20 for the subindex of the determinants in the reference market.

To determine the value of the performance index of responsible supply chain management as arithmetic mean of the subindexes, we have started from the following formula (Chilian, Albu and Iordan, 2010):

$$I_c = (I_{c1} + I_{c2} + I_{c3} + \ldots + I_{cn})/n \quad (1)$$

Thus, the composite index was calculated by the formula:

$$I_{pRSCM} = (I_1 + I_2)/2 \quad (2)$$

where: I_{pRSCM} – the value of the performance index of responsible supply chain management; I_1, I_2– subindexes for each category of determinants.

Based on these results, we have achieved the country ranking in terms of responsible supply chain management, the state with the highest index value also having a higher level of performance in implementing responsible supply chain management (Table no. 1).

The performance index of responsible supply chain management highlights the classification of the emerging European countries and explains the interest of the

companies located in the analyzed states to implement responsible supply chain management. The index produces some interesting scores distributions of the analyzed countries. The countries whose performance index of responsible supply chain management places them in the top, such as Estonia, Czech Republic and Slovenia have received significant involvement of foreign capital in the economy, FDI flows being significantly reflected on the GDP and the supply chain development. The countries at the end of the classification, such as Romania, have not received any support to implement a responsible supply chain management due to lack of strong infusion of foreign capital and a reduced activity of the NGOs in empowering business. Another issue concerns the communities, which are not actively engaged in CSR activities.

Table no. 1: Rankings of the emerging countries in Europe based on the performance of responsible supply chain management (RSCM)

Country	Subindex of OD	Subindex of DRM	Index of RSCM
Estonia	4.233	4,500	4.367
Czech Republic	3.900	4.580	4.240
Slovenia	4.000	4.480	4.240
Turkey	3.733	4.740	4.237
Lithuania	3.900	4.520	4.210
Poland	3.800	4.460	4.130
Latvia	3.967	4.280	4.123
Azerbaijan	3.933	4.220	4.077
Montenegro	3.967	4.040	4.003
Albania	3.733	4.140	3.937
Hungary	3.533	4.100	3.817
Kazakhstan	3.500	4.080	3.790
Slovakia	3.300	4.180	3.740
Croatia	3.567	3.840	3.703
Ukraine	3.233	4.160	3.697
Bulgaria	3.333	4.020	3.677
Georgia	3.667	3.600	3.633
Russia	3.267	3.700	3.483
Romania	3.200	3.760	3.480
Moldavia	3.200	3.680	3.440
Macedonia	3.100	3.700	3.400
Bosnia and Herzegovina	3.067	3.720	3.393
Serbia	2.833	3.380	3.107

Source: calculated by authors

The performance index values in responsible supply chain management obtained by Azerbaijan, Albania and Kazakhstan, situated above the values of the states such as Hungary, Croatia and Slovakia can be considered surprising because the companies in these countries are not known to be very active in the CSR community, but they receive positive appreciations from the surveyed population.

5. Data analysis and results of the research

Data analysis was realized using statistical methods of analysis, with the computer software named Excel, the Data Analysis module. Hypotheses testing were performed using the method of statistical correlation and regression method. We have attempted to establish the correlation between the variables that characterize the determinants of responsible supply chain management in order to demonstrate how strong the relationship between variables is.

We have used the following notations for the determinants of responsible supply chain management: D1 – Corporate ethics, D2 – Employee training, D3 - Nature of competitive advantage, D4 - Quality of local suppliers D5 - Control of international distribution, D6 - Intensity of local competition, D7 - Degree of customer orientation and D8 - Degree of buyer sophistication (Table no. 2).

Table no. 2: Table of results – Method of statistical correlation

	D1	D2	D3	D4	D5	D6	D7	D8
D1	1							
D2	0.616103	1						
D3	0.472871	0.419665	1					
D4	0.336719	0.456952	0.57864	1				
D5	0.564342	0.557595	0.379574	0.264831	1			
D6	0.380769	0.419922	0.450514	0.854952	0.236763	1		
D7	0.546065	0.67553	0.381251	0.687279	0.733316	0.600724	1	
D8	0.25376	0.64066	0.288189	0.040011	0.351028	-0.02828	0.250546	1

Source: calculated by authors

The results (Table no. 2) highlight the existence of some positive correlations between the analyzed variables. We can identify strong correlations with values > 0.75, between *The Intensity of Local Competition* and *The Quality of Local Suppliers*. There are also positive correlations (values > 0.5) between *corporate ethics* and *employee training*, between *The Nature of Competitive Advantage* and *The Quality of Local Suppliers*, between *The Control of International Distribution* and *Corporate Ethics*, between *The Control of International Distribution* and *Employee Training,* between *The Degree Of Customer Orientation* and *Corporate Ethics*, between *The Degree of Customer Orientation* and *Employee Training,* between *The Degree of Customer Orientation* and *The Quality of Local Suppliers,* between *The Degree of Customer Orientation* and *The Control of International Distribution*, between *The Degree of Customer Orientation* and *Intensity of Local Competition*. *The Degree of Buyer Sophistication* is positively and strongly correlated with *Employee Training* (value 0.64).

Consequently, hypothesis 1 according to which "*there is a positive correlation between the determinants of responsible supply chain management"* is correct.

The scientific validation of hypothesis 2 of the study, according to which *"responsible supply chain management is positively influenced by the following indicators: GDP per capita, public services to improve business performance, quality of infrastructure and performance of environmental actions"*, requires the application of the multifactor linear regression method.

Responsible supply chain management (RSCM) is considered the dependent variable, and the independent variables are the GDP per capita (GDP, expressed in dollars/person), public services to improve business performance (PSBP, expressed as a score with values on a scale from 1 to 7), quality of infrastructure (QI, expressed as a score with values on a scale from 1 to 7) and performance of environmental actions (Emerson, et al., 2012). Performance of environmental actions (PEA) is expressed as an index calculated at Yale University. To ensure comparability, we have chosen to normalise the GDP and PEA using the min-max method.

The model that verifies hypothesis 2 is presented as follows:

$$RSCM_i = b_0 + b_1 \times GDP_i + b_2 \times PSBP_i + b_3 \times QI_i + b_4 \times PEA_i + \varepsilon_i, \quad (3)$$

(RSCM = responsible supply chain management; GDP = gross domestic product/capita; PSBP = public services for business performance; QI = quality of infrastructure; PEA = performance of environmental actions; ε_i = error; i = the states, from 1 to 23).

The results generated by the multifactor linear regression method are presented in Table no. 3.

Table no. 3: Results of the regression function

Regression Statistics	
Multiple R	0.913
R^2	0.834
Adjusted R^2	0.797
Standard Error	0.155
Observations	23

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	2.177	0.5441733	22.5447418	0.0000008
Residual	18	0.434	0.0241375		
Total	22	2.611			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.165351	0.351587	3.314545	0.003855	0.426694	1.904008	0.426694	1.904008
GDP	0.000013	0.000007	1.758505	0.095651	-0.000003	0.000029	-0.000003	0.000029
PSBP	0.336272	0.070662	4.758876	0.000157	0.187817	0.484728	0.187817	0.484728
QI	0.109741	0.059074	1.857690	0.079650	-0.014369	0.233851	-0.014369	0.233851
PEA	0.016816	0.004844	3.471659	0.002723	0.006639	0.026992	0.006639	0.026992

Source: calculated by authors

The multiple correlation coefficient (r), with a value of 0.913, represents the correlation ratio indicating the existence of a strong link between responsible supply chain management and its main determinants. The determination coefficient – RSquare - has the value 0.834 and expresses that 83.4% of the variation of responsible supply chain management can be explained by the variables taken into consideration. The adjusted correlation ratio shows that 0.797 of the total variation is due to the regression line, given the number of degrees of freedom. Test F shows the role of the independent variables to

explain the evolution of the dependent variable. The value of test F (22.544) and of the materiality (0.0000008 <0.05) shows that the regression model is valid and can be used to analyze the dependence between variables.

The free term b_0, with the value of 1.165 is also the point of intersection of the regression line with the axis OY. Since the statistic t = 3.314 and P-value = 0.003 <0.05, it means that the coefficient is significantly different from 0, with the confidence interval [0.426, 1.904]. The coefficient for the GDP variable, with the value of 0.000013, is positive and indicates the existence of a direct link between RSCM and GDP, so that a 1 dollar increase of GDP per capita determines an increase of RSCM with 0.000013 points. Since P-value = 0.095 > 0.05, the coefficient is insignificant. The coefficient corresponding to the PSBP variable, with the value of 0.336, is positive and indicates the existence of direct link between RSCM and PSBP, so that a unit increase of PSBP will determine a RSCM increase with 0.336 points. Since P-value = 0.0001<0.05, the coefficient is significant, situated in the range of confidence [0.187; 0.484]. The coefficient corresponding to the QI variable, with the value of 0.109, is positive and indicates the existence of a direct link between RSCM and QI, so that a unit increase of QI will determine a RSCM increase with 0.109 points. Since P-value = 0.079>0.05, the coefficient is insignificant. The coefficient corresponding to the PEA variable, with the value of 0.016, is positive and indicates the existence of a direct link between RSCM and PEA, so that a PEA increase with one unit will determine a RSCM increase with 0.016 points. Since P-value = 0.002 <0.05, the coefficient is significant, situated in the range of confidence [0.006; 0.026]

The following regression model results from the analysis of the coefficients:

$$RSCM = 1.165 + 0.000013 \times GDP + 0.336 \times PSBP + 0.109 \times QI + 0{,}016 \times PEA + \varepsilon_i \quad (4)$$

The results presented in Table no. 3 show that hypothesis 2 is valid: *responsible supply chain management is positively influenced by the following indicators: GDP per capita, public services to improve business performance, quality of infrastructure and performance of environmental actions.*

Conclusions

The present study responds to a challenge, which is to measure and quantify the performance of responsible supply chain management. With the obtained results, the paper contributes to the construction of an index that gives the possibility to compare the performance of states in terms of responsible supply chain management. Despite the methodological limitations, there are reasons to believe that this index presents important performance related aspects of the responsible supply chain management in the 23 emerging countries analyzed here.

The index reveals significant differences between countries, for reasons that regard the proportion of the responsible companies in the host countries. The national differences in the performance of the responsible supply chain management may be interpreted as differences in the assessment of the indicators that are part of the index constitution.

The analysis outlines that the performance of responsible supply chain management depends more on national and local policies to stimulate social responsibility practices, and less on the economic development. Most of the time, organizations are voluntarily concerned with the accountability of responsible supply chain management, being aware of the long-term benefits to their business.

As the countries of the world will improve their annual reports regarding their stage of economic, political and social development, the methodology for calculating this index can be improved by using a broader range of determinants of responsible supply chain management. Thus, the index will acquire more complex meaning and higher relevance in adopting decisions in supply chains.

Acknowledgements

This work was supported by the project "Post-Doctoral Studies in Economics: training program for elite researchers - SPODE" co-funded from the European Social Fund through the Development of Human Resources Operational Programme 2007-2013, contract no. POSDRU/89/1.5/S/61755.

References

Aitken, J., 2004. *Logistics and supply chain management: strategies for redusing costs and improving services*. 2nd ed. England: Prentice Hall, Financial Times.

Amaeshi, K., Osuji, O. and Nnodim, P., 2008. Corporate Social Responsibility in Suplly Chains of Global Brands: The Boundaryless Responsibility? Clarifications, Exceptions and Implications. *Journal of Business Ethics*, 81(1), pp.223-234.

Andersen, M. and Skjoett-Larsen, T., 2009. Corporate Social Responsibility in Global Supply Chains. *Supply Chain Management*, 14(2), pp.75–86.

Arvis, J.F., Mustra, M.A., Ojala, L., Shepherd, B. and Saslavsky, D., 2012. *Connecting to Compete 2012. Trade Logistics in the Global Economy. The Logistics Performance Index and Its Indicators,* [online] Available at: <http://siteresources.worldbank.org/TRADE/Resources/239070-1336654966193/LPI_2012_final.pdf> [Accessed 2 September 2012].

Beamon, B.M., 1998. Supply Chain Design and Analysis: Models and Methods. *International Journal of Production Economics*, 55(3), pp.281-294.

Carter, C.R. and Jennings, M.M., 2004. The role of purchasing in corporate social responsibility: a structural equation analysis. *Journal of Business Logistics*, 25(1), pp.145-186.

Chen, I.J. and Paulraj, A., 2004. Towards a theory of supply chain management: the construct and measurements. *Journal of Operations Management*, 22(2), pp.119-150.

Chilian, M.N., Albu, L.L. and Iordan, M., 2010. European Performances regarding Flexicurity in the New Member States and Their Regions. *Romanian Journal of Economic Forecasting*, 13(5), pp.59-73.

Chow, W.S., Madu, C.N., Kuei, C.-H., Lu, M.H., Lin, C. and Tseng, H., 2008. Supply chain management in the US and Taiwan: An empirical study. *Omega*, 36(5), pp.665-679.

Christopher, M., 1998. *Logistics and Supply Chain Management: Strategies for Reducing Costs and Improving Services*. London: Pitman.

Cooper, M.C., Lambert, D.M. and Pagh, J.D., 1997. Supply Chain Management: more than a new name for logistics. *International Journal of Logistics Management*, 8(1), pp.1-13.

Dale, B.G., Lascelles, D.M. and Lloyd, A., 1994. Supply chain management and development. In: B.G. Dale, ed. 1994. *Managing Quality*. London: Prentice-Hall, pp.292-315.

Emerson, J.W., Hsu, A., Levy, M.A., De Sherbinin, A., Mara, V., Esty, D.C. and Jaiteh, M., 2012. *2012 Environmental Performance Index and Pilot Trend Environmental Performance Index.* New Haven: Yale Center for Environmental Law and Policy.

Emmelhainz, M.A. and Adams, R.J., 1999. The Apparel Industry Response to ''Sweatshop'' Concerns: A Review and Analysis of Codes of Conduct. *Journal of Supply Chain Management*, 35(3), pp.51–57.

Fisher, M.L., 1997. What is the right supply chain for your product? *Harvard Business Review*, 75(2), pp.105-116.

Ford, D., 1990. *Understanding Business Markets*. London: Academic Press.

Forrester, J., 1961. *Industrial Dynamics*. New York: Wiley.

Frohlich, M.T. and Westbrook, R., 2001. Arcs of integration: an international study of supply chain strategies. *Journal of Operations Management*, 19(5), pp.185-200.

Gogoneață, B., 2008. An analysis of explanatory factors of logistics performance of a country. *Amfiteatru Economic*, X(24), pp.143-156.

Green, R.F., Zimmerer, T.W. and Steadman, M.E., 1994. The Role of Buyer Sophistication in Competitive Bidding. *Journal of Business and Industrial Marketing*, 9(1), pp.51-59.

Houlihan, J.B., 1985. International Supply Chain Management. *International Journal of Physical Distribution and Materials Management*, 15(1), pp.51-56.

International Chamber of Commerce, 2008. *ICC guide to responsible sourcing. Integrating social and environmental considerations into the supply chain*. [pdf] Paris: International Chamber of Commerce. Available at: <http://www.iccwbo.org/Advocacy-Codes-and-Rules/Document-centre/2008/ICC-Guide-to-Responsible-Sourcing/> [Accessed 12 September 2012].

Ionașcu, V., 2007. Tendințe ale orientării spre client. *Revista de Marketing online*, 1(4), pp.52-55.

Karjalainen, K. and Moxham, C., 2012. Focus on Fairtrade: Propositions for Integrating Fairtrade and Supply Chain Management Research. *Journal of Business Ethics*, [online] 30 August, pp.1-16. Available at: <http://rd.springer.com/article/10.1007/s10551-012-1469-1#page-1> [Accessed 12 September 2012].

Kotler, P. and Armstrong, G., 2006. *Principles of Marketing*. 11th ed. New Jersey: Prentice-Hall Inc.

Lambert, D.M. and Cooper, M.C., 2000. Issues in Supply Chain Management. *Industrial Marketing Management*, 29(1), pp.65-83.

Lim, S. and Phillips, J., 2008. Embedding CSR Values: The Global Footwear Industry's Evolving Governance Structure. *Journal of Business Ethics*, 81(1), pp.143–156.

Maloni, M.J. and Brown, M.E., 2006. Corporate Social Responsibility in the Supply Chain: An Application in the Food Industry. *Journal of Business Ethics*, 68(1), pp.35–52.

Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. and Zacharia, Z.G., 2001. Defining Supply Chain Management. *Journal of Business Logistics*, 22 (2), pp.1-25.

Naslund, D. and Williamson, S., 2010. What is Management in Supply Chain Management? A critical review of Definitions, Frameworks and Terminology. *Journal of Management Policy and Practice*, 11(4), pp.11-28.

Neef, D., 2004. *The Supply Chain Impetrative: How to Ensure Ethical Behavior in Your Global Suppliers*. New York: American Management Association.

Oliver, R.K. and Webber, M.D., 1992. Supply Chain Management: Logistics Catches up with Strategy. In: M.G. Christopher, ed. 1992. *Logistics: The strategic issue*. London: Chapman and Hall, pp.63-75.

Opijnen, M. and Oldenziel, J., 2011. *Responsible Supply Chain Management, Potential success factors and challenges for addressing prevailing human rights and other CSR issues in supply chains of EU-based companies,* [online] Available at: <http://ec.europa.eu/progress>. [Accessed 12 August 2012].

Ozturen, A. and Sevil, G., 2009. Supply Chain Management as a Sustainable Performance Booster for the Accommodation Enterprises: Evidence from North Cyprus Tourism Sector. *International Journal of Business and Management*, 4(2), pp.97-111.

Panayiotou, N. and Aravosis, K.G., 2011. Suplly Chain Management. In: S.O. Idowu and C. Louche, eds. 2011. *Theory and Practice of Corporate Social Responsibility*. Berlin: Springer Verlag. Ch. 4.

Park, H., 2005. The Role of Idealism and Relativism as Dispositional Characteristics in the Socially Responsible Decision-Making Process. *Journal of Business Ethics*, 56(1), pp.81–98.

Park-Poaps, H. and Rees, K., 2010. Stakeholder Forces of Socially Responsible Supply Chain Management Orientation. *Journal of Business Ethics*, 92(2), pp.305–322.

Porter, M.E., 1987. Managing value-form competitive advantage to corporate strategy. *Harvard Business Review*, 65(3), pp.43-59.

Russell, S.H., 2007. Supply Chain Management: more than integrated logistics. *Air Force Journal of Logistics*, 31(2), pp.55-63.

Schileru, I., 2008. Accumulations and development in commercial logistics. *Amfiteatru Economic*, X(24), pp.41-58.

Schwab, K. and Sala-i-Martin, X., 2012. *The Global Competitiveness Report 2012–2013: Full Data Edition,* [online] Available at: <http://www3.weforum.org/docs/WEF_GlobalCompetitiveness Report_2012-13.pdf>. [Accessed 12 August 2012].

Sehgal, V., 2009. *Enterprise Supply Chain Management: Integrating Best in Class Processes.* New Jersey: John Wiley & Sons Inc.

Seuring, S. and Muller, M., 2008. From a Literature Review to a Conceptual Framework for Sustainable Supply Chain Management. *Journal of Cleaner Production*, 16(15), pp.1699–1710.

Strandskov, J., 2010. Sources of competitive advantages and business performance. *Journal of Business Economics and Management*, 7(3), pp.119-129.

Tan, K.C., 2002. Supply chain management: practices, concerns and performance issues. *Journal of Supply Chain Management*, 38(1), pp.42-53.

Thorsen, S.S., 2010. Are Current Approaches to Responsible Supply Chain Management working? *Institute of Human Rights and Business*, [online] Available at: <http://www.ihrb.org/ commentary/advisors/are_current_approaches_to_responsible_supply_chain_management_work ing.html> [Accessed 20 August 2012].

Tracey, M., Fite, R.W. and Sutton, M.J., 2004. An explanatory model and measurement instrument: a guide to supply chain management research and applications. *American Journal of Business*, 19(2), pp.53-69.

United Nations Global Compact, 2010. *Supply Chain Sustainability. A practical Guide for Continuous Improvement,* [online] Available at: <http://www.unglobalcompact.org/docs/ issues_doc/supply_chain/SupplyChainRep_spread.pdf> [Accessed 15 September 2012].

Womack, J.P., Jones, D.T. and Roos, D., 1990. *The Machine that Changed the World*. New York: Rawson Associates.