RISK INDICATORS

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Abstract: The need to analyze risk indicators and their implementation derives from the fact that they can assess which risks are significant and can quantify their impact on economic activity. Risk indicators are carefully selected parameters which serve as an alert to changing circumstances on risk management. These parameters must have a logical , clear, measurable and relatively simple- to –be- examined value. Such an indicators provides an early warning on the risks and weaknesses of the activity of an organization. Thus, we male an analysis of economic technical risk indicator, indicators to measure bank risk, used in the country risk analysis and other risk indicators.
Keywords: risk, risk indicators

1. INTRODUCTION

The analysis of an organization situation and its evolution will be made taking into account the factors listed in the previous essay, supplemented with a review of the indicators. An indicator is the ratio of two significant values thus allowing for the measurement of their importance and evolution in time. Based on such indicators and their evolution, the leader of the organization can take strategic decisions. The indicators proposed for study intend to represent risk and its management at national and international level, which identifies key issues that define them from an economic, social and even political pespective. Indicators essentially   show the effective "communication" of risk situations at different levels of territorial and organizational distribution, so that decision makers can identify and propose effective policies and actions against this issue. In order to achieve effective risk management is important for an organization to identify the types of indicators and their implementation thereof.

2. INDICATORS OF ECONOMIC RISK

Economic risk expresses the validity of the economic outturn under operating conditions. Economic risk analysis is done in several ways, by several indicators:
- *indicators of breakeven / profitable threshold* =is the point at which the turnover cover operating expenses, and the result (profit) is zero. The indicator is known in the literature as "critical turnover", "critical" or "dead" point. It highlights the work level to be reached by the firm for not working at a loss. Once exceeded this level, the business becomes profitable. Hence it follows that the economic risk will be even lower as the „dead point" is lower. The use of breakeven as a tool for risk assessment therefore requires knowledge of its calculation methodology and its cognitive value. Determining the breakeven value can be made in natural or physical units, number of days for the entire business or a single product (1).
- *indicators of result variability*. The risk means basically the variability of business results, profit and profitability indicators . Variability of results refers to the discrepancy between expected results and actual results,discrepancy which can occur either in a positive or in a negative way, making the risk to be understood in two ways, and the amplitude of result variations from their expected values gives the risk dimension. Given the definition of risk, particularly through the concept of variability, risk measurement requires the use of statistical indicators of dispersion and standard deviation of the results (profit, cost) compared to their average and also by the coefficient of elasticity through the results (profit) in relation to the level of business activity - turnover (2).

Financial risk characterizes the result indicators variability under the financial structure of the organization. Among the indicators measuring financial risk, the most used are: threshold turnover, bankruptcy risk, overall profitability threshold, different methods of synthesis (Conan-Holder model, the model of the National Bank of France, and so on). Quantifying the magnitude of the financial risk is based on a similar methodology used for operational risk, namely by determining the "variability" of the cash flow available to shareholders under variations of the operating cash flow. The relation is given by the coefficient indicator of the financial leverage (3).

Another indicator used in financial risk analysis is the financial leverage (Leverage = total debt / total assets) expressing the impact of financial structure on financial profitability of the organization. Financial leverage, favorable or unfavorable to the organization, affects the amount of financial return and quantify the impact of credit required for the organization to fund its operations. Therefore, the effect of financial leverage (or variation of the rate of return on equity) is a function of economic rate of return and debt cost (4).

The description of the risk can be achieved through both indicators of the actual situations of uncertainty and values that can be determined only on the basis of probability distributions of decision consequences: -the likelihood of negative outcomes; - Expected value (expected value) of results; - Standard deviation of the results; - Result variation coefficient (5)

3.TECHNICAL RISK INDICATORS

The technical risk characterizes an undesired event, specific to the technical / technological system operation and conditions associated with a potential risk by the probability (r, 0 <r <1) of event occurrence , by gravity (G) of its consequences and by the level of acceptance (A) of these consequences.
Structural equation of the technical riskis : technical risk = D * G * r * A
D = possible danger; G = Gravity; r = Probability;
A = Acceptability
Under the substantiation of certain criteria of evaluation / assessment of the severity of the technical accident consequences–highlighted   by the adoption of a conventional measurement scale for gravity G - and establishing their limits of acceptability, in the coordinating plan p-G three specific areas of technical risk can be defined:
- The negligible risk usually associated with disposals / failure or minor damage (less sever consequences), rare and very rare damage (low and very low probability of production);
- The acceptable risk associated with frequent minor damage (with high probability of production), or major damage (high severity consequences), rare and very rare damage;
- The inacceptable risk, for major possible (the likelihood of which can not be neglected) or frequent accidents (6)

Measuring the technical risk is complex operation for which several methods and indicators are used. An important indicator is the reliability indicator which in turn is given by indicators based on descriptive statistical methods (non parametric indicators) and indicators based on probabilistic models (parametric indicators). Non-parametric indicators may include: relative frequency of failures, malfunctions cumulative relative frequency, relative frequency of specimens according to the frequency (number) mean (average) of failures in an observation interval, mean good functioning time also called average time of good functioning, the density of failure rate (the failure), standard deviation from the mean values and variation coefficient (7).

4. BANK RISK MEASURING INDICATORS

Risk indicators becoming more relevant in a general context for assessing the bank's profitability and competitiveness on the market the final purpose consisting of bank management and maximizing the shareholders' income while adjusted to risk influence.

Indicators of credit risk

Almost all banks, to a lesser or greater extent, assume the credit risk which implies the need for careful analysis of how that the loan portfolio quality evolves in time , with special impact on profitability, capital adequacy and overall confidence in that bank. Therefore, two benchmarks for assessing credit risk is determined by the proportion of poor quality, which delays or does not allow to make anticipated revenue, as follows:

• volume of overdue loans / total loans * 100
• volume of nonperforming loans / total loans * 100

Of course, the optimum is the minimal values of the two indicators, tending to zero in the first case and the second case, overdue loans, especially nonperforming loans affecting the business and financial results of the bank. Other indicators of the credit risk use the formula of reserves and provisions that banks make up to cover possible losses, such as:

Reserves for loan losses / total loans * 100, a report that express management expectations regarding the evolution of the loan portfolio quality

Provisions for loan losses / net loss * 100, a report that reflects the level of prudence adopted by the bank in its lending (credit) policy

Gross profit / provision for credit losses * 100 respectively the cost to cover the credit risk assumed by the bank.

Potential indicators of risk measurement that may signal in advance variations in the bank income are: geographic concentration and economic sectors of credits, growth in the volume of credit, high cost of some credit categories. (7)

Indicators of liquidity risk

The key indicators for liquidity analysis are: global liquidity, the immediate one , depending on total deposits and according to their total deposits and loans. Other indicators for assessing liquidity risk are liquidity position, net assets, liquidity ratio and liquidity index. Minimum level of liquidity is calculated as the ratio between effective liquidity and liquidity needed for each maturity band. The lower limit of this indicator was fixed at 1.

The solvency indicator (capital adequacy)

As for indicators dimensioning the relative level of liquidity, the solvency- debt indicators are calculated based on the information summarized in the balance sheet or in the property sheet. In principle, solvency means the ability of an undertaker to meet his obligations to creditors in due time. Minimum level of solvency, calculated as a ratio between equity and total assets and off-balance sheet items, weighted according to their risk level is 15%.

Interest rate risk indicators used in banking practice are:

- Interest rate risk;
- Absolute bank interest margin;
- Gross margin percentage of bank interest;
- Net percentage margin of bank interest. (7)

Currency risk indicators

Currency risk assessment can be based on the following two indicators:

- foreign currency position - is determined by comparing assets and liabilities denominated in foreign currency. It is calculated for each currency separately. A currency position is considered short if currency liabilities are greater than assets in foreign currency. Conversely, when foreign currency assets are greater than liabilities in foreign currency, currency position is long. Bank's foreign currency position induce gains or losses depending on exchange rate developments. Bank's exposure to currency risk arising from transactions in a particular foreign currency is greater when the currency position for that currency is higher

- overall currency position - is defined as the net balance in a reference claim currency against liabilities in foreign currencies. This takes into account all individual currency positions providing an insight into foreign currency risk at the bank level. Overall currency position is used more in reporting the situation to the central bank and less in effective management of the currency risk. This position by offsetting the exposure to different currencies leads to a decreased calculated risk, but actually keeping it (8)

- employment structure, efficient operation of economic resources, size and structure of savings: Savings / GDP, real interest rate and the size and structure of investment: gross investment / GDP, gross investment ratio / gross domestic savings, economic efficiency of new investments, increasing money supply , indicators of quality employment, unemployment and structural imbalances, infant mortality, life expectancy, per capita income levels, indicators of living standards

5. INDICATORS USED IN THE ANALYSIS OF COUNTRY RISK

Sizing and analyzing the country risk is based on a system of economic and political indicators, which can be structured as follows:

- Macroeconomic result indicators :
- GDP/PIB per capita;
- Real GDP growth;
- Gross capital growth ;
- budget deficit as a percentage of GDP;
- Inflation;
- Macroeconomic financial structure;

- Other macroeconomic indicators such as economic, human and capital resources, employment structure, efficient operation of economic resources, size and structure of savings: Savings / GDP, real interest rate and the size and structure of investment: gross investment / GDP, gross investment / gross domestic savings ratio, economic efficiency of new investments, increasing money supply , indicators of employment quality, unemployment and structural imbalances, infant mortality, life expectancy, levels of per capita income, indicators of living standards

-balance of payments indicators:
- Foreign trade by indicators such as growth rates of exports and imports; income elasticity vs. demand for imported products, demand elasticity vs exported products, the level of imports coverage by exports;
- External revenues followed by: the share of exports in total exports to major trading partners, export dependence, imports of goods and services with respect to GDP, the share of imports of goods and essential services in total import, share of energy imports, the share of food imports

- sustainability of the current account deficit
-Indicators of external debt
- amount of external debt / GDP
- amount of external debt / export
- Total interest paid / exports
- amount of bank debt / exports

- Other external debt indicators such as debt damping related to debt, medium-term public debt relative to exports of goods and services, short-term debt relative to total external debt, external debt maturity structure and creditors, capital inflows relative to external debt service (9).

-Assessment of the political situation in terms of the analysis:
- Internal political situation (influenced by: social structure, institutions, personalities, popular support, the repressive nature of the regime, corruption, opposition force, the share of unionized employees , the share of the largest minority in the total population, population growth, income and consumption);
- Foreign political situation (regional political instability, geopolitical importance of the country, affiliation to a political group, economic or military group (IMF, EU, NATO, OPEC, etc..) legitimacy of the political regime, the stability of government support) (7)

- *B.E.R.I.* index (*Business Environment Risk Index*) = is a parameter to assessed the socio-political dimension of the business environment of a country according to 15 criteria. Each of them is given a mark ranging between zero (corresponding to the most unfavorable situations) and 4 (corresponding to the most favorable circumstances). The B.E.R.I. value is the result of the weighted sum of the marks obtained. Depending on the score, a country can be framed, in terms of political risk, into the following groups

     *group I (between 86 and 100 points), which includes countries with a favorable business environment;

     • Group II (between 71 to 85 points), which includes countries with low political risk;

     • group III (between 56 and 70 points), which includes countries of moderate political risk;

     • group IV (between 41 and 55 points), which includes countries with high political risk;

     • group V(less than 41 points), which is unacceptable for business investment. The B.E.R.I. index is mainly used in decision making on foreign direct investment in developing countries and estimation of government capacity to maintain social and political stability;

- *P.R.I. index* (Political Risk Index) = is a parameter to assess the level of political risk in a country through 10 variables that reflect both internal and external sources of socio-political instability. Each of these variables is given a

mark from zero (for the most favorable case) to seven (for the worst case), the PRI index being calculated by simply summing these marks. In relation to the score obtained., a country can be classified, according to its political risk, in one of the following groups

     * Group I (between 0 to 20 points), which includes countries with low political risk;

     • Group II (between 21 to 35 points), which includes countries with an acceptable political risk;

     • Group III (over 35 points), which includes prohibitive political risk countries. Like BERI index, the PRI index is mainly used for decision making on foreign investment in developing countries. This parameter, however, only expressees risks arising from socio-political instability, not those related to potential hostile attitudes of the government. Besides assessing the business environment at national level, political risk indices can be used in estimating the threats that social and political developments at local or regional level can induce for the activity of an enterprise. Generally these parameters do not provide a particularly accurate assessment of political risk as a result of the less fundamental way in which they are established .

Given all these indicators, the great rating agencies, have drafted their own way of risk assessment (as shown in Table 1), based on their own sources of information, using only part of the risk indicators as listed above and their country risk research methodology.

Tabel 1

Rating Agency	Evaluation model
Institutional Investor	**Products provided:** credit risk; **Type of information:** quality indicators; **Source of information:** information provided by international banks; **Indicators:** the economic environment (1), external debt service (2), international reserves / current account (3), tax policy (4), political environment (5) the availability of capital market (6), the trade balance (7), portfolio investment flows (8), the flow of direct investment (9); **Significance of the indicator:** credit risk **Methodology:** scalar indicator calculated as a weighted average of the indicators above
Standard & Poor's	**Products provided:** sovereign risk, ratings for issuers of bonds in domestic or foreign currency, risk for international bond issues **Type of information:** quality and quantity indicators; **Source of information:** published sources, internal sources; **Indicators (sovereign risk): political environment** (stability, alternation in governance, power system flexibility, political support, orientation of political parties), **social environment** (living standards, income distribution, labour market conditions, the rate of urbanization, level of education, relations with neighbours, border conflicts) **economic environment** (international investment position, GDP, exports, economic structure, natural resources, foreign exchange regime, the taxation level) **Significance of the indicator:** ordinal-type risk indicator (letters) **Methodology:** scalar indicator calculated by combining the indicators above
Political Risk Services	**Products provided:** country risk **Type of information:** quality and quantity indicators; **Source of information:** published sources, official ,internal sources; **Indicators:** economic evolution (6%), political leaders (5%), external conflicts(5%), corruption (3%), involving religion in politics (3%), involving army in politics (3%), racial and nationalistic tensions (3%), terrorism (3%), civil wars (3%), history of external debt (5%), control of transfers and currency exchanges (5%), expropriation (5%), inflation (5%), leverage (5%), international liquidity (5%), current account (8%), foreign exchange (5%) **Significance of the indicator:** ordinal-type risk indicator (scalar) **Methodology:** scalar indicator calculated as a weighted average of the indicators above acc to three groups: political (50%), financial (25%)and economic (25%).
The Economist	**Products provided:** country risk **Type of information:** quality and quantity indicators; **Source of information**: panel of experts (political indicators), internal sources published sources (economic indicators); **Indicators:**. economic growth (GDP), inflation, external debt, level of export processing, bad neighborhood, autolitarism, the legitimacy of government, military involvement in politics, corruption, ethnic tensions, internal conflicts **Significance of the indicator:** ordinal-type risk indicator (scalar) **Methodology:** indicator calculated based on the above indicators scale acc to three groups: economic (33 points), social (17 points)and politic (50 points)
Moody's	**Products provided:** sovereign risk, ratings of governments **Type of information:** quality and quantity indicators; **Source of information:** internal sources published sources official source; **Indicators:** political extremism, legal system, political structure, income distribution, ethnic / religious divergences, liquidity, balance of payments, monetary independence, interest rate, exchange rate, international capital flows, dependence on imports / exports, labor mobility, **Significance of the indicator:** ordinal-type risk indicator (letters) **Methodology:** scalar indicator calculated as a weighted average of the indicators above acc to three groups: political financial and economic
Alte agenții de rating	• Bank of America World Information Service; • Business Environment Risk Intelligence (BERI); • Control Risks Information Services (CRIS); • Economist Intelligence Unit (EIU) • Euromoney; • Political Risk Services-Coplin-O'Leary Rating System; • Fitch IBCA Duff & Phelps; • Coface Groupe; • MITI • EximBank

6. OTHER RISK INDICATORS

Capital indebtedness indicator = debt / equity or debt / Capital employed. (Borrowed capital = Loans over 1 year , Capital committed = Equity + Borrowed capital

G_i = [long-term debt/ equity] X 100

G_i = [long-term debt / Capital committed] X 100

The indebtedness shows the business assets financed by creditors, in correspondence with the owners financed assets. The higher this indicator, the firmer the company's debts and more risky the financial position. It is a general indicator of indebtedness and calculates the share of the total assets which is financed from sources other than their own, such as credit, providers, state debts.

The indicator is the inverse property solvency and may have values less than or equal to 1. Under normal activity, the indebtedness level should lie immediately around 50%. A limit below 30% indicates a reservation in resorting to credits and loans and over 80% a dependence on loans which is an alarming situation. **Interest coverage** calculated as follows: (earnings before deposit + interest expenses) related to interest expense. The smaller it is, the more risky the society position. If a company is able to generate a return on assets exceeding the interest expenses , it will make a profit. The company also is at risk of not achieving a return on assets equal to costs of financing those assets, thereby generating a loss.

Risk Indicators (KRI Measures - Key Risk Indicator Measures) are similarly defined and used as the performance indicators (KPI Measures), as long as they are allocated to a single objective of the Strategy Map. This statement is made because there are risks that are not specific to only one goal - detailed breakdown below in Figure 1. The value of a risk indicator is always a calculated one, not measured, being determined by the so-called heat maps built for each risk indicator, based on the two basic parameters for risk management: (a) probability of risk expressions and (b) Impact of event risk. The indicator changes according to the change of at least one of the two parameters
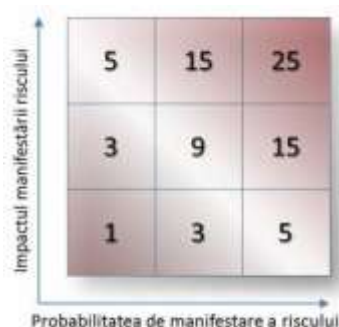

Fig.1. Strategy map
Source: http://bscromania.wordpress.com/2011/03/10/bsc-si-managementul-riscului/

For risks that affect more than one objective, specific risk objectives are introduced in the strategy map to get a focus on risks that have a larger area and an adequate control. Sometimes, if there are several such risk objectives and they may be found in many perspectives, they can be grouped into a risk management theme in the Strategy Map. Thus we can have the following categories of objectives on the Strategy Map:
(a). **Non-risk objectives** associated only with performance indicators (KPI Measures)
(b). **Dual objectives**, which have both associated performance indicators (KPI Measures) and risk (KRI Measures)
(c). **Risk objectives** associated only with risk indicators (KRI Measures).

Professor Nicolae Danila , PhD , member of the Romanian National Bank Board of Directors within the dissertations ceremony occassioned by the award of the title of Doctor Honoris Causa of "Ovid" Universitu in Constanta, believes that there are also other risk indicators as follows:
- Indicators of financial markets considering risk appetite and liquidity conditions;
- Indicators of risk concentration in the financial system. They are particularly important because they focus on the element that was missing from the analysis of financial stability before the 2007 crisis, namely contagion. Extension of risk depends on exposure and complex connections between financial institutions, financial sectors, markets and national economies. This type of indicators was much discussed by the Basel Committee which since July 2011 published a methodology to track the contagion risk for banks of globally systemic importance.
-aggregate indicators of imbalances, which are either macroeconomic data, or monetary sheet data and which are used to signal the strengthening of risk in the financial sector or the economy as a whole. Most states have resorted to a pair consisting of data on credit growth dynamics and that the price of assets.
Other risk indicators of national / local level:
- Disaster deficit index = measures the country risk in terms of loss (macroeconomic) and identifies the country's financial ability to cover losses (funds needed);
- Local disaster index = measures the local effects (based on death, loss and economic loss) of events that are to occur;
- Predominant vulnerability index = measures: direct physical impact (exposure/ sensitivity), indirect and intangible impacts (socio-economic fragility) and no risk resistance. It consists of three sub-indices based on development indicators (human development, governance, etc.).;

- Risk management index =measures the country performance in risk management and is composed of hazard identification, disaster mitigation and management and risk transfer;
- Disaster Risk Index = measures mortality caused by cyclones, floods and earthquakes (calculating average annual population in each country, exposed to these phenomena);
- Disaster risk Hotspost = measures also economic losses and in addition to the 3 aforementioned index threats also include risks of drought, landslides and volcanoes. It is calculated on grid resolution of 5 x 5.

7. CONCLUSIONS
Recommendations on risk indicators:
- it must be taken into account that risk is an abstract concept (it is not measured such as temperature), to measure it is not a trivial task and should consider the proposals of successive approaches;
- the academic support and the retaled research in developing indicators should be a crucial element of risk management process;
- an indicator must have a theoretical support to sustain (literature or conceptual tradition of the region)
- before comparing countries, cities or regions it is need a certain caution - a clear indication of the limits of indicators, indices;
- - Indicators do not identify and pursue the same things;
- -cheking an index sensitivity and the methodology for its use must be present in future initiatives

There are important initiatives in relation to risk indicators and their management, promoted by international organizations. The conclusion is that the current priority is far from proposing the creation of new indicators and approaches, but it is based on the need to communicate with existing initiatives focusing on agreement, understanding and application. It also noted a trend toward the production and dissemination of local indicators as a strategy to "communicate" with relevant partners, with risk situations so that indicators can be used to identify, measure and manage local risks.

Another conclusion is that research on the subject, on the identification of risk indicators, is not limited to developing communication initiatives and amortization of existing proposals, but is due primarily to the way of promoting the application of locally appropriate methodologies in collaboration with local institutions when adopting it.

BIBLIOGRAPHY
1. **Roman, Monica,***(2003) Statistica financiar-bancară ș i bursieră.* Bucureș ti : Ed. ASE
2. **Vintilă Georgeta; Armenau Ştefan Daniel; Filipescu Maria Oana; Moscalu Maricica; Lazăr Paula***, (2011) Economie teoretică şi aplicată, Volumul XVIII 2011, No. 5(558)Analiza şi evaluarea riscurilor activității antreprenoriale în mediul economic românesc.* Economie teoretică ș i aplicată, pg. 119-131
3. **Moț ocu, Marius,** *(2009) Managementul riscului în economie.* Cluj-Napoca : Ed. Risoprint
4. **Păvăloaia, Vasile-Daniel,** *(2009) Integrarea tehnologiilor informaț ionale în analiza financiară.* Iaș i : Ed. Universităț ii "Alexandru Ioan Cuza"
5. **Nistor, Costel,** *(2005) Gestiunea riscului în relaț iile economice internaț ionale.* Bucureș ti : Ed. Didactică ș i Pedagogică
6. **Popescu,Dorin; Pavel, Alecsandru,** *(1998) Risc tehnic/tehnologic.* Bucureș ti : Ed. Briliant
7. **Isaic-Maniu, Irina,** *(2006) Caracterizarea statistică a riscului. Concepte, tehnici, aplicaț ii.* Bucureș ti : Ed. ASE
8. http://www.scribd.com/doc/46462772/21/Indicatori-ai-riscului-valutar
9. **Dudian, Monica,** *(1999) Evaluarea riscului de ț ară.* Bucureș ti : Ed. All Beck