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b) KEYWORDS

- Globalization
- Global business
- Sustainable development
- Models and indicators for assessing sustainable development
- Sustainable performance
- Models and indicators for assessing performance
- Competitiveness
- Efficiency
- Freight transport
- Supply chain management
- Business continuity management
c) SUMMARY OF THE MAIN PARTS OF THE PHD THESIS

In the current economic context, characterized by economic globalization, internationalization of enterprises and increased requirements regarding the process of integrating European objectives on sustainable development at the national level, ensuring performance at national and organizational level is a challenge. This is why the overall objective of the present PhD thesis is to conduct an analysis on ensuring sustainable performance in business, in the context of globalization, increasingly sharp and unpredictable socio-economic changes and the risks arising from them.

The research primarily focuses on freight transport business, given the fact that this is an indispensable sector for the economic development of any country, ensuring the connection between business agents. The research provides a theoretical basis consisting in relevant studies in the field of sustainable performance in general and in freight transport in particular. Moreover, the case studies provide a true picture of the field, being particularly focused on serious current problems regarding sustainability: climate changes and the need to answer to those changes, changes in economic paradigm and the new macroeconomic context that they generate, business continuity in the context of risks generated by globalization. In terms of coverage, the research focuses on Romania, but presents a strong global and European structure.

Next, the specific research objectives based on which the chapters of the doctoral research have been constituted will be described. Through its specific objectives, the thesis represents an indispensable tool not only for policy makers in the economic field, but also for economic agents in freight transport. The first category of readers to whom this thesis addresses, namely policy makers, can use the research in order to create an overview of the risks arising from globalization. The second category of readers, the representatives of companies in the freight transport field, can use the research to optimize the management of their businesses. The present thesis is structured into five chapters, each containing its own specific objectives, as follows:

- **Chapter 1: Current approaches on the concept of sustainable performance.** This chapter has as first specific objective the presentation of the main approaches on defining sustainable performance. Subsequently, the concept of sustainable development is defined. Furthermore, the main characteristics of globalization as well as the risks generated from it are analyzed. Also, it contains an overview of sustainable performance in the context of global business and the performance dimensions in the context of sustainable development are defined. A very important objective is the presentation of
some specific aspects on ensuring sustainable performance in the context of global logistics.

- **Chapter 2: Sustainable performance assessment models in relation to the EU strategy on the achievement of a sustainable business environment.** This chapter has as first specific objective the presentation of the EU strategy for achieving a sustainable business environment. Subsequently, a range of indicators and models for measuring sustainable performance internationally are presented. At the same time, a detailed study in theory and practice regarding the main indicator models for monitoring sustainable development, based on the example of transportation, has been conducted internationally and in the EU.

- **Chapter 3: Evaluation of the indicators on sustainable development in the freight transport from Romania and improvement possibilities compared to other EU member states.** The first specific objective of this chapter is to conduct an analysis regarding the similarities between EU countries according to their grouping in clusters for critical economic periods, based on diverse macroeconomic variables, chosen according to a very carefully selected methodology. The second specific objective refers to the proposal of specific improvement measures in the field of freight transport in the EU. Further on, this chapter aims to analyze the transportation situation in Romania as compared to the one in EU-28 member states. Finally, the chapter aims to study the assurance of sustainable performance in freight transport, in relation to energy consumption.

- **Chapter 4: Study on ensuring sustainable performance in the freight transport from Romania in the context of sustainable development requirements.** Firstly, this chapter aims to analyze economic effects of the use of transport modes in Romania. Secondly, it aims to identify the best solutions on managing freight transport activity in Romania, in order to achieve sustainable performance. Finally, it wants to analyze the relation between infrastructure investment and the assurance of sustainable performance.

- **Chapter 5: Aspects on ensuring sustainable performance in freight transport using the principles of business continuity management.** This chapter aims to identify the latest practices and trends in the field of business continuity. Furthermore, it aims to identify the peculiarities of business continuity management in emerging countries. Moreover, it wants to analyze management practices in the field of sustainable performance from rail freight transport, using business continuity management.

Doctoral studies have resulted in 14 research papers published in Romania and abroad, grouped as follows:
An article in a journal indexed by Thomson ISI with positive Impact Factor;

9 research papers published in the volumes of conferences indexed ISI Proceedings, of which 7 as first author; from the total of published research papers, following the attendance to conferences, which usually publish volumes indexed ISI Proceedings, 4 are abroad;

One article as first author in a foreign journal indexed in international databases other than Thomson ISI;

One article as sole author in a journal indexed in the Cabell’s, Central and Eastern European Online Library, EBSCO Publishing, Index Copernicus- Journals Master List _ IDEAS, Econpapers, Socionet -, RePEc (Research Papers in Economics), DOAJ (Directory of open access journals), Google Scholar and SCOPUS international databases;

An article as first author in a journal indexed in the Index Copernicus, ECONPAPERS, RePEc, Cabell’S International and EBSCO international databases;

A study published in the volume of a scientific event in Romania.

As design, the PhD thesis consists in a total of 41 tables and 49 figures, distributed across chapters as follows:

- Chapter 1:
  - 7 tables;
  - 6 figures;

- Chapter 2:
  - 9 tables;

- Chapter 3:
  - 11 tables;
  - 28 figures;

- Chapter 4:
  - 6 tables;
  - 12 figures;

- Chapter 5:
  - 8 tables;
  - 3 figures.

Next, a description of the main results from each chapter will be provided. Also, the main innovative elements in terms of methodology used in the case of practical chapters, as well as the elements of particular use in case of theoretical chapters, will be outlined.
Chapter 1: Current approaches on the concept of sustainable performance

Regarding the definition of the concept of sustainable performance and sustainable development as well, there are many approaches in the literature. The ones considered as relevant from the point of view of policy makers have been highlighted in this chapter.

The chapter has also identified a number of characteristics of globalization in the way they are presented in the literature. The reason is that all facets of this phenomenon need to be presented, taking into account both positive and negative impact of its expansion, as well as the risks generated by this phenomenon. Moreover, the sustainable performance has been analyzed in the context of global businesses, through a comparison of business paradigm before and after globalization. Also in this chapter, an analysis of the social and ecological dimension of sustainable performance has been conducted.

Finally, some specific aspects on ensuring sustainable performance in the context of global logistics have been highlighted: the transition from logistics to Supply Chain Management, the importance Supply Chain Integration, the development of Supply Chain Management in the context of globalization.

Chapter 2: Sustainable performance assessment models in relation to the EU strategy on the achievement of a sustainable business environment

This chapter provides a critical analysis on the EU Strategy to achieve a sustainable business environment, by highlighting the key elements for the policy makers in Romania.

Subsequently, this chapter makes an overview of the main indicators and the most commonly used sustainable development measuring models internationally, and then focuses on the indicators in the above mentioned models specific for freight transport:

- Comission for Sustainable Development model of United Nations;
- Eurostat model;
- World Bank model;
- Model proposed by the Organization for Economic Co-operation and Development
- Models of national indicators;

Chapter 3: Evaluation of the indicators on sustainable development in the freight transport from Romania and improvement possibilities compared to other EU member states

Beyond the worldwide, regional and local environmental summits or the meetings of the worlds leaders in different contexts, the concerns regarding sustainable development at European level and global level have become increasingly acute in the last two decades. Each country tries
to find new and innovative tools to achieve the best possible position on an European market characterized by a fierce competition, but the cornerstone of any strategy in this regard, lies in the way in which each country chooses to develop, by reporting to economical, social and environmental issues, while respecting the commonly shared framework at the level of European specialized organisms.

In order to analyze the positioning of Romania in the European context in terms of sustainable performance in freight transport, the author has used an innovative strategy based on the Cluster analysis. The chosen indicators are consistent with the principles of sustainable performance. The analysis has been conducted for three key years in the economy of European countries: 2008, 2010 and 2012.

The results of the Cluster analysis in terms of sustainability indicators in freight transport have shown that at the EU level, in 2008 the countries were divided in four clusters. Starting from 2010, amid the deepening of the economic crisis, the number of clusters fell to three. In 2008, the fourth cluster consisting of Estonia and Latvia stand up in particular by being the best performing cluster in terms of energy consumption in rail and road transport and in terms of emissions of greenhouse gases, ozone precursors and particulate matter. The situation in 2012 is completely different from 2010 and 2008.

Assessment of Romania’s position regarding the indicators for sustainable development in freight transport compared to the EU member states

In this section an analysis has been conducted regarding the transportation in Romania compared to the one in the EU-28 member stated from several point of views: energy consumption of transport relative to GDP, modal split of road freight transport, modal split of rail freight transport, modal split of inland waterways transport, volume of freight transport relative to GDP, energy consumption of transport, annual average indices for transport prices, greenhouse gas emissions from transport, greenhouse gas emissions from road transport, emissions of nitrogen oxides (NOx) from non-road transport, emissions of nitrogen oxides (NOx) from road transport, emissions of particulate matter from non-road transport, emissions of particulate matter from road transport.

The analysis suggests that Romania, although it has a good position on the European map, lacks of a infrastructure necessary to promote a favorable modal split and the non-road means of transport are old. All these aspects have a negative influence on the sustainable development indicators in the freight transport at the national level.
Study on the impact of freight transport on the environment in Romania, using the Engel Granger methodology

The purpose of this section is to verify to what extent a more efficient management of the available transport modes can help Romania both in improving environmental indicators and fulfilling the objectives proposed by the European Commission regarding the reduction of pollution.

Although there are several methods that can help in analyzing the long-term dependency between CO₂ and the quantity of transported freight, the author has chosen the Engel Granger methodology to analyze the co-integration, as it was easy to apply and suitable for the length of the time series considered (20 years). In the case of stationary data the Pearson coefficient has been used.

The analysis revealed that there is a negative long-term relationship between CO₂ emissions and the quantity of goods transported by rail. A positive long-term relationship is registered between the quantity of goods transported on sea and the CO₂ emissions. A similar relationship is registered between the quantity of goods transported on inland waterways and the CO₂ emissions. In addition, it has been observed that in Romania there is a significant correlation between the growth rhythm of CO₂ emissions and the one of road freight transport, which suggests that this transport mode, although indispensable, is less prior in the development of a new modal split at national level.

Study on ensuring sustainability in terms of energy consumption in freight transport, using the multiple Ordinary Least Squares method

Due to the strong competition between road and rail transport and the existing regulations from the EU, the objective of this case study was to analyze by comparison the impact of the use of rail and road freight transport on the evolution of energy consumption from transport in Romania. In order to demonstrate that rail transport is much more environmentally friendly than other modes of transport relative to energy consumption, the author has applied the multiple Ordinary Least Squares method.

The resulted study has showed that rail freight transport is much more ecological and cheaper than road transport. Furthermore, it has been demonstrated that despite an increase in road transport due to an increased need of infrastructure, an equal increase in the quantity of goods transported by rail will generate a considerable decrease in energy consumption. As 60% of the energy consumption in the transport sector is explained by the quantity of goods transported by rail and road, this chapter has highlighted the fact that a well balanced mix
between the two transport modes should be implemented in Romania in order to meet the energy consumption objective imposed by the EU until 2020.

Chapter 4: Study on ensuring sustainable performance in freight transport from Romania in the context of sustainable development requirements

Study on the economic effects of the use of transport modes in Romania, using the Engel Granger methodology and the Pearson correlation coefficient

This section aimed to analyze the existence of a long-term relationship between the modal split of transports and the sustainable economic development. Moreover, a comparative analysis regarding the different actions used in the modal field, which affect the sustainable economic growth has been conducted. The methodology used was the Engel-Granger analysis for the estimation of co-integration.

The analysis has found that an increase in the quantity of freight transported on inland waterways will generate an increase of GDP index, causing economic growth. Moreover, an increase of GDP index generates an increase in quantity of freight transported on inland waterways, which means that entrepreneurs consider this mean of transport profitable. A long-term relationship has been observed between the quantity of goods transported on sea and the economic growth, only at a significance level of 15%. The inverse realationship is confirmed for the significance level of 5%.

Study on the management of freight transport in Romania, to achieve sustainable performance, using the seasonal adjustment

Transport represents a sector which significantly contributes to the economy of any country. This is why this activity should be optimized accordingly. One of the components, that should be carefully analyzed in this respect is the seasonal component.

Typically, the data adjustment at company level takes place in order to compensate the fluctuations in demand, in order to control seasonal factors. However, this type of analysis presents limitations especially when it is desired to follow de trends for many months or years. This is why, the present section aimed to verify the impact that the elimination of seasonal influence on the annual transported quantities can have at national level (in Romania). In order to do so, the author has used JDemetra+, the software package officially recommended by Eurostat, in order to perform the seasonal adjustments. The analyzed data series were represented by quarterly values for the rail and road freight transport quantities.
The analysis of adjusted series is necessary to ensure a sustainable supply chain. Based on such an analysis, companies can predict the transported amount of goods for the next 4 quarters. Moreover, one can calculate the growth indices of a quarter compared to the previous quarter, so that to instantly obtain a diagnosis on the transport activity. Also, these indicators can predict the overall evolution of economy in a very short time period.

**Study on infrastructure investments as a support for the ensurance of sustainable performance, using the Engel-Granger methodology**

This section offered an analysis conducted in order to find out if in Romania’s case there is a long-term relationship between road, rail, inland waterways and air infrastructure investments and the GDP evolution. Therefore the Engel-Granger analysis has been used.

The results of the analysis indicated that an increase of infrastructure investments will determine an increase of GDP, generating thereby economic growth. At national level, for a sustainable economy, investments must be made primarily in rail transport.

**Chapter 5: Aspects on ensuring sustainable performance in freight transport using the principles of business continuity management**

Emerged as a form of crisis management, business continuity management has evolved subsequent due to the emergence of new paradigms in the way of doing business. The risks of globalization play an essential role in this regard. Normative pressures - based on national and international standards - practiced in the last ten years by governments and regulatory agencies encourage organizations to modify their processes. Obviously, activity sectors where risk is more likely and more intense - and transports are part of this category - evolve faster and wider than others.

In response to these evolutions, many decision makers in the public and private sector pronounce today in favor of *rethinking of practices in the business continuity field*: they affirm that in the current - globalized, turbulent and complex - context, continuity management should become a routine element for any business, integrated at a global level within the company. One of the recent trends is thus the integration of relevant disciplines such as risk management, supply chain management, and of the sustainable development requirements in the business continuity management programs.

Emerging countries play today an important role in the sustainable development of world’s economy, but the rapid evolution of companies that operate on this globalized market is
accompanied by increased risks. Romanian companies should therefore identify and manage these risks in order to ensure themselves a sustainable economic development.

This is why one tries to move from *ad hoc* practices to global, systematic, predetermined processes, which can play a more strategic role. The aim is the development of continuity management methodologies, that can enable the development of a strategic defensive capacity against risks, alerting company’s managers, evaluating company’s vulnerability and enabling the development of preventive, corrective, proactive and reactive measures, designed to counter the impact of any possible activity disruption.

**Business continuity management, strategic planning and sustainable performance**

The integration of business continuity management with the strategic planning of performance allows tackling global strategic aspects in strict correlation with the continuity requirements and can prove as beneficial both at country, and company level. Beyond the existing international regulations and standards in this area, the sense of reality and the manager’s capacity to produce best practices specific to their businesses, play an essential role. In this context, the author has focused on an example of sustainable performance management in rail freight transport, using business continuity management.

In the current globalized, turbulent and complex context, a key concern of Romanian enterprises is the long-term performance ensurance, in the context of critical situations, that can affect business continuity. The literature does not present a defined model in this respect.

Relying on the approach proposed by Hotchkiss (2013) the author has proposed a business continuity model, which was tested in a Romanian rail freight transport enterprise, using the simulation of a crisis situation on a supply route of a fuel depot. With performance being directly conditioned by the obligation to ensure the quantity and regularity of transport specified in the contract, the optimal route has been calculated to ensure business continuity. The definition and experimentation of an assessment model of global performance of a rail freight transport company considering the business continuity steps and criteria have shown, that the ensurance of a sustainable performance requires taking into consideration the emergency management, before signing any freight transport services contract.

**Performance, business continuity planning and supply chain management**

One area in which business continuity planning is still relatively used is the one of supply chains at the enterprise level and this despite the fact that in the actual context of globalization, the disruptions in the supply chain are becoming more increasingly common in a large number of
sectors (transport sector being a good example in this respect). If not properly managed, the risk of supply chain disruption results in performance issues.

Business continuity planning needs to be incorporated in the supply chain so as to make it resistant to activity interruption. There is thus a clear relationship between performance monitoring and preventing supply chain interruption in the form of continuity management. Understanding and managing performance represents an essential element for companies that operate in rapidly changing business environments.

It is obvious that for an effective supply chain management one should take into account the indicators that ensure a balanced approach, that represent the strategic, tactical and operational levels and to be both financial and non-financial measures. Thus, a balanced supply chain management assessment, such as a Balanced Scorecard approach, enables a faster and comprehensive monitoring of operation’s execution and can improve internal and external business functions, by ensuring their continuity. Therefore the study has concentrated on this type of approach, drawing on the work of Bhagwat and Sharma (2007), who themselves inspired from the framework proposed by Kaplan and Norton (1996).

The study was conducted in a Romanian rail freight transport company, which expressed it’s interest in monitoring and improving it’s supply chain management at the level of the existing contracts, in order to ensure business continuity. The rail freight transport contract required the rail operator zero rail accidents due to his fault, 100% fulfillment of monthly orders and the 95% delivery deadlines compliance (requirements that ultimately correspond to ensuring business continuity).

The research has confirmed the fact that the proposed method enables the real time monitoring of supply chain management results and offers the possibility to take corrective measures so that discontinuities to be substantially reduced.