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Tatjana SVIDERSKĖ

COUNTRY RISK ASSESSMENT IN ECONOMIC SECURITY AND SUSTAINABILITY CONTEXT

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Abstract

In the dissertation the issues of country risk assessment in economic security and sustainability context are investigated. The main object of research is country risk and its structural components. The dissertation‘s main goal is to analyze valuation methods of country risk from different perspectives and suggest a model for country risk measurement which allows to adequately evaluate country risk, economic security and economic sustainability level and dynamics, including structural components and their relationships.

The dissertation approaches several main tasks: to highlight the importance of country risk evaluation and its assessment in growing global markets, analyzing causes and elements of country risk based on other scientific researches; to explore and clarify advantages and disadvantages of country risk assessment methods, as well as to investigate sources of country risk and ways how to manage the risk; to apply quantitative and qualitative methods for analysis, formulate, create and present country risk assessment model in economic security and sustainability context, which will identify factors, influencing country risk and determine their direct and indirect relationship between each other. The last task is to verify practical suitability of country risk assessment model by performing empirical analysis in EU Baltic Sea region countries, identifying directions for mitigating risk effects.

The dissertation consists of introduction, 3 chapters, general conclusions, references, list of publications by the author on the topic of dissertation and 4 annexes. The introduction presents the investigated problem, importance of the thesis, the object of research and describes the goal and tasks of the thesis, as well as research methodology, importance of scientific novelty, the practical significance of results and defended statements. The introduction ends with the author’s publications on the topic of the dissertation and states the structure of the thesis. Chapter 1 presents analysis of concepts and methodologies of country risk, further describing economic sustainability concept and economic security approach. Chapter 2 presents analysis of assessment methods for country risk and its assessment, analysis of multicriteria methods MOORA and MULTIMOORA and approaches of different rating agencies and analysis of those approaches. Chapter 3 presents suggested country risk assessment model as well as investigated results of empirical approbations of the model in EU Baltic Sea region countries. At the end of the dissertation, general conclussions are presented.

4 articles focusing on the topic of the dissertation are published to approve the results.

Reziumė

Disertacijoje nagrinėjami aktualūs klausimai, susiję su šalies rizikos vertinimu ekonominio saugumo ir tvarumo kontekste. Pagrindinis tyrimo objektas yra šalies rizika ir jos struktūriniai komponentai. Pagrindinis disertacijos tikslas – išanalizuoti šalies rizikos vertinimo metodus skirtingais aspektais ir pasiūlyti šalies rizikos vertinimo modelį, kuris leistų adekvačiai vertinti šalies rizikos, šalies ekonominio saugumo ir ekonominio tvarumo lygį, jų pokyčių dinamiką, atsižvelgiant į struktūrinius komponentus ir jų tarpusavio ryšius.

Disertaciniame darbe sprendžiami keli uždaviniai: atskleisti šalies rizikos nustatymo ir jos vertinimo svarbą augančiose globaliose rinkose, naudojant mokslinių tyrimų rezultatus išanalizuoti šalies rizikos priežastis ir elementus; ištirti esamų šalies rizikos vertinimo metodų pranašumus ir trūkumus, taip pat išnagrinėti šalies rizikos veiksnius ir būdus kaip valdyti riziką; pritaikyti kiekybinius ir kokybinius metodus atlikti analizei, parengti šalies rizikos vertinimo modelį ekonominio saugumo ir tvarumo kontekste, kuris leis įvertinti šalies rizikai įtaką darančius veiksnius, nustatyti jų tiesioginius ir netiesioginius tarpusavio ryšius. Disertacijoje dar sprendžiamas uždavinys patikrinti šalies rizikos vertinimo modelio praktinį tinkamumą, atliekant empirinį ES Baltijos jūros regiono šalių rizikos vertinimo tyrimą, numatyti kryptis šalies rizikos padariniams mažinti.

Disertaciją sudaro įvadas, trys skyriai, bendrosios išvados, naudotos literatūros šaltinių sąrašas, autorės mokslinių publikacijų disertacijos tema sąrašas ir 4 priedai. Įvade atskleidžiama tiriamoji problema, darbo aktualumas, aprašomas tyrimų objektas, formuluojamas darbo tikslas bei uždaviniai, aprašoma tyrimų metodika, darbo mokslinis naujumas, darbo rezultatų praktinė reikšmė ir ginamieji teiginiai. Įvado pabaigoje pristatomos disertacijos tema autorės paskelbtos publikacijos bei disertacijos struktūra. Pirmame disertacijos skyriuje analizuojama šalies rizikos sąvoka ir metodologijos, taip pat analizuojamos šalies ekonominio tvarumo ir ekonominio saugumo sąvokos. Antrajame disertacijos skyriuje pateiktas šalies rizikos nustatymo ir jos vertinimo metodų tyrimas, daugiakriterinio MOORA ir MULTIMOORA vertinimo metodų analizė ir skirtingų reitingavimo institucijų vertinimo būdų analizė. Trečiajame skyriuje pristatytas siūlomas šalies rizikos vertinimo modelis bei aprašomi ES Baltijos jūros regiono šalių empirinių tyrimų modelio rezultatai. Disertacijos pabaigoje pristatomos mokslinio darbo bendrosios išvados.

Disertacijos tema paskelbtos keturios mokslinės publikacijos pagrindžiančios darbo rezultatus.

Notations

Abbreviations

AHP – analytic hierarchy process
AVS – aggregate value of state
BERI – business environment risk intelligence
BRS – business risk service
CGSDI – consultative group on sustainable development indicators
CRA – country risk analysis
DSS – decision support system
EAW – economic aspects of welfare
ECR – euromoney country risk
EESI – european economic sustainability index
EIU – economist intelligence unit
EPI – environmental performance index
ESI – environmental sustainability index
EU – European Union
GARCH – generalized autoregressive conditional heteroskedasticity
GDSS – group decision support system
GPI – genuine progress indicator
GSI – genuine savings indicator
HDI – human development index
ICRG – international country risk guide
IISD – international institute for sustainable development

IMF – international monetary fund
IRS – internal revenue service
ISEW – index for sustainable economic welfare
ISP – index of social progress
LDC – less-developed country
MEW – measure of economic welfare
MH DIS – multi-group hierarchical discrimination
MIPS – material input per service unit
MOORA – multi-objective optimization by ratio analysis
NI – national income
NSE – national stock exchange
OECD – organization for economic cooperation and development
ORI – operations risk index
POR – profit opportunity recommendation
PQLI – physical quality of life index
PRS – political risk services
SPI – sustainable progress index

Contents

Introduction

Problem Formulation

Each business operation causes some kind of risk. When business operations occur in international dimension, they bring additional risks, which are not typical for domestic operations. These additional risks are called country risks and usually include risks arising from a variety of national differences in policies, geography, economic structures, socio-political institutions and currencies. Country risk analysis (CRA) tries to solve this problem by identifying the potential for these risks to decrease the expected return of cross-border investments.

Concept of "Country risk" began to be widely used in the 1970s. It was originally more professionally oriented in the sense that it aimed at addressing the concrete issue of a particular business in a particular country and was generally used by the banking industry.

Reviewing the sovereign rating history and its methodological evolution, the term "country risk" as opposed to "political risk" has been gaining ascendency because it has a broader meaning in that it can include any risk specific to a given country, whereas "political risk" restricts the risks to those that are exclusively political in nature.

Every year it becomes more and more difficult to analyse and predict changes in the financial, economic and political sectors of business. The

importance of country risk analysis is now more understandable and potential for it is growing by establishing more and more country risk rating agencies, which combine a wide range of qualitative and quantitative information regarding alternative measures of economic, financial and political risk into associated composite risk ratings. However, the accuracy of any rating agency with regard to any or all of these measures is open to question. Different researchers (Busse, Hefeker 2006; Cathy, Goldberg 2009; Kesternich, Schnitzer 2010; Benítez *et al.* 2007; Bordo 2009; D'Argensio, Laurin 2009; Abdullah 1985; Aggarwal *et al.* 1989; Aliber 1973; Collier *et al.* 1999; Levy *et al.* 1970; Grubel 1968) in their studies provide a qualitative comparison of country risk rating systems used by seven leading rating agencies, as well as a novel analysis of four risk ratings using univariate and multivariate volatility models for nine East European countries.

These ratings are compiled by the International Country Risk Guide (ICRG), which is the only risk rating agency to provide consistent monthly data for a large number of countries. The limitation of this rating is that it can not be used for all countries and takes into account quite clearly identified and not changable bucket of variables.

Globalization, after undermining the old definition of economic security, is found at the centre of a new definition that emphasizes the risks of unexpected shocks and economic volatility. The new definition must capture the causal consequences of globalization accurately and establish explicit benchmarks for assessing globalization's effects on economic security and country's economic sustainability.

The dissertation will answer the question to a problem how to capture the balanse to adequately assess country risk, economic security and economic sustainability level and dynamics, taking into account structural components and their relationships between each other.

Relevance of the Thesis

Practical results of this thesis could be used for formation of country's strategy for assessing country risk and for attracting investments, aiming to correctly establish strategical country's economic and social-political issues, taking into account evaluation of country economic security and sustainability. Furthermore, complex country risk assessment model will allow to analize in more details country risk factors and their types.

The results could be applied for analysis and evaluation of current country risk influence on country market, in order to find out major factors and evaluate possible concerns to form country's policy with target to correctly assess

country risk influencers attracting new possibilities for growth in a specific country or region.

The Object of Research

Object of research – country risk and its structural components in economic security and sustainability context.

The Aim of the Thesis

The main goal of the thesis is to create a model for country risk assessment which allows to adequately evaluate country risk, economic security and economic sustainability level and their dynamics, taking into account structural components and their relationships between each other.

The Objects of the Thesis

For achieving the goal of the thesis several tasks were raised:

1. To highlight the importance of country risk evaluation and its assessment in growing global markets, analyzing causes and elements of country risk performed by other scientific researches.
2. Explore and clarify advantages and disadvantages of country risk evaluation methods, as well as investigate sources of country risk and ways how to mitigate the risk.
3. Applying quantitative and qualitative methods for analysis, formulate, create and present country risk assessment model in economic security and sustainability context, which will identify factors, influencing country risk and determine their direct and indirect relationships between each other.
4. Verify practical suitability of country risk assessment model by performing empirical analysis EU Baltic Sea region countries, identifying directions for mitigating risk effects.

Research Methodology

Preparing scientific analysis and analysis of the data, different types of methods for research were used: complex, multicriteria evaluations, comparative analysis, quantitative and qualitative methods for analysis, modeling, analysis of statistical data and others.

In theoretical part of the dissertation, where scientific problem and scientific literature were analyzed, comparative, generalization and systematic methods were applied.

In second section of the dissertation, where country risk assessment methods and sources are analyzed, scientific and analytical methods, as well and qualitative and quantitative were employed.

The third part of the dissertation, empirical one, is imposed to create and verify country risk assessment model, using combination of both quantitative and qualitative valuation methods as well as multicriteria methods MOORA and MULTIMOORA for approbation of results.

Scientific Novelty of the Thesis

Country risk assessment has been analyzed by different authors but in quite narrow way, in this dissertation the concept of country risk and influencing factors are presented in an extended view.

Preparing dissertation, following new scientific novelties in economics were discovered:

1. Expanded and consolidated overview of analyzes of country risk concept, its components and arising problems were analyzed in another angle which allowed to identify new possibilities and challenges for creating new model for assessment of country risk.
2. Broader analysis of country risk – includes not only political risk, but as well socio-economical aspects, presents clear and analyzed new concept which was not assumed in previous researches.
3. Created and empirically approved complex country risk assessment model in economic security and sustainability context can be used in analyzing status of country risk of a specific country or region.

Value of Research Findings

Presented systematic analysis of theoretical country risk aspects and its valuation and assessment methods could be useful in creating new country risk assessment model based on suggested conception, which allows to evaluate and take into account specific mases of country risk assessment, as well as notice and assess country risk cause and effect relationship.

Proposed complex model of country risk assessment would open opportunity to coherently and in details to investigate importance of country risk components and detect instruments to possess country risk.

Suggested country risk assessment model could be usefull for different interested parties – government, commercial and national banks, regulatory authorities, citizens, investors and other institutions.

The Defended Statements

1. Country risk concept should be understandable in a broader way, including not just several economic aspects and political risk, but considering economic sustainability and economic security variables as well.
2. Country risk assessment should include not only country's domestic economic variables and influencing factors, but as well include assessment of social, macroeconomic policy evaluation and balance of payment variables.
3. Country risk, economic security and sustainability variables are interrelated and interdependent between each other in one or another direction and the level of dependence could be clearly identified.

Approval of the Research Findings

There are 4 scientific publications on the topic of dissertation: two listed in ISI Web of Science (Stankevičienė, Sviderskė, Miečinskienė 2013; Stankevičienė, Sviderskė, Miečinskienė 2014), 1 listed in ISI Proceedings (Stankevičienė, Sviderskė 2012) and 1 is published in other journals (Stankevičienė, Sviderskė, Miečinskienė 2014). The results of research were introduced in 2 conferences:

– international scientific conference *"Contemporary Issues in Business, Management and Education'2013"* in 2013 held in Vilnius;

– conference for junior researchers *"Business in the XXI Century"* in 2014 held in Vilnius.

Dissertation Structure

Dissertation is composed of introduction, three chapters and general conclusions, list of references, list of author's publications on dissertation topic and 4 appendixes.

Disseration volume – 120 pages, including the summary but excluding appendixes, in which 7 formulas, 11 figures and 21 tables are used. 202 literature references were used when preparing the dissertation.

1

Problem of Country Risk Assessment in Economic Security and Sustainability Context

To start with a research, firstly it is needed to identify the problem of country risk assessment in economic security and sustainability context. This chapter will cover the problem of the research, analyze definitions of concepts, their classifications, sources and conceptual analysis.

For topic of this chapter of dissertation two scientific articles were published (Stankevičienė, Sviderskė, Miečinskienė 2014; Stankevičienė, Sviderskė, Miečinskienė 2013).

1.1. Introduction to a Problem

Every year it becomes more and more difficult to analyse and predict changes in the financial, economic and political sectors of business. The importance of country risk analysis is now more understandable and potential for it is growing by establishing more and more country risk rating agencies, which combine a wide range of qualitative and quantitative information regarding alternative measures of economic, financial and political risk into associated composite risk

ratings. However, the accuracy of any rating agency with regard to any or all of these measures is open to question. Hoti (2005a) in the study provides a qualitative comparison of country risk rating systems used by seven leading rating agencies, as well as a novel analysis of four risk ratings using univariate and multivariate volatility models for nine East European countries. These ratings are compiled by the International Country Risk Guide, which is the only risk rating agency to provide consistent monthly data for a large number of countries since 1984. The empirical results enable a comparative assessment of the conditional means and volatilities associated with country risk returns, defined as the rate of change in country risk ratings, across the nine East European countries.

Country risk analysis is an attempt to deal with a large set of uncertainties. The massive number of variables the researcher must grapple with and the range of areas they cover (for example, political, economic, or legal) make the attempt seem futile at first glance. Judging by its results, the attempt was indeed futile in most of the cases. Ingo Walter (1981) accurately summarized the problems of country risk analysis: "In the absence of an efficient market whose data can be analyzed, the delivery of effective country risk assessment ideally requires the employment of a true 'Renaissance person', exceedingly intelligent, a holder of doctorates from respectable institutions in economics, political science, sociology, psychology, and perhaps a few other fields as well, totally objective, with a great deal of common sense."

Country risk appears to be very unsystematic in nature and thus very unpredictable. Agencies with vast resources and intelligence networks failed to predict quite many changes in economics worldwide. This shifting sand undermines any analysis no matter how carefully constructed. The same loan could be almost without risk under one set of conditions and very risky under different world economic conditions, world political conditions, a different government in the borrowing country or different policies by the same government in the borrowing country. However, intricate and forbidding this may appear, bankers have tried and continue to find better ways to assess country risk and update their country ratings one to four times per year. Country risk analysis usually begins with a look at the available data and moves towards building reasonable and comprehensive models that would utilize the data and produce forecasts about defaults and their probability of occurrence. The data currently available to banks are less than adequate. Their quality is largely, if not totally, uncontrollable by banks. Some of them may be "managed", incomplete, or fundamentally flawed. The ability of banks to extract additional information is limited. The release of certain data may be deemed inconsistent with the national interest. Yet the data set continues to expand, as does the frequency of its release, thanks to the efforts of the Institute of International Finance, the BIS and large commercial banks. The various adjustments applied to the debt data

have also been subject to controversy. Some economists prefer to speak of net instead of gross debt, where net means gross borrowing adjusted for external reserves of the borrowers. Other economists prefer to speak in real terms instead of nominal terms. They adjust the debt level and thus the real size of the principal amortization to balance the increase in interest payments resulting from higher actual or expected inflation. Most economists break down sovereign loans into their component parts by type of borrower and by maturity. This is necessary as the maturity structure in relation to available net cash flow at a point in time could change the risk profile of the country.

The breakdown between private and public debt is becoming increasingly fuzzy, however, as governments decree for themselves preferential access to foreign exchange earnings both private and public. The available data are largely acceptable and are getting better, particularly on private debt not publicly guaranteed. The data on long-term, public, non-military debt, of developing countries are quite adequate. The creditor reporting system of the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee, the World Bank and the biannual survey of the maturity of international bank lending by the BIS contain valuable and reliable sources of information. The bulk of the data is on economic variables.

Political and sociological data, while available, are not as accurate and certainly not as carefully analyzed by users. That is why the common wisdom is that bankers are good at assessing economic risk but very poor at assessing other risks. Furthermore, it would be dangerous to assume that the political factor can be ignored in developed countries. Therefore, while developed countries are generally more stable, more accountable and have higher levels of diversification in their exports, both in terms of markets and exported products, their country risk is not negligible.

1.2. Analysis of Country Risk Concept, Classification and Sources

In order to clarify the potential aspects for problem decision, thorough analysis of different theories and concepts for country risk, its classification and sources of country risk should be analysed.

1.2.1. Definitions of Country Risk

There are a lot of studies related to country risk, its financial integration in a country, the impact on economics and other aspects of country's welfare (Cathy, Goldberg 2009; Kesternich, Schnitzer 2010; Benítez *et al* 2007; Bordo 2009;

D'Argensio, Laurin 2009, Eichengreen, Rose 2000, Cantor, Packer 1996a, Cosset, Suret 1995, Erb *et al.* 1995, Harvey 1995, Kennedy 1991, Sortino, van der Meer 1991, March, Shapira 1987, Merrill 1982, Kobrin 1978, Nagy 1978, 1988).

For some group of researchers country risk refers to the "probability of occurrence of political events that will change the prospects for profitability of a given investment" (Haendel *et al.* 1975). One of approaches adopts a practical stance and analyzes risk as a negative outcome. With this meaning, risk will exist if it implies a possible loss or at least, a potential reduction of the expected return, as stated by Meldrum (2000).

The concept of country risk has different meanings and could be understood either as a performance variance or just as the likelihood of a negative outcome that reduces the initially expected return. The concept of downside risk was already mentioned in Markowitz (1952, 1959), though it is mainly because of computational difficulties in handling this type of model as well as the assumption of normally distributed returns that the variance was favoured as a measure of risk. The paper of Nawrocki (1999) reviews the literature and presents the advantages of using a downside risk approach in view of a total risk stance.

Roy (1952) and Bawa and Lindenberg (1977) had already integrated the notion of downside risk into portfolio theory, but Estrada (2000), Feldstein (2002) and Reuer and Leiblein (2000) have emphasized the usefulness of the downside risk approach for studying emerging markets and international joint ventures. Quer, Claver and Rienda (2007) have introduced an integrated approach by comparing the impact of country risk and cultural distance on entry mode choice. Busse and Hefeker (2006) have also analyzed the risk and its influence of foreign direct investments. Table 1.1 consolidates some of the terminologies of risk.

Analyzing the literature over the last 40 years, situation with country risk changes, as more and more companies are making their businesses abroad, as a result, the specific risks it engenders occurs, whatever the source of risk and the nature of the industry. Without doubt, specific features of each investment or transaction type must obviously be taken into account. Country risk analysis (CRA) tries to define the potential for these risks in order to decrease the expected return of a cross-border investment. Such definition rejoins the very early articles of Gabriel (1966) or Stobaugh (1969) where the investigation was made on difference in investment climate at home and abroad – in a foreign country.

Table 1.1. Various approaches in the literature on country risk (author)

Terminologies	Definition of risk	Sources of risk	Nature of the investment	Methodology
Political risk	Performance variance	Sovereign interference	Foreign direct investment	Qualitative
Country risk	Negative outcome	Environmental instability	Banking commercial loans	Quantitative
Sovereign risk	Foreign exchange	Credit institutions	Portfolio investment	Quantitative
Cross-border risk	Foreign governments	Volatility of consumption	Banking loans	Quantitative

It highlights the specific risks when doing business abroad, outside the national borders of the company's country of origin. Sometimes economic level of country's development is not so important, as even economically developed countries can face with a degree of country risk. Finnerty (2001) noted that "many project finance professionals would argue that natural resource projects in the United States are exposed to political risk because of the proclivity within the United States to change the environmental laws and apply the new laws retroactively".

A comprehensive formulation of country risk theory is yet in progress. Till now, the literature is usually indicating the implicit assumption that, for a given country, imbalances in the economic, social and political fields are likely to increase the risk of investing there. Because of the multiplicity of the sources of country risk, the complexity of their interactions and the variety of social sciences involved, an underlying theory of country risk is still missing. Such a conceptualization would greatly help to identify the variables at stake. It would make it possible to test the respective relevance of the various approaches on offer. So far, most of the research merely consists of a classification and a description of the various potential sources of risk, and the assessment methods turn these elements into numerical variables without any scientific justification. Fitzpatrick (1983) writes on the subject that "the literature is found to define political event risk rather than political risk". Citron and Nickelsburg (1987) have proposed a model of country risk for foreign borrowing as well as estimated which incorporates a political instability variable. The proposed model predicts high probabilities of default for most of the actual default dates for six countries looking on historical perspective. This is suggestive of how to understand the phenomenon of foreign debt default.

To summarize the analysis of scientific literature about country risk, it is obvious that researchers are analyzing country risk approach only partially, not

adapting the concept to growing globalization topic, which definitely makes changes in country risk approach. Country risk concept should be analyzed and understandable in abroader way, including economic security and sustainability effect, so this updated approach will be discussed in upcoming chapters.

1.2.2. Classification of Country Risk

To start with, a historical classification of country risk will be analyzed. Afterwards, modern classifications prepared by nowadays researches will be presented.

A survey by the Export Import Bank classified country risk models into four categories:

- fully qualitative;
- structured qualitative with some statistical data;
- structured qualitative plus checklist qualitative with some quantitative techniques added;
- econometric approach – highly structured and mathematically based.

An example of this is the logit model, which predicts the probability of default. The early country risk assessment models built on the original work of Avramovic (1964). Frank and Cline (1971), followed by Feder and Just (1980), first explored logit analysis. Ratio analysis was emphasized, as far as academic research shows, by Sofia (1981), the checklist of selected variables by Thompson (1981), and market spread rate analysis by Haegele (1981).

Afterwards, Morgan (1986), Solberg (1988), Shanmugam (1990), Kaminsky *et al.* (1997), Wynn (1995, 1997), Ul Haque *et al.* (1996), Klein (1998), Krugman (1998), Hardy *et al.* (1999), Terrier (1999), and Wynn *et al.* (1999) provided further analyses of various factors that contribute to the sovereign risk or country risk in general. The factors investigated in these studies, which often use a linear regression model, include several categories of indicators:

- debt variables;
- balance of payments variables;
- income and expenditure variables;
- monetary variables; and
- credit market supply-side variables.

In many cases, the factors used in each model included a wide array of variables. How one can carefully weigh each variable (over 100 in some cases), each with its own dynamics, and come out with a consistently accurate prediction remains a big question. This did not discourage banks from trying to

find the solution. The frequently used variables in a qualitative or a quantitative model are (Wynn et al. 1999):

I Economics:

A. Background (natural resources, demographics, other).

B. Current indicators:

(1) internal – GNP, inflation, government budget, consumption, investment;

(2) external – trade account, current account, capital account and/or foreign debt analysis, other (export diversity, import compressibility, main trading partners).

C. Long-run indicators:

(1) managerial capability;

(2) investment in human capital;

(3) long-run projections – internal economic indicators, external economic indicators.

II Politics:

A. Stability:

(1) type of government;

(2) orderliness of political successions;

(3) homogeneity of the populace.

B. External relations:

(1) quality of relationships with major trading partners;

(2) quality of relationships with the United States.

C. Long-run social and political trends.

All the analyses assume that the past is a guide to the future. This can lead banker into believing that the presence of a model is sufficient grounds for setting loan rates that are consistent with the estimated underlying risk. Euromoney (2001) has developed a new rating system that assigns points to each country. The system reflects "access to market rather than economic rating". Some misgivings have, however, been raised by Cantor and Packer (1995) as to the usefulness of the ratings. They point particularly to (i) disagreements between the relative sovereign risks implied by the rank orders of market yields on sovereign bonds, and to (ii) differences between the ratings themselves from different agencies for a number of countries, especially those countries with lower ratings.

What all the models, regardless of sophistication, ignore or cannot incorporate are these important considerations (Harlow *et al.* 1989; Solnik 1991; Schwartz *et al.* 1992; Roy *et al.* 1994; Stevens 1997; West 1999; Kobrin 2001):

1. The compounding effects a bad loan can have on the bank balance sheet. Bad debt begets more bad debts as banks attempt to bail out client states.
2. Banks with a heavy commitment to a country lose their flexibility. The use of bank loans is frequently beyond the control of the bank. Non-productive uses increase future debt service requirements but not debt servicing capacity. An example of a loan for financing consumption is a balance of payments adjustment loan.
3. The importance of and the price one has to pay for penetrating a market can be very substantial. Several of the toeholds in international lending, by regional banks in particular, were achieved through loan syndications where the lead bank had excessive leverage.
4. The lack of vigour of regulatory agencies may very well influence the type, size and other characteristics of the loan. Political pressures in the country of domicile could supersede country risk considerations.
5. The hardened mentality regarding a critical economic variable can be very problematic. The dramatic increase of bank loans to the Organization of Petroleum-Exporting Countries (OPEC) in the late 1970s was based on the pervasive faith that oil prices cannot but go upward. This was the "consensus" which proved disastrous.
6. As banks charge higher interest rates to reflect higher country risk, they may be increasing that risk. Higher interest rates increase the probability of default. A significant portion of current less-developed country (LDC) debt represents accumulated interest on debt. Furthermore, higher interest rates in the world markets make for more attractive investment opportunities, encouraging capital flight out of LDCs, which decreases their ability to pay.
7. A new loan by a given bank will have a different impact on the total riskiness of the bank's portfolio, depending on how much is already outstanding in this type of loan or for this type of borrower. The current diversification rules, which limit lending to a single borrower to 5% of capital, do not apply to categories of borrowers. This means that a bank can have exposure in a given country equal to several times its capital.
8. Lenders are not capable of monitoring either the economies of debtor countries or the total indebtedness of these countries. They lack both the legitimacy and the expertise. The upper limit on country risk is, therefore, not controllable by the bank unless country exposure is limited to the worst possible scenario, which effectively negates the usefulness of country risk analysis. The data, while available, may not be sufficiently revealing. From a banker's perspective, a balance of payments surplus, for example, resulting from cash or near cash deals is superior to one resulting from barter-type deals. Hyperinflation is but a slower (mildly)

way for wealth expropriation. It is a form of tax which rises exponentially and scares in the process both lenders and investors (Euromoney, 1998, World Bank Issue).

Country risk analysis, irrespective of the evidence, was and remains strongly dependent on human judgement. That is the nature of the beast. The country risk discussed deals with single loans and single borrowers. The portfolio effects cannot be ignored, however. Ingo Walter (1981) argued that several problems are encountered when the portfolio approach is considered. Among them are:

1. The dispersion in portfolio preferences between bankers, investors and regulatory authorities. Each of these agents has a different objective function to maximize.
2. The illiquidity of sovereign debt held by banks, which reduces their ability to adjust their portfolio. This risk has been reduced by debt restructuring involving third-party guarantees such as those provided by the government in the form of the bonds.
3. The asymmetry in the variance of returns on international loan portfolios: "The variance of these returns may be entirely on the downside". Upside variances that would favour the bank are typically treated as equally significant as those on the downside.
4. The lumpiness of changes in country exposure makes portfolios "difficult to adjust at the margin".

All of these factors contribute further to the difficulty of assessing and dealing with country risk. The problem is compounded by the eternal optimism with which banks treat troubled loans. Loans are classified (reluctantly) as 'non-performing' while in reality they are bad debt. The IRS (Internal Revenue Service) encouraged this by limiting the tax deductibility of reserves against troubled loans. Loan-loss reserves, which are tax deductible, are limited to 0.6% of the bank's portfolio. Any reserves in excess of these limits must be taken from post-tax earnings. The Interagency Country Exposure Review Committee proposed, in October 1983, two additional reserves to deal with this problem. The first is special prudential reserves for certain countries (bad situations) and basket-type reserves for problem countries. Both of these reserves will be identified on the balance sheet as 'Allocated Transfer Risk Reserves' and will not be considered part of the bank's capital.

Country risk assessment is further complicated by the nature of the contract between a commercial entity and a sovereign government. Sovereign risk emanates from the legal dimension of the problem. There are serious legal issues which need to be addressed. Solnik (1974a,b), Brewer (1981), Flood *et al.* (1984), Ghose (1988), Brewer *et al.* (1990), Ryan (1990), Miller (1992), Swyngedouw (1992), Coplin *et al.* (1993), Juttner (1995), Lensink *et al.* (1998),

Meldrum (2000), Hoti (2002), Hoti (2005b), Bali and Cakici (2010) list each type of country risk and describe its characteristics after having classified the main origins.

Indeed, in the absence of any comprehensive theory, an accurate and exhaustive classification is necessary in order to make an extensive review of the different specific sources of risk, without missing in the future any possible new factor of instability. This is also necessary to be able to undertake an operational monitoring at the country's level. Table 1.2 recaps these various groupings.

Table 1.2. Sources of risk classification (author)

Type of risk	Grouping	Description
Socio-political risk	Political	Democratic or non-democratic change in the government
	Government policy	Change in the policy of the local authorities
	Social	Social movement intending to influence foreign business or host country policy
Economic risk	Macroeconomic	Any macroeconomic risk specific to the host country
	Microeconomic	Any microeconomic risk specific to the host country
Natural risk	Natural	Earthquake and other natural disaster

Globalization and internationalization led to a variety of country risks, which occur due to increase in business relationships internationally. So, importance of understanding how county risk should be classified is obvious, as only then correct evaluation and assessment approach could be applied and used.

1.2.3. Sources of Country Risk

To identify the sources of risk and factors, which are influencing the country's image is more than important. It is not straight-forward approach, so a lot of variables and factors should be take into consideration.

Kobrin (1979) and Desta (1985) identify two main streams. The first one only focuses on the governmental or sovereign interference with business operations. Weston and Sorge (1972) write: "Political risks arise from the actions of national governments which interfere with or prevent business transactions, or

change the terms of agreements, or cause the confiscation of wholly or partially foreign owned business property." For this group of authors, such as Zenoff (1967), Aliber (1975), Baglini (1976), Stehle (1977), Krugman (1979), Agmon *et al.* (1973, 1983), Eichengreen (1996), Frankel *et al.* (1996), Clark *et al.* (1999) or Feils and Sabac (2000), country risk narrowly originates from adverse governmental or sovereign actions. The second stream of literature represented by Robock (1971), Root (1972), Feder *et al.* (1977), Haendel *et al.* (1975), Adler *et al.* (1983), Erunza *et al.* (1985), Rummel and Heenan (1978), Ryan (1992), Kielmas (1998), Spillers (1999) and Stone (2001) refers to the environmental instability and its impact on business conditions. Their line provides a broader perspective and includes not only governmental sources of risk but also any other causes that may impede the efficient functioning of any foreign organization abroad. Fitzpatrick (1983), Stulz (1984), Shapiro (1985) further refine this second approach and divides it into three categories. They identify:

1) "political risk in terms of occurrences of a political nature",
2) "political risk in terms of an environment rather than in isolation", where any change in the business environment may represent a risk, provided it can impact the firm's operations,
3) a last category, where authors do not try to conceptualize the notion of "political risk" but rather merely concentrate on the consequences of operating "in countries where the environment is strange and not well understood", as written subsequently by Drake and Prager (1977).

1.3. Conceptual Analysis of Country Risk Assessment

After analyzing scientific literature about country risk concept, it is clear that to evaluate country risk in nowadays economic situation is not an easy task.The country risk of one country could be expressed by a single index, which shows the degree of the overall risk to invest in or loan to this country. Two types of indices, which represent the degree of country risk, discrete and continuous, exist. Discrete type includes several risk levels, which are predefined and every country is in one level. The number of risk levels may vary from 1 to 20. The single index representing the degree of country risk is a set of different factors about the country. The main interested factors are political and economic-financial ones, and the total number of factors used may vary from less than ten to more than twenty.

Information on country risk covers many fields of knowledge given the multiple number of the factors which lie at the heart of the risks. Information sources can be classified as public and private (Fig. 1.1).

Public sources include governments and their statistics agencies, publicly-owned ECAs, central banks, IFIs and multilateral organizations. Private sources include rating agencies and other rating bodies, commercial and investment banks, insurance companies and the media in general, particularly the press.

Moreover, various associations, policy institutes and research centres, which can be both public and private, also provide useful information for the study of country risk. The graph above provides a summary of the information sources, featuring some examples of each type of source.

Ratha *et al.* (2011) suggest predicting sovereign ratings for developing countries that do not have risk ratings from agencies (such as Fitch, Moody's, and Standard and Poor's). It is important to determine the volume and cost of capital flows to developing countries through international bond, loan, and equity markets.

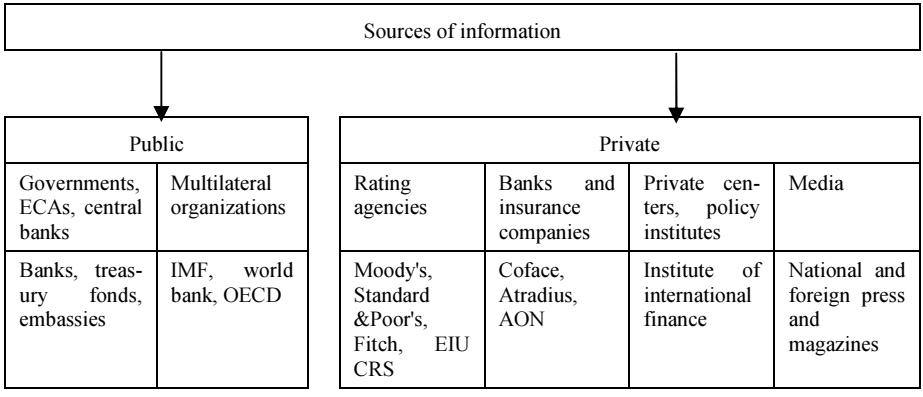

Fig 1.1. Information sources on country risk (author)

Sovereign rating also acts as a ceiling for the foreign currency rating of sub-sovereign borrowers and can be important for their access to international debt and equity capital. Shadow ratings for several developing countries, that have never been rated, could be generated and then it could be found that unrated countries are not always at the bottom of the rating spectrum. Several of them will be in a similar range to that of the emerging market economies with capital market access.

Chen, Gang and Jianping (2008) proposed a new approach for country risk evaluation, which is based on the MH DIS multicriteria decision aid method (Multi-Group Hierarchical Discrimination). They took a sample, consisting of 40 main oil-producing countries and used to estimate the performance of the method in classifying the coun-tries into two groups. A comparison with multiple discriminant analysis, logit analysis and probit analysis were also performed The results indicate the superiority of the MH DIS method as

opposed to these traditional discrimination techniques already applied in country risk assessment. Similarly, Cathy and Goldberg (2009) introduced their point of view on country risk and financial integration by presenting a case study. Marshall *et al.* (2009) have estimated and determined the country risk of emerging market as well as dynamic conditional correlation by using GARCH model, which could be one of alternative for country risk evaluation.

Schroeder (2008) in her paper also surveys the history and current status of country risk assessment. The goal is to understand why it is that country risk assessors have such a poor track record in anticipating the onset of financial crises. The development of the field reflects changes in the composition of international capital flows. These changes have confounded a definition of country risk, especially if a definition is centered on a particular event. It is then argued that the field has reached an impasse, and this impasse is related to the methods of abstraction and the current crisis of vision within the science of economics. This crisis of vision, as it pertains to theories of financial crises, has led to increased reliance on quantitative methods in the field of country risk. So, it is very important to find the object of country risk assessment, which is not to monitor for a particular event or symptom of financial crisis, but, rather, to monitor for a particular state of the economy. Besten (2007) has introduced an analysis on similar risk assessment approaches for European countries.

Further in Chapters, deeper analysis of evaluation of country risk will be presented, taking into account all modern approaches as well as analyzing historical ones.

1.4. Theoretical Approaches to Economic Security and Sustainability

Each government of each country wants to be economically secured from any kind of risks. Economic security is quite new concept in the economy, though it was aready discussed some years ago. Economic security is not a new concern of governments. Earlier, economic instruments have long been part of the governmental strategy, a mean to influence other states and their policies. Economic security in this traditional view was security from manipulation by other governments that wielded these instruments.

The successful state is that state which exports more than imports (Burton *et al.* 1985; Screpanti and Zamagni 1993; Brue 1963, 2000; Krasner 2001, 2003; Jackson, Sorensen 1999; Salvatore 1983; Udovič 2004). The main reason for promoting export was that only through export the state can accumulate a lot of gold that was, in those times, the sign of power. Having power meant being stable and secure. No state intended an attack on other state if it was aware that the

other state was rich, so consequently powerful. Gold was an assurance for peace and stability. Mercantilists view on economic stability and security derived from the state's point of view. The powerful, rich state was a warrantor for stability and welfare. This method of trade is known as zero sum game (only one can gain).

Reassuming this it can be pointed out that for mercantilists the crucial security was state security and they did not acknowledge other types of security or other possible insecurities (like environmental, political, personal, etc.). They also realised that the political instability derives from economic instability, because the primary state's goal was trade and economic welfare. If the last was not achieved then people were unsatisfied. Discontentment (that was created by economic instability) provoked riots, wars and revolutions. Svetličič and Rojec (2002) explain that "security depends equally on reality and perception and it is today understood and guaranteed as "economic and political stability, social cohesion, democracy and employment. Security is a state of mind and that it strongly depends on others and not only on oneself."

Simple explanation (although it is known that can raise many objections) is that "economic security is a never-ending (and not a standstill) process, firstly determined by macroeconomic environment, which is strictly connected with, and effects, mezo level (firms and enterprises); and both determine the micro level (individual needs) economic security. This last, through perception that (personal) economic security exists, and is fixed and stable, directly and indirectly exert influence to the macroeconomic environment, which becomes, for the sake of confidence, even more stable, secure and consecutivnessly reproduces the economic security feelings through "hard macroeconomic indexes" (inflation rate, employment) back to the micro economic level. The circle of reproduction is infinite."

Damijan (1996) established its own criteria called Aggregate value of state (AVS), which is composed of three variables: (1) percentage of the state area in the whole world area, (2) percentage of the population in the whole world population and (3) percentage of the home GDP in world GDP. The result is not the sum, but it is the weighted sum with weights 0.108; 0.205 and 0.976.

Economic security is a topic, which is quite rarely approached by researchers. Very often, the significance of this issue is fully understood only post factum, when the threats to the economic security of a country have had effect (Geršl, Heřmánek, 2006). The history of economy shows that economic security should become the object of a permanent monitoring and management system (Heslop, Helen, 2009; Hlaváček, 2007).

According to Huber *at al.* (2010) economic security could be considered as a preparation state of the economy for ensuring decent conditions for living and developing the personality, the social-economic stability and the political-

military capability of the society and the country in order to eliminate internal and external threats. Generally, there is no finalized and accepted definition of the concept for economic security, because of its multilateral and multidimensional features.

After analysis of different scientific articles and different opinions of researchers (Kesternich, Schnitzer 2010; Bordo, Meissner, Weidenmier 2009; Busse, Hefeker 2006; Finnerty 2001, Zonis 2001; Alon *et al.* 1998; Schwimmer 1995; Simon 1982; Sercu 1980; Wilson 1979), it is clear that the concept of economic security is complex and dynamic. Its complexity stems from the multitude of economic, social, financial processes and phenomena, as well as, a major role is played by globalisation (Miskiewicz, Ausloos, 2010; Scheve, Kenneth, Slaughter, 2002), seen both as a process and as a phenomenon acting systematically and permanently on national economies. Its dynamism is caused by the quick pace of the economic processes and phenomena on both national and global level (Reuer, Leiblein, 2000).

Economic security should be understood as (Rehm, Schlesinger, 2013; Quadrini, 2011; Ausloos, Miskiewicz, 2010; Rehm, Schlesinger, 2010; Marshall, Maulana, Tang, 2009; Besten den, 2007; Estrada, 2000; Meldrum, 2000):

− an essential factor of national security, that is, one ensuring resources and the dynamic balance of the other components of this system (national security);

− one dimension of national, regional and global security, which is an aim of every individual, community, country, etc.;

− a priority objective of governments, regional and international organizations pursuing to ensure and guarantee global human security;

− a state of the national economy, seen as a source and basis for eliminating poverty, famine, social and economic inequalities both between individuals and between regions of a country.

Most of the definitions of economic security provided by researchers from various countries (Ratha, De Prabal, Mohapatra 2011; Schroeder 2008; Quer, Claver, Rienda 2007) may be classified into three categories:

− definitions that identify economic security with its objectives;

− definitions that identify economic security with a state of the economy, which implies several favourable consequences;

− definitions that consider economic security as an element of production stability.

The country's economic security is determined by three main components: economic security of country, companies and consumers. The balance of the three is crucial for the security of the whole country's economy. The main objective of the country's economic security consists of ensuring basic conditions for the country's socio-economic development (Rehm, Philipp, Hacker, Schlesinger 2012; Osberg, Lars, Sharpe 2009).

The concept of economic security has a lot of milestones, which should be considered: it lacks the historical primacy and intellectual currency assigned to military security; it suffers from a diffuseness of both potential threats and remedies; and its content resists neat categories of threat.

Further analysis will show how it is important to distinguish dependance of economic security on country risk indicators, as by this approach, many decisions could be made, evaluating different types of opportunities.

Over the past two decades interest has grown in developing indicators to measure sustainability. Sustainablity is presently seen as a delicate balance between the economic, environmental and social health of a community, nation and of course the earth. Measures of sustainability at present tend to be an amalgam of economic, environmental and social indicators. Economic indicators have been used to measure the state of the economy for much of this century. Social indicators are largely a post-war phenomenon and environmental indicators are more recent still. Interest in developing these indicators largely began when their respective theatres became stressed and where the purpose was to monitor performance and to indicate if any ameliorating action was required. Whereas economists have no difficulty deriving objective and quantitative indicators, sociologists had and still have great difficulty in deriving indicators, because of intangible quality of life issues. Environmental scientists have less difficulty when limiting themselves to abundance of single species rather than biodiversity and ecological integrity.

Sustainability however is more than just the interconnectedness of the economy, society and the environment. Important though these are, they are largely only the external manifestations of sustainability. The internal, fundamental, and existential dimensions are neglected. Sustainability therefore may be something more grand and noble, a dynamic, a state of collective grace. Rather than ask how can be measured sustainability, it may be more appropriate to ask how it could be measured up to sustainability.

1.5. Conclusions for Chapter 1 and Formulation of the Objectives of the Thesis

1. After analysis of the scientific literature conclusion can be done that country risk appears to be very unsystematic in nature and thus very unpredictable. To summarize the analysis of scientific literature about country risk, it is obvious that researchers are analyzing country risk approach only partially, not adapting the concept to growing globalization topic, which definitely makes changes in country risk approach. Country risk is referred as probability of occurrence of po-

litical events that will change the prospects for profitability of a given investment.

2. Country risk analysis, irrespective of the evidence, was and remains strongly dependent on human judgement. Country risk assessment is further complicated by the nature of the contract between a commercial entity and a sovereign government.

3. In the absence of any comprehensive theory of country risk, an accurate and exhaustive classification of this concept is necessary in order to make an extensive review of the different specific sources of risk, without missing in the future any possible new factor of instability. This is also necessary to be able to undertake an operational monitoring at the country's level. So clear classification is crucial in understanding country risk concept. Based on author's analysis, the classifications of country risk models are as follow: fully qualitative; structured qualitative with some statistical data; structured qualitative plus checklist qualitative with some quantitative techniques added; and econometric approach – highly structured and mathematically based.

4. Country sustainability is more than just the interconnectedness of the economy, society and the environment. Important though these are, they are largely only the external manifestations of sustainability. The internal, fundamental, and existential dimensions are neglected. Country sustainability therefore should be analyzed together with country risk approach.

5. Economic security is a never-ending process, firstly determined by macroeconomic environment, which is strictly connected with, and effects, mezo level (companies); and both determine the micro level (individual needs) of economic security. Economic security is a topic, which is quite rarely approached by researchers. Very often, the significance of this issue is fully understood only post factum, when the threats to the economic security of a country have had effect. This approach is not correct and economic security should be analyzed in advance to have clear focus for future predictions.

After analysis of scientific literature about country risk, its classification and evaluation methods, as well as concept of economic sustainability and security, several tasks for this dissertation were raised:

1. To highlight the importance of country risk evaluation and its assessment in growing global markets, analyzing causes and elements of country risk performed by other scientific researches.

2. Explore and clarify advantages and disadvantages of country risk evaluation methods, as well as investigate sources of country risk and ways how to mitigate the risk.
3. Applying quantitative and qualitative methods for analysis, formulate, create and present country risk assessment model in economic security and sustainability context, which will identify factors, influencing country risk and determine their direct and indirect relationships between each other.
4. Verify practical suitability of country risk assessment model by performing empirical analysis EU Baltic Sea region countries, identifying directions for mitigating risk effects.

2

Evaluation Methods for Country Risk

After analyzing scientific literature about country risk concept, it is clear that to evaluate country risk in nowadays economic situation is not an easy task.The country risk of one country could be expressed by a single index, which shows the degree of the overall risk to invest in or loan to this country. The main interested factors are political and economic-financial ones, and the total number of factors used may vary. In this chapter different types of evaluation of country risk will be analyzed based on scientific researches.

For topic of this chapter of dissertation two scientific articles were published (Stankevičienė, Sviderskė 2012; Stankevičienė, Sviderskė, Miečinskienė 2013).

2.1. Analysis of Methods for Country Risk Assessment

Approaches for country risk assessment vary from subjective and interactive deliberation by a group of experts, through priority ranking and weight estimation of information components as well as statistical designs using regression or

factor analysis, to formative rule-based methods for evaluating risk variables from a linguistic rather than numerical perspective.

Table 2.1. Methods for country risk assessment (author)

Risk assesment method	Input measures	Output measures	Advantages	Disadvantages	References
Panel of experts	Perception of country risk	Consensus risk index	- combines experts' knowledge and practice; - amenable to group decision process	- time-consuming; - nonobjective; - experts' bias; - difficulty identifying qualified experts	Backhaus, Meyer (1984), Miller (1992)
Discrete scoring model	Interval index for each risk attribute	Average risk index or average factor-score risk	- easy application of quantitative techniques; - ease of comprehension, computation, and interpretation	- arbitrariness in estimating weights of attributes for qualitative information	Blank *et al.* (1982), Hake (1982), Miiller-Berghoff (1984), Backhaus *et al.* (1985), Backhaus, Meyer (1986)
Analytic hierarchy process	Judgmental assessment for each risk attribute	Relative weights of risk attributes	- combines management judgment and intuition; - amenable to group decision process	- possible inconsistency or bias in determining information categories	Jensen (1986), Saaty, Vargas (1994)
Simulation survey	Intention of early/late entry for different risk scenarios	Probability estimates for entry decision	- flexible for scenario design; - combines regression or discriminant analysis	- time-consuming and costly for survey design, data collection, and analysis and evaluation	Karakaya, Stahl (1991), Punnett (1994)
Full fuzzy scoring model	Categorical assessment of each risk variable	Fuzzy envelope for country risk	- performs linguistic analysis; - propagates complete information from stage to stage	- user subjectively interprets fuzzy envelope; - interpretation may vary among users	Levy, Yoon (1995)
Reduced fuzzy scoring model	Categorical assessment of each risk variable	Point estimate of fuzzy envelope for country risk	- performs linguistic analysis; - propagates easy-to-interpret scalar from stage to stage	- loss of full information; - potentially restrictive single-category summary; - subjective interpretation of fuzzy envelope that may vary among users	Levy, Yoon (1993)

Collaboration by experts assists unstructured decision making through its intrinsic process of fostering a combination of different solutions from decision makers, while the other methods support semistructured decision making through integration of routine, repetitive structured decisions with unique, nonrecurrent unstructured decisions. All approaches can be incorporated as

useful model management techniques and linked to a database management system with appropriate support tools (e.g. user interfaces, graphical analysis, on-line help, and means for error correction and control) for design of a formal decision support system (DSS) with specific application to country risk analysis. Table 2.1 compares major risk assessment techniques with respect to measures of input and output and summarizes their main advantages (benefits) and disadvantages (limitations).

Country risk assessment can be conducted by a panel of experts striving for concurrence. This amenable approach to group decision making is experiential, judgmental, and intuitive, typically using a nominal scale of raw risk measures for input. It combines a wide variety of knowledge and practice elicited from experts into a common understanding to assess cumulative entry risk for a target market. "Experts" are usually considered by whether they can enhance the performance of global-market entry decision and include experienced managers, field practitioners, industry protagonists, and professional consultants. Panel consensus, however, is often criticized on several points, including a comparatively long process to reach acceptable conclusions, a general lack of formal extrinsic analyses, and the tendency for bias shared among experts, besides the persistent difficulty of identifying qualified "experts" (Backhaus and Meyer 1984, Miller 1992).

A more common approach is the (discrete) scoring model that averages indices from different risk categories (Schaefer 2002, Kraussl 2000, Kuhner 2001, Brealey, Myers 2000, Gori 2002, Baird, Thomas 1990, Blank, La Palombara, and Sacks 1982, Hake 1982, MCiller-Berghoff, 1984).

After consolidating of scientific literature, typical steps were classified and they include:

- select appropriate risk attributes as evaluation criteria;
- develop the relative importance of the attributes;
- evaluate target countries across attributes;
- estimate the overall risk level for each country by weighting the evaluation with the relative importance of every attribute.

Backhaus and Meyer (1986) compare 23 risk indices developed from scoring models reported in the business literature. Factor analysis can be employed to identify underlying dimensions of various risk attributes and develop an appropriate weighting scheme for scoring models (Backhaus, Meyer, and Weiber 1985). It analyzes a set of interval-scale indices for various risk variables, computes covariance matrices, and determines an interval average of factor loadings which serve as weights to assess overall country risk. The scoring model will be most useful for processing numerical information when a framework for analysis has already been determined by the decision maker. It is

best applied for evaluating quantitative data such as market potential or economic risk because of its simplicity and relative ease of use for comprehension, computation, and interpretation. However, its principal limitation is that it often requires arbitrary data manipulation when processing qualitative information, particularly to estimate attributes weights.

The analytic hierarchy process (AHP) is a technique that has been successfully applied for identifying an appropriate structure (typically a hierarchical tree) of various information components in a group decision model and estimating their relative importance to a decision (Saaty 1972, 1980, Jensen 1986, Sauber *et al.* 1991). The process of integration using the framework (or a variation of it designed for a specific market-entry case) requires the weighted contributions of these components. AHP estimates the weights so that the analysts' evaluation of relevant information best fit their practical or hypothetical Go/No Go decision. AHP is most useful for coordinating actual data and the results of other quantitative models with subjective information obtained from a group of experts' general knowledge, experience, and intuition, particularly amidst personal conflict, e.g. strategic intention which depends on the positional policies of the decision participants as well as their own personal goals and career plans. Disadvantages include potential bias or inconsistency in the experts' derivation of different information categories.

A simulation survey utilizes a qualitative scenario to create risk evaluation and entry decision for different combinations of market barriers and entry conditions (Karakaya, Stahl 1991, Punnett 1994). As example, the barriers for a specific country are simultaneously characterized in terms of "low" cultural differences, "low" product adaptability, "high" channel accessibility, "stable" currency exchange rate, and "favorable" foreign government policies. Then a decision maker may conclude there is, e.g. a 70% chance of an early market-entry opportunity but only, e.g. a 40% chance of a late market-entry opportunity. If, instead, channel accessibility were deemed only "adequate" and foreign government policies "indifferent," then the opportunity might shift to, e.g. 60% for early entry and 45% for late entry. This method is flexible, since a country's risk can be evaluated for various taxonomic combinats of risk factors.

Additionally, the data created by the simulation survey can be analyzed through statistical regression or discriminant analysis to estimate the association between the scenario components of market barriers (explanatory variables) and the probabilistic assessments about early/late entry (dependent variable). The resulting model is also a useful guideline to assess entry risk for other target markets. The method's main limitations are the relatively long process and high cost of scenario and questionnaire design, survey and data collection, and analysis and evaluation.

Finally, there are two fuzzy-logic techniques that are based on fuzzy sets and production rules to describe the fundamental relationships between the framework's variables. These are the full fuzzy scoring model and the reduced fuzzy scoring model, which categorically analyze each risk attribute to develop a composite linguistic representation of country risk through two successive stages of production rules. This process enables problem solving by deriving new (fuzzy) facts about country risk from previously known (fuzzy) facts. A generic production rule has the form "If X is A, then Y is B," where the "if" part is the premise or antecedent and the "then" part is the conclusion or consequent of the rule, X and Y are linguistic instead of numerical variables, and A and B are terms instead of real values designated by fuzzy sets.

In a fuzzy rule-based system, at each stage of analysis fuzzy input A is matched against rule antecedent A to reach a conclusion B that only approximates the intended conclusion B, since A is not exactly A. This is an example of fuzzy modus ponens, an inference mechanism often used as a systematic approach for accommodating uncertainty based on discourse and imprecise reasoning. It contrasts with classical modus ponens, in which terms are crisp and, for a rule to fire, input must match precisely the antecedent to infer the given consequent. All outputs B are summarily combined into a representative fuzzy set, an envelope, which is the ultimate linguistic evaluation, or score, for that stage.

The two models differ in the type of information exchanged between stages. The full fuzzy scoring model (or fuzzy evaluation method (Levy and Yoon, 1995) transmits the entire envelope as input, maintaining complete information from one stage to the next, encouraging multiply descriptive interpretations consistent with the decision maker's innate feeling for different but conformable solutions. Of course, potentially wide variation among decision makers interpreting output is a disadvantage. The reduced fuzzy scoring model converts the envelope to a single scalar input for the next stage, thereby conceding information entirety for facility of use but possibly restricting interpretation (Levy and Yoon 1993). A typical user at first may find the reduced model easier and more comfortable to work with than the full model.

Moreover, while the accompanying, envelope is available for analysis, interpreting scalar output is intuitively more appealing. Both approaches provide a formal structure for integrating categorical input data, linguistic variables, and production rules to systematically generate and aggregate knowledge, as well as embody the flexibility of output interpretation desired by users and often obtained through "What if?" analysis from applying the previous non-fuzzy procedures.

These methods enable and enhance support for country risk assessment or any other decision category for market entry analysis including the final Go/No

Go evaluation. Any of the previous approaches can be incorporated into a model management base for building a group decision support system (GDSS), in which conciliation and cooperation among all participants with a wide variety of styles and thought processes are ultimately required in practice for successful decision making (Mallach 1994).

For application to international market entry analysis, it generally can be assumed that level-one components require raw information which has already been developed through, e.g. judgments and the scoring model partially using hard facts, while the relative importance of level two or three components can be determined by, e.g. interviews with industry experts, scenario survey, or AHP.

2.2. Euromoney Country Risk Index

Euromoney Country Risk evaluates the investment risk of 186 countries across 15 criteria (or factors) to determine the risks of default on a bond, losing direct investment or to global business relations, by polling more than 400 international economists and other risk experts. The qualitative scores are averaged and combined with three basic quantitative values to give an overall ECR score on a 100-point scale, where 100 is the safest and 0 the riskiest. Evaluation includes such risk as of default on a bond, risk of losing direct investment, risk to global business relations etc, by taking a qualitative model, which seeks an expert opinion on risk variables within a country (70% weighting) and combining it with three basic quantitative values (30% weighting).

Factors included in the ranking of countries by risk (ECR 2013; Pinter *et al.* 2005; Monfort, Mulder 2002):

- political risk;
- economic performance/projections;
- structural assessment;
- debt indicators;
- credit ratings;
- access to bank finance;
- access to capital markets.

Euromoney assigns a weighting to six categories. The three qualitative expert opinions are political risk (30% weighting), economic performance (30%), and structural assessment (10%). The three quantitative values are debt indicators (10%), credit ratings (10%), access to bank finance/capital markets (10%).

The qualitative average of Euromoney country risk is produced by combining evaluations of political, economic, and structural assessments from experts around the world. When applying political, economic, and structural assessments to a 100 point scale for the qualitative average only (rather than the full Euromoney Country Risk score), the following weighting is used: political 43%, economic 43%, and structural 14%.

In the qualitative assessments of Euromoney country risk the participants rate each country for which they have knowledge from 0–10 across 6 sub factors to equal a score out of 100. The categories of economic risk scored are as follows: bank stability/risk; GNP outlook; unemployment rate; government finances; monetary policy/currency stability. Political risk: participants rate each country for which they have knowledge from 0–10 across sub factors to equal a score out of 100. The categories of political risk scored are as follows: corruption; government non-payments/non-repatriation; government stability; information access/transparency; institutional risk; regulatory and policy environment. Structural risk: participants rate each country for which they have knowledge from 0–10 across 4 sub factors to equal a score out of 100.

The categories of structural risk scored are as follows: demographics; hard infrastructure; labour market/industrial relations; soft infrastructure. Individual experts must apply a value to each sub factor before their score is accepted into the system. Individual experts can also modify the sub factor weights to modify their effect on the overall score of 100. The weight of an individual sub factor can be lowered to a minimum of 10% and to a maximum of 30%. This allows the system to capture a second attribute along side of the evaluation of that category, which is the estimated effect of the category. For instance, a user may make a judgement that the single most important issue facing a given country is maintaining the stability of its currency, and so decide to increase the weighting of the monetary policy/currency stability category from 20% to 30%. Within each sub factor, ECR also asks experts for further information on the reasons behind each individual score, and these fall under the category of related factors.

These are more like poll points, and do not directly affect the score. Instead, they inform a change made to a sub factor score and weight. For example, within the economic risk category of bank stability lie four further related factors: regulatory risk, trading exposures, asset quality and undercapitalisation. Individual experts are able to add more related factors and ignore ones which are not applicable.

In the quantitative score factors of Euromoney country risk the participants rate each country's accessibility to international markets on a scale of 0–10 (0=no access at all and 10=full access). These scores are averaged and then weighted to 10%. *Debt indicators*: calculated using the folloiwng ratios from the World Bank's Global Development Finance figures: total debt stocks to GNP

(A), debt service to exports (B); current account balance to GNP (C). Developing countries which do not report complete debt data get a score of zero.

Credit ratings: nominal values are assigned to sovereign ratings from Moody's, Standard & Poor's and Fitch IBCA (2001, 2002). The ratings are converted into a score using a set scoring chart. This score is then averaged and the score weighted to 10%. The higher the average value the better.

2.3. MULTIMOORA Method

Multi-Objective Optimization by Ratio Analysis (MOORA) method was introduced by Brauers and Zavadskas (2006). This method was developed (Brauers, Zavadskas 2010) and became MULTIMOORA (MOORA plus the full multiplicative form). These methods have been applied in different studies (Brauers *et al.* 2007; Brauers, Ginevičius 2009; Brauers, Zavadskas 2009; Brauers, Ginevičius 2010; Baležentis *et al.* 2010; Brauers *et al.* 2010).

According to Brauers and Zavadskas (2006), MOORA goes for a ratio system in which each response of an alternative on an objective is compared to a denominator, which is representative for all alternatives concerning that objective.

MOORA method begins with the matrix X where its elements x_{ij} denote j-th alternative of i-th objective ($i = 1, 2, \ldots, n$ and $j = 1, 2, \ldots, m$). In this case it has m=3 alternatives (Baltic States) and n=12 objectives (indicators. MOORA method consists of two parts: the ratio system and the reference point approach.

The Ratio System of MOORA defines data normalization by comparing alternative of an objective to all values of the objective:

$$x_{ij}^{*} = \frac{x_{ij}}{\sum_{j=1}^{m} x_{ij}^{2}}, \tag{2.1}$$

where x_{ij} = response of alternative j on objective i; $j = 1, 2, ..., m$; m – number of alternatives; $i = 1, 2, \ldots n$; n – number of objectives; x^{*}_{ij} – a dimensionless number representing the normalized response of alternative j on objective i. These responses of the alternatives on the objectives belong to the interval [0; 1].

These indicators are added (if desirable value is maximal) or subtracted (if desirable value is minimal) and summary index of state is derived according by formula:

$$y_{j}^{*} = \sum_{i=1}^{i=g} x_{ij}^{*} - \sum_{i=g+1}^{i=n} x_{ij}^{*}, \tag{2.2}$$

where $i = 1, 2, \ldots, g$ as the objectives to be maximized; $i = g + 1, g + 2, \ldots, n$ as the objectives to be minimized; y_j^* – the normalized assessment of alternative j with respect to all objectives.

The Reference Point of MOORA starts from the already normalized ratios as defined in the MOORA method. The j-th coordinate of the reference point can be described as rj=max x*ij in maximization case. Every coordinate of this vector represents maximum or minimum of certain objective. Then every element of normalized responses matrix is recalculated and final rank is given according to the deviation from the reference point and the Min-Max Metric of Tchebycheff:

$$\min_i(\max_j | r_j - x_{ij}^* |) . \tag{2.3}$$

Brauers and Zavadskas (2010) proposed updated MOORA with the Full Multiplicative Form method embodying maximization as well as minimization of purely multiplicative utility function. Overall utility of the j-th alternative can be expressed as dimensionless number:

$$U_j^i = \frac{A_j}{B_j}, \tag{2.4}$$

where $A_j = \prod_{g=1}^{i} x_{gi}$, j=1,2,…,m; m – number of alternatives; i – number of objectives to be maximized; $B_j = \prod_{k=i+1}^{n} x_{kj}$, n-i – number of objectives to be minimized, $U_j^{'}$- utility of alternative j with objectives to be maximized and objectives to be minimized.

Thus MULTIMOORA summarizes MOORA (which includes Ratio System and Reference point) and the Full Multiplicative Form.

2.4. Global Country Risk Ratings

This section refers to the global ranking methods that aim at developing a holistic approach to country risk.

These systems assess the general investment climate for any kind of foreign investor and rank various countries based on their respective degree of risk. This approach is developed by firms specialized in country risk ranking, and by credit export agencies.

Different approaches exist in the construction of different rating systems. Ciarrapico (1992) distinguishes a range varying from fully qualitative systems to

structured qualitative systems, checklist systems and other quantitative methods. Ciarrapico acknowledges that a clear-cut separation is sometimes difficult due to the smooth transition from one to another. Table 2.2 presents the different types of system with their characteristics according to Ciarrapico.

Table 2.2. Different rating approaches and their characteristics (Chiarrapico 1992)

Rating approach	Characteristics
Fully qualitative system	country report without fixed format.
Structured qualitative system	- fixed format country report, allowing for cross-country comparison; - sometimes subjective expert opinions (from international bankers or consultants) are included; - potentially some quantification.
Checklist system	- quantitative information on indicator variables of economic, political and social data; - subjective (weighted) combination of scores into overall rating.
Other quantitative methods	econometric and statistical approaches, including logit and discriminant analyses

Commercial rating services tend to concentrate on structured qualitative systems and checklist systems (Smith, Walter 2001). Academic literature tends to use more sophisticated statistical methods that belong to Ciarrapico's category of "other quantitative methods". it is arguable that these "other quantitative methods" are more objective than the previously mentioned approaches.

Usually the focus is done on three main issues:

- the usefulness of both qualitative and quantitative risk rating methods to explain and predict actual debt-servicing problems;
- the potential to explain and reproduce actual qualitative ratings by a limited combination of quantitative economic variables; and
- the importance of yield spreads in primary and secondary financial markets for the assessment of country risk.

2.4.1. The Suppliers of Country Risk Analysis

There is a variety of formats in which country risk analyses appear.

Table 2.3. Commercial publishers of country and political risk analyses (author)

Institution	Format	What is rated?
The Economist Intelligence Unit (EIU) is part of the group that publishes the weekly magazine "The Economist" www.eiu.com	1. Country reports that provide political and economic outlook for the country, supported with a large number of statistics; printed edition: quarterly update. Internet: monthly updates for 117 countries. 2. Risk ratings by attaching rates that range from A–E and from 0–100	Composite macro indicator of country risk through political risk (22%), economic policy risk (28%), economic structure risk (27%) and liquidity risk (23%).
Euromoney magazine, monthly magazine www.euromoney.com	Risk rankings for 185 countries, each country is attached a numerical value between 1–100, yearly rankings	A country's economic performance including political risk (25%), economic performance (25%), debt indicators (10%), debt in default or rescheduled (10%), credit ratings (10%), access to bank finance (5%), to short term finance (5%), to capital markets (5%) and discount on forfeiture (5%).
Fitch IBCA www.fitchibca.com	Country risk ratings	The sovereign rating methodology establishes a range of key leading indicators of distress. These are incorporated in a risk model that gives a percentage score to sovereign borrowers, which is then used to derive the long-term ratings.
Institutional investor magazine www.institutionalinvestoronline.com	Country risk ratings, each country is attached a numerical value between 1–100	Ratings are based on information provided by senior economists and sovereign risk analysts at global financial institutions. The participants in the survey are asked to grade a number of countries on a scale between 0–100. The individual responses are weighted so as to give more importance to banks with greater worldwide exposure.
International country risk guide, issued by the PRS (Political Risk Services) group www.prsgroup.com	1. The PRS group provides country reports for 100 countries. 2. Risk ratings for 140 countries, monthly ratings. range from 0–100	Ratings are based on 3 sub-categories of risk for which n index is created: political risk (50%), economic risk (25%) and financial risk (25%)
Moody's investor service, published by Moody's www.moodys.com	Sovereign risk ratings for over 100 countries and opinion on rating outlook. Furthermore, there are ratings for 17 supranational organizations, ratings range from A to C	Government bonds, based on political and economic variables.
Standard&Poor's ratings group www.standardpoor.com	Sovereign risk ratings (sovereign issuers of bank and bond debt) for 97 countries, updated weekly, ratings range from A to C	Standard and Poor's publish sovereign credit ratings: an assessment of the governments' capacity and willingness to repay debt. These ratings are based on a large number of political and macro-economic variables.

Some institutions publish tables, measuring country risk by attaching a numerical value to each country and the higher or the lower the number, the higher the country risk. Other agencies publish country surveys with special attention to trade and investment risks in trading with certain countries. The latter ones build

on the country surveys that have been published by the OECD and IMF for quite some years. Table 2.3 shows the world's leading commercial publishers of country and political risk analyses. It shows that all agencies publish country risk ratings in a number or letter format. Furthermore, although not all ratings are based on the same sort of underlying product, most are based on a judgement on the economic performance of a country.

Moody's and Standard&Poor's are the two largest rating agencies and account for around 80% of the global market for ratings. Fitch is the third largest rating agency. These companies publish issuer ratings, which apply to the creditworthiness of a separate entity and involve short-term or long-term financial commitments.

There is a large and ever increasing variety in the types of rating. Broad ratings seem to have develop into more tailor made products. This holds true for all sorts of ratings, including country or sovereign ratings. The term "issuer ratings" where the issuer of a debt instrument is rated, covers this development. Moreover, agencies rate according to type of debt instrument as well. Hence, bonds denominated in local currency are rated as well as bonds denominated in foreign currency. Issuer ratings are made for, among others, private companies, public entities, commercial banks and multilateral banks. The most important issuer rating for country risk purposes is the sovereign rating, which describes the risk that a national government defaults on its bond obligations. Sovereign ratings exist for both local and foreign currency obligations. Standard&Poor's sees sovereign risk ratings as an assessment of each government's capacity and willingness to repay debt according to its terms. Sovereign ratings are not country risk ratings, but set the benchmark for the ratings assigned to other issuers under its jurisdiction.

Euromoney, International Country Risk Guide and Institutional Investor Magazine do not focus on specific debtors. The EIU holds a separate position as this institution provides ratings for the country as a whole and for more specific risks.

As to methodology in general, there does not seem to be much difference between the various providers. Most rating agencies base their country risk indicators on their own research into the development of economic and political variables. This way, most indicators are based on current economic developments. These projections are based on the opinion of experts as to current and future performance on a number of specified indicators of a country.

Country risk analyses are offered in various formats: one-dimensional indicators (ratings) and multi-dimentional country risk reports. Both a single country risk indicator and a detailed country risk report have their advantanges and drawbacks. It is obvious that expressing country risk in one single number or letter is necessarily at the cost of all kinds of subtleties and details that cannot

be fully covered in this one-dimentional rating. However, this systm enables easy comparison of country risks. Detailed reports on the other hand hamper such comparisons but provide more insight in the variables that influence country risk.Finally, the process of assessing country risk is more transparent in case this assessment is based on a report that discusses the economic performance of a country.

The process behind construction of a country risk rating is complicated and full of subjective judgments. Because risk ratings have been widely used in the determination of country risk and in country risk research, it is obvious that rating agencies do not fully explain how they construct and calculate their ratings.

The relation between country risk ratings of the different rating institutions has been subject of a number of studies. Erb *et al.* (1996) compare the credit ratings from Moody's, Standard&Poor's and the International Country Risk Guide (ICRG) of 45 countries (developed countries, developing countries and emerging markets) as of October 1995. The rank correlation between the ratings lies around 95%.

Besides, their analysis of equal-weighted average risk ratings over the period 1984–1995 show that the ratings are quite close for developed countries, but there is more variation between emerging countries. Oetzel *et al.* (2001) test the usefulness of credit ratings from various rating agencies to predict actual realized risks. They conclude that there is not much difference between these ratings in this respect. The rating agencies that have been listed in Table 2.4 include a number of similar variables in their ratings. If to combine them with the large number of variables that are used in the construction of these ratings, one may conclude that the ratings between the various agencies do not differ to a large extent.

2.4.2. Specialized Ranking Firms

Specialized ranking firms include many countries in their analysis. They evaluate the degree of risk for each country, establish a rank and then sell their research to third parties. Clients are mainly firms with overseas operations or investments that wish to gauge the risk of their business.

The following paragraphs present a selection of the most widely used ranking techniques that have been developed by these organizations. The list is far from exhaustive and similar products are offered by firms such as Rundt's, DRIWEFA, or Control Risks Group.

The Geneva-based firm, Business Environment Risk Intelligence SA, was founded in 1966 by Haner, one of the pioneers in political and country risk assessment (Haner 1965, 1966) when he was director of international activities of

the American Cement Corporation. Three times a year, BERI produces its Business Risk Service (BRS). The BERI index covers about 50 countries and has been available since the mid-1970s. As such, it constitutes one of the oldest consistent time series in the field. Four types of ratings are provided by BERI. They are the Political Risk Index (PRI), the Operations Risk Index (ORI), the Remittance and Repatriation Factor (R Factor), and the Composite Score, which represents a combination of the other three. For each of them, an assessment of the present situation as well as a one-year and a five-year forecast are published. The PRI and ORI originate from a Delphi method process undertaken and monitored by the BERI team of analysts.

The Political Risk Index aims at assessing the social and political environment of a country. It is built on the opinion and scores provided by 100 experts with a diplomatic or political science background. These specialists are asked to grade 10 socio-political variables divided among three categories: internal causes, external causes and symptoms.

Internal causes of political risk:

- fractionalization of the political spectrum and the power of these factions;
- mentality, including xenophobia, nationalism, corruption, nepotism, willingness to compromise;
- fractionalization by language, ethnic and/or religious groups and the power of these factions;
- social conditions, including population density and wealth distribution;
- restrictive (coercive) measures required to retain power;
- organization and strength of forces for a radical government.

External causes of political risk:

- dependence on and/or importance to a major hostile power;
- negative influences of regional political forces.

Symptoms of political risk:

- societal conflict involving demonstrations, strikes and street violence;
- instability as perceived by non-constitutional changes, assassinations and guerilla wars.

The experts rate each variable from zero (highest risk) to seven points (lowest risk), summing up to a total score between zero and 70. Moreover, up to 30 bonus points can be added up for the eight internal and external causes criteria, resulting in an overall possible score between zero and 100. Then, BERI splits the PRI's country results into four categories from prohibitive risk (0–39 points), high risk (40–54 points), moderate risk (55–69 points), up to low risk (70–100

points). PRI's one-year and five-year forecasts are obtained by asking the experts to give their overall feeling on the business operations climate, and not by detailing each variable's prevision. The experts' opinions are then averaged after discarding the extremes.

The goal of the Operations Risk Index is to assess the general business climate. Like the PRI, it is derived from another panel of 100 experts with international experience, and whose opinion is processed through a Delphi method. It grades the degree of hospitality of a country and how welcoming it is vis-`a-vis foreign investment. It deals with both economic and regulatory environments, and also tries to gauge any possible discrimination against foreign business. Fifteen criteria are taken into account and given between zero (unacceptable conditions) and four points (superior conditions). They are assigned various weightings so that the total ORI score scales from zero to 100, with the same type of grouping as for the PRI.

Policy continuity:

- economic growth;
- currency convertibility;
- labor costs/productivity;
- short-term credit;
- long-term loans and venture capital;
- enforceability of contracts;
- attitude toward foreign investors and profits;
- degree of privatization;
- monetary inflation;
- balance of payments;
- communications and transportation;
- local management and partners;
- bureaucratic delays;
- professional services and contractors.

ORI's one-year and five-year forecasts are obtained in the same way as for the PRI.

The Remittance and Repatriation Factor addresses the issue of repatriation and convertibility in a foreign currency. Contrary to the two previous indices, the R factor does not rely solely on expert judgments. It is essentially "produced by a large computer program that manipulates over 14,000 cells of data and makes hundreds of calculations", as stipulated mysteriously on BERI's information web page (BERI 2001b). It estimates a country's ability and

willingness to implement and maintain a fully convertible system so that foreign firms may freely repatriate profit and capital in any currency and also import any goods paid in a foreign currency.

The R factor is computed from four sub-indices: legal framework (20% of the R factor), foreign exchange generation (30%), accumulated international reserves (30%), and foreign debt assessment (20%). The resulting scores are grouped with the same risk categories as for PRI and ORI. BERI (2001a) states that "forecasts are the result of regression analyses, trends in the ratings, and senior staff judgment". Moreover, they specify that "wholly quantitative forecasts proved unreliable".

The Combined Score is a simple average of the PRI, ORI and R factor. It aims at providing an overall assessment of the country's riskiness through a Profit Opportunity Recommendation (POR) that differentiates countries between "No Business Transactions", "Trade Only", "Nondividend Cash Flow", and "Investment Quality".

Nord Sud Export was founded in 1981 by Jean-Louis Terrier, Nord Sud Export is now part of the French media group Le Monde. It publishes a bimonthly information letter covering about 100 developing countries. The country ratings list is calculated once a year, starting in 1982. NSE provides two types of complementary rankings. The first one is the opportunity rating, and assesses the market potential for a foreign investor. The second is the traditional country risk rating. This latter is computed from four categories of risk parameters: sovereign financial risk, financial market risk, political risk, and business environment risk. Each parameter is the product of the weighted average of very narrowly defined individual criteria, taken from a series of 60 variables. Each of them is graded on an eight-unit scale, from zero (worst) to seven (best).

NSE emphasizes its willingness to follow as objective an assessment process as far as possible. In order to do so, they refuse to use expert panels, and rely mainly on quantitative criteria (43 out of 60). As for the remaining 17 qualitative items, Terrier (2001) states that they "are rated according to rigorous 'rating grids' which reduce the level of subjectivity".

Parameter 1: sovereign financial risk:

- Factor 1 (weight 4/10): importance of the public debt in the economy. Computed from six quantitative variables.
- Factor 2 (weight 4/10): sovereign default risk. Computed from four quantitative variables and two qualitative criteria.
- Factor 3 (weight 2/10): non-convertibility risk. Computed from two quantitative and one qualitative variables.

Parameter 2: financial market risk:

This risk category was previously aggregated with the sovereign risk set in a more general financial risk grouping. They were split after the Mexican and Asian crises when the specific influence of financial markets was evidenced.

- Factor 4 (weight 4/10): fundamental macroeconomic equilibrium. Computed from four quantitative items.
- Factor 5 (weight 3/10): risk of unexpected and sharp devaluation. Computed from four quantitative variables.
- Factor 6 (weight 3/10): systemic risk and economic volatility. Computed from five quantitative variables and one qualitative criterion.

Parameter 3: political risk:
This parameter addresses the social and political features of a country, and that may generate a specific risk.

- Factor 7 (weight 3/10): homogeneity of the society. Computed from three quantitative and one qualitative variables.
- Factor 8 (weight 5/10): regime and government stability. Computed from three quantitative and four qualitative criteria.
- Factor 9 (weight 2/10): external conflicts. Computed from two quantitative and two qualitative items.

Parameter 4: business environment risk:
This risk category gauges the quality of the business conditions and the "hospitality" of a country.

- Factor 10 (weight 4/10): attitude toward foreign investments. Computed from four quantitative and one qualitative variables.
- Factor 11 (weight 3/10): labor conditions. Computed from two quantitative and two qualitative variables.
- Factor 12 (weight 3/10): quality of the governance. Computed from two quantitative and three qualitative variables.

NSE also differentiates between two broad types of investors: exporters and direct investors. Exporters are seen as more short-term oriented and more concerned by sovereign credit risk and payment delays. On the other hand, direct investors are perceived as more long-term oriented and more sensitive to political instability.

Two different ratings are established, depending on the nature of the investment. Ranking for exporters is based on 30% of parameter 1 sovereign financial risk, 40% of parameter 2 financial market risk, 10% of parameter 3 political risk, and 20% of parameter 4 business environment risk. Ranking for

direct investors is computed from respectively 10%, 30%, 30%, and 30% of the aforementioned risk parameters.

Once rated, the country is allocated to one of the seven following classes of risk (with points):

(1) dangerous (0–159);
(2) very high (160–269);
(3) high (270–319);
(4) quite high (320–379);
(5) moderate (380–429);
(6) low (430–539);
(7) very low (540–700).

Then, NSE translates these classifications into recommendations in terms of margin rate premium for exporters, and risk premium above the home country internal rate of return for direct investors.

The NSE method does not aim at extrapolating to obtain future scenarios but focuses only on present conditions, in order to estimate the level of risk. Finally, NSE stresses that this country risk rating must not be taken as a tool per se, but must be jointly analyzed with the country opportunity rating, which is developed in parallel by the firm.

After having been part of the IBC Group, the USA-based Political Risk Services Group was purchased in 1999 by Mary LouWalsh, its then managing director. The PRS Group publishes Political Risk Services (PRS) as well as the International Country Risk Guide (ICRG). The PRS Group was founded by William Coplin and Michael O'Leary at the end of the 1970s.

The PRS analyses were initially published in theWorld Political Forecasts of Frost & Sullivan under the nameWorld Political Risk Forecasts (WPRF), and are now disseminated via the PRS Group's Country Reports. They cover 100 countries and are updated on a quarterly basis. They provide 18-month and five-year forecasts of risk to international business. The PRS originality lies in its rating system process.

The PRS method is built from the Coplin–O'Leary Rating System whose underlying architecture is based on the Prince model (Coplin and O'Leary, 1972). It can be seen as a kind of "modified Delphi technique" (Howell and Chaddick, 1994) that treats and systematically processes several experts' opinions for each country under review. PRS usually relies on three experts per country and tries to select teams with diversified backgrounds. It separately considers three types of risk, depending on the nature of the investment: financial transfers (convertibility from local to foreign currency and repatriation), foreign direct investment (any direct control of overseas assets), and exports (any risk and difficulties faced by exporters).

Firstly, experts look at a series of 17 variables, and evaluate the current degree of risk or restriction (current base level) on a four-unit scale: 0 (low risk), 1 (moderate risk), 2 (high risk), and 3 (very high risk). These risk factors are split between 18-month and five-year forecasts, and are described below.

18-month forecasts:

1. Turmoil: actions that can result in threats or harm to people or property by political groups or foreign governments.
2. Equity restrictions: limitations on the foreign ownership of businesses.
3. Operations restrictions: general quality of the operational business environment, including regulations, efficiency of the officials, and degree of corruption.
4. Taxation discrimination: possible discrimination vis-`a-vis foreign businesses, due to formal and informal tax policies.
5. Repatriation restrictions: formal and informal rules regarding the repatriation of profits, dividends and investment capital.
6. Exchange controls: degree of freedom and easiness to convert local currency to foreign currency.
7. Tariff barriers: the average and range of financial costs imposed on imports.
8. Other import barriers: formal and informal quotas, licensing provisions, or other restrictions on imports.
9. Payment delays: degree of punctuality with which government and private importers pay their foreign creditors.
10. Fiscal and monetary expansion: assessment of a country's fiscal and monetary policy as to whether it can generate a healthy business climate or create economic disorders.
11. Labor policies: government policy, trade union activity, and productivity of labor forces.
12. Foreign debt: relative size of the foreign debt and the ability of the country's public and private institutions to service it in due time.

For the five-year forecasts, in addition to the 12 previous criteria, five other elements are taken into consideration.

Five-year forecasts:

13. Turmoil: same item as in the 18-month list but on a five-year horizon.
14. Investment restrictions: the current base and likely changes in the general climate for restricting foreign investments.

15. Trade restrictions: the current base and likely changes in the general climate for restricting the entry of foreign trade.
16. Domestic economic problems: the ranking of the country according to its most recent five-year performance record in per capita GDP, GDP growth, inflation, unemployment, capital investment and budget balance.
17. International economic problems: the ranking of the country according to its most recent five-year performance record in current account (as a percentage of GDP), the ratio of debt service to exports, and the annual percentage change in the value of the currency. Secondly, experts try to identify the three most likely political regimes that will be in power, in 18 months and five years respectively.

Each political scenario is assigned a probability of occurrence. Then, they assess the potential impact of each of the three possible political regimes on the 17 previously described criteria. For each variable, experts must forecast how its degree of risk will be modified by the regime under consideration.

They quantify this change according to the following rule:

(1) -1.0 (less risk);
(2) -0.5 (slightly less risk);
(3) 0 (same risk);
(4) +0.5 (slightly more risk);
(5) +1.0 (more risk).

These numbers are weighted by the probability of occurrence of the regime in question and then added to the current base level of risk.

As an example, the experts estimate that the regime XYZ has a 40% probability of seizing power in 18 months and that this will worsen the repatriation conditions (variable #5) so that it will generate more risk for this item (+1.0). If the current prevalent environment on this specific issue is seen by the experts as high risk (2), the 18-month impact of this anticipated regime on this criterion-would be 40%×1.0=0.4, to be added to the current level (2), resulting in an 18-month forecast of 2.4 for item #5. Finally, for each of the three types of investment previously identified (financial transfer risk, direct investment risk, export market risk), PRS focuses on a preselected number of relevant criteria.

The 18-month rating for financial transfer risk is calculated as the average of four items: repatriation restrictions (#5), payment delays (#9), fiscal and monetary expansion (#10), foreign debt (#12). The five-year grade is obtained from the average of the 18-month rating, the fiveyear level of turmoil forecast (#13), and the international economic problem score (#17).

The 18-month rating for direct investment risk is based on the average grade of seven factors: turmoil (#1), equity restrictions (#2), operations restrictions

(#3), taxation discrimination (#4), repatriation restrictions (#5), exchange controls (#6), labor policies (#11). The five-year grade is the average of the 18-month rating, the five-year level of turmoil forecast (#13), the investment restrictions (#14), and the domestic economic problems (#16).

The 18-month rating for export market risk is built from the average of six variables: turmoil (#1), exchange controls (#6), tariffs (#7), other import barriers (#8), payment delays (#9), foreign debt (#12). The five-year score is given by the average of the 18-month result, the five-year level of turmoil forecast (#13), trade restrictions (#15), and the domestic economic problems (#16).

Under each of these three approaches, countries are classified in one of the following 12 categories: D− (most risky), D, D+, C, …, B+, A−, A, A+ (least risky).

One of the main distinctive features of the PRS method is that it first anticipates the possible future political regimes, and only after that estimates the potential impact of each regime on the predetermined variables.

Founded in 1980, the International Country Risk Guide (ICRG) was initially published in the newsletter International Reports. Like PRS, it has been, since 1992, a product of the PRS Group. ICRG covers about 140 countries. It produces three distinct risk categories on a monthly basis: political, economic and financial, as well as a composite risk rating derived from the previous three indices. ICRG assesses the current situation and makes forecasts over one-year and five-year time horizons.

The political risk rating aims at gauging the country's degree of stability. It is obtained from the subjective assessment of ICRG editors that transform qualitative information into numerical scores through a series of preset questions. This index is calculated as the sum of 12 social and political qualitative components.

The score may vary between 0 and 100 points:

(1) < 50 (very high risk);
(2) 50–59.9 (high risk);
(3) 60–69.9 (moderate risk);
(4) 70–79.9 (low risk);
(5) 80–100 (very low risk).

Political risk components:

- Government stability (max. 12 points) is determined by government unity, legislative strength and popular support.
- Socio-economic conditions (max. 12 points) derives from unemployment, consumer confidence and poverty.

- Investment profile (max. 12 points) results from contract viability/expropriation, profits repatriation and payment delays.
- Internal conflicts (max. 12 points) is based on civil war, terrorism/political violence and civil disorder.
- External conflicts (max. 12 points) is a function of war, cross-border conflict and foreign pressures.
- Corruption (max. 6 points) is estimated from the length of time a government has been in power continuously.
- Military in politics (max. 6 points).
- Religious tensions (max. 6 points) is determined by the degree of religious freedom, and the capacity of several religious groups to live in harmony.
- Law and order (max. 6 points) depends on the strength and impartiality of the legal system, as well as on an assessment of popular observance of the law.
- Ethnic tensions (max. 6 points) is evaluated as a function of the degree of tolerance and compromise between various ethnics.
- Democratic accountability (max. 6 points) gauges the degree of responsiveness of a government to its people. ICRG differentiates between five types of governance: alternating democracy, dominated democracy, de facto one-party state, de jure one-party state, and autarchy.
- Bureaucracy quality (max. 4 points). ICRG tries to assess the ability of the local bureaucracy to administrate the country without drastic changes in policy or interruption in government services.

The economic risk rating evaluates the economic strengths and weaknesses of a country. It is built on a set of five purely quantitative components (ratios). It goes from 0 to a maximum of 50 points:

(1) 0–24.9% (very high risk);
(2) 25–29.9% (high risk);
(3) 30–34.9% (moderate risk);
(4) 35–39.9% (low risk);
(5) 40–100% (very low risk).

Economic risk components:

- GDP per head (max. 5 points), compared to the average of the total GDP of all the countries covered by ICRG: the lower in the GDP per head ranking, the riskier the country is supposed to be.

- Real GDP growth (max. 10 points): the more growth, the lower risk is assigned by ICRG.
- Annual inflation rate (max. 10 points): the more inflation, the riskier the country is.
- Budget balance as a percentage of GDP (max. 10 points): the more deficit, the riskier the country is.
- Current account as a percentage of GDP (max. 15 points): the more deficit, the riskier the country is.

The financial risk rating is concerned with the country's ability to pay its way. It assesses the country's capacity to generate enough hard currency so that it can assume its foreign financial obligations. It is based on five criteria that can add up to 50 points. It has the same risk category ranges as the economic risk rating.

Financial risk components:

- Foreign debt as a percentage of GDP (max. 10 points): the higher the ratio, the riskier the country.
- Foreign debt service as a percentage of exports of goods and services (max. 10 points): the higher the ratio, the riskier the country.
- Current account as a percentage of exports of goods and services (max. 15 points): the lower the ratio, the riskier the country.
- Net international liquidity as months of import cover (max. 5 points): the shorter the coverage period, the riskier the country.
- Exchange rate stability (max. 10 points) is gauged on the appreciation/depreciation rate of the local currency versus the US dollar: the more volatile (whether it is appreciation or depreciation), the riskier the country.

The one-year and five-year forecasts are derived from the ICRG staff's forecasts for each of these components. For the financial and economic components, experts try to use the forecasts produced by the relevant government or official institution as much as possible. However they are often obliged to make subjective extrapolations, especially for the five-year time horizon. The political, economic and financial risk categories are eventually combined into a composite risk rating with respectively 50%, 25% and 25% weights. Furthermore, each criterion is available to clients so that they can build their own personal rating system.

Part of the London-based The Economist Group, The Economist Intelligence Unit (EIU) was founded in 1949. It presents itself as the "world's leading provider of country intelligence" (EIU 2002). Since 1997, its Country Risk Service product has delivered country risk ratings for 100 developing countries on a

quarterly basis. The EIU method flows from experts' answers to a series of 77 predetermined qualitative and quantitative questions. It results in a 100-point index (the higher the score, the riskier the country), which is divided into five bands from A (lowest risk) to E (highest risk). Four general risk categories are analyzed (political risk, economic policy risk, economic structure risk, liquidity risk), and are combined into an overall risk index.

In addition to this broad macro measure of risk, EIU produces other more investment-specific micro risk ratings (currency risk, sovereign debt risk, banking sector risk) that address the particular needs and concerns of certain groups of investors.

The political risk assessment is based on a set of 11 subjective points split between issues of political stability and political effectiveness.

The economic policy risk addresses the quality of the economic policy management as well as the level of the economic performance. This index is computed from 27 criteria, among which 15 are subjectively estimated. They are shared across five groups: monetary policy, exchange rate policy, fiscal policy, trade policy, regulatory environment.

The economic structure risk is concerned with the growth potential, but also with the degree of dependence of the country vis-a-vis foreign capital. It also estimates the fragility of the economy in case of an external shock. It is a kind of solvency indicator. This rating is based on 29 questions among which 11 are subjective, relative to five subcategories: global environment, growth, current account, debt, financial structure. The liquidity risk focuses more specifically on the country's short-term financial strengths and weaknesses. It gauges any potential imbalance between resources and obligations. It is based on 10 questions of which two are subjective.

These four risk indices are aggregated into an overall rating with a 22%, 28%, 27%, and 23% weighting respectively. Contrary to the BERI, PRS or ICRG approaches, but more like the NSE method, EIU uses only historical data and current expert estimation. It bases its assessment on the existing situation, without trying to predict the evolution of the relevant parameters.

2.4.3. Export Credit Agencies

In order to facilitate international trade and to promote their exports, many countries have fostered the creation of public or state-backed specialized institutions, usually named credit export agencies. Their mission is twofold: they provide country risk insurance and they assist exporters through financial support and funding. Among the most famous are EDC (Canada), Coface (France), Hermes (Germany), Sace (Italy), ECGD (UK), or Exim Bank (USA). In some cases, official multilateral agencies provide investors with insurance for non-commercial

risk. This is the case of the Multilateral Investment Guarantee Authority, a Washington-based specialized subsidiary of the World Bank Group. Most of these agencies collaborate and exchange information within the International Union of Credit and Investment Insurers (better known as the Berne Union).

The credit export agencies may cover a large class of risks that starts with the standard default payment of a foreign client, including sovereign entities, and goes on to hedging against economic slowdown in a foreign country. These risks are usually categorized between country risk at the macro level, and commercial risk at the micro level. As Coface (2002a,b) put it: "The country rating measures the average corporate payment default risk in a given country and indicates to what extent a company's financial commitments are affected by the local business, financial and political outlook." Thus, credit export agencies are concerned not only with credit rating and sovereign default like a bank, but they also deal with several other types of risk arising from the local business environment and possibly affecting the foreign firm's financial commitments, including equity investments (Bouchet, Groslambert 2002, Moser 2002, Bronstein 2001).

As explained above, the rating serves as a basis for setting premium rates, and is widely used by most credit export agencies. However, a few avoid using this system, among them MIGA: "unlike many insurers – private and public – MIGA does not utilize a country rating system to calculate premium rates" (Bellinger 2001).

In order to regulate the industry and to avoid subsidies and trade distortions, the OECD credit export agencies agreed, in 1999, on a common risk classification scheme. This agreement led to the implementation of seven categories of country and sovereign risk, for each of which a minimum premium rate was accepted. This classification is obtained from an econometric model based on three sorts of quantitative criteria: the default history of the country, its financial situation, and its economic situation. In addition, some qualitative political considerations may be taken into account to determine the final risk category of the country. According to Estrella (2000), and based on seven export credit agencies, there is a very high consistency across their respective classifications: the rank correlation coefficients of export credit agency ratings vary between 0.951 and 0.995.

Cosset and Roy (1994) studied EDC, the Canadian export credit agency. They tried to replicate its ratings, based on certain publicly available economic variables. Using the EDC 1990 country risk classifications and economic data as of 1989, they found that with only few explanatory variables, it was possible to correctly reproduce the agency's rankings. The main determinants were related to certain external debt indicators, which does not constitute a surprise because of the period under consideration. The short-term ratings were also dependent on

the GDP per capita and the GDP growth rate, whereas the current account to GDP ratio had an influence on the long-term notes.

Focusing on the methodology of Coface, which is the self-proclaimed worldwide leader of the industry, the following paragraph will illustrate the export credit agency rating approach. Incorporated in 1946 by the French government as a public sector institution, Coface was privatized in 1994 and floated on the Paris Bourse in 2000. However, it "still covers the political risk on behalf of the French State with its guarantee and with the goal of promoting French exports" (Groslambert *et al.* 1999; Gherardi 1998; Eichengreen *et al.* 1998; Madura *et al.* 1997).

At least every three months, their team of seven analysts produces country risk ratings called rating for about 140 countries. These ratings try to assess the likelihood of default for short-term commercial transactions (up to six months). Their methodology has evolved over the last decades, so that it takes into account the new sorts of risk that appeared during this period. The assessment process is based on quantitative criteria shared across seven groups: political factors, risk of currency shortage, sovereign risk, risk of a sudden devaluation, risk of a systematic crisis in the banking sector, cyclical risk, payment behavior.

The political factors subset deals with the political risk in its strict meaning. It measures the likelihood of external and internal conflicts, the degree of religious or ethnic tensions, as well as any potential social disturbances. It also evaluates how these factors could undermine the execution of contracts in progress.

The risk of currency shortage assesses the country's economic and financial situation. The financial factor analyzes the balance of payments position and the external financing requirement. It also monitors the short-term debt level. The economic situation deals with the economic performance, the level of development, and includes the country's vulnerability in case of external shocks.

The sovereign risk is concerned with the state's capacity to fulfill its obligations. It monitors the public finance sector as well as some of the more qualitative aspects such as the fight against corruption or the degree of the administration's independence vis-`a-vis business and political groups.

The risk of a sudden devaluation estimates the likelihood of a financial crisis resulting from massive capital flight. It is obtained from three sub-indices: the vulnerability index, the degree of exposure to a confidence drop, and the level of market confidence. The vulnerability index is a function of the level of dependence vis-a-vis foreign short-term investments and the economy's ability to resist speculative attacks. The degree of exposure to a drop in confidence depends on the possible exchange rate overvaluation, the situation of the trade balance, and the existence of financial bubbles. The level of market confidence

is computed from financial market data such as the evolution of interest rates, stock market prices, and the discount on the secondary debt market.

The risk of a systemic crisis in the banking sector focuses on the soundness of the banking system. It evaluates both the financial health of the local banks, and the regulatory framework in which they evolve. The cyclical risk estimates the risk of a strong economic slowdown that could occur independently of the five above-mentioned cases. It is based on short-term growth forecasts.

The final criterion examines the payment behavior for short-term transactions in a given country. Thanks to Coface's extensive worldwide network of clients and partners, it can be updated very regularly and followed almost without any time delay. The inclusion of this parameter in their rating process distinguishes the export credit agencies' methodology from other methods.

Coface defines several types of country each of which is assigned a specific weighting grid. This rating process results in seven cohorts of risk, ranging from A1 to A4 for the investment grade categories, and from B to D for the speculative grade categories. Finally, it is worth noting that, even though this model is purely quantitative, in fine, the grade is given by a rating committee that may decide not to follow the model's result, thus leaving the final decision to the analysts' judgment.

2.4.4. Summary of Global Country Risk Ranking Methods

Built on the underlying assumption that "careful data collection and analysis can generate rules for anticipating politico-economic events in a robust way that does not depend on problematic theory" (Ascher 1989), and because no comprehensive theory of country risk has yet been developed, all these country risk ranking techniques rely simply on checklists of predetermined indicators. These criteria are carefully selected and weighted by the model's designer, from his own experience or from an historical data analysis.

Howell (2001) identifies various types of country risk ranking methods. Type I is only concerned by the present situation of a country and assumes a correlation between its current features and possible future problems. This is theway followed by NSE, EIU or Coface. Type II also deals with a series of factors that are supposed to characterize a country's environment. However, unlike Type I, experts are asked to forecast the future level of these criteria over various time horizons. Illustrations of Type II are BERI's one and five-year forecasts, or ICRG's 18-month and five-year ratings. Howell (2001) presents a Type III, which only differs from Type II in the sense that variables in the Type III models are not general attributes of the country in question, but are directly linked to potential losses for foreign businesses, such as the "nationalization"

parameter. Most of the Type II approaches also contain some Type III variables and it is quite difficult to draw a strict distinction between these two methods. The last model is the Type IV. Instead of directly forecasting the future outcomes of specific criteria, it starts by anticipating the possible governments in power in the future. Only then, does it try to assess the impact of each alternative on a set of predetermined factors.

All these methodologies, whatever their type, are based on expert judgment. Even the most quantitative criteria are evaluated subjectively in order to determine their relevance, or in order to allocate appropriate thresholds. Is the GDP per head a relevant parameter for assessing country risk? Does a 2% current account deficit make a big deal? Does it represent a low, a moderate, or a high risk? Why should the composite score be made of 35% of that, plus 40% of this, and 25% of that? Everything depends on the expert's choice. Even though some approaches try to mitigate the criticism of subjectivity by relying on expert panels, such as those using a Delphi process, the problem remains. As the vice-president of coordinating and planning at Conoco said: "If you pretend to quantify things by your subjective judgment, it is not very helpful. You can't boil things down to numerical indices" (BusinessWeek 1980). Rummel and Heenan (1978) also note that: "The strength of the Delphi technique rests on the posing of relevant questions. When they are defective, the entire structure crumbles".

In order to test the reliability of these models, Howell and Chaddick (1994) are among the very few who studied their predictive power and their ability to anticipate losses. They only focus on the political component of country risk, and investigate the degree of correlation between the 1986 projections of The Economist socio-political factors, the BERI Political Risk Indices (PRI), and the Political Risk Services (PRS) ratings, on the one hand, and on the other hand, a loss indicator for the period 1987–1992. This loss indicator was mainly built from the OPIC documentation of losses due to political risk. They find very low correlation coefficients of 0.33, 0.51 and 0.57, for The Economist, BERI and PRS respectively. The coefficients of determination (R2) are also quite weak at 11% for The Economist and 26% for BERI (the coefficient for PRS is not provided). Howell and Chaddick (1994) analyzed the various criteria making up each index and, based on historical data, rebuilt a posteriori a new rating system. Thus, they were able to create other, more statistically efficient models. However, no out of sample testing was done. Howell (1992), concentrating on The Economist rating and analyzing the period 1987–1991, extends this approach to the economic factors and to the overall score. In this case, he finds a lower correlation coefficient for the socio-political variables (0.10), but notices that the result is improved when taking the overall score into consideration

(0.17) and significantly better when considering the economic indices alone (0.25). However, results are still weak.

2.5. Indicators and Indices of Sustainability

For the past two decades, there have been many local, regional, state/provincial, national and international efforts to find useful sustainability indicators. The key feature of some of these suggested indicators is that they are defined through public participation. Therefore, these indicators are meaningful to the respective community. However, indicators based on asymmetric information and the heterogeneous interests of the stakeholders often make them incomparable, and therefore, less usable in other environments. International Institute for Sustainable Development (IISD) hosts and manages the compendium of sustainable development indicator initiatives around the world. Currently, the site has information about 669 initiatives (IISD 2006).

The most popular sustainability indicators are as follows (BERI 2001a; IISD 2006; Mishkin 2001; Murinde, Ryan 2001, 2002; Davis 1981):

- human development index (HDI);
- sustainable progress index (SPI);
- ecological footprint;
- material input per service unit (MIPS);
- index for sustainable economic welfare (ISEW);
- genuine progress indicator (GPI);
- genuine savings indicator (GSI);
- barometer of sustainability;
- environmental pressure indicators (EPI);
- total material requirement;
- Eco-efficiency indices;
- compass of sustainability;
- environmental sustainability index (ESI);
- environmental performance index (EPI);
- European economic sustainability index (EESI).

The UN Commission on Sustainable Development (UNCSD) from its working list of 134 indicators derived a core set of 58 indicators for all countries to use. The CSD is currently updating this set of indicators. I believe that where possible, a universal set of indicators can be defined, but local sustainability

concerns should be addressed in assessing the sustainability of an economic activity (Meadows 1998). It is needef to work to find a mechanism that is flexible enough to incorporate these diverse sets of indicators (Pinter *et al.* 2005), and yet give a comparable index.

Recent initiatives include the development of aggregate indices, headline indicators, goal-oriented-indicators, and green accounting systems. Early composite indices include Measure of Economic Welfare (MEW) by Nordhaus and Tobin (1973), Index of Social Progress (ISP) by Estes (1974), Physical Quality of Life Index (PQLI) by Morris (1979), and Economic Aspects of Welfare (EAW) by Zolotas (1981). Brekke (1997), however, challenges the concept of distinguishing economic welfare from noneconomic welfare.

Indices developed in the 1990s to measure the aggregate performance of the economy or the sustainability include Human Development Index (HDI) by the UNDP (1990), Sustainable Progress Index (SPI) by Krotscheck and Narodoslawsky (1994), Ecological Footprint by Rees and Wackernagel (1994), Material Input Per Service Unit (MIPS) by Schmidt-Bleek (1994), Index for Sustainable Economic Welfare (ISEW) by Daly, Cobb and Cobb (1989, 1994), Genuine Progress Indicator (GPI) by Cobb, Halstead and Rowe (1995), Genuine Savings Indicator (GSI) by Hamilton *et al.* (1997), Barometer of Sustainability by IUCN-IDRC (1997), and Environmental Pressure Indicators (EPI) by EU (1999).

The Consultative Group on Sustainable Development Indicators (CGSDI) at IISD as part of their effort to create 'an internationally accepted sustainable development index' produced the Dashboard of Sustainability, a performance evaluation tool, in 2001.

More recently developed indices include Total Material Requirement by EEA (2001), Eco-efficiency Indices by WBCSD (2003), the Compass of Sustainability by AtKisson (2005), Environmental Sustainability Index (ESI) and Environmental Performance Index (EPI) by YCELP, CIESIN, WEF and EU (2005, 2006). Most of these indices are not used by policy-makers due to measurement, weighting and indicator selection problems (Bartelmus 2001; Pinter *et al.* 2005). However, some of them are popular among different stakeholders.

There are two distinct methodologies that can be found in all of these. Mainstream economists use monetary aggregation method, whereas scientists and researchers in other disciplines prefer to use physical indicators (Moffatt 1996). Economic approaches include greening the GDP, resource accounting based on their functions, sustainable growth modelling, and defining weak and strong sustainability conditions. For example, recently developed ISEW and GPI are corrections of the National Income (NI) accounts for environmental and some other non-market activities to reflect Hicksian income (Hicks 1946).

Some of the indicators that are unaccounted for, or not accounted for as costs, in the GDP, but are included in either ISEW or GPI as 'defensive expenditures' (Daly, Cobb 1989), are private expenditures on health and education; costs of commuting, urbanization and auto accidents; costs of different types of pollution, depletion of non-renewable resources and long term environmental damage; the value of volunteer work; and the costs of crime, family breakdown, underemployment, etc.

The European Economic Sustainability Index (EESI)

In light of the unprecedented turmoil in the euro-zone and the uncertainty over what the future holds, it is important to not only understand the current pressures on public finances but also the medium- to long-term factors which will affect the economic stability and sustainability of EU countries in future. The long-term competitiveness of European economies, their governance and their ability to carry out structural reforms to cope with long-term challenges will all influence whether countries have a sustainable economy in the long run. This will also determine the success or failure of the euro. To assess the economic sustainability of Europe's economies, the EPC has developed an index to assess simultaneously the short-, medium- and long-term economic sustainability of EU countries relative to each other. This index is constructed using six domains: deficits, national debt, growth, competitiveness, governance/corruption and cost of ageing.

To examine economic sustainability in more detail, the European Policy Centre developed the European Economic Sustainability Index (EESI) in 2010. This Policy Brief updates the EESI with the most recent data. Not only does it take into account deficits (average 2011–2012) and debt levels (2011), but also considers growth forecasts (average 2011–2012). Furthermore, the EESI is oriented towards the long term: it incorporates the Global Competitiveness Index (2011), the Corruption Perceptions Index (2011) and the Labour Market Adjusted Dependency Ratio (2011). These provide indications of how an economy is likely to perform in future. All these different factors are combined in the EESI to produce a relative ranking for all EU-27 countries.

Of course, no index can fully capture how a country's economy is likely to perform. There are always issues linked to each component of such an index: what are the appropriate indicators? Any analysis that fails to take into account indicators of long-term performance is both incomplete and misleading. The trajectory of the crisis will also depend on these long-term factors. A poor performance in the index doesn't mean that there is no chance of economic sustainability in the long term. Rather, the index suggests that those countries at the bottom of the ranking need to focus more on implementing the kind of reform that boosts efficiency and growth. It also suggests that these countries

will need to do more to invest in future growth, and some of this investment will need to come from their stronger European partners. The summary of indicators, which are included in EESI, is presented in Table 2.4.

Table 2.4. Indicators, which are included in EESI (author)

Indicator domain	Description	Reason for inclusion
GDP growth (a)	Annual change in GDP, average of two years	Short-term indicator of economic performance and of ability to repay debt
Debt levels (b)	Total government debt measured as a percentage of GDP – part of the so-called Maastricht or convergence criteria of economic and monetary union	Medium- to long-term indicator of public finance performance
Deficit/surplus (c)	Government's net borrowing requirement, i.e. the difference between revenues and expenditure – part of the so-called Maastricht or convergence criteria of economic and monetary union	Short-term indicator of public finance performance
Global competitive index (world economic forum) (d)	A composite indicator, capturing microeconomic and macro-economic foundations of competitiveness, defined "as the set of institutions, policies, and factors that determine the level of productivity of a country. The level of productivity, in turn, sets the sustainable level of prosperity that can be earned by an economy (e)	Long-term index of competitiveness and future growth potential
Corruption perception index (f) (transparency international)	Measures the perceived level of public-sector corruption in 180 countries and territories around the world. The CPI is a "survey of surveys", based on 13 different expert and business surveys (g)	Underlying index of governance/rule of law and proxy for public sector efficiency
Future cost of ageing	Long-term expenditure projections covering pensions, health care, long-term care, education and unemployment transfers for all Member States (h)	Very long-term indicator of public public finance pressure and proxy for structural reform

One of the key questions surrounding any index is its sensitivity to any changes in the weight of its various domainsix. If more emphasis is put on shortterm indicators (deficits and growth) and less on long-term indicators (Corruption Perceptions Index and Global Competitiveness Index), it tends to improve the position of the CEE-MS: for example, Latvia and Bulgaria's rankings would improve significantly. At the same time, Ireland, France and the UK would all fall significantly in the rankings.

These indicators have been chosen to reflect a balance between short-, medium- and long-term pressures on economic sustainability. They have to be available in all EU Member States and ideally are updated regularly. They also have to enable a clear ranking i.e. there has to be a clearly identifiable

performance scale which enables a ranking from high performance to low performance.

2.6. Determinants of Country Risk Evaluation

Excluding the discussed methodologies, the other country credit risk approaches prove difficult to detail precisely, either for strategic reasons, which make the raters reluctant to give precise information on their system, or because they involve a substantial amount of subjective judgment which is hard to translate into an explicit analytical process.

In the face of this challenge, several researchers tried to replicate these ratings, using readily available public information, in order to incorporate them into an analytical model. While Errunza (1977), Fitzpatrick (1983), Feder and Uy (1985), Oral *et al.* (1992), Cosset *et al.* (1993), Lee (1993), McAleer (1994), Obstfeld (1994) or Miller *et al.* (1996) only focus on Institutional Investor, Krayenbuehl (1985), Eaton *et al.* (1986), Cosset and Roy (1991), Cosset *et al.* (1992), Haque *et al.* (1996, 1997, 1998), Murinde (1998), Murinde *et al.* (1999), Demirguc-Kunt *et al.* (1998) investigate Euromoney as well. Others such as Cantor and Packer (1996b), Ferri *et al.* (1999), or Mulder and Perelli (2001) look at the credit rating agencies. Finally Cruces (2001) or Monfort and Mulder (2000) tackle both the magazine and agency ratings.

Using a panel of Moody's and Standard & Poor's ratings for 49 developed and emerging countries, Cantor and Packer (1996b) try to identify their determinants. Among eight factors under review, they find that income per capita, GDP growth, inflation, external debt, level of economic development, and history of default do have significant explanatory power. To their surprise, fiscal balance as well as external balance coefficients are not significant. Contrary to the seemingly complex methodology used by the rating agencies, Cantor and Packer (1996b) claim that, with only few variables, "the model's ability to predict large differences in ratings is impressive". Their regression is able to explain more than 90% of the sample variation.

Monfort and Mulder (2000), in a very comprehensive investigation, review four previous studies and run their own regressions. They only focus on emerging countries as "rating behavior for industrialized countries may be quite well different". They cover II, S&P, and Moody's from the first semester 1995 to the first semester 1999. Their results are consistent with Cantor and Packer (1996b) except for the income per capita variable. Other factors are taken into consideration and prove to be statistically significant: current account over GDP, terms of trade, export growth rate, and investment over GDP. The explanatory ower of these models remains at a very high 80%.

However, Monfort and Mulder (2000) challenge the validity of these regressions, including the Cantor and Packer (1996b) results, for not taking into account the serial correlation of the statistical series, shown clearly in Cruces (2001). Dividing their time span between three subperiods, they show that the relationship is not stable, a result already found with Lee (1993) when comparing the periods 1979–1982 and 1983–1987. Implementing a more robust dynamic specification, in order to cope with this issue, Monfort and Mulder (2000) demonstrate that ratings do exhibit a strong inertia. Except for the terms of trade and history of default criteria, all the factors mentioned above and retained in the static model are significant. Moreover, introducing an external crisis indicator, they establish that ratings are strongly influenced by crisis occurrences: "Countries are downgraded following a major crisis, possibly because they do not perform as expected." Rating agencies justify this point by explaining that, during a crisis, new information about the way countries are able to manage their problems is revealed and taken into account.

Using a slightly different panel, Mulder and Perelli (2001) confirm most of these outcomes. They emphasize the importance of the investment to GDP ratio, and note that debt to exports, as well as the rescheduling history (contrary to Monfort, Mulder 2000) are the main sources of change in the level of the ratings. In addition, in the aftermath of the Asian crisis, they discover a structural break in the determinants of ratings. From 1997, the short-term debt over reserves ratio becomes significant, highlighting the growing attention paid by the rating agencies to this criterion. Fitch confirmed that: "Both the agencies and the IMF had understated the impact that high levels of short-term debt could have on the official reserves of South Korea and other Asian economies" (Luce 1998).

An earlier paper of Cosset and Roy (1991) and Gaddis (1992, 1993), looking at Euromoney and Institutional Investor, had already stressed the weights of the propensity to invest and the debt to export ratios as the main determinants of country ratings. In their study, the GNP per capita was also very significant, probably because they did not separate industrialized and emerging countries.

Contrary to the rating agencies' explanations, political factors are not included as significant criteria in the papers mentioned above. Accordingly, Haque *et al.* (1998) "examines the relative importance of political and economic variables in the determination of a country's standing". They find that "political events and variables do not add any additional information once economic factors have been accounted for".

Another interesting feature of the country credit ratings was established by Cruces (2001). Investigating the statistical properties of S&P (2001, 2002), Moody's (2001a, 2001b, 2002) and II series, he evidenced a high level of predictability in the credit rating revisions: "A positive revision has a probability

of two-thirds of being followed by another positive revision six months later." This fact was also established by Erb *et al*. (1996) for the changes in the II grades. It is also worth noting the strong degree of consistency between the credit rating agencies and the export credit agencies (Estrella 2000).

Meldrum (2000) also measures the predictive power of four risk services, the Standard & Poor's ratings, and the author's owncompany-specific manufacturing risk measure. He explores the relationship between these ratings and the returns earned by US manufacturing firms on their direct investment abroad (data taken from the Bureau of Economic Analysis), between 1994 and 1997. Another type of critique raised by West (2001) concerns the static feature of ratings. A priori, there is no reason for a criterion to keep the same weight forever. This explains why most of these rating methods are regularly updated, usually after the event. There is also no justification for a factor to be as crucial or to have the same graduations in countries as different as Nigeria or Brazil, for example. Goldstein *et al.* (2000) illustrate this point by writing that "a 25% decline in stock prices would be considered a signal of future currency crisis in Malaysia and Sweden but not in Mexico, where volatility is historically much higher". To circumvent this issue, some models, such as NSE, avoid analyzing developed economies and only tackle the developing countries, assuming that they share more or less the same common characteristics.

Others, like Coface, devise several weighting schemes for various types of countries. A further flaw of these methods arises from their linear aggregation process. Indeed, once a variable is assigned a weight, it can only impact the final outcome between zero and 100% of its original weight. However, under certain circumstances, it seems reasonable to think that, when a situation reaches a certain threshold, feedback effects could be generated. A sort of chain reaction may start that could make the factor in question much more decisive in the overall assessment of the country risk than originally accounted for in the model. In addition, other criteria could be impacted and see their relative importance revised as well. This is why approaches such as that of Goldstein *et al.* (2000) refuse to rely on the linear regression techniques, and prefer to use non-parametric methods. The Asian crisis exemplified this problem, where cumulative and contagion effects coupled with herd behavior turned an a priori seemingly manageable situation into a very chaotic process.

However, even though these approaches do not forecast country risk events as well as could be expected, they do incorporate a non-negligible amount of information about the level of risk. Looking at between 28 (in 1984) and 48 (in 1995) national stock market indices, Erb *et al.* (1996) found that the ICRG ratings were able to predict the cross-section of expected returns. Based on this fact, they implemented a successful portfolio strategy that, a posteriori, was able

to deliver some substantial abnormal returns. Consequently, this shows the ratings' ability to contain relevant information for international investors.

Finally, these global country risk methods may prove useful, provided they are only taken for what they are: a first rough grid of analysis that aims at providing as exhaustive a weighted checklist as possible or a means of limiting the analysts' subjectivity, or providing a single axis of analysis for comparing countries. From an operational point of view, the rating process offers managers, CEOs and investors the possibility of comparing and quantifying risks. As Terrier (2001) put it: "From a methodological point of view, to quantify in order to compare is disputable, but to decide without quantifying is still more questionable."

2.7. Conclusions for Chapter 2

1. There are a plenty of methodologies to evaluate country risk, the most popular are as follows: panel of experts, discrete scoring model, analytic hierarchy process, simulation survey, full fuzzy scoring model and reduced fuzzy scoring model. However, all these methodologies, whatever their type, are based on expert judgment. Even the most quantitative criteria are evaluated subjectively in order to determine their relevance, or in order to allocate appropriate thresholds.
2. It was clarified that usually the focus is done on three main issues: the usefulness of both qualitative and quantitative risk rating methods to explain and predict actual debt-servicing problems; the potential to explain and reproduce actual qualitative ratings by a limited combination of quantitative economic variables; and the importance of yield spreads in primary and secondary financial markets for the assessment of country risk.
3. Different rating approaches were analyzed: fully qualitative system; structured qualitative system; checklist system, and other quantitative methods. This analysis helped to understand the limitations of such rating approaches. Because no comprehensive theory of country risk has yet been developed, all these country risk ranking techniques rely simply on checklists of predetermined indicators. These criteria are carefully selected and weighted by the model's designer, from his own experience or from an historical data analysis.
4. Most of country risk evaluation methods are based on a judgement on the economic performance of a country. There are several world's leading commercial publishers of country and political risk analysis:

The Economist Intelligence Unit (EIU), Euromoney Magazine, Fitch IBCA, Institutional Investor magazine, International Country Risk Guide, Moody's Investor Service, Standard&Poor's Ratings Group. Unfortunately, all these publishers are evaluating country risk taking into account only economic variables and sometimes political risk, though economic security and sustainability variables should be also evaluated.

3

Country Risk Assessment Model and its Empirical Approbation

After analysis of country risk definition, its components, influencing factors and different evaluation methods, new sophisticated and complex model for country risk assessment could be created.

For topic of this chapter of dissertation four scientific articles were published (Stankevičienė, Sviderskė, Miečinskienė 2014; Stankevičienė, Sviderskė, Miečinskienė 2013, Stankevičienė, Sviderskė, Miečinskienė 2013; Stankevičienė, Sviderskė 2012).

3.1. Creation of Country Risk Assessment Model

After analysis of scientific literature, it became clear that country risk should be evaluated from different perspectives – include not only economical and political variables, but consider impact of economic security and sustainability variables. Euler Hermes (2014) monitors country risks in 241 countries and territories (Fig. 3.1). Euler Hermes is the largest global credit insurance company in the world that offers a large range of bonding, guarantees and collections services for the management of business-to-business trade receivables. It is also one of

the oldest credit insurance company in the world, with the history spanning back to 1893. Its credit intelligence network analyzes the financial stability of 40+ million businesses worldwide. Euler Hermes offers services for both domestic and export business trade transactions, protecting clients against commercial and political risk in more than 200 countries and territories worldwide. They also provide services to help companies of all sizes outsource their debt collection, risk management and credit management information needs.

Based on the ranking, it is obvious that a model for country risk assessment is needed across Europe, as there are still countries with medium, sensitive or even high country risk.

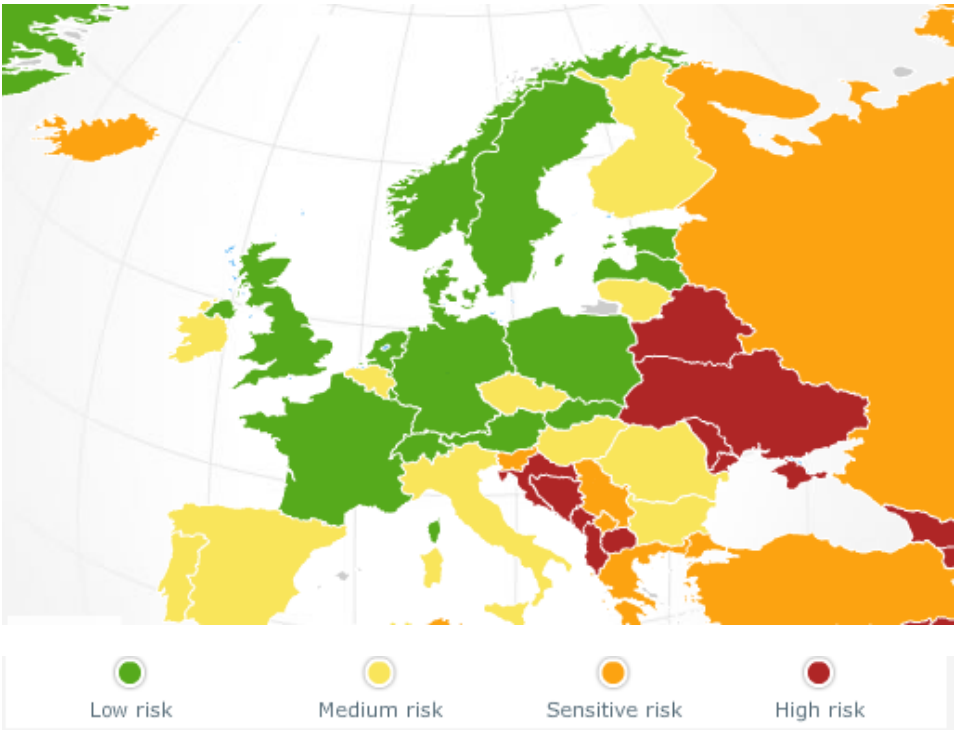

Fig. 3.1. Country risk map (Euler Hermes 2014)

Selection of variables is very important step in starting to analyze and create new country risk assessment model. Based on the analysis of scientific literature on different methods for country risk assessment, variables for the model were chosen (Fig. 3.2, Fig. 3.3, Fig. 3.4).

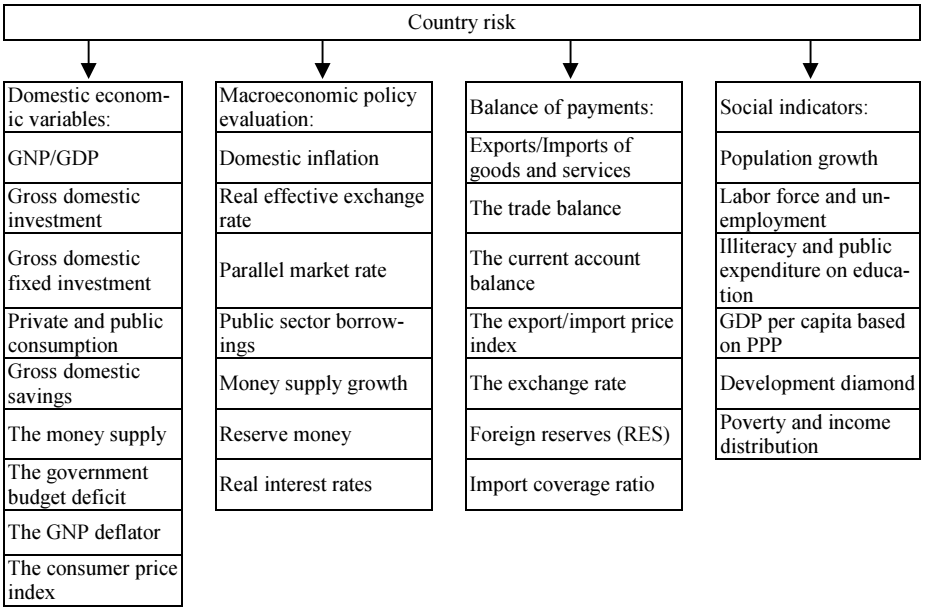

Fig. 3.2. Variables for country risk (author)

For each group the amount of variables and their range differs. For country risk main four groups of variables were distinguished: domestic economic variables, macroeconomic policy evaluation, balance of payments and social indicators. Tottally, 28 indicators were found.

For country sustainability 7 groups of variables were identified, which include: economic well-being indicators, foundational well-being indicators, social indicators, state of environment, economic development, social development and regional development. Summarizing, 61 indicators were identified, with different range per concrete group.

For country economic security 7 groups as well were distinguished. They are: economic well-being, consumption flows, stock of wealth, economic security, ongoing domestic and international conflict, societal safety and security and militarisation. Totally, 31 indicators were found.

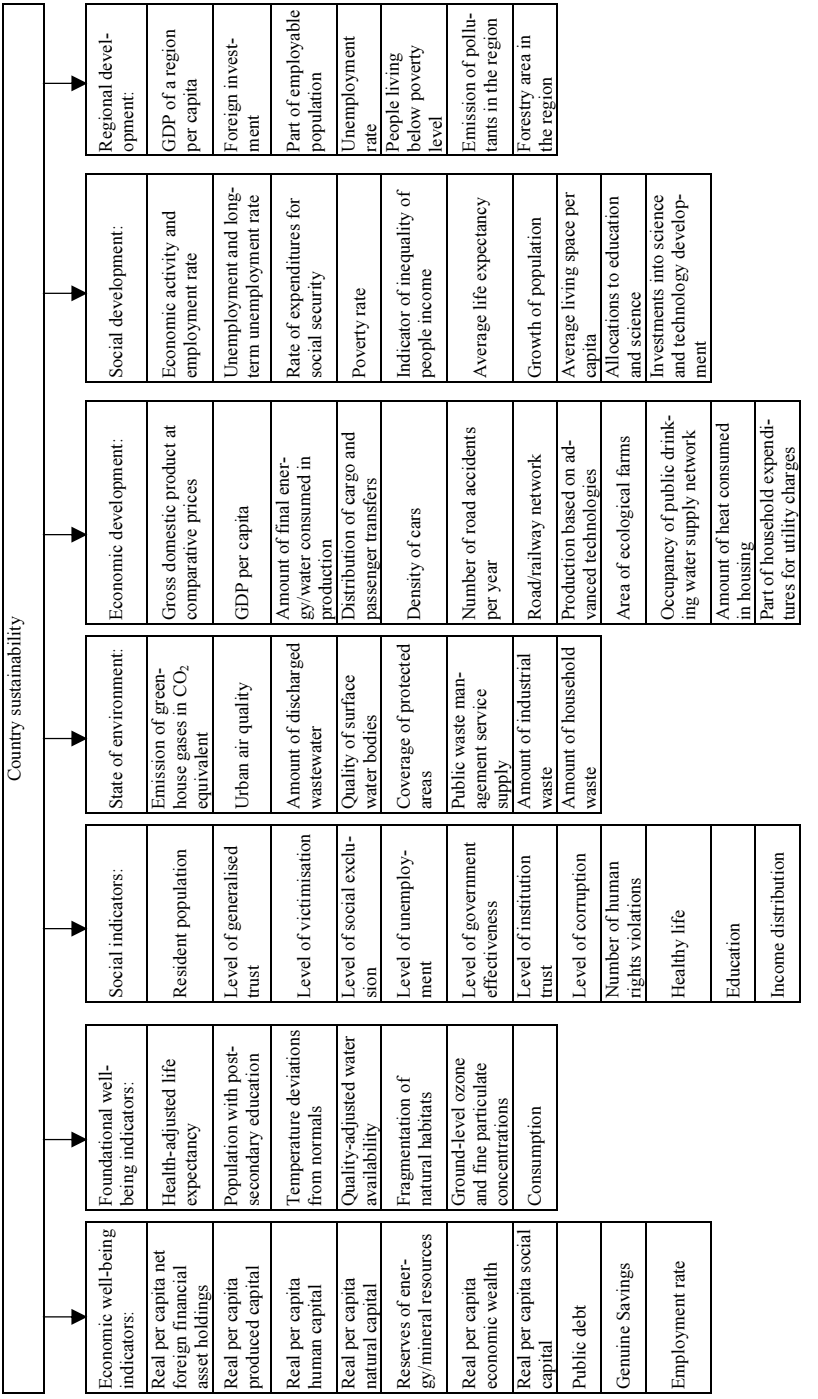

Fig. 3.3. Variables for country economic security (author)

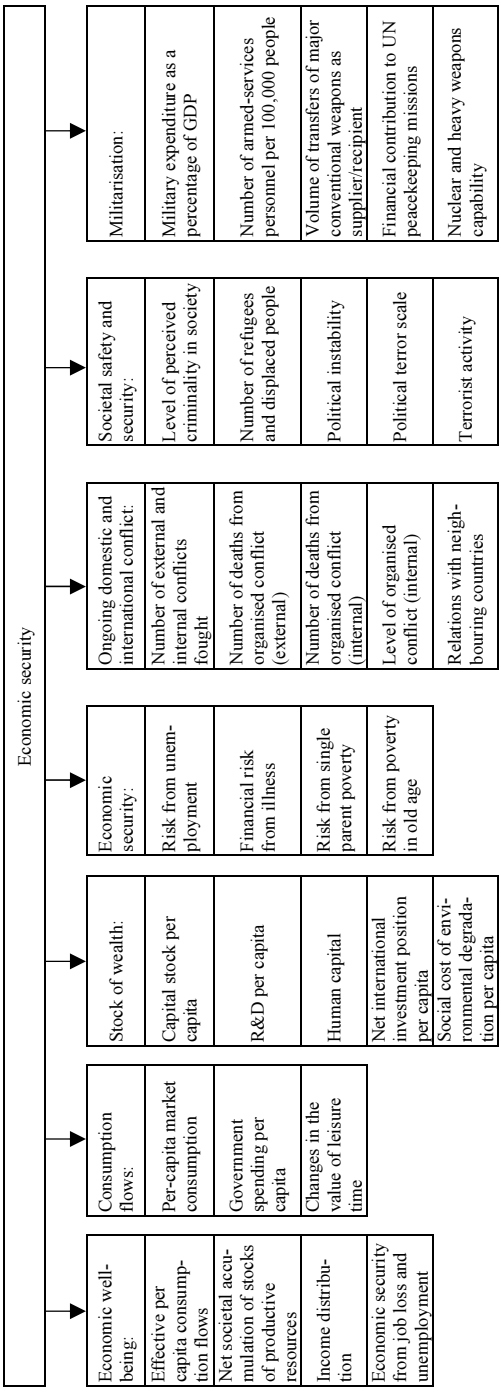

Fig. 3.4. Variables for country economic security (author)

Afterwards, based on the availability of information from Eurostat (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database), the narrower list of variables was chosen. After consolidating different types of variables' splitting, different groups of country risk, economic security and sustainability indicators were created (Fig. 3.5, Fig. 3.6 and Fig. 3.7).

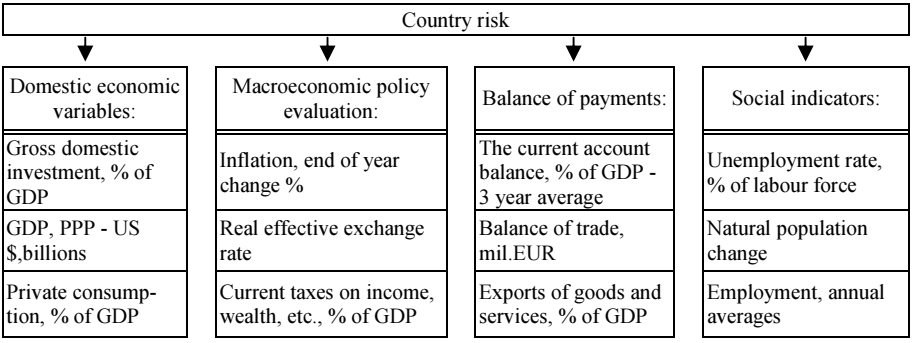

Fig. 3.5. Grouping of indicators for country risk evaluation (author)

For country risk, four main groups of variables were distinguished – domestic economic variables, macroeconomic policy evaluation, balance of payments and social indicators. Each group includes a set of three indicators, which mostly describe country risk.

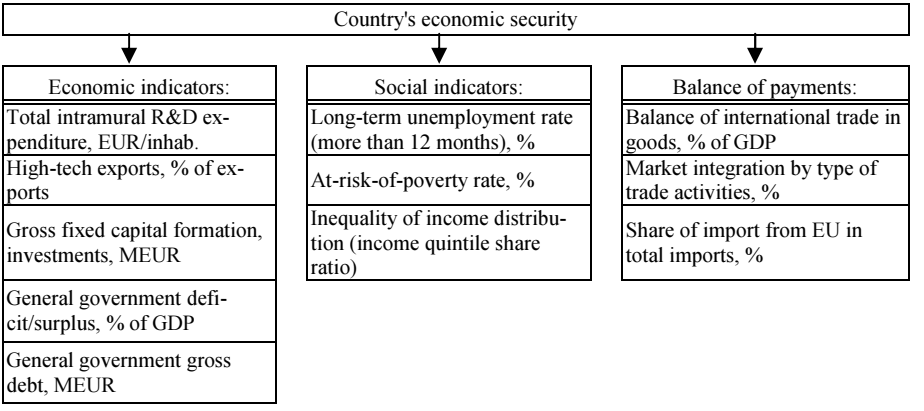

Fig. 3.6. Grouping of indicators for country's economic security evaluation (author)

For economic security, three main groups of variables were distinguished – economic indicators, social and balance of payments. Each group includes a set of indicators, which mostly describe countries' economic security (Saisana, Saltelli 2010; Saaty 2010).

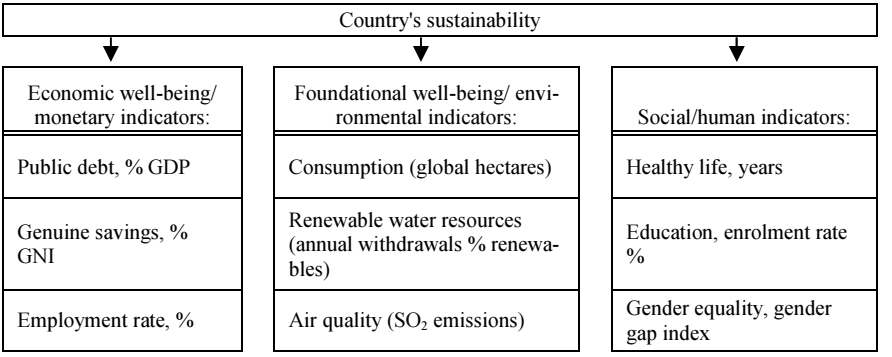

Fig. 3.7. Grouping of indicators for country sustainability evaluation (author)

For country sustainability, three main groups of variables were distinguished – economic well-being/monetary indicators, foundational well-being/environmental indicators and social/human indicators. Each group includes a set of indicators, which mostly describe country sustainability.

Then, country risk assessment model could be finalized (Fig. 3.9). As assumption is that country risk, economic security and sustainability indicators are interrelated and influencing each other, this point is at the ground of the model. The first step is to have appropriate data which should be evaluated, there is a list of proposed variables which should be included in evaluation for each group of variables. Then general estimation of critical situations should be reviewed, not to have some specific or non-usual cases, when whole country risk assessment is changing dramatically. Afterwards, country risk should be evaluated based on inital data and indicators, using different approaches and methods for evaluation, which are not giving the final solution for assessing country risk. Then identification for each indicator should be made – indicate whether concrete indicator should be maximized or minimized. If there is country risk evaluation of a region, then both internal and external threats should be taken into account. Then using different types of valuation methods, the analysis and diagnostics, as well as normalization of variables should be prepared. The proposed methods for multicreteria evaluation are MOORA and MULTIMOORA. Afterwards, ranking of a country or region could be calculated and then the relationship between variables should be detected. The relationship could should the threshold indicators, which are mostly depending on each other, in this sense mostly influencing rating of country for country risk. Then arrangements to assess country risk should be performed. Knowing the mostly interrelated indicators, it becomes obvious which indicator should be changed (maximized or minimized) in order to change general ranking of the country. By this step, internal and external sources of country risk are being detected. When the detec-

tion is performed, the available data about variables should be checked, as only then it becomes clearer which range of indicators could be changed. Ideally, the forecast for predictions of different variables should be made and this forecast possibility will be done in future scientific researches.

The model has several steps to be checked in order to have final country risk assessment instrument.

3.2. Comparison of Country Risk, Sustainability and Economic Security Indices in Baltic States Countries

The main task is to find out the relationship between country risk, economic sustainability and economic security (Fig. 3.8). To start with, Baltic States countries were taken as focus countries to find out relationship between ratios. The first step was to identify variables which should be analyzed for each group.

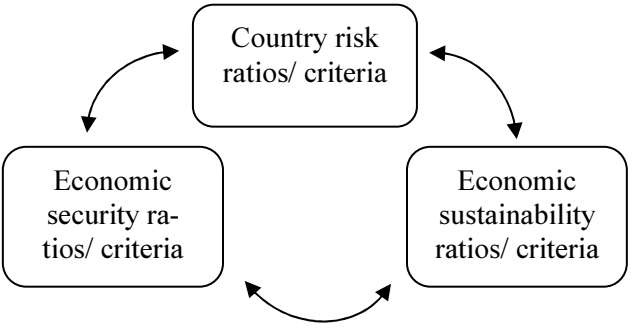

Fig. 3.8. Interdependence between ratios (author)

The ratios taken are Euromoney country risk index for evaluation of country risk, European economic sustainability index for evaluation of economic sustainability and aggregate value of state index for evaluation of economic security. All ratios for 2011 year for European Union members were analyzed.

The results of aggregated valuation of three indices and ranking by each index are presented in Table 3.1.

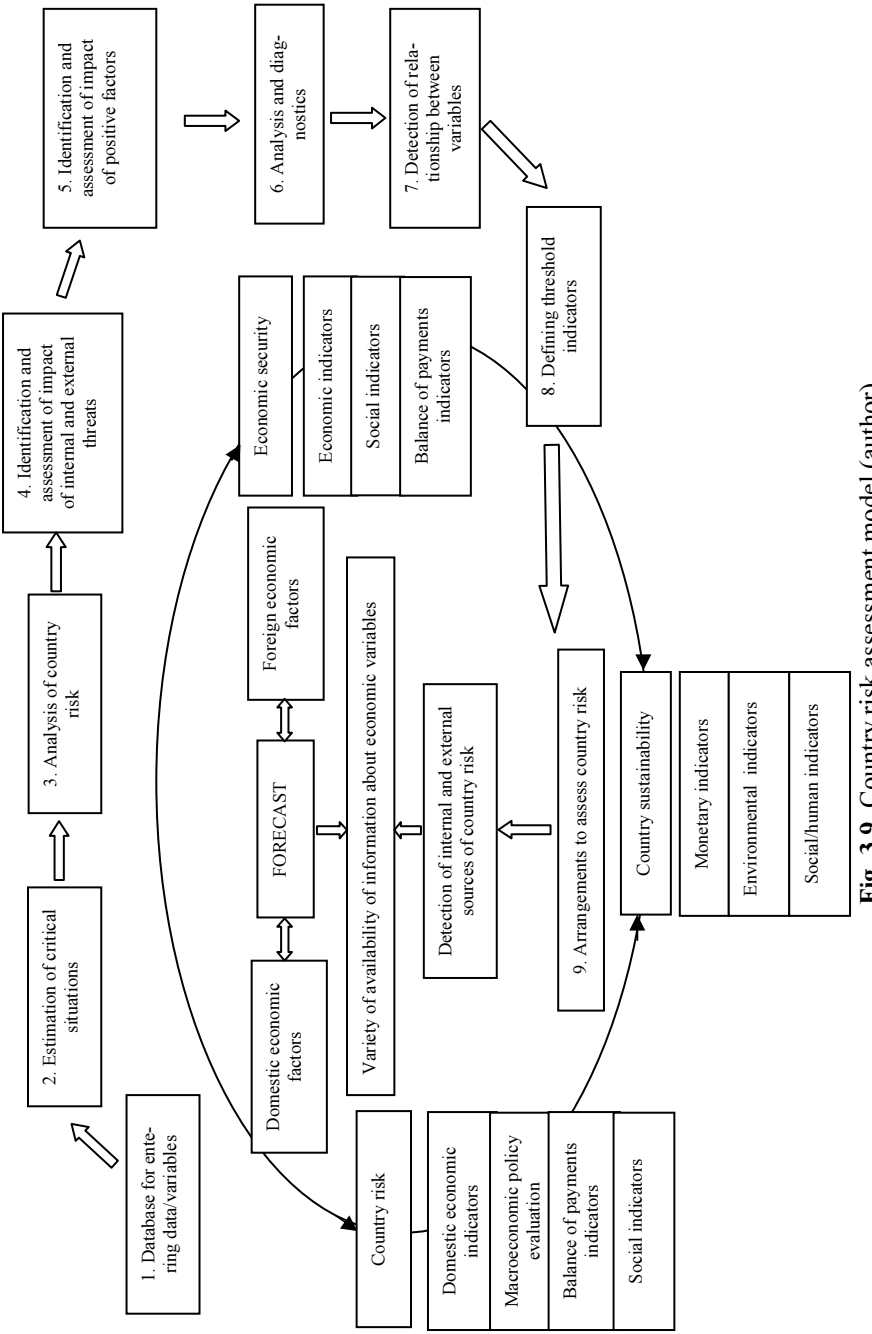

Fig. 3.9. Country risk assessment model (author)

Table 3.1. EU countries ranking based on three criteria Euromoney Country Risk Index, European Economic Sustainability Index, and Aggregate Value of State Index for 2011. (Source: author, based on http://www.euromoneycountryrisk.com; http://www.epc.eu and Damijan's criteria, 1996)

EU country	Euromoney country risk index		European economic sustainability index		Aggregate value of state index	
	Overall score	Rank	Overall score	Rank	Overall score	Rank
Austria	84.36	7	0.26	7	0.5766	10
Belgium	76.78	10	0.05	9	0.4109	9
Bulgaria	53.77	24	-0.17	18	0.3158	25
Cyprus	75.56	11	-0.01	11	0.2813	24
Czech Republic	74.52	13	-0.10	13	0.2070	16
Denmark	89.07	2	0.51	2	0.1064	13
Estonia	57.50	22	0.36	5	0.0868	23
Finland	87.31	4	0.51	2	0.0851	11
France	81.42	8	0.00	10	0.0693	2
Germany	85.73	6	0.32	6	0.0617	1
Greece	49.72	26	-0.88	26	0.0534	12
Hungary	58.75	21	-0.21	19	0.0457	17
Ireland	63.38	19	-0.15	16	0.0446	15
Italy	70.60	17	-0.47	25	0.0381	4
Latvia	52.38	25	-0.14	14	0.0303	21
Lithuania	57.18	23	-0.04	12	0.0250	19
Luxembourg	90.86	1	0.37	4	0.0250	22
Malta	74.49	14	-0.24	21	0.0123	27
Poland	71.15	16	-0.14	15	0.0084	8
Portugal	60.73	20	-0.23	20	0.0078	14
Romania	49.59	27	-0.26	22	0.0070	26
Slovakia	73.82	15	-0.31	24	0.0060	18
Slovenia	74.92	12	-0.15	17	0.0048	20
Spain	66.53	18	-0.27	23	0.0033	5
Sweden	88.72	3	0.76	1	0.0020	7
The Netherlands	86.97	5	0.46	3	0.0018	6
United Kingdom	80.21	9	0.16	8	0.0011	3

It is considered n elements to be compared, C_1 … C_n and denoting the relative "weight" (or priority or significance) of C_i with respect to C_j by a_{ij} and forming a square matrix $A=(a_{ij})$ of order n with the constraints that $a_{ij} = 1/a_{ji}$, for $i \neq j$, and $a_{ii} = 1$, all i. Such a matrix is said to be a reciprocal matrix.

The weights are consistent if they are transitive, that is $a_{ik} = a_{ij}a_{jk}$ for all i, j, and k. Such a matrix might exist if the a_{ij} are calculated from exactly measured data. Then find a vector ω of order n such that

$$A\omega = \lambda\omega, \tag{3.1}$$

where ω is an eigenvector (of order n) , λ is an eigenvalue.

For a consistent matrix,

$$\lambda = n. \tag{3.2}$$

As the field of interest is Baltic States, the data was summarized accordingly, taking out only three Baltic countries (Table 3.2).

Table 3.2. Baltic States indices (author)

Country	Country risk index	Sustainability index	Economic security index
Estonia	57.50	0.36	0.0868
Latvia	52.38	-0.14	0.0303
Lithuania	57.18	-0.04	0.0250

These indices should be compared with each other, for this reason a table with three attributes is presented as a matrix (Table 3.3).

Table 3.3. Matrix with weights for each country (author)

Indices	Estonia	Latvia	Lithuania	Root of product of values	Eigenvector
Country risk index	6	1	3	0.363	0.089
Sustainability index	2	1/3	1	2.621	0.642
Economic security index	1	1/6	1/2	1.101	0.270
Total				3.931	1.000

The eigenvector of the relative importance or value of each index is (0.089; 0.642; 0.270). Thus, sustainability index is the most valuable, country risk index and economic security indices are behind.

The next stage is to calculate λ_{max} so as to lead to the Consistency Index and the Consistency Ratio. Firstly, it is multiplied on the right the matrix of judgements by the eigenvector, obtaining a new vector. The calculation for the first row in the matrix is: $6 \times 0.089 + 1 \times 0.642 + 3 \times 0.270 = 1.983$ and the remaining two rows give 0.661 and 0.330.

This vector of three elements (1.983; 0.661; 0.330) is, the product A_{ω} and the AHP theory says that $A\omega=\lambda_{max}\omega$, so it can be got three estimates of λ_{max} by the simple expedient of dividing each component of (1.983; 0.661; 0.330) by the corresponding eigenvector element. This gives $1.983/0.089 = 22.33$ together with 1.03 and 1.23.

The mean of these values is 8.20 and that is the estimate for λ_{max}. If any of the estimates for λ_{max} turns out to be less than n, or 8 in this case, there has been an error in the calculation, which is a useful sanity check.

Table 3.4. Indices of consistency for random judgments (Saaty T. L., 2010)

1	2	3	4	5	6	7	8	9	10
0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

The Consistency Index for a matrix is calculated from

$$(\lambda_{max}\text{-n})/(\text{n-1}) \qquad (3.3)$$

and, since n = 3 for this matrix, the CI is 2.6. The final step is to calculate the Consistency Ratio for this set of judgments using the CI for the corresponding value from large samples of matrices of purely random judgments using the Table 3.4, derived from Saaty's book, in which the upper row is the order of the random matrix, and the lower is the corresponding index of consistency for random judgments.

For this case, it gives 2.6/1.41=1.84. Saaty (2010) argues that a CR > 0.1 indicates that the judgments are at the limit of consistency though have to be accepted sometimes. It means that calculated results are quite relevant to make conclusions.

The aim of this study was to develop a system which, based upon existing research, mainly on indices and multicriteria evalution methodology, could be used for complex valuation of country risk, sustainability and economic security. It was demonstrated that proposed aggregation system of three indicators: Euromoney country risk inde, European economic sustainability index and Aggregate value of state index of 27 EU countries offers the ability to compare and benchmark each country according to the complex valuation of main risk drivers.

Proposed complex valuation system of country risk, sustainability and economic security could be perfectly used while evaluating and standardizing country risk, sustainability and economic security as a ratio system, reference point and multiplicative form appropriately suit for case, where there are several alternatives (EU countries or Baltic countries) and several objectives.

3.3. Analysis of Country Risk, Economic Securitity and Sustainability Variables

In this abstract relationship between country risk and economic security ratios will be analyzed. There is an assumption, proposed by the author, that all three variables are interrelated between each other in one or another direction/dependence (Fig. 3.10) and it is the main hypothesis, which is already approved by several scientific researches (Stankevičienė, Sviderskė, Miečinskienė 2014; Stankevičienė, Sviderskė 2012).

All data for analysis was received from European Statistics Database (Eurostat) and International Monetary Fund for EU Baltic Sea region countries. The data therefore covers 8 EU Baltic Sea region countries, year 2012 (latest available data) and 32 structural indicators, 256 observations in total. The indicators used for calculations are presented in Fig. 3.5 and Fig. 3.6.

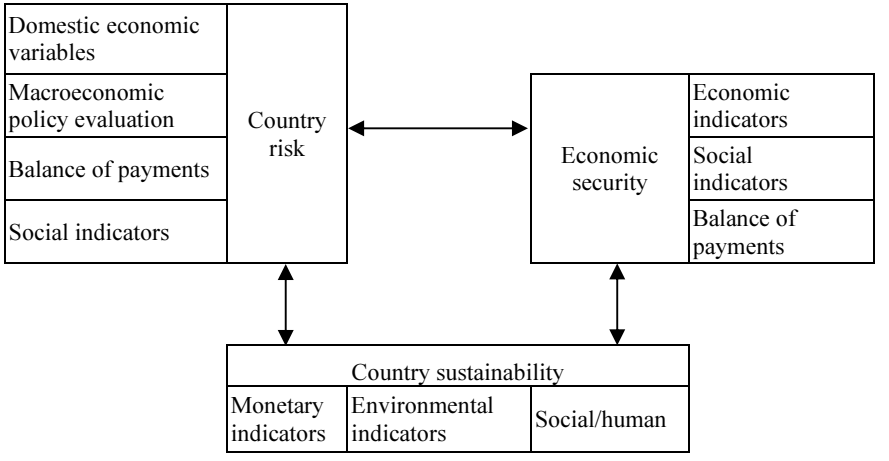

Fig. 3.10. Interdependence between ratios (author)

In Table 3.5, Table 3.6, Table 3.7 all country risk, economic security and sustainability indicators for evaluation are presented.

Table 3.5. Country risk indicators for EU Baltic Sea region countries for 2012 (author)

EU Baltic Sea region countries	Domestic economic variables			Macroeconomic policy evaluation			Balance of payments			Social indicators		
	Gross domestic invest-ment, % of GDP	GDP, PPP - US $,billions	Private con-sump-tion, % of GDP	Inflation, end of year change %	Real effective exchange rate	Current taxes on income, wealth, etc., % of GDP	The current account balance, % of GDP	Balance of trade, MEUR	Exports of goods and servines, % of GDP	Unem-ploy-ment Rate, % of labour force	Natural popula-tion change	Employ-ment, annual averages
Denmark	17.32	210.15	49.50	1.96	96.20	30.40	5.60	585.40	54.50	7.55	1.00	2,688.60
Estonia	27.63	29.09	51.80	3.76	111.30	7.00	1.30	-203.50	92.50	9.77	-1.10	624.40
Finland	18.74	197.48	56.30	3.45	95.00	15.90	-0.60	-527.90	39.70	7.68	1.40	2,483.20
Germany	17.22	3,197.07	57.60	2.04	93.70	12.10	6.50	16,097.6	51.60	5.46	-2.30	40,062.10
Latvia	25.89	37.27	62.10	1.60	116.10	7.70	-0.30	-135.90	61.10	14.94	-4.50	885.60
Lithuania	17.10	23743	64.20	2.93	109.30	4.90	-1.40	40.30	84.20	13.25	-3.50	1,278.50
Poland	21.8	800.93	61.20	2.40	100.60	7.20	-4.50	-788.20	46.20	10.35	0.00	15,590.70
Sweden	18.54	392.96	48.20	1.04	100.80	18.30	7.00	459.90	48.70	7.90	2.20	4,657.10

Table 3.6. Economic security indicators for EU Baltic Sea region countries for 2012 (author)

EU Baltic Sea region countries	Economic indicators					Social indicators			Balance of payments		
	Total intramu-ral R&D ex-penditu-re, EUR/inh ab.	High-tech exports, % of exports	Gross fixed capital for-mation, invest-ments, MEUR	General go-vernment deficit/ surplus, % of GDP	General government gross debt, MEUR	Long-term unemplo-yment rate (more than 12 m.), %	At-risk-of-poverty rate, %	Inequality of income distribution	Balance of internatio-nal trade in goods, % of GDP	Market integration by type of trade activi-ties, %	Share of import from EU in total im-ports, %
Denmark	1,311.50	9.50	42,638.50	-4.10	110,980.20	2.10	13.10	4.50	2.20	32.40	70.70
Estonia	284.90	14.10	4,392.00	-0.20	1,712.10	5.50	17.50	5.40	-4.30	76.10	80.00
Finland	1,264.90	7.30	37,868.00	-1.80	103,145.00	1.60	13.20	3.70	0.10	29.20	62.80
Germany	951.00	13.90	470,550.00	0.10	2,160,192.5	2.50	16.10	4.30	6.70	41.00	63.50
Latvia	71.70	6.30	5,072.80	-1.30	9,038.00	7.80	19.20	6.50	-9.80	49.50	78.20
Lithuania	98.90	5.80	5,483.60	-3.20	13,333.10	6.60	18.60	5.30	-3.20	71.80	56.80
Poland	89.00	5.90	72,981.60	-3.90	217,691.00	4.10	17.10	4.90	-1.40	39.20	67.20
Sweden	1,464.90	12.90	77,454.90	-0.20	158,000.30	1.50	14.10	3.70	2.10	32.00	67.10

Table 3.7. Country sustainability indicators for EU Baltic Sea region countries for 2012 (author)

EU Baltic Sea region countries	Economic well-being indicators			Environmental indicators			Social/human indicators		
	Public debt	Genuine savings	Employment rate	Consumption	Renewable water resources	Air quality	Healthy life	Education	Gender equality
Denmark	46.43	13.88	6.13	5.72	10.75	67.33	72.37	36434	0.78
Estonia	6.04	15.62	12.48	2.80	14.02	8.42	67.81	89.50	0.70
Finland	48.56	9.74	7.78	2.06	1.49	48.66	72.36	100.53	0.84
Germany	81.51	13.17	5.98	2.08	20.97	58.87	73.28	95.20	0.76
Latvia	37.77	10.53	15.63	2.47	1.17	74.41	65.89	82.38	0.74
Lithuania	38.96	10.36	15.50	2.80	9.55	42.75	64.78	90.71	0.71
Poland	55.39	7.37	9.65	1.92	19.40	25.36	67.45	88.00	0.70
Sweden	37.44	17.04	7.47	2.71	1.50	66.10	74.46	92.78	0.80

Table 3.8. Correlation matrix between country risk and economic security indicators for EU Baltic countries (author)

	Indicators	Economic security										
		Intramural R&D expenditure	High-tech exports	Gross fixed capital formation	Government deficit/ surplus	Government gross debt	Long-term unemployment	At-risk-of-poverty rate	Inequality of income distribution	Balance of international trade	Market integration	Share of import from EU
Country risk	Gross domestic investment	-0.558	0.083	-0.391	0.314	-0.358	0.604	0.538	0.675	-0.744	0.491	0.863
	GDP, PPP	0.177	0.438	0.992	0.359	0.989	-0.330	-0.052	-0.289	0.684	-0.237	-0.293
	Private consumption	-0.755	-0.699	0.009	-0.283	0.059	0.660	0.722	0.549	-0.440	0.332	-0.316
	Inflation, end of year change	-0.295	-0.069	-0.241	-0.073	-0.191	0.164	0.110	0.059	-0.179	0.514	-0.031
	Real effective exchange rate	-0.744	-0.230	-0.556	0.104	-0.511	0.915	0.811	0.869	-0.909	0.733	0.507
	Current taxes on income	0.832	0.220	0.039	-0.216	-0.003	-0.712	-0.858	-0.552	0.524	-0.670	0.001
	The current account balance	0.742	0.766	0.491	0.482	0.461	-0.548	-0.515	-0.455	0.624	-0.316	0.046
	Balance of trade	0.211	0.519	0.979	0.458	0.990	-0.260	-0.028	-0.220	0.640	-0.126	-0.244
	Exports of goods and services	-0.568	0.156	-0.311	0.116	-0.255	0.671	0.614	0.584	-0.464	0.968	0.272
	Unemployment rate	-0.789	-0.644	-0.617	-0.252	-0.576	0.910	0.785	0.845	-0.920	0.538	0.228
	Natural population change	0.753	0.263	-0.096	-0.084	-0.168	-0.860	-0.877	-0.827	0.535	-0.626	-0.107
	Employment, annual averages	0.104	0.367	0.966	0.281	0.960	-0.306	-0.013	-0.263	0.656	-0.243	-0.294

The initial data from Table 3.5, Table 3.6 and Table 3.7 was normalized according to formula (2.1) for Ratio System of MOORA, and then formula (2.2) was used for obtaining ranks of the Ratio System of MOORA. Formula (2.3) was applied for the ratios obtained according to formula (2.1) for Ratio System of MOORA. At the end, initial data was computed according to formula (2.4), providing ranks of the Full Multiplicative Form. Final ranks were obtained through the dominance theory (Brauers 2004).

Table 3.9. The reaction on countries' rating after the MULTIMOORA approach, evaluating country risk and sustainability indicators (author)

Country	MOORA Ratio system	MOORA Reference Point	Multiplicative form	MULTIMOORA
Denmark	2	2	2	2
Estonia	4	6	4	4
Finland	6	7	5	6
Germany	1	1	8	1
Latvia	8	5	7	8
Lithuania	7	4	3	5
Poland	5	8	6	7
Sweden	3	3	1	3

It is seen from the results that depending on different evaluation methods, the rankings of countries are also different.

Table 3.10. The reaction on countries' rating after the MULTIMOORA approach, evaluating country risk and economic security indicators (author)

Country	MOORA Ratio system	MOORA Reference Point	Multiplicative form	MULTIMOORA
Denmark	3	2	6	3
Estonia	4	5	1	4
Finland	5	6	5	5
Germany	1	1	8	1
Latvia	8	8	4	8
Lithuania	7	4	2	7
Poland	6	7	3	6
Sweden	2	3	7	2

As MULTIMOORA method is more complex and reliable, the focus is mostly on ranking of MULTIMOORA. As obvious from ranking results above, evaluation of different indicators determines different position of country ranking. Based on MULTIMOORA multicriteria method, rankings for EU Baltic Sea region countries were received (Table 3.11). All calculations are provided in the appendices. The results are presented in Table 3.9 for evaluation of country risk and country sustainability indicators and in Table 3.10 for country risk and economic security indicators.

Table 3.11. EU Baltic Sea region countries rankings (author)

Country	Country risk vs sustainability	Country risk vs economic security	Country sustainability vs economic security
Denmark	2	3	3
Estonia	4	4	4
Finland	6	5	7
Germany	1	1	1
Latvia	8	8	6
Lithuania	7	7	5
Poland	5	6	8
Sweden	3	2	2

Comparing different variables between each other, each country has different ranking, meaning that depending on the area of evaluation, the position of a country differs. From presented analysis it is clear, that only Estonia and Germany have the same ranking when comparing three basic groups for evaluation.

The main task is to identify the variables which are making the most influence on country risk and changing the ranking of a country in general view. Further, relationship between variables should be found and clarified the dependence between variables.

After data is normalized, the correlation analysis (Mirkin 2011; Miskiewicz 2012, Ausloos, Miskiewicz 2010) was presented in order to understand the relationship between each variable for each country risk, economic security and sustainability group (Table 3.8 and Table 3.12).

As can be seen from Table 3.8, there are both – positive and negative correlations between variables. The relationship between indicators is quite strong, the strongest correlation is between macroeconomic policy evaluation (country risk group) and social indicators (economic security group), as well as between social indicators (country risk group) and social indicators (economic security group). Domestic economic variables and balance of payments for country risk are also correlating with economic, balance of payment and social indicators for economic security. The strongest negative correlation is between real effective exchange rate (country risk ratio) and Balance of international trade in goods for economic security – -0.909, as well as between unemployment rate (social indicator of country risk) and Balance of international trade in goods for balance of payments in economic security – -0.920; it means that if one indicator increases, another one will be decreasing and vice versa. Good positive correlation is between GDP in domestic economic variables and balance of trade in balance of payment (country risk) and gross fixed capital formation and general government gross debt (in economic indicators for economic security) – 0.992 and 0.990 accordingly. As well, strong positive correlation is between exports of goods and services (balance of payments for country risk) and market integration by type of trade activities (balance of payments for economic security) – 0.640. Such ratios of country risk as Inflation are not very influencing (no strong relationship) all economic security ratios.

This research shows that economic security indicators depend on country risk and the calculations prove it.

As can be seen from Table 3.12, there are both – positive and negative correlations between variables as well. The relationship between indicators is quite strong, the strongest correlation is between macroeconomic policy evaluation (country risk group) and social/human indicators (sustainability group), as well as between social indicators (country risk group) and social/human indicators (sustainability group). Domestic economic variables and balance of payments for country risk are also correlating with monetary, environmental and social indicators for sustainability. The strongest negative correlation is between real effective exchange rate (country risk ratio) and social/human group for sustainability – -0.840, -0.802 and -0.605 accordingly, it means that if one indicator increases, another one will be decreasing and vice versa. Good positive correlation is between current taxes on income, wealth, etc. and natural population change (country risk ratios) and social/human group for sustainability – 0.727, 0.703 and 0.654 accordingly. Such ratios of country risk as Gross Domestic Investment, Inflation, and Balance of Trade and Employment rate are not very influencing (no strong relationship) all sustainability ratios. From this research it is clear which economic sustainability depend on country risk.

Table 3.12. Correlation matrix between country risk and sustainability indicators for EU Baltic Sea region countries (author)

Indicators		Country sustainability								
		Public debt	Genuine Savings	Employ-ment rate	Consump-tion	Renewable water re-sources	Air quality	Healthy life	Education	Gender equality
Country risk	Gross domestic investment	-0.666	0.055	0.552	-0.217	-0.081	-0.408	-0.490	-0.678	-0.482
	GDP, PPP	0.796	0.035	-0.506	-0.292	0.635	0.132	0.414	0.192	0.029
	Private consumption	0.266	-0.820	0.625	-0.510	0.152	-0.089	-0.737	-0.496	-0.454
	Inflation	-0.364	-0.247	0.231	-0.177	0.205	-0.771	-0.339	0.188	-0.238
	Real effective exchange rate	-0.685	-0.026	0.934	-0.128	-0.274	-0.179	-0.802	-0.840	-0.605
	Current taxes on income, wealth, etc.	0.178	0.404	-0.724	0.766	-0.200	0.516	0.727	0.703	0.654
	The current account balance	0.188	0.835	-0.596	0.423	-0.045	0.511	0.769	0.435	0.458
	Balance of trade	0.707	0.177	-0.431	-0.186	0.538	0.220	0.407	0.217	0.059
	Exports of goods and servi-ces	-0.673	0.255	0.676	0.111	0.145	-0.497	-0.625	-0.401	-0.691
	Unemployment rate	-0.443	-0.410	0.946	-0.141	-0.323	-0.037	-0.894	-0.792	-0.527
	Natural population change	-0.012	0.306	-0.744	0.239	-0.141	-0.039	0.726	0.650	0.600
	Employment, annual avera-ges	0.810	-0.058	-0.489	-0.331	0.695	0.067	0.356	0.139	-0.041

To check the reliability of the results, information from different years was taken. In the calculations the data of 2012 year (latest available data) was taking into consideration, though data of 2010 and 2011 years was also taking into consideration and the results were very similar – no significant variations in relationship and dependancies between variables.

To conclude the research, it means that based on performed calculations and analysis, it could be clearly identified which variables are mostly influenced by country risk indicators. Based on this, change in each group of variables presents change in country‘s ranking, which is very important in making the country to be attractive.

3.4. Optimization of Country Risks in Baltic States

Empirical analysis of Baltic States’ began with the definition of system of structural indicators used in diachronic analysis of performance (Table 3.13).

Table 3.13. System of structural indicators of Baltic States performance (author)

No.	Structural indicators, abbreviations	Desirable values
I. General economic background		
1	GDP per capita in PPS	Max
2	Labour productivity per person employed	Max
II. Employment		
3	Employment rate	Max
4	Employment rate of older workers	Max
III. Innovation and research		
5	Youth education attainment level	Max
6	Gross domestic expenditure on R&D	Max
IV. Economic reform		
7	Business investment	Max
8	Comparative price levels	Min
V. Social cohesion		
9	At-risk-of-poverty rate	Min
10	Long-term unemployment rate	Min
VI. Environment		
11	Greenhouse gas emissions	Min
12	Energy intensity of the economy	Min

The system consists of 12 indicators from the shortlist of structural indicators. Directions of either minimization or maximization were also attributed to each indicator. Finally, the optimization of these indicators will lead to assess country risk and ability to measure it.

Data covering these indicators was obtained from EUROSTAT Structural Indicators database. Due to limited data availability three time points were chosen for the analysis, namely years 2000, 2005 and 2009.

The data therefore covers 3 Baltic States, 3 years and 12 structural indicators, 108 observations in total. The indicators used for calculations are presented in Table 3.14.

The initial data was normalized according to formula (2.1) for Ratio System of MOORA, and then formula (2.2) was used for obtaining ranks of the Ratio System of MOORA. Formula (2.3) was applied for the ratios obtained according to formula (2.1) for Ratio System of MOORA.

At the end, initial data was computed according to formula (2.4), providing ranks of the Full Multiplicative Form. Final ranks for each year analyzed were obtained through the dominance theory (Brauers 2004). Such process was repeated three times for each year. The results are presented in Table 3.15.

Table 3.14. Indicators used in diachronic analysis of Baltic States performance for 2000, 2005 and 2009 year (author)

Indicator/Year	Lithuania			Latvia			Estonia		
	2000	2005	2009	2000	2005	2009	2000	2005	2009
GDP per capita in PPS	40.0	53.0	55.0	36.0	48.0	51.0	45.0	62.0	64.0
Labour productivity	43.2	55.0	57.5	40.1	47.8	52.8	47.2	60.8	65.8
Employment rate of olders	40.4	49.2	51.6	36.0	49.5	53.2	46.3	56.1	60.4
Youth education level	78.9	87.8	86.9	76.5	79.8	80.5	79.0	82.6	82.3
GD expenditure on R&D	0.6	0.8	0.8	0.5	0.6	0.5	0.6	0.9	1.4
Business investment	16.3	19.2	13.2	23.1	27.7	17.2	22.0	28.1	16.5
Comparative price levels	52.7	54.9	67.4	58.8	57.0	76.0	57.3	64.7	76.5
At-risk-of-poverty rate	17.0	20.7	20.6	16.0	19.8	25.7	18.0	18.7	19.7
Unemployment rate	8.0	4.3	3.2	7.9	4.1	4.6	6.3	4.2	3.8
Greenhouse gas emissions	39.0	46.0	44.0	39.0	43.0	40.0	43.0	47.0	41.0
Energy intensity (economy)	576.3	481.2	445.9	440.5	356.1	354.5	806.0	616.5	607.0

Table 3.15. Analysis of Baltic States performance indicators by MULTIMOORA (author)

Country/ Year	MOORA Ratio system			MOORA Reference Point			Multiplicative form			MULTIMOORA		
	2000	2005	2009	2000	2005	2009	2000	2005	2009	2000	2005	2009
Lithuania	2	3	2	2	2	2	2	3	2	2	3	2
Latvia	3	2	3	3	3	3	3	2	3	3	2	3
Estonia	1	1	1	1	1	1	1	1	1	1	1	1

As it can be seen from Table 3.15, there was a case of absolute dominance in either year – Estonia is a leader. It received first rank in both MOORA and MULTIMOORA each year. Other results were received for Lithuania and Latvia – as there were some changes during years and evaluating by different methods. Situation with Lithuania and Latvia has changed comparing MULTIMOORA results of 2000, 2005 and 2009, as these countries scored different rankings during these periods. As an example, using MULTIMOORA method, in 2005 the first rank was received by Estonia, second one – by Lithuania and the third one – by Latvia, the same results were obtained in 2009, but 2005 had another ranking, where Lithuania and Latvia have changed their places. However, there were no significant changes in final ranking observed. It means that after optimization of country risk by using specific set of indicators, the country risk assessment in Estonia was in the highest level, while for Lithuania and Latvia the results were not so good and country risk in these countries should be managed and assessed more precisely in the future. The data for later years was also analyzed by other researches, taking into consideration variables of 2010–2012 years.

3.5. Conclusions for Chapter 3

1. The system of 32 indicators for 8 EU Baltic Sea region countries for country risk, economic security and economic sustainability was introduced. It includes 4 groups for country risk: Domestic economic variables (Gross domestic investment, GDP, Private consumption), Macroeconomic policy evaluation (Inflation, Real effective exchange rate, Current taxes on income, wealth, etc.), Balance of payments (The current account balance, Balance of trade, Exports of goods and services) and Social indicators (Unemployment Rate, Natural popula-

tion change, Employment rate). 3 groups for economic security: Economic indicators (Total intramural R&D expenditure, High-tech exports, Gross fixed capital formation, General government deficit/surplus, General government gross debt), Social indicators (Long-term unemployment rate, At-risk-of-poverty rate, Inequality of income distribution) and Balance of payments (Balance of international trade in goods, Market integration by type of trade activities, Share of import from EU in total imports). and 3 groups for country sustainability: Economic well-being/monetary indicators (Public debt, Genuine Savings, Employment rate), Foundational well-being/environmental indicators (Consumption, Renewable Water Resources, Air Quality) and Social/human indicators (Healthy life, Education, Gender Equality).

2. Both MOORA method and its updated model MULTIMOORA could be perfectly used while evaluating and standardizing country risk, economic security and sustainability, as a ratio system, reference point and multiplicative form appropriately suit for case, where there are several alternatives (EU Baltic Sea region countries) and several objectives (indicators, which directly show country risk and economic security).

3. After implementation of MOORA method for EU Baltic Sea region countries, it could be concluded that the data was correctly normalized, standardized and optimized. After correlation matrix was presented, the results are as follow: the correlation between country risk economic sustainability and economic security exists, the strongest negative correlation is between real effective exchange rate (country risk ratio) and Balance of international trade in goods for economic security, as well as between unemployment rate (social indicator of country risk) and Balance of international trade in goods for balance of payments in economic security, it means that if one indicator increases, another one will be decreasing and vice versa. Good positive correlation is between GDP in domestic economic variables and balance of trade in balance of payment (country risk) and gross fixed capital formation and general government gross debt (in economic indicators for economic security). As well, strong positive correlation is between exports of goods and services (balance of payments for country risk) and market integration by type of trade activities (balance of payments for economic security). Such ratios of country risk as Inflation are not very influencing (no strong relationship) all eco-

nomic security ratios. It was proved that economic security and sustainability have relationship/dependence with country risk ratios.

4. The dependence of economic security and country sustainability indicators on country risk variables was proven by several empirical analysis in 8 EU Baltic Sea region countries. The relationship between indicators is proven and it means that in order it is needed to qualitatively analyze country risk, economic security and country sustainability should be evaluated and included in the calculation.

General Conclusions

1. From perspective of different scientific research, country risk concept was not analyzed in a broad way. The concept of country risk has different meanings and could be understood either as a performance variance or just as the likelihood of a negative outcome that reduces the initially expected return. It is not adapted to growing globalization topic, which definitely makes changes in country risk approach.
2. During research, two main streams of sources for country risk were identified. The first one only focuses on the governmental or sovereign interference with business operations. The second one refers to the environmental instability and its impact on business conditions. This line provides a broader perspective and includes not only governmental sources of risk but also any other causes that may impede the efficient functioning of any foreign organization abroad.
3. Country sustainability is more than just the interconnectedness of the economy, society and the environment. Economic security is determined by both – macro and micro-economic environment of a country. Indicators of country sustainability and economic security should be also taken into account when creating model for country risk assessment, as only then the full analysis about country's attractiveness for investors could be performed.

4. Approaches for country risk assessment vary from subjective and interactive deliberation by a group of experts to formative rule-based methods for evaluating country risk variables. Most of country risk evaluation methods are based on a judgement on the economic performance of a country, having limitations due to not evaluating other non-economic related variables.

5. There are several potentially interesed groups in having complex country risk assessment model: country‘s government, private and public banks, regulatory authorities, foreign and national investors and citizens. Each of the group has its own field of interest causing a result to have complex country risk evaluation method.

6. For empirical analysis of the model, the system of 32 indicators for 8 EU Baltic Sea region countries for country risk, economic security and economic sustainability was introduced. It includes 4 groups for country risk, 3 groups for economic security and 3 groups for country sustainability. This set of indicators is unique and was not used previously in any research, which allows to conclude that the country risk assessment model is unique as well.

7. Variables of country risk, economic security and country sustainability have clearly identified relationships between each other as well as level of dependence or non-dependence between variables can be calculated using suggested country risk assessment model.

8. The strongest negative correlation is between real effective exchange rate (country risk ratio) and social/human group for sustainability – -0.840, -0.802 and -0.605 accordingly. Furthermore, it is between real effective exchange rate (country risk ratio) and balance of international trade in goods for economic security – -0.909, as well as between unemployment rate (social indicator of country risk) and balance of international trade in goods for balance of payments in economic security – -0.920.

9. Good positive correlation is between current taxes on income, wealth, etc. and natural population change (country risk ratios) and social/human group for sustainability – 0.727, 0.703 and 0.654 accordingly. Furthermore, positive correlation is between GDP in domestic economic variables and balance of trade in balance of payment (country risk) and gross fixed capital formation and general government gross debt (in economic indicators for economic security) – 0.992 and 0.990 accordingly.

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The List of Scientific Publications by the Author on the Subject of the Dissertation

Articles Published in the Reviewed Scientific Journals

Stankevičienė, J; Sviderskė, T.; Miečinskienė, A. 2013. Relationship between economic security and country risk indicators in EU Baltic sea region countries, *Entrepreneurial business and economics review (EBER)* 1(3): 21–34. Cracow: Cracow University of Economics.

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Other Articles

Stankevičienė, J.; Sviderskė, T. 2012. Country risk assessment based on MULTIMOORA, *The 7th international scientific conference "Business and Management 2012": selected papers. May 10–11, 2012*, p. 530–536. (ISI Proceedings)

Summary in Lithuanian

Įvadas

Problemos formulavimas

Kiekvienas verslas susiduria su skirtingais rizikos veiksniais. Tarptautiniu mastu vykdomam verslui atsiranda papildomos rizikos, kurios yra netipinės nacionaliniame lygmenyje. Tokios papildomos rizikos yra vadinamos šalies rizika ir paprastai apima rizikas, kylančias dėl skirtumų įvairovės nacionalinėje politikoje, geografinėje padėtyje, ekonomikos struktūrose, socialinėse ir politinėse institucijose ir skirtingose valiutose. Šalies rizikos analizė (angl. CRA) leidžia įvertinti šalies rizikos potencialą, kuris sumažina tarpvalstybinių investicijų laukiamą grąžą.

Sąvoka „šalies rizika“ pradėta plačiai naudoti 1970 metais. Iš pradžių ji buvo naudojama beveik išimtinai bankų sektoriuje.

Analizuojant nepriklausomų reitingų istoriją ir jų metodologinę raidą, terminas „šalies rizika“, o ne „politinė rizika“, buvo dominuojantis, nes jis turėjo platesnę prasmę ir galintis apimti bet kokią riziką, būdingą tam tikroje šalyje, skirtingai nei „politinė rizika“, apsiribojanti tokiomis, kurios būdavo išimtinai politinio pobūdžio ekvivalentu.

Kiekvienais metais tampa vis sunkiau ir sudėtingiau analizuoti ir prognozuoti pokyčius finansiniuose, ekonominiuose ir politiniuose verslo sektoriuose. Pastaruoju metu šalies rizikos analizės svarba dabar labiau suprantama ir jos potencialas auga, steigiant vis daugiau ir daugiau šalies rizikos reitingavimo agentūrų, kurios vertina platų kokybinės ir kiekybinės informacijos šaltinių spektrą apie alternatyvias ekonominės, finansinės ir politinės rizikos matavimo priemones į bendrą susijusios rizikos

kompleksinį reitingo įvertinimą. Tačiau bet kurios reitingavimo agentūros vertinimo tikslumas, atsižvelgiant į bet kurias arba visas paminėtas priemones, palieka neišsprestų klausimų šiuo požiūriu. Įvairūs mokslininkai (Busse, Hefeker 2006; Cathy, Goldberg 2009; Kesternich, Schnitzer 2010; Benítez *et al.* 2007; Bordo 2009; D'Argensio, Laurin 2009; Abdullah 1985; Aggarwal *et al.* 1989; Aliber 1973; Collier *et al.* 1999; Levy *et al.* 1970; Grubel 1968) savo tyrimuose pateikia kokybinį šalies rizikos reitingų sistemų palyginimą iš septynių pagrindinių reitingavimo agentūrų, taip pat pristato neįprastą keturių rizikos reitingų analizę, naudojant vienmačius ir daugiamačius nepastovumo modelius iš devynių Rytų Europos šalių. Šie reitingai yra sudaryti pagal Tarptautinės šalies rizikos standartinį modelį (angl. ICRG), kuris yra vienintelė šalies rizikos reitingavimo agentūra, pastoviai teikianti mėnesinę informaciją apie daugelio šalių duomenis. Šis vertinimo metodas turi trūkumą/apribojimą, nes jis negali būti naudojamas visoms šalims ir atsižvelgia į gana aiškiai nustatytus kintamuosius, kurie negali būti keičiami.

Globalizacija, vertinant senuoju ekonominiu saugumo apibrėžimu, yra nustatoma naujo apibrėžimo kontekste, kuris pabrėžia netikėtų sukrėtimų ir ekonominio nepastovumo riziką. Naujas apibrėžimas turėtų tiksliai apimti globalizacijos priežasties ir pasekmės padarinius ir nustatyti globalizacijos poveikio aiškius kriterijus ekonominiam saugumui ir ekonominiam tvarumui įvertinti.

Disertacija nagrinėja klausimą kaip rasti teisingą sprendimą adekvačiai vertinant šalies rizikos, šalies ekonominio saugumo ir šalies ekonominio tvarumo lygį, jų pokyčių dinamiką, atsižvelgiant į struktūrinius komponentus ir jų tarpusavio ryšius.

Darbo aktualumas

Vienas svarbiausių šiandieninių šalies vertinimo kriterijų, planuojant investicijas, yra šalies patrauklumo įvertinimas, todėl šalies strategijos numatymas ir kūrimas gali būti esminiu žingsniu, kuris galėtų padėti įvertinti šalies riziką bei atpažinti būdus kaip pritraukti kapitalą, ir investicijas, o taip pat padėti teisingai numatyti šalies ekonomines ir socio-politines kryptis, įskaitant šalies ekonominio saugumo ir tvarumo vertinimą, bei tinkamumą. Reikalingas kompleksinis sprendimas, nes šalies rizikos modelis turėtų suteikti galimybę išsamiai nagrinėti šalies rizikos veiksnius, ir jų tipus, ir taip patenkinti sudėtingų sprendimų poreikį.

Akivaizdu, kad esamos šalies rizikos poveikio analizė valstybei ir rinkai turi būti atlikta tam, kad išskirti esminius rizikos veiksnius, bei sudaryti prielaidas formuoti valstybės politiką, minimizuojančią šalies rizikos padarinius šalies ar regiono lygmenyje.

Tyrimų objektas

Pagrindinis tyrimo objektas – šalies rizika ir jos struktūriniai komponentai ekonominio saugumo ir tvarumo kontekste.

Darbo tikslas

Pagrindinis disertacijos tikslas yra išanalizuoti šalies rizikos vertinimo metodus skirtingais aspektais ir pasiūlyti šalies rizikos vertinimo modelį, kuris leistų adekvačiai vertinti šalies riziką, šalies ekonominio saugumo ir ekonominio tvarumo lygį, jų pokyčių dinamiką, atsižvelgiant į struktūrinius komponentus ir jų tarpusavio ryšius.

Darbo uždaviniai

Siekiant įgyvendinti disertacijoje numatytą tikslą, iškelti tokie uždaviniai:

1. Išryškinti šalies rizikos nustatymo ir jos vertinimo svarbą augančiose globaliose rinkose, analizuojant šalies rizikos priežastis ir elementus, nagrinėjant mokslinius tyrimus.
2. Ištirti šalies rizikos vertinimo metodų pranašumus ir trūkumus, taip pat išnagrinėti šalies rizikos veiksnius ir būdus kaip valdyti riziką.
3. Pritaikyti kiekybinius ir kokybinius metodus tiriamojo darbo analizei, parengti ir sukurti šalies rizikos vertinimo modelį ekonominio saugumo ir tvarumo kontekste, kuris leistų įvertinti šalies rizikai įtaką darančius veiksnius, nustatyti jų tiesioginius ir netiesioginius tarpusavio ryšius.
4. Patikrinti šalies rizikos vertinimo modelio praktinį tinkamumą, atliekant empirinį Europos Sąjungos (ES) Baltijos jūros regiono šalių rizikos vertinimo tyrimą ir numatyti kryptis šalies rizikos padariniams mažinti.

Tyrimų metodika

Atliekant mokslinį tyrimą ir duomenų analizę, buvo taikomos skirtingos tyrimų metodikos: kompleksinės metodikos, daugiakriterinis vertinimas, lyginamoji mokslinės literatūros analizė, kiekybinės ir kokybinės rizikos vertinimo analizės, modeliavimas, statistinių duomenų analizė ir kitos.

Teoriniame disertacijos skyriuje nagrinėjama mokslinė problema ir mokslinė literatūra, taikant palyginimo, apibendrinimo ir sisteminės mokslo literatūros analizės metodus.

Antrajame disertacijos skyriuje nagrinėjami šalies rizikos vertinimo metodai ir jos šaltiniai, pritaikius mokslinius ir analitinius metodus, bei kokybinius, ir kiekybinius vertinimo metodus.

Trečiasis disertacijos skyrius skirtas sukurti ir patikrinti šalies rizikos vertinimo modelį, naudojant kiekybinių ir kokybinių tyrimo metodų kombinaciją bei daugiakriterinius vertinimo metodus MOORA ir MULTIMOORA.

Darbo mokslinis naujumas

Šalies rizikos vertinimas buvo pateiktas ir nagrinėjamas skirtinguose moksliniuose straipsniuose, tačiau esamų tyrimų analizė buvo nepakankama ir ganėtinai siaura. Šioje disertacijoje šalies rizikos sąvoka ir jai įtaką darantys veiksniai yra pristatyti išplėstu požiūriu.

Rengiant disertaciją, atskleisti šie ekonomikos mokslui nauji rezultatai:

1. Skirtingais pjūviais atlikta detali ir konsoliduota šalies rizikos sampratos, jos struktūrinių komponentų ir kylančių problemų analizė atvėrė naujas galimybes ir iššūkius kuriant naują šalies rizikos vertinimo modelį.
2. Atlikta platesnė šalies rizikos analizė, apimanti ne tik politinę riziką, bet taip pat socialinius ir ekonominius aspektus, pateikiant aiškią ir išanalizuo-

tą naują koncepciją, kuri nebuvo analizuojama ankstesniuose moksliniuose tyrimuose.

3. Sukurtas ir empiriškai patvirtintas kompleksinio šalies rizikos vertinimo modelis ekonominio saugumo ir tvarumo kontekste, kuris praktiškai gali būti naudojamas nustatant šalies rizikos reitingą konkrečioje šalyje arba regione.

Darbo rezultatų praktinė reikšmė

Pateikta teorinių šalies rizikos aspektų ir jų vertinimo metodų sisteminė analizė gali būti naudinga, kuriant naują šalies rizikos vertinimo modelį, kuris patvirtintų siūlomą koncepciją, kuri leidžia įvertinti ir atsižvelgti į konkrečius šalies rizikos vertinimo aspektus, taip pat pastebėti ir įvertinti šalies rizikos priežasties ir pasekmės ryšius.

Siūlomas šalies rizikos kompleksinio vertinimo modelis gali ir turi atverti galimybę nuosekliai ir išsamiai ištirti šalies rizikos komponentų svarbą ir atrasti priemones, mažinančias šalies riziką.

Pateiktas šalies rizikos vertinimo modelis gali būti naudingas skirtingoms suinteresuotoms šalims – vyriausybei, komerciniams ir nacionaliniams bankams, reguliuojančioms institucijoms, gyventojams ir investuotojams.

Ginamieji teiginiai

1. Sąvoka „šalies rizika“ turėtų būti naudojama kaip platesnė sąvoka, apimanti ne tik kelis ekonominius aspektus bei politinę riziką, bet ir ekonominio tvarumo ir ekonominio saugumo rodiklius.
2. Vertinant šalies riziką reikalinga atsižvelgti ne tik į šalies mikroekonomikos kintamuosius ir jiems įtaką darančius veiksnius, bet ir įtraukti socialinių, makroekonominių ir mokėjimo balanso kintamųjų vertinimą.
3. Šalies rizikos, ekonominio saugumo ir ekonominio tvarumo rodikliai yra tarpusavyje susiję bei priklausomi vienas nuo kito, ir priklausomybės lygis gali būti konkrečiai identifikuotas.

Darbo rezultatų aprobavimas

Paskelbtos 4 publikacijos disertacinio darbo tema. 2 iš jų paskelbtos recenzuojamuose mokslo žurnaluose: dvi įtrauktos į *ISI Web of Science* (Stankevičienė, Sviderskė, Miečinskienė 2013; Stankevičienė, Sviderskė, Miečinskienė 2014), viena – *ISI Proceedings* (Stankevičienė, Sviderskė 2012) ir kita viena – kituose žurnaluose (Stankevičienė, Sviderskė, Miečinskienė 2014). Disertacijoje atliktų tyrimų rezultatai buvo paskelbti 2 konferencijose: tarptautinėje mokslinėje konferencijoje *“Contemporary Issues in Business, Management and Education‘2013”* 2013 m. Vilniuje ir jaunųjų mokslininkų konferencijoje *„Verslas XXI amžiuje*“ 2014 m. Vilniuje.

Disertacijos struktūra

Disertaciją sudaro įvadas, trys skyriai, bendrosios išvados, literatūros šaltinių sąrašas, autorės publikacijų sąrašas disertacijos tema ir 4 priedai.

Darbo apimtis yra – 120 puslapių su santrauka, neįskaitant priedų, tekste panaudotos 7 formulės, 11 paveikslų ir 21 lentelė. Rašant disertaciją buvo panaudoti 202 literatūros šaltiniai.

1. Šalies rizikos vertinimo problema šalies ekonominio saugumo ir tvarumo kontekste

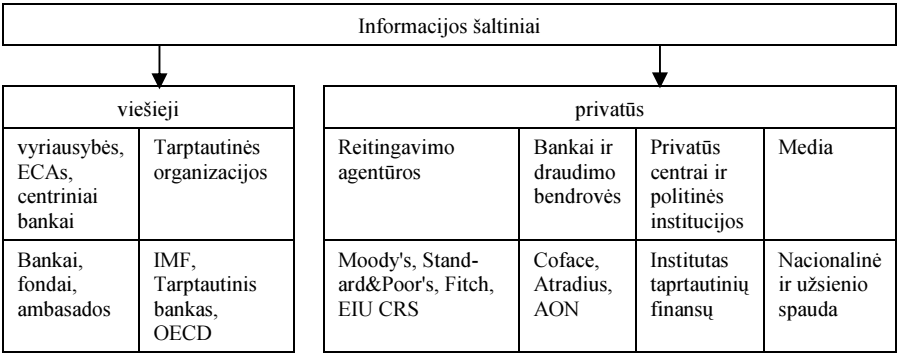
Šio skyriaus tema buvo paskelbtos dvi mokslinės publikacijos (Stankevičienė, Sviderskė, Miečinskienė 2014; Stankevičienė, Sviderskė, Miečinskienė 2013).

Šalies rizika yra ypatinga, nesisteminio pobūdžio rizika ir todėl labai nenuspėjama. Šalies riziką nagrinėjantys moksliniai tyrimai vertino jos finansinę integraciją šalyje, poveikį šalies ekonominei gerovei ir kitiems aspektams (Cathy, Goldberg 2009; Kesternich, Schnitzer 2010; Benítez et al 2007; Bordo 2009; D'Argensio, Laurin 2009). Išsami šalies rizikos teorijos formuluotė dar nebaigta.

Apklausa, atlikta Eksporto-Importo banko (angl. EIB), klasifikuoja šalies rizikos modelius į keturias kategorijas:

- pilnai kokybinis modelis;
- struktūrizuotas kokybinis modelis su tam tikrais statistiniais duomenimis;
- struktūrizuotas kokybinis modelis su kontroliniu sąrašu, susidedančiu iš kokybinių ir kiekybinių vertinimo metodų;
- ekonometrinis metodas – labai struktūrizuotas ir matematiškai pagrįstas modelis.

Šalies rizikos analizė, nepaisant įrodymų, buvo ir tebėra labai priklausanti nuo žmogaus sprendimo, t. y. žmogiškojo faktoriaus. Manoma, kad tai yra lemiančiu veiksniu, kodėl ji turi daug apribojimų.



S1 pav. Informacijos šaltiniai apie šalies riziką (sudaryta autorės)

Išanalizavus mokslinę literatūrą apie šalies rizikos sampratą, tampa aišku, kad įvertinti šalies riziką šiuolaikiniame ekonomikos pasaulyje nėra lengva užduotis. Šalies rizika vienoje šalyje gali būti išreikšta vienu indeksu, kuris rodo bendrą rizikos laipsnį,

priimant sprendimą ar investuoti, ar imti paskolą šioje šalyje. Egzistuoja daug skirtingų reitingavimo agentūrų, kurios skirtingais būdais bando įvertinti šalies riziką. S1 paveiksle pateikti informacijos apie šalies riziką šaltiniai. Kiekvienos šalies vyriausybė nori būti ekonomiškai apsaugota nuo bet kokio tipo rizikos. Ekonominis saugumas yra gana nauja sąvoka ekonomikoje, nors jau buvo apie ją diskutuojama prieš keletą dešimtį metų. (Screpanti and Zamagni 1993; Brue 1963, 2000; Krasner 2001, 2003; Jackson, Sorensen 1999; Salvatore 1983; Udovič 2004).

Išanalizavus skirtingus mokslinius straipsnius ir įvairias mokslininkų nuomones (Kesternich, Schnitzer, 2010; Bordo, Meissner, Weidenmier, 2009; Busse, Hefeker, 2006; Finnerty, 2001), tampa aišku, kad ekonominio saugumo koncepcija yra komplikuota ir dinamiška. Jos sudėtingumas kyla iš daugybės ekonominių, socialinių ir finansinių procesų, ir reiškinių, taip pat vienas svarbiausių vaidmenų tenka šiaidieninei globalizacijai (Miskiewicz, Ausloos, 2010; Scheve, Kenneth, Slaughter, 2002), kuri, manoma, tiek kaip procesas, tiek ir kaip reiškinys nuolat ir sistemingai veikia nacionalinę ekonomiką. Ekonominio saugumo dinamiką nulemia greitas ekonominių procesų ir reiškinių tempas tiek nacionaliniame, tiek pasauliniame lygyje (Reuer, Leiblein 2000). Per pastaruosius du dešimtmečius išaugo susidomėjimas rodikliais, kurie galėtų įvertinti šalies tvarumą. Tvarumas šiuo metu vertinamas kaip trapi pusiausvyra tarp ekonominės, aplinkos ir socialinės sveikatos bendruomenės bei tautos. Šalies tvarumo vertinimo priemone galėtų būti ekonominės, aplinkos apsaugos ir socialinių rodiklių visuma. Ekonominiai rodikliai buvo naudojami ekonominės būklės vertinimui jau nuo senų laikų.

Ekonominis saugumas galėtų būti suprantamas kaip (Rehm, Schlesinger, 2013; Quadrini, 2011; Ausloos, Miskiewicz, 2010; Rehm, Schlesinger, 2010; Marshall, Maulana, Tang, 2009; Besten den, 2007; Estrada, 2000; Meldrum, 2000):

− esminis nacionalinio saugumo veiksnys, kuris užtikrina išteklių ir kitų šios sistemos komponentų dinamikos pusiausvyrą (nacionalinis saugumas);

− viena iš nacionalinio, regioninio ir tarptautinio saugumo dimensijų (matmenų), esančių kiekvieno individo, bendruomenės, šalies, ir t. t. tikslas.

− prioritetinis vyriausybių, regioninių ir tarptautinių organizacijų objektas, siekiantis užtikrinti ir garantuoti visuotinį gyventojų saugumą;

− nacionalinės ekonomikos būklė, vertinama kaip šaltinis ir pagrindas pašalinti skurdą, badą, socialinius, ir ekonominius skirtumus tiek tarp gyventojų, tiek ir tarp šalies regionų.

2. Šalies rizikos vertinimo metodai

Šio skyriaus tema buvo paskelbtos dvi mokslinės publikacijos (Stankevičienė, Sviderskė 2012; Stankevičienė, Sviderskė, Miečinskienė 2013).

Norint išanalizuoti šalies rizikos vertinimo modelį, buvo nagrinėjamas daugiakriterinio vertinimo metodas MULTIMOORA. Brauers ir Zavadskas (2010) pasiūlė atnaujintą MOORA ir Full Multiplicative Form metodą, kuris apjungtų tiek maksimizavimo, tiek minimizavimo multiplikatyviojo naudingumo funkciją. Bendras *j*-osios alternatyvos naudingumas gali būti išreikštas neišmatuojamu skaičiumi (S2):

$$U_j^i = \frac{A_j}{B_j}, \qquad \text{(S2)}$$

čia $A_j = \prod_{g=1}^{i} x_{gi}$, j=1,2,…,m; m – alternatyvų skaičius; i – objektų skaičius, kurie turi būti maksimizuojami; $B_j = \prod_{k=i+1}^{n} x_{kj}$, n-i – objektų skaičius, kurie turi būti minimizuojami, $U_j^{'}$ - j alternatyvos naudingumas su objektais, kurie turi būti maksimizuojami ir minimizuojami.

S3 lentelė. Šalies rizikos vertinimo metodai (sudaryta autorės)

Vertinimo metodas	Vertinimo priemonė	Gautas rezultatas	Privalumai	Trūkumai	Šaltinis
Ekspertų grupė	Šalies rizikos suvokimas	Bendras rizikos indeksas	Apjungia ekspertų žinias ir patirtį; tinkamas grupiniam sprendimo priėmimui	Reikalauja daug laiko; abstraktus; ekspertų šališka nuomonė; sunku nustatyti ekspertų kvalifikaciją	Backhaus ir Meyer (1984), Miller (1992)
Diskretus vertinimo metodas	Intervalinis indeksas kiekvienam šalies rizikos veiksniui	Vidutinis rizikos indeksas	Lengvas kiekybinių metodų taikymas; lengvai suprantamas, apskaičiuojamas ir interpretuojamas	Atsitiktinumas, vertinant kokybinės infomacijos požymių svorius	Blank *et al.* (1982), Hake (1982), Miiller-Berghoff (1984), Backhaus *et al.* (1985, 1986)
Analitinis hierarchijos procesas	Kritiškas kiekvieno šalies rizikos veiksnio vertinimas	Santykiniai rizikos požymių svoriai	Apjungia valdybos sprendimus bei intuiciją; tinkamas grupiniam sprendimo priėmimui	Galimas nenuoseklumas ir šališkumas, nustatant informacijos kategorijas	Jensen (1986), Saaty *et al* (1994)
Simuliacinė apžvalga	Tikslas turėti skirtingus įrašus įvairiems šalies rizikos scenarijams	Tikimybės apskaičiavimas įrašo sprendimui	Lankstus modeliuoti scenarijus; apjungia regresijos ir diskriminantinę analizes	Reikalauja daug laiko ir pakankamai brangus modeliuoti scenarijų, rinkti duomenis ir analizuoti, bei vertinti juos	Karakaya ir Stahl (1991), Punnett (1994)
Pilno neapibrėžtumo priežasties modelis	Kategoriškas kiekvienos šalies rizikos kintamosios vertinimas	Neapibrėžta šalies rizikos visuma	Atlieka lingvistinę analizę; propaguoja visą informaciją iš vieno etapo į kitą	Vartotojas subjektyviai interpretuoja neapibrėžtumo visumą; interpretacijos tarp vartotojų gali skirtis	Levy ir Yoon (1995)
Sumažėjusio neapibrėžtumo priežasties modelis	Kategoriškas kiekvienos šalies rizikos kintamosios vertinimas	Nurodo neapibrėžtą šalies rizikos visumos vertinimą	Atlieka lingvistinę analizę; propaguoja lengvą interpretavimą iš vieno etapo į kitą	Pilnos informacijos praradimas; potencialiai apribota vienos kategorijos santrauka; subjektyvi neapibrėžtos visumos interpretacija gali skirtis tarp vartotojų	Levy ir Yoon (1993)

Požiūriai į šalies rizikos vertinimus skiriasi nuo subjektyvaus ir interaktyvaus svarstymo ekspertų grupėje, atitinkamai, vertinant pirmumo reitingavimą ir informacinių komponentų svorio apskaičiavimą, taip pat vertinant statistinius dizainus, naudojant regresinę arba faktorinę analizę, iki formuojamų metodų vertinimo, pagrįstų taisyklėmis, vertinant rizikos kintamuosius iš lingvistinės perspektyvos negu iš skaitmeninės perspektyvos. S3 lentelėje palyginti svarbiausi šalies rizikos vertinimo metodai, atsižvelgiant į vertinimo priemones ir gautus rezultatus bei apibendrina pagrindinius privalumus ir trūkumus (apribojimus).

Komercinės vertinimo agentūros linkusios orientuotis į struktūrizuotas kokybines sistemas ir kontrolinio sąrašo sistemas.

Šalies rizikos analizė gali būti rodoma įvairiomis formomis ir formatais. Kai kurios institucijos publikuoja lenteles, kurios matuoja šalies riziką, pridedant skaitmeninę vertę prie kiekvienos šalies, ir, atitinkamai, kuo didesnė arba mažesnė vertė, tuo didesnė šalies rizika. Kitos agentūros skelbia apžvalgas apie šalis, ypatingą dėmesį skiriant prekybos ir investicijos rizikai prekiaujant tam tikrose šalyse. Dar kitos agentūros pateikia informaciją apie šalies riziką, naudojant apžvalgas, publikuotas OECD ir IMF.

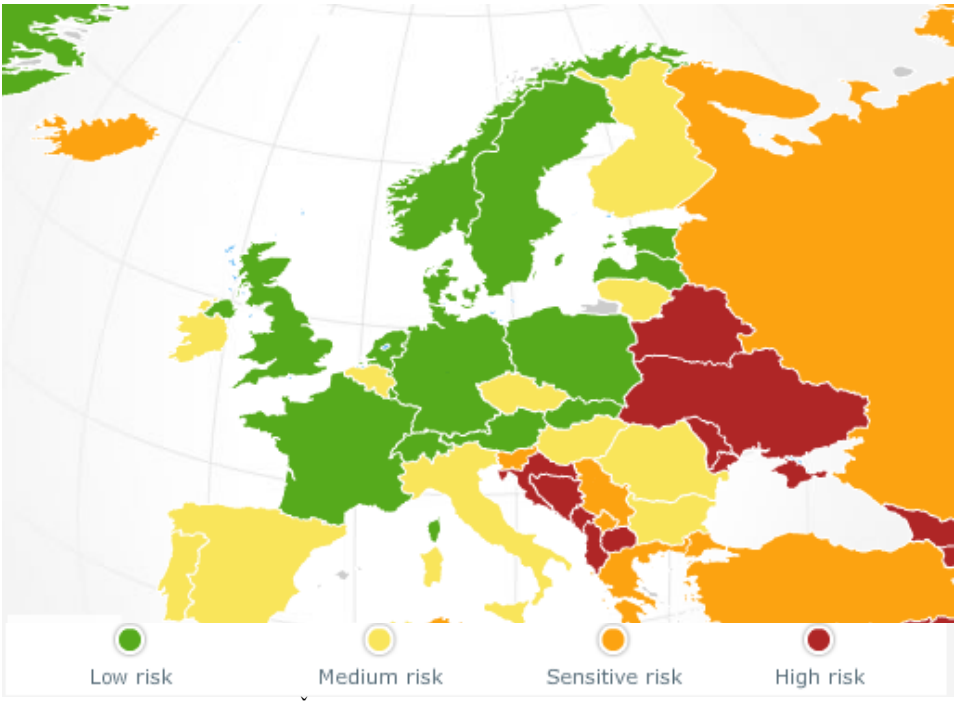
Esant tokiam iššūkiui (pateikti šalies rizikos įvertinimą kuo tiksliau), keletas mokslininkų bandė atkartoti šiuos reitingus, nes jie yra lengvai prieinami visuomenei, ir įtraukti juos į analizės modelį. Kai Feder ir Uy (1985), Oral et. al. (1992), ir Lee (1993) susitelkia tik į Institucinį investuotoją (angl. II), Cosset ir Roy (1991), Haque *et al.* (1996, 1997, 1998) taip pat tiria vadinamąjį Euromoney rodiklį. Kiti, pvz. Cantor ir Packer (1996b), Ferri *et al.* (1999), arba Mulder ir Perelli (2001) apžvelgia kredito reitingavimo agentūras. Cruces (2001) arba Monfort ir Mulder (2000) naudoja tiek žurnalų, tiek agentūrų reitingus.

3. Šalies rizikos vertinimo modeliavimas ir empirinis aprobavimas

Išanalizavus mokslinę literatūrą tapo neabejotinai aišku, kad šalies riziką reikia vertinti skirtingais aspektais, atsižvelgiant ne tik į ekonominius ir politinius rodiklius, bet ir vertinant šalies rizikos ir ekonominio tvarumo rodiklių poveikį. Euler Hermes (2014) pateikia šalies rizikos rodiklius iš 241 šalių ir teritorijų (S4 pav.); remiantis šiuo reitingu, galima teigti, kad šalies rizikos vertinimas yra aktualus ir reikalingas visoje Europoje.

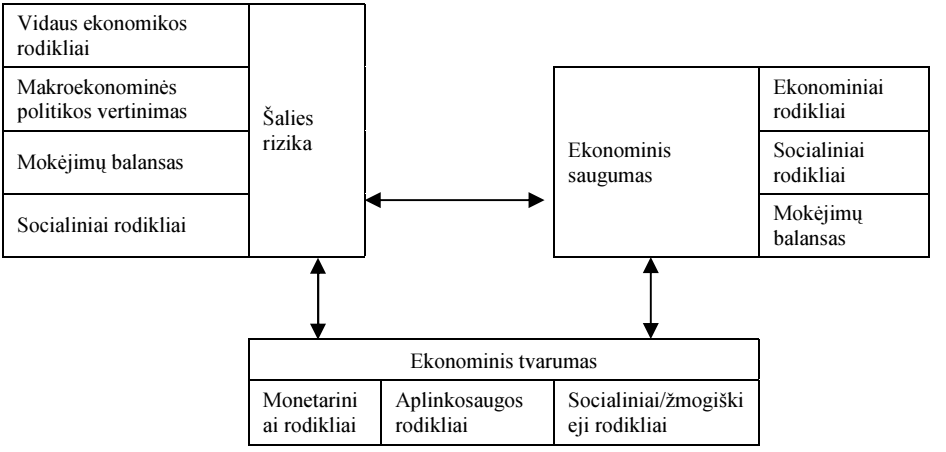
Pagrindinis šio skyriaus tikslas yra išanalizuoti šalies rizikos, ekonominio saugumo ir ekonominio tvarumo tarpusavio ryšius. Autorės daroma prielaida, kad visos trys rodiklių grupės yra tarpusavyje susijusios ir kiekviena iš rodiklių grupių lemia kitos grupės pokyčių dinamiką (S5 pav.).

Analizei buvo atrinkti tam tikri kiekvienos grupės rodikliai, kurie vėliau buvo išanalizuoti ir jų pagrindu apskaičiuoti rezultatai. Taip pat buvo atrinktos šalys, kurios buvo patikrintos empiriniais tyrimais – tai buvo aštuonios ES Baltijos jūros regiono šalys, atrinktos pagal tai, kad turi panašią padėtį pagal pritraukiamų investuotojų lygį, naudojant prieigą prie Baltijos jūros.



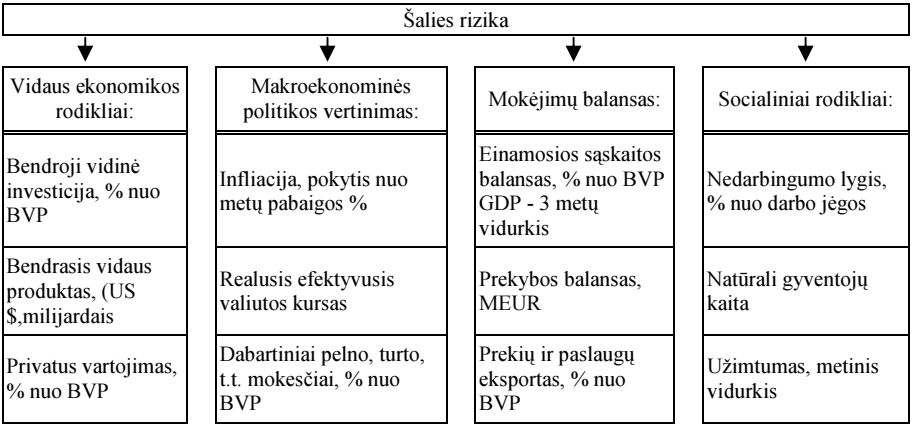
S4 pav. Šalies rizikos žemėlapis (Euler Hermes 2014)

Tuo pačiu reikia pabrėžti, kad buvo atrinktos tik ES šalis, nes jos turi vienodas sąlygas bendradarbiauti su kitomis šiame struktūriniame vienete ES šalimis, o tai leidžia manyti, kad investicijų pritraukimo galimybės yra panašios.



S5 pav. Tarpusavio priklausomybė tarp rodiklių (sudaryta autorės)

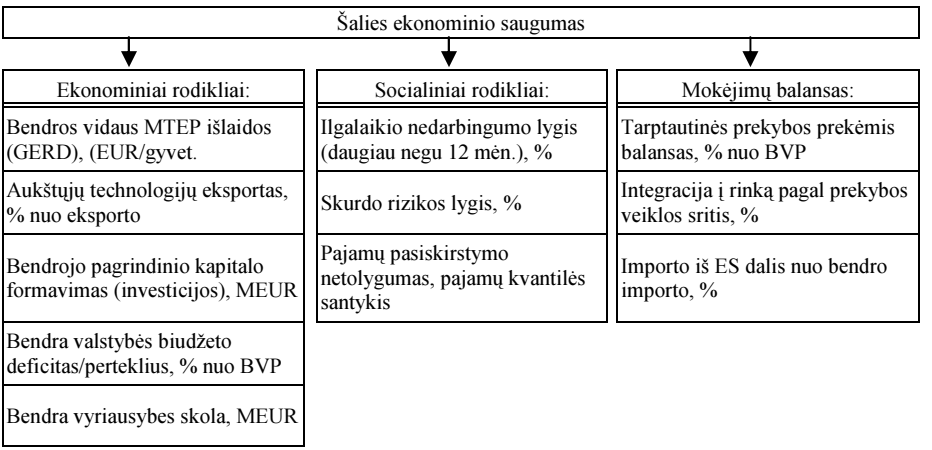
Bendrai tariant, atrinktos šalys gali būti palygintos tarpusavyje. Šios, analizei atrinktos, šalys yra – Lietuva, Latvija, Estija, Danija, Vokietija, Suomija, Lenkija ir Švedija. S6 paveiksle yra pateiktas šalies rizikos rodiklių grupavimas, kuris vėliau bus naudojamas vertinimui.



S6 pav. Šalies rizikos rodiklių grupavimas vertinimui (sudaryta autorės)

Šalies rizikos įvertinimui buvo atrinktos keturios pagrindinės rodiklių grupės – vidaus ekonomikos rodikliai, makroekonominės politikos vertinimas, mokėjimų balansas ir socialiniai rodikliai. Kiekviena grupė apima tris rodiklius, kurie geriausiai apibūdina šalies riziką.

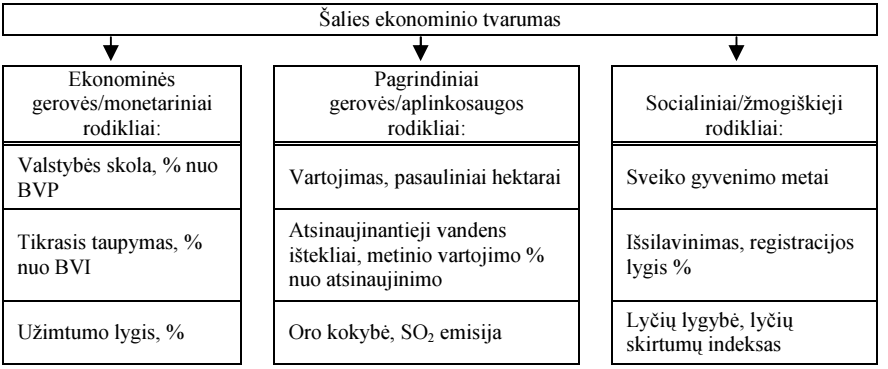
S7 paveiksle yra pateiktas šalies ekonominio saugumo rodiklių grupavimas, kuris vėliau bus naudojamas vertinimui.



S7 pav. Šalies ekonominio saugumo rodiklių grupavimas vertinimui (sudaryta autorės)

Šalies ekonominį saugumą įvertinti buvo atrinktos trys pagrindinės rodiklių grupės – ekonominiai rodikliai, socialiniai rodikliai ir mokėjimų balansas. Kiekviena grupė apima nuo trijų iki penkių rodiklių, kurie geriausiai apibūdina šalies ekonominį saugumą (Saisana, Saltelli 2010; Saaty 2010).

S8 paveiksle yra pateiktas šalies ekonominio tvarumo rodiklių grupavimas, kuris vėliau bus naudojamas vertinimui.



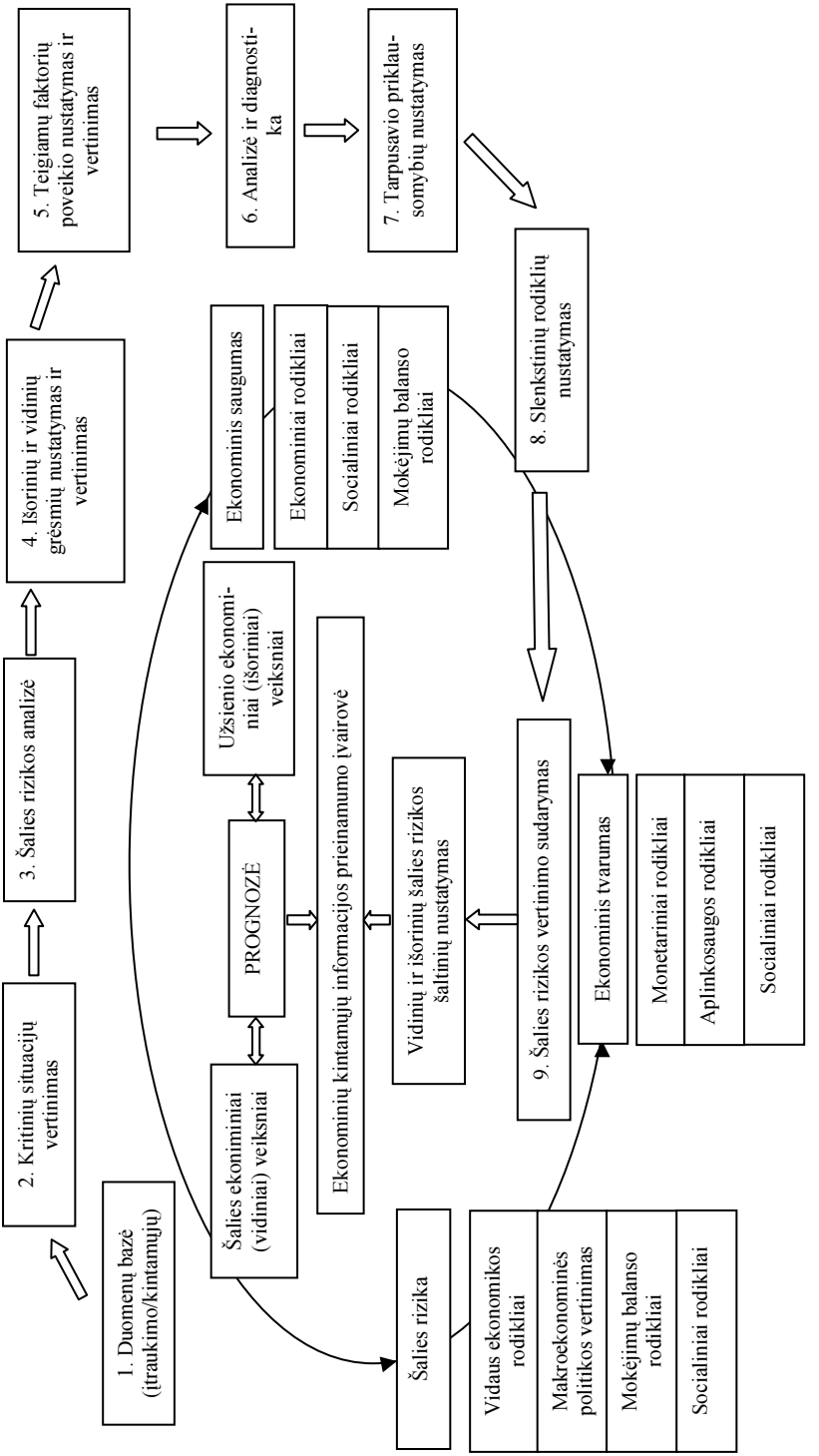
S8 pav. Šalies ekonominio tvarumo rodiklių grupavimas vertinimui (sudaryta autorės)

Šalies tvarumą įvertinti buvo atrinktos trys pagrindinės rodiklių grupės – ekonominės gerovės/monetariniai rodikliai, pagrindiniai gerovės/aplinkos rodikliai ir socialiniai/žmogiškieji rodikliai. Kiekviena grupė apima tris rodiklius, kurie geriausiai apibūdina šalies tvarumą.

Pasiūlytas šalies rizikos vertinimo modelis ekonominio saugumo ir tvarumo kotekste leidžia nustatyti pagrindinius vertinimo etapus, kuriuos reikia atlikti tam, kad įvertinti šalies rizikai įtaką darančių veiksnių tiesioginius ir netiesioginius tarpusavio ryšius, ir nustatyti ekonomikos rodiklius (veiksnius), kurie gali pakeisti šalies patrauklumą, ir pakeisti jos reitingą (vietą) tarp kitų regiono šalių (S9 pav.).

Tiriamojo darbo metu buvo sudarytas šalies rizikos vertinimo modelis, kuris leidžia įvertinti pagrindinius žingsnius, kurie yra reikalingi tam, kad adekvačiai galima būtų įvertinti šalies riziką ir rodiklius, kurie yra priklausomi nuo šalies rizikos kintamųjų.

Tiriamojo darbo metu buvo patikrinti ir išanalizuoti 32 šalies rizikos, šalies ekonominės ūkio plėtros tvarumo ir ekonominio saugumo vertinimo rodikliai iš 8 ES Baltijos jūros regiono šalių, viso 256 rodikliai. Tyrimo metu išskirtos 10 sudėtinių rodiklių grupių, kurias sudarė papildomi rodikliai, ir tos grupės buvo išanalizuotos.



S9 pav. Šalies rizikos vertinimo modelis (sudaryta autorės)

Po rodiklių atrankos ir analizės, visi išanalizuoti rodikliai buvo normalizuoti pagal MOORA ir MULTIMOORA daugiakriterinį vertinimo metodą, ir atliktas šalių reitingavimas, atsižvelgiant į tam tikrų grupių analizę (S10 lentelė).

S10 lentelė. ES Baltijos jūros regiono šalių išsidėstymas pagal MOORA ir MULTIMOORA daugiakriterinę metodą (sudaryta autorės)

Šalis	Šalies rizika vs tvarumas	Šalies rizika vs ekonominis saugumas	Šalies tvarumas vs ekonominis saugumas
Danija	2	3	3
Estija	4	4	4
Suomija	6	5	7
Vokietija	1	1	1
Latvija	8	8	6
Lietuva	7	7	5
Lenkija	5	6	8
Švedija	3	2	2

Koreliacinei analizei atlikti (Mirkin 2011; Miskiewicz 2012, Ausloos, Miskiewicz 2010) reikėjo normalizuoti rodiklius, kad galima būtų kuo geriau įvertinti šalies rizikos, ekonominio saugumo ir tvarumo rodiklių tarpusavio priklausomybę.

Nustatyta, kad egzistuoja tiek stiprios, tiek silpnos priklausomybės tarp rodiklių. Stipriausias neigiamas koreliacinis ryšys buvo nustatytas tarp realaus efektyviojo valiutos kurso ir tarptautinės prekybos prekėmis balanso – -0,909, bei tarp nedarbingumo lygio, ir tarptautinės prekybos prekėmis balanso – -0,920; tai reiškia, kad vienai rodiklio reikšmei didėjant, kita reikšmė mažės, arba atvirkščiai.

Stipri teigiama koreliacija yra nustatyta tarp bendrojo vidaus produkto ir prekybos balanso bei tarp bendrojo pagrindinio kapitalo formavimo, ir bendros vyriausybės skolos rodiklių – 0,992 ir 0,990, atitinkamai reikšmingai. Tyrimo metu paaiškėjo, kad infliacija ekonominio saugumo ir tvarumo rodikliams įtakos nedaro.

Rezultatų patikrinimui buvo naudojama skirtingų metų informacija. Skaičiavimuose naudoti 2012 metų rodiklių reikšmės (naujausi duomenys), nors buvo atsižvelgta ir į 2010 m., bei 2011 m. duomenis. Šių skaičiavimų rezultatai buvo panašūs – neegzistuoja reikšmingų nukrypimų nuo šalies rizikos vertinimo modelio.

Apibendrinant tyrimo rezultatus, atlikus minėtus skaičiavimus ir analizę, galima teigti, kad rodikliai labiausiai priklauso nuo šalies rizikos kintamųjų. Tai reiškia, kad pasikeičiant vienam iš rodiklių ar tam tikrai rodiklių grupei, gali keistis šalies išsidėstymas pagal rizikos veiksnių analizę, kuris nulemia šalies patrauklumą investicijoms.

Bendrosios išvados

1. Remiantis skirtingų mokslininkų tyrimais, šalies rizikos koncepcija niekada nebuvo analizuojama plačiąja prasme. Šalies rizikos sąvoka turi skirtingas reikšmes ir gali būti suprantama kaip veiklos atlikimo sklaida arba tiesiog kaip neigiamų pasekmių tikimybė, kuri sumažina pirminę lauktą grąžą. Ji nėra pritaikyta augančiai globalizacijai, kuri neabėjotinai keičia šalies rizikos traktavimą.

2. Tyrimo metu buvo nustatyti du pagrindiniai šalies rizikos šaltinių srautai. Pirmas telkiasi tik į vyriausybės įsikišimo poveikį verslo procesams. Antras yra susijęs su aplinkos nestabilumu ir jo įtaka verslui. Tai suteikia platesnę perspektyvą ir apima ne tik vyriausybės sukeltus rizikos šaltinius, bet ir kitas priežastis, kurios gali apsunkinti veiksmingą bet kurios užsienio organizacijos funkcionavimą kitoje šalyje.

3. Šalies tvarumas yra daugiau nei vien tik ekonomikos, visuomenės ir aplinkos sferų apjungimas. Ekonominį saugumą lemia tiek makro-, tiek mikroekonominė šalies aplinka. Kuriant šalies rizikos vertinimo modelį, turi būti atsižvelgiama į šalies tvarumo ir ekonominio saugumo rodiklius, nes tik tada gali būti atlikta visapusiška šalies patrauklumo analizė.

4. Požiūriai į šalies rizikos vertinimus skiriasi nuo subjektyvaus ir interaktyvaus svarstymo ekspertų grupėje iki formuojamų įvairiomis metodikomis, pagrįstomis taisyklėmis, vertinant rizikos kintamuosius. Dauguma šalies rizikos vertinimo metodų yra pagrįsti sprendimu apie šalies ekonominę veiklą, turintys apribojimus dėl neįvertintų su ekonomika nesusijusių rodiklių.

5. Egzistuoja kelios suinteresuotų šalių grupės, kurias domina kompleksinis šalies rizikos vertinimo modelis: šalies vyriausybė, komerciniai ir nekomerciniai bankai, reguliojančios institucijos, užsienio ir vietiniai investuotojai bei šalies gyventojai. Kiekviena grupė turi savo interesų sritį, todėl siūloma sudaryti kompleksinį šalies rizikos vertinimo metodą.

6. Empiriniam tyrimui buvo sudaryta 32 šalies rizikos, šalies ekonominio tvarumo ir ekonominio saugumo rodiklių iš 8 ES Baltijos jūros regiono šalių sistema. Ji apima 4 šalies rizikos rodiklių grupes: vidaus ekonomikos rodiklius, makroekonominės politikos vertinimą, mokėjimų balansą ir socialinius rodiklius; 3 ekonominio saugumo grupes: ekonominius rodiklius, socialinius rodiklius ir mokėjimų balansą; ir 3 šalies ekonominio tvarumo grupes: ekonominės gerovės/ monetarinius rodiklius, pagrindinius gerovės/ aplinkosaugos rodiklius bei socialinius/žmogiškuosius rodiklius.

7. Šalies rizikos, šalies ekonominio tvarumo ir ekonominio saugumo rodikliai turi aiškiai identifikuojamus tarpusavio ryšius; rodiklių tarpusavio priklausomybės ir nepriklausomybės lygis taip pat gali būti apskaičiuotas, naudojant pasiūlytą šalies rizikos vertinimo modelį.

8. Stipriausias neigiamas koreliacinis ryšys buvo nustatytas tarp realaus efektyviojo valiutos kurso (šalies rizikos grupė) ir šalies tvarumo socialinių rodiklių – -0,840, -0,802 ir -0,605 atitinkamai. Analogiškai, stipriausias neigiamas koreliacinis ryšys buvo nustatytas tarp realaus efektyviojo valiutos kurso ir tarptautinės prekybos prekėmis balanso – -0,909, bei tarp nedarbingumo lygio, ir tarptautinės prekybos prekėmis balanso – -0,920.
9. Stipri teigiama koreliacija egzistuoja tarp dabartinių pelno, turto mokesčių ir natūralios gyventojų kaitos ir šalies tvarumo socialinių rodiklių – 0,727, 0,703 ir 0,654 atitinkamai. Analogiškai, stipri teigiama koreliacija yra nustatyta tarp bendrojo vidaus produkto ir prekybos balanso bei tarp bendrojo pagrindinio kapitalo formavimo, ir bendros vyriausybės skolos rodiklių– 0,992 ir 0,990, atitinkamai.

Annexes[1]

Annex A. Evaluation of Country Risk and Economic Security Indicators for European Union Baltic Sea Region Countries Using MULTIMOORA
Annex B. Evaluation of Country Risk and Country Sustainability Indicators for European Union Baltic Sea Region Countries Using MULTIMOORA
Annex C. Agreements of Co-authors to Use Publication Material in the Thesis
Annex D. Copies of Publications of the Author on the Topic of the Dissertation

[1] Annexes are attached in compact disk

COUNTRY RISK ASSESSMENT IN ECONOMIC SECURITY AND SUSTAINABILITY CONTEXT

Doctoral Dissertation

Social Sciences,
Economics (04S)

Tatjana SVIDERSKĖ

ŠALIES RIZIKOS VERTINIMAS EKONOMINIO SAUGUMO IR TVARUMO KONTEKSTE

Daktaro disertacija

Socialiniai mokslai,
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