LITERATURE REVIEW REGARDING THE CONCEPT OF RESILIENCE AND ITS ASSESSMENT IN THE CONTEXT OF THE ECONOMIC DIMENSION

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Abstract: *The concept of resilience is rather complicated and deep in content as well as quite complex for an assessment and measurement. This paper aims to make appropriate an literature review and to highlight the definition of "resilience", as well as to analyze components in the context of the economic dimension, which, on the one hand, allowed seeing the diversity of the processes for economic resilience, and on the other hand contributed to the isolation and understanding of the main basics in the process of its assessment. Content analysis of core Resilience Indices made by international organizations and research institutes as well as fundamental research papers and theories on the issue of resilience has been carried out to identify generals in mainstream of comprehension the definition and approaches to its assessment. According to the results, the analyzed papers and reports raise a systemized collection of definitions and components that suggest the detailed view, for better understanding of approaches to economic resilience assessment.*

Keywords: resilience; definition of resilience; economic resilience; systematic literature review
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Introduction

The concept of resilience is rather complicated and deep in content as well as quite complex for an assessment and measurement. At the moment, there is no generally accepted or generalized definition of resilience and consequently it leads to a certain misunderstanding and different variations of its indexing and ranking. In a relatively short period of time scientific progress has made available access to the global level of understanding the whole economic sphere. As the result, researchers consider the question of economic resilience in the global perspective. However, each school allocated its economic approach and framework for the study of the resilience, which corresponded to historical conditions of evolutionary development.

While we can argue that resilience is one of the integral components of sustainable development, we state that, in comparison, the issue of resilience is much less investigated and popular in the scientific literature and it is just in the early phases to gain momentum of its deep researching. Analyses of the different indices of resilience suggest to look through and investigate the core problems and issues posed by researchers, as well as to find out what is the future and prospects for further development of the concept of resilience in the light of its connection to sustainable development.

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This paper aims to make an appropriate literature review and to highlight the definition of "economic resilience", as well as to analyze components in the context of economic dimension, which, on the one hand, allowed seeing the diversity of the processes for resilience, and on the other hand contributed to the isolation and understanding of the main basics in the process of its assessment.

1. Methodology

This study is based on literature review, investigating articles and research papers on the issues of resilience, economic components of resilience concept, indexing of resilience utilizing international database of scientific resources. Content analysis was applied to consider Resilience Indices developed by individual researchers, international foundations and organizations.

2. The concept of economic resilience

Throughout the evolution of the economic theory, the scientific community has not been able to give an exhaustive answer to the question: what measures can lead to well-being of a society? Following each crisis, new theories were developed, hoping to find a solid foundation for sustainable growth, as well as identifying new tools of regulation of the economic field, and so on until the next crisis.

Resilience (resiliency, resile) has a long history of multiple, interconnected meanings in art, literature, law, science and engineering. Some of the uses invoked a positive outcome or state of being, while others invoked a negative one. In synthesis, before the 20th century, the core meaning was "to bounce back". Mechanics, aided by politics, had already started to change that: in both the literal and the figurative sense, under the aegis of the resilience concept, ductility had been added to elasticity (Alexander, 2013, p. 2710).

Crawford Stanley Holling was the first to transform the concept of resilience in an independent theory. In his conceptual work, Holling (1973, p. 14) determined concept of resilience as "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables". Originally his concept of resilience was applicable to ecological issues.

Most of the scientific literature refers to resilience as the ability of any system to recover from an external shock or to absorb against downturns (Briguglio *et al*., 2009; Rose and Krausmann, 2013; Brock *et al.*, 2002; Gunderson and Holling, 2002). Thereby, resilience includes the ability to deal

with external factors and reduce vulnerability, and one of its main tasks is to minimize losses and as a result to ensure the economic recovery in the shortest terms.

According to Rose (2004), we emphasize inherent and adaptive resilience. In general, the inherent resilience is determined by the existing capabilities of the system to be resistant to external influences, including the need to have a framework that allows it to be flexible with respect to price signals. And adaptive resilience is defined as the ability of the system to use additional measures and efforts due to the crisis to address issues for recovery from the crisis, while applying ingenuity skills.

Thus, the resilience characterizes the state of the system with respect to external influences. A more stable condition is that at equal external influences and internal shifts it will be subject to smaller changes and deviations from the previous state. The condition of resilience to external shocks is an intrinsic property of the system. Resilience is the outward manifestation of the internal structure of the system. In order to increase its resilience to a variety of factors, it is necessary, first of all, to improve the system itself. This motivation is a great incentive for policymakers and as the result decision-making process for further improvements (Mileti, 1999).

Economic resilience is a concept that is often used, but it is not always determined in detail. Pendall *et al.* (2009) determined two main terms that conceptually define the concept of "economic resilience." Equilibrium analysis is based on the concept of the possibility of the economic system to return to a previous state including respective indicators of economic performance. The second determines the resilience as the complex concept of adaptation in the conditions which meant adapting and changing the system, taking into account external shocks and factors.

Economic resilience means not only preserving the positive level of its economic performance, but also includes a development which manifests itself in the economic growth, that is, the trend of positive changes in aggregate indicators of economic and financial development of the system over time. In order to characterize economic growth, it is preferably to use both general and particular indicators and definitions.

Hill *et al*. (2008) argues that regions that are facing negative economic shocks may experience three different kinds of responses and according to their ability to be resilient:

- “resilient” regions - regions that have returned to or exceeded their previous growth path within a relatively short period of time;
- “shock-resistant” regions - regions that have been thrown off their growth path at all;
- “non-resilient” regions - regions that have been unable to rebound and return to or exceed their previous path.

Rose and Krausmann (2013) developed the typology of economic resilience based on a method of reactions and interactions during external influences. They consider static and dynamic economic resilience, where static one is determined as the system's ability to maintain the function during the shock. It is one of the core challenges, where the usual shortage becomes more severe than usual, and it is crucial to use efficiently the remaining resources at any given time in the course of recovery. On the other hand dynamic economic resilience refers to the effective use of resources for repair and recovery after economic downturn and focuses on capacity building.

As a conclusion we note that the term "economic resilience" is capacious concept carrying strong a semantic load. Thus, economic resilience can be defined as a state of the system in which its characterizing parameters (financial, operational, organizational or any others) tend to make the system "economically resilient" and are at the same time capable of harmonic development and improvement at any changes of the external environment.

3. Indexing resilience

Earlier studying of economic resilience centered on characterizing the idea of phenomenon and applying of case studies. In recent years, the trend has changed towards the identification of indicators and the establishment of a full and holistic index.

Angeon and Bates (2015) argue that, in general, indexes concentrate on economic growth descriptors to characterize a country's performance and economic resilience level respectively. These indices refer to the following two issues:

1. Despite the fact that the majority of these indicators cover the economic measurement of resilience, they could be deciphered and/or developed from a sustainable development perspective. Contrariwise, since the indicators of economic resilience do not completely cover all aspects of assessment and direction of sustainable development, an explicit interpretation of resilience in terms of sustainability should be developed respectively;
2. A large number of variables and methods used in the indexing of economic resilience lead us to the need to understand and determine the minimum number of indicators that could fully describe the economic resilience of any system. Given this problem, one of the main tasks of researchers is to create an effective system of evaluation and indexing of the studied phenomenon.

With regard to quantitative assessment of economic resilience, the immateriality of the category determines the difficulty of measuring it. Since economic resilience is not expressed outwardly, we cannot define it in quantitative form. However, the level or economic resilience can be measured by quantitative parameters of the components that are predetermined by patterns of economic resilience of the system in the form of changes in the environment and the state of intra-subjective environment, the presence of economic independence (self-organization), the equilibrium state of all subsystems, market demand service and, economic interests. Thus, economic resilience has an impact on the process of the system changes, and as the result, it is the main condition for its existence.

Consequently, the level of economic resilience defined as a degree of stability of the equilibrium between internal subsystems and a system with the environment depends on the ratio of balanced and unbalanced elements. This circumstance also makes it possible to quantify the economic resilience. In this case, the degree of deviation of the actual value of the equilibrium level of components with each other and the system as a whole with the environment of the highest possible level is a quantitative value of the achieved level of economic resilience. However, deviation leading to an imbalance in the system and change the resilience, manifested not only in the resource potential, as in the respective areas of socio-economic systems.

4. Results

The evaluation of activity areas from the standpoint of determining the state of the economic resilience of the socio-economic system based on the system of indicators is necessary for characterizing the conditions of their operation and reducing the threat to resilience; thus it allows us to set the deviation leading to an imbalance in the elements of the system and its resilience as a result of changes in certain factors in response to the quantitative changes of the others. In order to ensure a steady state of the system it is necessary to maintain the specified values of activity spheres (at the level of the minimum allowable gaps between actual and projected values) for an extended period when it is the subject of the influence of various external factors. In that case, we can observe the so-called dynamic equilibrium.

Table 1 – Resilience Indices focusing on economic dimension

Year	Index	Author(s)	Indicators
2009	Economic Resilience Index	Briguglio, L., Cordina, G., Farrugia, N. and Vella, S.	Macroeconomic stability, Microeconomic market efficiency, Social development, Good governance

2009	Index of Economic Resilience	EDAW and AECOM	Sectoral Mix; The Workforce; Enterprise; Labour Market; Assets and Infrastructure; Scale and Proximity.
2012	Community Resilience Index	Ainuddin, S. and Routray, J.	Economic resilience, Social resilience and Institutional resilience
2010	Disaster Resilience Index	Cutter, Burton and Emrich	Social Resilience, Economic Resilience, Institutional Resilience, Infrastructure Resilience, Community Capital,
2014	City Resilience Index	Rockefeller Foundation	Four categories: the health and wellbeing of individuals (people); infrastructure & environment (place); economy and society (organization); and, finally, leadership and strategy (knowledge).
2015	Resilience Index	FM Global	Economic, Risk Quality, Supply Chain
2011	Community Resilience Index	Norris, F.H.	Diversity of Economic Resources, Equity of Resource, Distribution

Source: Author's representation

The theoretical analysis with application of the expert method enabled scientists to justify the use of ranking method based on assessing the significance of each factor to rank the sustainability of socio-economic systems in relation to the strategic risk factors of the external shocks (Ainuddin and Routray, 2012; Rockefeller Foundation, 2014; Norris, 2011). Advantages of presented indices to the system of economic resilience assessment caused by the fact that they allow to develop the information-analytical methodology for monitoring, taking into account the most important aspects and indicators of the social and economic systems, as well as to establish not only the results of existing activities, but also to track trends in their appearance. In addition, such approaches to the assessment are characterized by flexibility and the possibilities of taking into account the conditions and characteristics of the operation and development of specific systems.

It should considered that the mechanism for monitoring the economic resilience of the socio-economic system is designed as a tool for the indicators that are usually at the level of the socio-economic system and determining how to achieve the level of economic resilience and the desired state in the long term. The intentions of increasing the level of economic resilience are the result of findings reached by comparing the level of the planned strategic development.

Conclusions

To summarize, we note that the term "economic resilience" is capacious concept carrying strong semantic load. Thus, the economic resilience can be defined as a state of the system in which its

characterizing parameters (financial, operational, organizational or any others) tend to make system "economically resilient" and at the same time capable of harmonic development and improvement, at any changes of the external environment

We can conclude that at present there is no single view of scientists on a methodology for evaluating economic resilience. Many scientists offer similar methods for determining economic resilience. As the result, we argue the increasing trend of holistic management, focuses primarily on the quality of relationships between indicators of economic resilience.

The basic principles on which should be based assessment methodology of economic stability is the principle of reliability, adequacy, comprehensiveness and timeliness.

The advantages of the considered indexes assess the level of economic sustainability are:

- complexity;
- economic resilience is determined by the influence of factors of the macro- and micro-environment;
- flexibility;
- exclusion of subjectivity since resilience indexes use reliable information;
- using the final result for the development of specific ways to maintain and improve resilience.

The ideas presented in this research paper may help to advance research concepts dealing with studied issues.

References

Ainuddin, S. and Routray, J. (2012), "Community resilience framework for an earthquake prone area in Baluchistan", *International Journal of Disaster Risk Reduction*, Vol. 2, pp.25-36.

Angeon, V. and Bates, S. (2015) "Reviewing Composite Vulnerability and Resilience Indexes: A Sustainable Approach and Application", *World Development*, Vol. 72, pp.140-162.

Alexander, D. (2013), "Resilience and disaster risk reduction: an etymological journey", *Natural Hazards and Earth System Science*, Vol. 13, issue 11, pp. 2707-2716.

Briguglio, L., Cordina, G., Farrugia, N. and Vella, S. (2009), "Economic Vulnerability and Resilience: Concepts and Measurements", *Oxford Development Studies*, Vol. 37, Issue 3, pp. 229-247.

Brock, W., Mäler, K. and Perrings, C. (2002), *Resilience and sustainability,* Beijer International Institute of Ecological Economics, Stockholm.

Briguglio, L., Cordina, G., Farrugia, N. and Vella, S. (2009), "Economic Vulnerability and Resilience: Concepts and Measurements", *Oxford Development Studies*, Vol. 37, issue 3, pp. 229-247.

Cutter, S., Burton, C. and Emrich, C. (2010), "Disaster Resilience Indicators for Benchmarking Baseline Conditions", *Journal of Homeland Security and Emergency Management,* Vol. 7, Issue 1.

EDAW and AECOM (2009), "Index of Economic Resilience Sheffield City Region Report", available at: http://sheffieldcityregion.org.uk/wp-content/themes/lepress/Downloads/Index%20of%20Economic%20Resilience%20Report.pdf.

FM Global (2015), "Resilience Index", available at: http://www.fmglobal.com/assets/pdf/Resilience_Methodology.pdf

Gunderson, L. and Holling, C. (2002), *Panarchy,* Island Press, Washington, DC.

Hill, E., Wial, H. and California, B. (2008), "Exploring regional economic resilience", Working paper. Berkeley, CA: University of California, Institute of Urban and Regional Development.

Holling, C. (1973), "Resilience and Stability of Ecological Systems", *Annu. Rev. Ecol. Syst.*, Vol. 4, Issue 1, pp.1-23.

Mileti, D. (1999), *Disasters by design*, Joseph Henry Press, Washington, D.C.

Norris, F.H. (2011), "A community resilience index", Dartmouth University.

Pendall, R., Foster, K. and Cowell, M. (2009), "Resilience and regions: building understanding of the metaphor", *Cambridge Journal of Regions, Economy and Society*, Vol. 3, Issue 1, pp.71-84.

Rockefeller Foundation, (2014), "City Resilience Framework", available at: https://www.rockefellerfoundation.org/report/city-resilience-framework/

Rose, A. (2004), "Defining and measuring economic resilience to disasters", *Disaster Prevention and Management*, Vol. 13, issue 4, pp.307-314.

Rose, A. and Krausmann, E. (2013), "An economic framework for the development of a resilience index for business recovery", *International Journal of Disaster Risk Reduction*, Vol. 5, pp.73-83.