

MIHAELA NONA CHILIAN<sup>1</sup>  
MARIOARA IORDAN<sup>2</sup>  
GABRIELA CIURARIU<sup>3</sup>

## ECONOMIC VULNERABILITY<sup>4</sup> – CONCEPT AND INDICATORS<sup>5</sup>

**Abstract.** *The paper addresses the economic vulnerability, in general, and of the households of population in Romania; in particular, from the point of view of the main theoretical approaches and the connections with other economic concepts relevant for the assessment and characterization of standard of living, namely those regarding poverty, well-being, resilience. The analytical approach is based on a relatively expanded system of indicators gathered within a methodology taken from the international literature, adapted by the authors to the limitations posed by the availability of relevant statistical information and data.*

**Key words:** *economic vulnerability, living standards, well-being indicators, exogenous shocks, resilience.*

**JEL:** *D11, D12, E21, I31*

### Introduction

The identification of vulnerabilities and the exposure of countries, regions, communities, households and individuals to exogenous economic shocks has lately become an important issue. Vulnerability is not a simple concept and there is no consensus as to its precise meaning. Generally, this refers to a potential loss or deterioration due to external/exogenous shocks. In other words, the economic vulnerability refers to the risks caused by external/exogenous shocks to the production, distribution and consumption system.

### 1. Defining the relationship with other economic concepts (welfare, poverty)

In the opinion of Adger *et al.* (2004), the vulnerability of a system, population or individual to a threat refers to their ability to be affected/impacted by it. According

---

<sup>1</sup> CS II, Institute for Economic Forecasting, “Costin C. Kirişescu” National Institute of Economic Research, Romanian Academy, Bucarest, cnona@ipe.ro.

<sup>2</sup> CS I, Institute for Economic Forecasting, “Costin C.Kirişescu” National Institute of Economic Research, Romanian Academy, Bucarest, miordan@ipe.ro.

<sup>3</sup> Lecturer, “Gheorghe Asachi” Technical University of Iassy, g.ciurariu@yahoo.com.

<sup>4</sup> Retrieved from UK Essays, <http://www.ukessays.co.uk/essays/economics/economic-vulnerability.php#ixzz4IiV9e1YG>.

<sup>5</sup> The paper represents the partial valorisation of the research study “Evolutions and perspectives of welfare, poverty and sustainability of the consumption patterns of the population in Romania, 10 years after joining the European Union” coordinator Marioara Jordan, manuscript, IPE, INCE, Romanian Academy.

to Briguglio *et al.* (2008), the economic vulnerability is attributed to the inherent conditions that affect the exposure of a country (or region or household) to exogenous shocks.

Guillaumon (2007) states that the economic vulnerability of a country can be defined by the risk of seeing its development hindered by the exogenous shocks to which it is exposed. It states that there are two main types of exogenous shocks or two main sources of vulnerability:

1) environmental or “natural” (natural disasters): earthquakes or volcanic eruptions, the most common climate shocks, such as typhoons and hurricanes, drought, floods; 2) external shocks (related to commerce and trade relationships), decreases in external demand, instability of world commodity prices and correlated instability of trade terms), international interest rate fluctuations.

Vulnerability, as defined by Hoddinott and Quisumbing (2003) represents the probability that, at some point in the future, an individual will benefit from a level of well-being under a certain standard of reference: for example, the likelihood of being poor, aging or poor in the old age. From an economic point of view, well-being is generally expressed in terms of level of income or consumption, as well as regards the level of reference or benchmark, and as poverty level.

The review of the specialized literature highlights the side-by-side use of the vulnerability concept with the notion of poverty, but not synonymous with the concept of poverty.

Lipton and Maxwell (1992) explain, by contrast, that vulnerability is a dynamic process: it captures the changes that occur at the level of well-being of the individual/people by moving within and outside the poverty line. Therefore, for vulnerability assessment, time series data are needed in order to capture the long-term process of change in the vulnerability indicators. Moser (1998) states that although the poor people are usually the most vulnerable, not all the vulnerable people are poor, a distinction that can facilitate the differentiation among the low-income populations.

Chaudhuri *et al.* (2002) state that vulnerability is an *ex ante* concept (future-oriented), rather than an *ex post* concept. The state of poverty can be observed in a certain period of time, given the measure of well-being and the poverty line. In contrast, the vulnerability of households is not directly observed, but rather can only be predicted (the household will become more vulnerable to shocks only on the assumption that no other factors will change).

Hoddinott and Quisumbing (2003) mentioned three main approaches: (1) vulnerability as expected poverty; (2) vulnerability as expected low utility; (3) vulnerability as an uninsured risk exposure. The three approaches share the fact that they refer to an assessment/estimation of well-being, namely a measure of well-being that can be a type of consumption, or, in another alternative, well-being indicators might be used.

At the same time, vulnerability has several dimensions, which should be taken into account in the process of identifying the impact factors/vulnerability

indicators. According to several authors, such as Blaikie and Brookfield (1987), Bayliss-Smith (1991) and Moser (1998), two dimensions of vulnerability are used: (1) sensitivity, that is, the magnitude of response to a shock of the individuals, households and communities; (2) resistance/resilience, the ease and speed of individuals, households and communities to recover from a shock.

According to Moser (1998), the vulnerability analysis involves identifying not only the threat but also the “resilience”, or responsiveness in exploiting opportunities, and resistance to or recovery from the negative effects of a changing environment. The author addresses the vulnerability as insecurity and sensitivity in well-being (measured by the total income or the value of the total assets held) of individuals, households and communities facing an environment undergoing a process of negative change (ecological, economic, social and political).

Briguglio *et al.* (2008) associate economic resilience with actions undertaken by policy makers and private economic agents meant to provide support to a country to withstand/recover from the negative impacts of shocks (for example, production declines, poverty growth).

Guillaumon (2007) agrees with the two above-mentioned dimensions, and also supports the nature of shocks, as well as another dimension of the approached concept – economic vulnerability. Specifically, he argues that vulnerability can be understood as the result of three components: (a) the size and frequency of exogenous shocks, either observed (ex-post vulnerability) or anticipated (ex-ante vulnerability); (b) the exposure to shocks; (c) the ability to react to shocks, or “resilience”.

Hoddinott and Quisumbing (2003) highlight the vulnerability dependence on four main factors: (1) the nature of the shock (for instance, large scale disasters, such as drought, earthquakes, floods or landslides; world market instability; political instability); (2) the availability of additional sources of income; (3) the functioning of the labor, credit and insurance markets; (4), the degree of public assistance. Because the last three factors are determined by the available income, they are consequently dependent on the adaptability/resilience.

In conclusion, we may say that the level of vulnerability of a household/region depends on or is a function of three factors: the degree of sensitivity, the degree of resilience of the household/region and the nature of the shocks. Theoretically, it can be hypothesized that the function has a positive relationship with the first factor (more sensitive, more vulnerable), a negative relation with the second factor (more resilient or with a greater capacity to recover, less vulnerable) and a positive relationship with the third factor (larger or more severe shocks, higher vulnerability).

## 2. Vulnerability indicators

Evaluation of vulnerability is carried out with the help of the vulnerability indicators, selected as according to the following criteria: (i) adequacy (according to a concept framework or definitions); (ii) availability of data; (iii) shock sensitivity.

The literature pays closer attention to the individuals' or households' ability to recover from the aftermath of the shock/crisis, to the necessary actions that people have the power to undertake to deal with them. Knowing the resilience of individuals/households is very important for the policy makers, since a good knowledge determines the correct choice of the shapes / types of interventions needed to effectively help the poor during the economic downturns through poverty alleviation policies.

We present in the following a review of the representative indicators for highlighting the ability of individuals/ households/regions to deal with crises.

According to Streten *et al.* (1981), the capabilities of individuals/households to recover from a shock are highly influenced by factors ranging from the perspectives to earn their living, to the social and psychological effects of the deprivation and exclusion. These include the basic needs of the people, employment of workforce for reasonable wages and the facilities related to health and education.

Swift (1989) analyzes vulnerability and safety in relation to assets classified in his model into three categories, namely: (1) investments (human investments in education and health, as well as physical investments in housing, equipment and land); (2) supplies (for example, foodstuffs, money, and value assets, such as jewelry); (3) support from others for assistance (for example, on the basis of friendship, kinship, community, networks of patronage, government and the international community).

According to Moser (1998), the ability of an individual to recover from the negative effects of an economic shock depends largely on the owned means – which are assets and rights (such as labor, land) that he / she can mobilize and manage in order to face the hardships caused by the shocks. As a result, vulnerability is closely linked to the property rights over the assets: the more assets a person owns, the less is he / she vulnerable, and the higher the erosion/reduction of assets, the higher is the insecurity of the person.

In the case where the economic vulnerability is defined, in a general sense, as a loss of welfare associated with poverty or the shock, starting from the above-presented issues the identification of vulnerability indicators should start from the factors (direct and subsidiary) of welfare or incomes, the employment of workforce being a significant source of / welfare factor as well as a vulnerability indicator.

Depending on the level of aggregation, the economic vulnerability can be assessed at the macro level: country, region or community, as well as at the micro level: individual / household. Some macro-level indicators are considered as sensitivity indicators<sup>6</sup> and others as indicators of resilience<sup>7</sup>, or both cases.

We further present some of the most important assessment indicators of economic vulnerability at the macro level.

---

<sup>6</sup> Sensitivity indicators refer to the inherent and permanent characteristics (which cannot be the object of policies and the governance), which make the regions / countries predisposed to shock waves.

<sup>7</sup> Resilience indicators refer to the ability to adapt to crises.

1) Size (indicator of resilience/sensitivity). The small size of a region limits the ability to benefit from economies of scale and constrains the production possibilities. There is no generally accepted definition of which variable should be used to measure the size of countries or regions and which should be delimitation point between a small region and a large region.

Frequently, population (number of settlers/residents) is used as an indicator of the dimension/size of a region (province, county) or a country.

Guillaumont (2007) considers that from among the many ways through which the size of a region can be assessed, the most significant is the number of its residents.

Production – production capacity – has a direct connection with population in order to describe the economies of scale. The population is considered as market of production from the point of view of demand and as a factor of production (employment) from the point of view of supply.

A large population allows for producing, theoretically at least, a larger output than a small population, *caeteris paribus*. In this context, the indicators used to measure economic size are GDP and population.

2) Density and population structure (indicator of resilience/sensitivity). The total population positively influences the economy, namely the economies of scale and the production possibilities. Overpopulation can have negative effects on the production of wealth. The hypothesis is that, beyond a certain threshold, population density and production capacity or future per capita income may be negatively correlated: too much people in a certain area, less space for production, *caeteris paribus* (so that beyond such a threshold population density and vulnerability tend to be positively correlated).

The structure of population by gender and ages is also important in determining the vulnerability of regions. The regions where the marginalization of women is an issue are more vulnerable to shocks as compared to those where there is no gender discrimination. Also, regions where the share of the non-productive population is high are more vulnerable to shocks than those where the productive age category as a percentage of the total population is high.

3) Geographical location (sensitivity indicator). The degree of economic openness of a region is affected, among other factors, by the geographical location of the region. According to several studies, being far away from the world markets (for production as well as for inputs) is a structural handicap not only because it is a factor of vulnerability: even if transportation costs have decreased, distance remains a major obstacle to trade.

Thus, as a hypothesis, the farther a region is, the greater its sensitivity to exogenous shocks, *caeteris paribus*.

4) Economic openness (sensitivity indicator). According to Briguglio *et al.* (2008), the economic openness is, to a significant extent, an inherent characteristic of any economy, mainly conditioned by two factors: (1) the size of the country's internal market, which affects the ratio of exports to GDP (for example, a small

domestic market leads to higher exports, *caeteris paribus*, etc.) and 2) the availability of a country's resources and its capability to efficiently produce the range of goods and services needed to meet the demand of the internal market, which affects the ratio of imports to GDP (that is, the resource-poor countries and with lower capacity to produce effectively have larger imports, *caeteris paribus*).

A high degree of economic openness of a region may also be reflected by the ratio of foreign investment (capital inflows, plus capital outflows) to GDP. Without any doubt, a region with a high degree of economic openness is particularly sensitive to the economic conditions outside it. As mentioned in Briguglio *et al.* (2008), economic vulnerability is defined as the exposure of an economy to the exogenous shocks resulting from the economic openness.

Thus, the hypothesis regarding this indicator is the fact that regions with open economies face a greater vulnerability to shocks than the regions with protected economy, *caeteris paribus*.

5) Export dependency and its concentration (sensitivity indicator). The risk of a region being negatively affected by export instability is exacerbated when a large export dependence is found for a narrow range of exports. Or, according to Briguglio *et al.* (2008), the dependence on a narrow range of exports has resulted in related risks associated with the lack of diversification, and, in the end, exacerbated vulnerability associated with the open economy. In other words, the economically open countries, those with low export market diversification (higher concentration of export) are more susceptible to external shocks as compared to the opposite situation.

Thus, it can be assumed, given the ratio of exports to GDP, there is a positive relationship between the level of export concentration and the level of vulnerability, *caeteris paribus*.

6) Import dependency and its concentration (sensitivity indicator). Regions with a high degree of import dependence, especially strategic imports, such as energy, other essential natural resources and industrial goods, exacerbated by limited import substitution possibilities, are highly susceptible to instability in the world supply chains (availability) or in the world prices (cost of imports) pertaining to the respective import items.

On the one hand, we have as hypothesis the fact that the ratio of imports to GDP and the level of sensitivity to external shocks are positively correlated, *caeteris paribus*. On the other hand, another hypothesis is that, considering this ratio, the lower the diversification of the import market is (the higher the import concentration), the greater the vulnerability to external shocks is, *caeteris paribus*.

As a theoretical illustration, a significant increase in the world prices or a sharp decline in the global stockpiles for a globally marketable product may be a crisis for importers in times when this is a crucial commodity for them, for example, rice or oil (see the two oil crises: 1974 and 1980).

7) Share of processing industry / agriculture in GDP (sensitivity indicator). The contribution of the manufacturing industry or agriculture to the formation of GDP highlights the economic diversification of the economic system of regions/countries: a very large percentage share of the manufacturing industry or agriculture in GDP, reveals a higher economic concentration or lower level of economic diversification. Moreover, considering the demand level on the internal market (which, among other key factors, is determined by population size), a high level of economic concentration also means high dependence on imports (for other sectors with small GDP contributions).

Thus, the higher economic concentration in a region is, the more vulnerable to the external shocks a region is, *caeteris paribus*, but, of course, this depends on the sectors the shocks hit the most.

8) Share of sectors in total employed population (sensitivity indicator). Single dependence on an only one economic sector for income generation creates a form of economic vulnerability for counties/regions. As explained by Cutter *et al.* (2003), the boom-bust economies based on the development of the petroleum industry, of fishing, the coastal areas based on tourism are good examples – in periods of glory, prosperity, the income levels are high, but when the industries face harsh weather or are affected by a natural hazard the recovery may last longer. The agricultural sector is no exception and is probably even more vulnerable, given its dependence on climate (modification of the weather conditions, increases in the hydrometeorological dangers – floods, drought or hail). Thus, the yearly or decadal incomes are affected and, consequently, the sustainability of resource basis.

Therefore, as a hypothesis, it is possible to recognize that the regions where most of the workforce is employed in a single sector are poorly resistant to shocks as compared to the regions with a relatively equal distribution of workforce by sectors, *caeteris paribus*, which are less affected by shocks.

9) Real income per capita and income distribution (resilience indicator). Real income per capita is often used as an indicator of well-being, revealing the purchasing power of an economy. Thus, ideally, should be measured the total welfare (real value) per capita instead of the actual income (from employment) per capita. This total proportion of well-being as compared to total population is more appropriate to indicate the ability to absorb losses and increase resistance to impact shock hazard.

In such a context, the welfare hypothesis highlights the ability of the communities in rich regions to faster absorb and recover from losses than those in poor regions. However, a higher real income or wealth per capita will be meaningless when all the income/wealth obtained is not equally distributed among the population. In other words, even when the real per capita income is high, the poverty rate can also be high when the income disparity is high. Income inequality is often measured using a Gini coefficient.

Starting from the level of real income per capita, the higher the Gini coefficient (close to unit), the higher the level of vulnerability, *caeteris paribus*.

10) Percentage of population living below the poverty line (indicator of resilience). The share of the population in a region or a community that lives below the actual poverty threshold (poverty rate) indicates the level of sensitivity, as well as the resilience degree of the region/community to the external / exogenous shocks, because it is generally considered that only the individuals or households that are not poor (which own, for instance, money or assets), are more likely to stand up to a crisis than the poor ones.

Because the poverty rate and the employment rate (unemployment/underemployment) are negatively (positively) correlated, the unemployment rate / underemployment (or employment) can be used as an alternative indicator of poverty and, consequently, of vulnerability. According to Mileti (1999) and Cutter *et al.* (2003), the potential loss of workforce employment as a result of a shock fast increases the number of unemployed workers in a community or a region, contributing to a slower recovery in the aftermath. Thus, a hypothesis is that the poor regions are more vulnerable and they face more difficulties in dealing with the crisis as compared to the rich regions, *caeteris paribus*.

11) Adult literacy ratios and school enrollments (indicator of resilience). Educational progress, as measured by two indicators of the human capital index, the literacy rate of adults and the rate of enrollment in education, is generally considered to be an important factor of the ability to cope with crises in the regions/communities.

Briguglio *et al.* (2008) argue that social development is another essential component of economic resilience and they consider the educational progress as a good indicator of social development. Also, it is important the difference between the literacy rate of women and that of men, or the literacy rate of women relative to the total population who can read and write. A related hypothesis is that regions with higher education levels of population are less vulnerable to shocks than those where most of the population has only primary school education, *caeteris paribus*.

12) State of health (indicator of resilience). As in the case of educational progress, the state of health is also another important indicator of human capital, given that high educational progress cannot be achieved in an unhealthy society. In other words, education and health go together, or they complement each other. Briguglio *et al.* (2008) also consider advancement in the health standard as a driver for economic resilience. The correlated hypothesis is that the healthy communities are better able to cope with a crisis supporting minimal damage/loss as compared to the unhealthy communities, *caeteris paribus*.

13) Technological capability (indicator of resilience). It is generally recognized that technology is the most important factor, apart from human capital, for economic development or economic well-being. The technological capability of a region is determined by several factors, including people's access to advanced technologies, through either formal education, or training, workshops, or self-learning, with full access to information (internet, newspapers, television, etc.).

Thus, the hypothesis related to this is that regions with higher technological capability are more resilient to exogenous shocks than those with low technological capability, *caeteris paribus*.

At national level, the most used indicators are R&D investment/expenditure as a percentage of GDP, number of scientists and engineers in research and development per million inhabitants and enrollment in tertiary education. At the regional/provincial level, in addition to enrollment in tertiary education, the number of research and development institutes, polytechnic universities, the number of scientists and engineers, as percentage of the total population, as well as the number of graduates of technical universities as percentage of the total population can be used as alternative indicators.

14) Social and economic infrastructure (indicator of resilience). Social and economic infrastructure, for example, schools, hospitals, public utilities, roads, bridges, ports, telecommunication facilities, transport facilities, sewerage, water supply, industrial properties, electricity, irrigated areas (for agriculture-based regions), etc., is a very important determining factor for the vulnerability or resilience of a region. The hypothesis is that the areas with well-developed social and economic infrastructures are facing lower vulnerability or they have higher capacity to adapt to shocks, as compared to the regions with underdeveloped infrastructures.

15) Social capital (indicator of resilience). Social capital is a critical factor in building and maintaining the confidence needed to ensure social cohesion and change. In the economic field, social capital is important as a factor of feasibility and productivity of the economic activities. Putnam (1993), for example, defines social capital “stocks” as informal (unorganized) and formal (organized) mutual trust networks and norms integrated into the social organization of communities, with social institutions in both hierarchical and horizontal structures. Adger *et al.* (2004) approach social capital as the ability to act collectively. According to Hoddinott and Quisumbing (2003), social capital includes networks, norms and social trust, which facilitate coordination and cooperation. Thus, a community with a well-developed social capital (reflected in the strong community level of trust and collaboration) faces a low vulnerability (or high resilience) to a shock, *caeteris paribus*.

According to Moser (1998), the ability of a region or community to respond to a shock does not only depend on the level of trust and collaboration of the community, but also on the social cohesion of households. Thus, social capital (at community/macro level) and social cohesion (at household / micro level) are two invisible intangible assets that determine the crisis response capacity. The importance of social capital at the time of an economic crisis can be manifested in the forms of increasing dependence on the provision of informal loans (for example, through rural cooperatives instead of banks) or by increasing the networks of informal support between households or farmers through the association of farmers or increased activity at community level (Moser, 1998).

16) Participation of women in work/economic activities (indicator of resilience). The gender issue is more relevant in the less developed countries than

in the more developed countries or in the countries with greater female power or higher female emancipation rate. Because of the many restrictions the women are facing in such countries (culture, norms, customs, biased male religious practices), the level of marginalization of women is generally considered to be higher than in the developed world. On the other hand, women's emancipation or more opportunities for women to obtain a good education and economic/employment activities will reduce poverty. At the time of the crises, as stated in the literature, women may have more difficult times during recovery than men, often due to sector-specific employment, lower wages and family care responsibilities. Thus, regions with low levels of marginalization of women are less vulnerable to external shocks than those with low levels of women's emancipation.

17) Macroeconomic stability (indicator of resilience). Briguglio *et al.* (2008) consider macroeconomic stability to be an important variable in building a resilience index that captures the effect of shock absorption or shock counteracting policies. Macroeconomic stability refers to the existence of an internal economic balance, manifested by a sustainable budgetary, fiscal or public position, low inflation rate and unemployment rate near the natural rate, as well as by external balance. The latter is reflected in the balance of payments, the trade balance, the international current account position or through the level of external debt.

Regarding the fiscal position, the hypothesis is that larger fiscal deficit, lower sustainability of the state budget, means less resilience, and therefore greater vulnerability, *caeteris paribus*. At the regional level, the ratio of public expenditures to government revenues can be used as an indicator of regional fiscal sustainability. With regard to inflation and unemployment, the hypothesis is that higher inflation and unemployment rate mean higher welfare costs caused by a shock, and lower resilience, *caeteris paribus*. According to Briguglio *et al.*, unemployment and inflation are often associated with the ability to adapt/resiliently absorb the shocks.

According to Adger *et al.* (2004) the ability of a country to pay for emergency planning or to finance recovery programs, will be affected by the level of debt. Moreover, the economic policy in heavily indebted countries is often driven by the international financial institutions that require structural and trade liberalization programs readjustment, which reduce the ability of governments in these countries to pursue policies that reduce vulnerability associated with poverty. Ndikumana and Boyce (2003) also found evidence that debt can encourage capital outflows, further aggravating economic well-being at the national level.

At the micro level, the most used indicators on the vulnerability of a household are the following (household features):

1) Occupation and status of head of the family. In general, families with unemployed heads of household are, *caeteris paribus*, more vulnerable than those with employed persons as heads of household (they have permanent jobs). Therefore, there is a positive correlation between employment status and salary/income level. In conclusion, the better the professional status of the head of household, the more the degree of resilience increases and the vulnerability of the household decreases, *caeteris paribus*.

2) Level of education of the head of the family. Theoretically, the level of formal education is positively correlated with the employment condition and the status of the head of household or with the salary/income (because the level of education is positively correlated with productivity, *caeteris paribus*). From their study of vulnerability in Bulgaria, using a panel data set for 1994, Ligon and Schechter (2003) found that households with educated, employed heads were less vulnerable to shocks than other households. Thus, the higher the formal education level of household head, the higher the resilience and the lower the household vulnerability, *caeteris paribus*.

3) Sex and age of the head of the family. Given the constraints faced by women in less developed countries, in general, families with female heads of household may be more vulnerable or have more difficulty in coping with external shocks, as compared to those with male heads. Regarding age, because age is negatively associated with productivity, beyond a certain age, which is considered to be the optimal productive age, it can be hypothesized that there is a positive link between the age of the household head and the level of vulnerability of the household; with the assumption that other factors remain constant.

4) Size of household and the employment and educational structure. A larger household is more vulnerable to a crisis than a smaller one, when the large household has a high number of economically dependent/non-productive/unemployed or low-educated members. Cutter *et al.* (2003) explain that families with large numbers of dependents (or single-parent households) have limited finances for outsourcing care for dependents and, consequently, must carefully manage work and care responsibilities for the family members.

In a study on Southern China, Chaudhuri and Christiaensen (2002) compared a series of features of the poorest 26% (let us say group A) and the most vulnerable 26% (group B) of the households surveyed, finding that the average family size as well as the share of members with a high dependency ratio in group A are higher than in group B. The hypothesis related to this problem: the lower the size, considering the family structure or the better structure (low dependency ratio; low illiteracy rate), given the size, the higher the level of resilience and the lower the vulnerability, *caeteris paribus*.

5) Health conditions. Human capital is made up of education / skills and health. As with education, the health status of family members is also an important determinant of the family's ability to respond to a crisis. Related hypothesis: the better the health status of a family, the higher and lower, respectively, the resilience and vulnerability of the family, *caeteris paribus*.

6) Property over assets. The ability of a family to respond to an economic crisis is determined not only by income, but also by its total welfare, which is given by the income from employment plus the income that can be generated from all of its assets; for example, natural capital (land and livestock), physical capital (lodging, means of transport, agricultural tools); financial capital (for example, bank / savings account, outstanding net loans), as well as other assets of labor /

human capital. According to Hoddinott and Quisumbing (2003), all these assets (including social capital), by allocating them for a number of activities, for example, food production and marketing crops, as well as others generating income, determine the ability of households to respond to shocks. Cutter *et al.* (2003) built an index of social vulnerability to environmental risks (referred to as the social vulnerability index) for the US based on socio-economic and demographic data from 1990 at the county level. In their model, personal wealth is measured in addition to the income from employment, by the median values of the houses and the average rents. Using an analytical factor approach, their analysis shows that the wealth factor explains 12.4% of the variation. Thus, the hypothesis related to this is: the more assets a family owns, the higher the resilience of the family and the lower the vulnerability, *caeteris paribus*.

7) Location. According to Cova and Church (1997), Mitchell (1999), and Cutter *et al.* (2000), rural dwellers may be more vulnerable than urban dwellers to shocks due to lower incomes and dependence on extraction economies based on local resources (*e.g.*, agriculture, fisheries). In such a context, the features of households located in remote areas (for example, mountain, hill, rural areas) make them more vulnerable because they are less resistant to shocks (they face many constraints to recover), than households in open / fully accessible / urban locations, *caeteris paribus*.

### 3. Conclusions

The level of vulnerability of a household/region depends on or is a function of three factors: the degree of sensitivity, the degree of resilience of the household / region and the nature of the shocks. Theoretically, it can be hypothesized that the function has a positive relationship with the first factor (*i.e.* more sensitive, more vulnerable), a negative relation with the second factor (more resilient or with a greater capacity to recover, less vulnerable), and a positive relationship with the third factor (greater or more severe shocks, greater vulnerability).

Vulnerability assessment is carried out with the help of vulnerability indicators, selected by using as criteria: (i) adequacy (according to a conceptual framework or definitions); (ii) data availability; (iii) shock sensitivity.

### References

1. Adger, W.N., N. Brooks, M. Kelly, G. Bentham, M. Agnew, and S. Eriksen (2004), "New Indicators of Vulnerability and Adaptive Capacity", Final Project Report, January, Oslo: Tyndall Centre for Climate Change Research
2. Allen, K. (2003), "Vulnerability reduction and the community-based approach", in Pelling (ed.), *Natural Disasters and Development in a Globalising World*. Routledge, London.
3. Atkins, J., Mazzi, S. and Ramlogan, C. (1998), *A Study on the Vulnerability of Developing and Island States: A Composite Index*, August, the Commonwealth Secretariat, London.

4. Briguglio, L. (1995), “Small Island States and their Economic Vulnerabilities”, *World Development* Vol. 23, 1615–1632.
5. Briguglio, L. (2003), “The Vulnerability Index and Small Island Developing States: A Review of Conceptual and Methodological Issues”, paper prepared for the AIMS Regional Preparatory Meeting on the Ten Year Review of the Barbados Programme of Action, September, Praia, Cape Verde.
6. Briguglio, L. and W. Galea (2003), “Updating the Economic Vulnerability Index”, *Occasional Chapters on Islands and Small States, 2003-2004*, April, Malta: Islands and Small States Institute, University of Malta.
7. Briguglio, L., G. Cordina, N. Farrugia, and S. Vella (2008), “Economic Vulnerability and Resilience. Concept and Measurements”, *Research Paper No.2008/55*, May, Helsinki: UNU-WIDER.
8. Chaudhuri, S. and L. Christiaensen (2002), “Assessing household vulnerability to poverty: Illustrative examples and methodologies issues”, paper presented at the IFPRI-World Bank Conference on Risk and Vulnerability, 23–24 September, Washington, D.C.
9. Chaudhuri, S., J. Jalan, and A. Suryahadi (2002), “Assessing household vulnerability to poverty: a methodology and estimates for Indonesia”, *Department of Economics Discussion Paper No.0102-52*, New York: Columbia University.
10. Combes, J.-L., and P. Guillaumont (2002), “Commodity Price Volatility, Vulnerability and Development”, *Development Policy Review*, 20 (1): 25-39.
11. Cutter, Susan L., Bryan J. Boruff, and W. Lynn Shirley (2003), “Social Vulnerability to Environmental Hazards”, *Social Science Quarterly*, 84(2): 242-261.
12. Cutter, Susan L., Bryan J. Boruff, and W. Lynn Shirley (2003), “Social Vulnerability to Environmental Hazards”, *Social Science Quarterly*, 84(2): 242-261.
13. Hoddinott, John and Agnes Quisumbing (2003), “Methods for Microeconomic Risk and Vulnerability Assessments”, *Social Protection Discussion Paper Series No.0324*, December, Social Protection Unit, Human Development Network, The World Bank, Washington, D.C.
14. Von Neumann, J., & Morgenstern, O. (1944). *Game theory and economic behavior. Theory of Games and Economic Behavior*, Princeton University Press, Princeton.
15. [http://www.mmuncii.ro/j33/images/Documente/Familie/2016/StrategyVol1EN\\_web.pdf](http://www.mmuncii.ro/j33/images/Documente/Familie/2016/StrategyVol1EN_web.pdf), Government of Romania (SN): *National strategy on social inclusion and poverty reduction 2015-2020*. / I. Poor and vulnerable groups / I.1 People at risk of poverty or social exclusion (Guvernul României (SN): *Strategia națională privind incluziunea socială și reducerea sărăciei 2015–2020*. /I. Grupuri sărace și vulnerabile/ I.1 Persoane expuse riscului de sărăcie sau excluziune social), pp. 22–33.

