

František Hocman

Global risks - irrationality, identification and new type of threats

Kultura Bezpieczeństwa. Nauka-Praktyka-Refleksje nr 21, 138-146

2016

Artykuł został opracowany do udostępnienia w internecie przez Muzeum Historii Polski w ramach prac podejmowanych na rzecz zapewnienia otwartego, powszechnego i trwałego dostępu do polskiego dorobku naukowego i kulturalnego. Artykuł jest umieszczony w kolekcji cyfrowej bazhum.muzhp.pl, gromadzącej zawartość polskich czasopism humanistycznych i społecznych.

Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

GLOBAL RISKS – IRRATIONALITY, IDENTIFICATION AND NEW TYPE OF THREATS

FRANTIŠEK HOCMAN
University of Economics in Bratislava

ABSTRACT

Systematic analysis based on the assumption of rational behaviour of human being in addition to the mathematical models is based on the inherent factors in quantification of global risks. Decisions are made based on all available information, to act in order to maximize the utility. However, the current state of global quantification of risks based on the probability of economic loss scenarios, rationality of action in emergencies excludes and puts to the forefront scenarios likelihood and severity based on information asymmetry. If all risk takers were fully informed, it would avoid the moral hazard and the amount of individual risks would be stable in the global context.

KEY WORDS

global risk, risk analysis, risk area, risk exposure, risk of transfer

ABSTRAKT

Východiskovým faktorom pri kvantifikácii globálnych rizík je okrem matematických modelov systematická analýza založená na predpoklade racionálneho správania človeka. Rozhoduje sa na základe všetkých dostupných

informácií aby konal za účelom maximalizácie užitočnosti. Avšak súčasný stav kvantifikácie globálnych rizík založený na scenároch pravdepodobnosti ekonomickej straty racionálnosť opatrení pri krízových situáciách vylučuje a dáva do popredia scenáre pravdepodobnosti a závažnosti na základe informačnej asymetrie. Ak by všetci účastníci trhu boli dokonale informovaní, nedochádzalo by k morálnemu hazardu a výška jednotlivých rizík by bola v globálnom kontexte stabilná.

KLÚČOVÉ SLOVÁ

globálne riziko, riziková analýza, riziková oblasť, riziko expozície, riziko transferu

JEL classification: G32



INTRODUCTION

Political risk may be defined as a strategic, monetary or personnel loss, or as non-market factors, for example macroeconomic or social policies (fiscal, monetary, employment) or events which relate to political instability (terrorism, hysteria, overthrows, civil war, insurrection). Individual governments may lessen these consequences and financial losses in diplomatic or military ways, or by other interventions with the result of political risk. A low level of observed political risk may be achieved by an equal degree of political liberty. Flanagan and Norman (Flanagan, Norman 1993) focus on the threat of the potential risk of loss, in case when the entity (averse to risk) fears of the minimum level of loss. Based on the situation of the global environment in introducing new institutional or management market that can bring dynamic maximize opportunities while delivering not only potential growth, but also losses. Risk decision thus means the choice between risks taking the same loss with high probability of something to get something uncertain.

EXPOSURE OF GLOBAL RISK

Model defined by Eugene Fama (1970) - the University of Chicago exclude any risk. His definition of the “efficient market hypothesis” excludes any deviation from the prescribed range, as a separate element, as part of the

market, cannot overcome market by their behaviour. However, if any market possibility has already existed, anybody could use it, thus this uncertainty has disappeared. His hypothesis explains using the example that he rejects picked up twenty dollar bank note from the ground, because there cannot be any. If there even was any, someone would have picked up before him certainly. Such approach was also used for the risk of overvaluation or undervaluation of the market. If such risks arose, someone have already taken advantage of it, therefore the market can locate and eliminate risk alone, so there is not any. The market is considered efficient and therefore the stock market replicates the impact of all information. Therefore, according to him, overvalued or undervalued stocks does not exist, there are only stocks, which price depend on real information and its value is therefore real and quantifiable follows the trends in macroeconomic variables. Chapman and Ward (1997) exclude situations in which the risk was not included. If there is a project with minimum or zero risk, "it is no worth powder and shot". Organisations that understand the character of these risks and can manage them effectively, can avoid unforeseen disasters, but also can work with smaller deviations and lower coincidences, may release resources for continued efforts and may take the advantage of beneficial investment opportunity that might otherwise be dismissed as too risky.

Risk and uncertainty differentiate Bussey (1978) as the decision that is conditional of risk. If the decision maker knows the full time series of possible outcomes and when he can assign to each known outcome probabilities, he can apply decisions based on definite values. In practice, however, this theory is difficult to apply. Bussey therefore defines uncertainty as phenomenon that exists when there is activity in the course of more than one possible result. A possible outcome is determined also by its probability, which is unknown. Thus, the decision maker can apply the argument in deciding between the results, but cannot assign their current probability values. Rowe (1977) defines risk as "the possibility of unwanted negative consequences of events or acts" as opposed to Gratt (1987) that has defined risk as "estimate of uncertainty based on the expected outcome conditional probability of an event occurring multiplied by the consequences of the event that occurred." Thus, he explained that if the risk is quantifiable and subsequently in the context of an undesirable phenomenon, such as a disaster - natural disaster, in which two thousand inhabitants live, to estimate the expected result by means of the likelihood of the occurrence

- one of thousands died, or as the value of future result - two dead, can be used both.

“CUT’-AND-DRIED’” MODELS

The Human development index (HDI – Human development index) was presented as an instrument for measuring quantifiable indicators (poverty, literacy, education, and average life span) in individual countries. Since 1993 the United Nations has published it in their annual report. For its calculation, variables which achieve the values in the interval 0 to 1 are used. Such a quantification allows the combination of the individual parameters into a summary indicator in which the range of the individual values is restricted by the maximum value which the variable can attain ($\max(x)$) and by its lowest value ($\min(x)$).

$$x - index = \frac{x - \min(x)}{\max(x) - \min(x)} \tag{1}$$

The Human development index represents a mathematical average of the Life Expectancy Index – LEI, Education Index – EI and the Adult Literacy Index – ALI.

The Life Expectancy Index is calculated as the ratio of the Life Expectancy, from which we deduct the minimum achieved by the country divided by the difference of the maximum and minimum values.

$$LEI = \frac{E - \min(x)}{\max(x) - \min(x)} \tag{2}$$

The Education Index is mathematically expressed by the equation:

$$E = \frac{2}{3}xALI + \frac{1}{3}xGEI \tag{3}$$

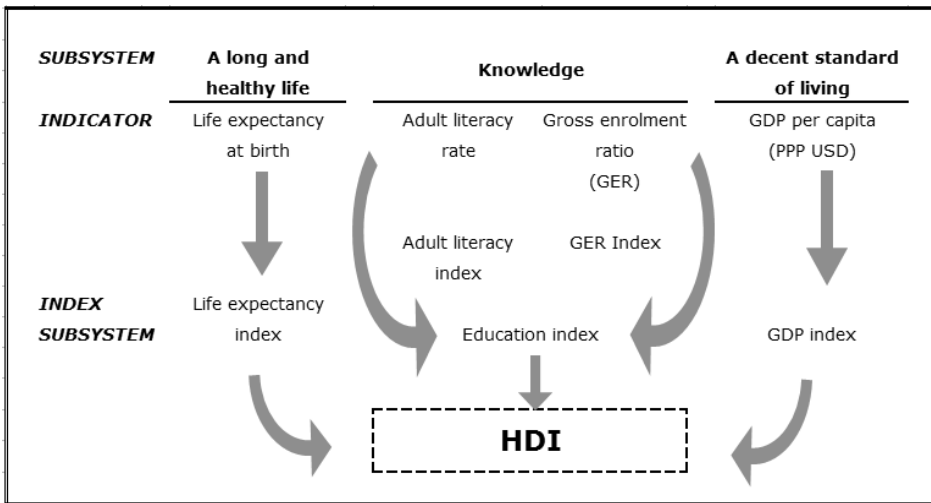
In which the ALI – Adult Literacy Index is calculated: $ALI = \frac{ALR - 0}{100 - 0}$ and the value GEI (Gross Enrollment Index) = $\frac{CGER - 0}{100 - 0}$ in which the

variable ALR – is the indicator of the Adult Literacy rate, CGER – Combined gross enrolment ratio, and GDP is the ratio of the GDP per inhabitant expressed in USD.

$$\text{GDP Index} = \frac{\log(GDP_{pc}) - \log(100)}{\log(40000) - \log(100)} \tag{4}$$

HDI index is therefore the compound indicator from the average values achieved in the country in the three basic areas: development of human health, education and standard of living. Health is measured by the birth rate, education as the indicator of the adult literacy and by a combination of primary, secondary and tertiary education. HDI is therefore defined by three areas: the length of healthy life, whose indicator is the expected life expectancy at birth, from which is calculated the LEI, the level of knowledge, and by the compound indicator of the degree of education of the adult population and the GER Index and by the actual standard of living, measured by the GDP level per inhabitant in USD.

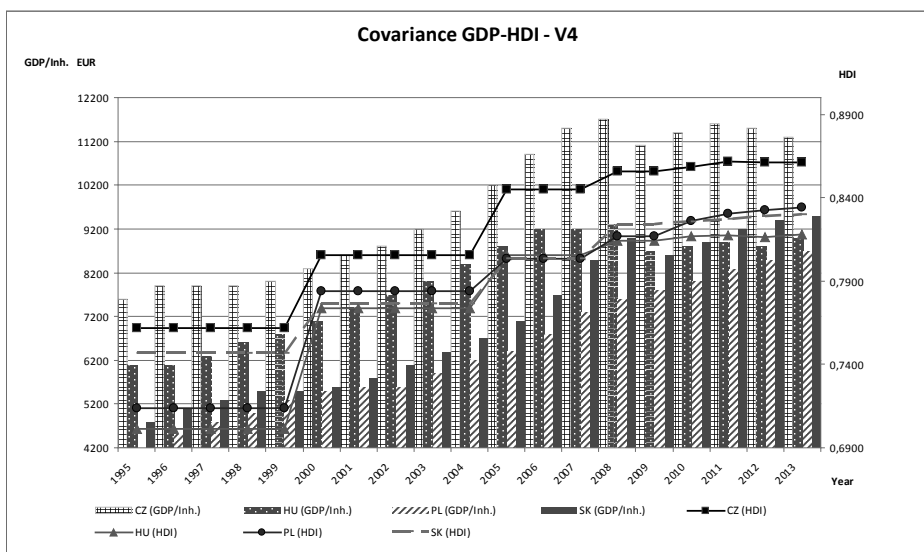
DIAGRAM 1: HUMAN DEVELOPMENT INDEX



Source: United nations Development Programme: Human Development report.

Defining due to indicators mentioned above, states were divided into three groups - countries with high index value - the value of 0.8, a country with a mean index - the value of (0.8 to 0.5) and countries with a low index value: a value of less than 0.5. The Human development index is therefore an indicator of the application process of expanding opportunities and potential opportunities to live a quality life. Using Holistic approach, which is measured by the applicability of people in terms of the whole development process, will thus be able to assess risk, and that this process creates. Human development index defined as a socio-economic indicator can be used for the Slovak republic.

DIAGRAM 2: TREND DEPENDENCE SERIES PIT (SR) AND GDP (SR)



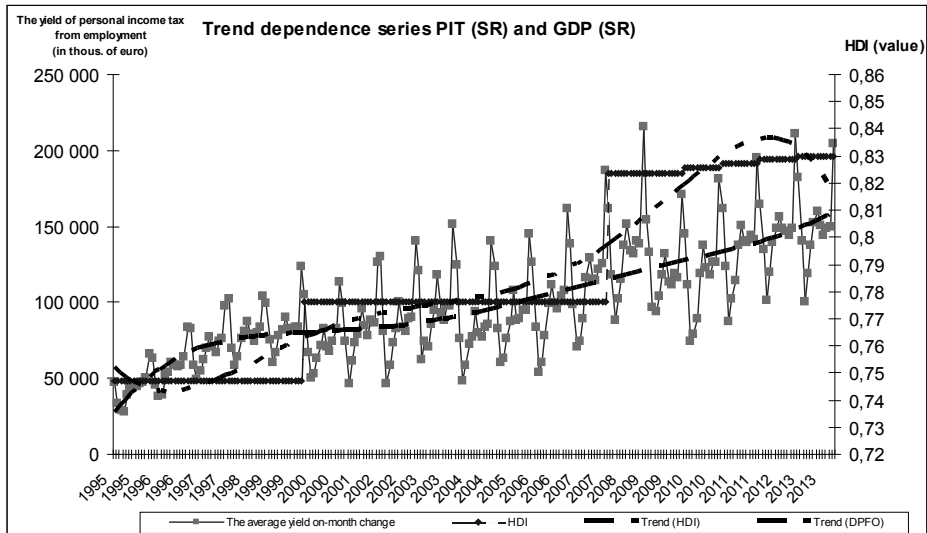
Source: Own processing

The need for a global indicator was first necessary to define its significance depending on the basic macroeconomic indicators - GDP figures. For comparisons were set V4 countries. Despite the representation depending HDI for the V4 countries during the reporting period, the results revealed no significant dependence on observed historical data. The common trends or mutual covariance, the communal movement of the indicators were not confirmed by measuring.

For the Slovak republic was therefore studied historical data series adapted to dynamic aspects of public finance - personal income tax reve-

nue from employment during the reporting period. Extraction of data, we investigated the dependence of HDI. The results thus obtained correspond to the tightness of the statistical correlation file can be found in Diagram 3.

DIAGRAM 3: TREND DEPENDENCE SERIES PIT (SR) AND GDP (SR)



Source: Own processing

Based on the processing of the regression analyses, Human Development Index can be defined as global identifier for risks of global risk including the field of public finance. It is necessary; however, to define the exact parameters of the examined model, because only using interaction with a given set of other variables, we can evaluate the development - as in examined variables - average growth rate of income tax from individuals of the territory of Slovak republic. The model is simply linearized with a coefficient of determination values in excess of 0.62 and 0.917, as due to Cohen's interpretation of the values of reliability, can be the model considered as sufficiently large applicable. Therefore, in spite of short history of the index, its versatility and relative simplicity, is the index appropriate tool for comparing and valuating of global risks.

CONCLUSIONS

Undisputed advantages of economically developed countries with developed infrastructure and technological development cannot nevertheless

eliminate risks and ensure effective and economically functioning market economy. The combination of partial risk factors can integrate risk factors to peak season, when traditional risk tools analysis do not fulfil their role and the comparative costs of eliminating them far exceeds their actual benefits. In the case of states of nature, when all parameters are being equal, it is still preferable to use unconventional tools not only to identify risks, but also to keep the traditional assumptions indicators. Their advantage is the psychological effect of improving the quality of life in parallel with the psychological barrier of the microeconomic threat. Hazard assessment shall reflect the particular circumstances and the essential characteristics of the potential risks in the assessment of short- and long-term effects and manifestations. Risk identification to the event or phenomenon is a detailed assessment of the risk of toxicity and mobility - classification into various groups, their effects and value terms.

The dimension or severity of the consequences of using common denominators can be measured by the precisely financial definition of price function. The severity of the risk is therefore determined by the general scope of its impact on the likelihood of the transformation of the value of the universal indicator. Its demonstrations are settled on the value of a dimensionless unit, as in the utility function. Correct identification of the selection units as appropriate benchmarks to measure the impact affects the scope of the objective function. This function must represent diverse risks in the global environment through the expression of the macro and micro environment.

REFERENCES

1. Bussey, L.E., *The Economic Analysis of Industrial Projects*. Prentice Hall, Englewood Cliffs. 1978.
2. Jančovičová Bognárová, K., *Vybrané modelové prístupy na skúmanie vzťahu ukazovateľov finančnej výkonnosti a výnosu akcie podniku*. Nová ekonomika: vedecký časopis Národohospodárskej fakulty Ekonomickej univerzity v Bratislave. 2014.
3. Fama, E.F., *Foundations of Finance*. New York: Basic Books. 1976.
4. Gertler L., *Information content of sovereign risk measures*. *Auspicia*, vol. 11, No. 1, pp 30-36, 2014.
5. Gratt, L.B., *Risk analysis or Risk Assessment: A proposal for consistent definitions*. Springer US, San Diego, CA. 1987.

6. Greene, M.R., *The effect of insurance settlements in a disaster*. American Risk and Insurance Association, Journal, v. 31 no. 3, pp. 381-391. 1964.
7. Chapman, C.B. & Ward, S.C., *Project Risk Management: Processes, Techniques and Insights*. John Wiley & Sons. 1997.
8. Jílek, J., *kciové trhy a investování*. Grada Publishing, spol. s r.o., Praha. 2009.
9. Knight, F. H., *Risk, uncertainty and profit*. Chicago: Univ. of Chicago Pr., 1921.
10. Kušnířová J., *The global crisis and its impacts on business in EU countries – European journal of transformation studies*. - Tbilisi : Europe Our House, 2013.
11. Merna, A. & Smith, N.J., *Projects Procured by Privately Financed Concession Contracts*, Vols. 1 and 2. Asia Law and Practise. Hongkong. 1996.
12. Polednáková A., Bikár M., Kmetko M., *Medzinárodný finančný manažment*. Vydavateľstvo Iura Edition. Bratislava. 2006.
13. Rowe, W.D., *An Anatomy of Risk*. John Wiley & Sons. Madison. 1977.
14. Smith, N., *Engineering Project Management*. Oxford : Blackwell Science. Wiley. 1995.
15. Sivák R. & Willett K. & Čaplánová A., *Pricing mechanisms for cap and trade policies: computer-assisted smart markets for air quality*. Journal of environmental planning and management, London, 2014.

Author:

František Hocman, Ing., PhD.

University of Economics in Bratislava

(Bratislava, Slovak republic)

Department of Finance

Faculty of National Economic

email: hocman@gogino.sk