

The Socio-Demographic Changes in Romania: and Analysis from the Human Development Perspective

Mioara BORZA¹, Camelia SOPONARU²

Abstract

The social and demographic changes registered in recent years, at European and Romanian level, have produced some effects visible in various reference areas. By this paper, we propose to achieve an empirical analysis meant to emphasize the main socio-economic changes of the last 10 years and their influence on the human society development. Based on the inventory of statistical data referring to the socio-demographic dynamics and using a research methodology based on inductive reasoning, dynamic and dialectics analysis, we will obtain some results of research that indicate: the human development is in positive evolution, even the number of population is decreasing.

Key words: demographic, society, changes, resources, development, sustainability

1. Introduction

The socio-demographic changes are normal dynamic phenomena, insofar as we approach the concept of normality from the perspective of human society evolution and development by relating mainly to the time factor and to social norms. Nonetheless, the scientific literature in the field and the current socioeconomic reality show that in some directions of human society evolution, changes are significant and they exceed the patterns of an evolutionary rhythm specific to normality. Among the most visible such changes, we mention as follows: alarming population decrease at European level, ample migration phenomena, and a significant increase in hyperconsumerism in association with high consumption of resources resulting in a massive amount of waste, in higher pollution levels, etc. All of these changes are visible and important, but it is worth noting certain relevant regional differences. The aforementioned general-major changes, along with different and particularized ones are part of a complex circular circuit, where subsystems influence each other: the dynamic of socio-demographic changes influences research management methods, while research management methods adapt to socio-demographic changes. Hence, economic growth – illustrated most of the times by the GDP values, though GDP alone is not representative – determines an increased consumption of goods, a phenomenon correlated with changes in the attitude and

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mentality of the population regarding consumption and the direction of human development. This conjecture determines the emergence of new forms of approaching the issue of socio-demographic changes and multiple economic and social implications, such as high costs for waste management, technological adaptation, health issues of the population, adaptive socio-educational phenomena, innovations in managerial systems, etc.

Approached from the perspective of sustainability, the present paper aims at pointing out the main socio-demographic changes in the past 10 years in Romania and their possible consequences upon human development. We take into account that sustainable development - including as a desideratum of Europe 2020 Strategy – involves the optimal intertwining of economic, social, and ecological aspects. [7] Hence, a certain imbalance recorded in any of the components determines imbalances in the ensemble of a sustainable development. The research - empirical and predominantly quantitative – uses official data and reports and it includes a qualitative interpretative analysis. We use analysis indicators specific to the theme, and our base of reference is the Human Development Index (HDI), to which we add socio-demographic and economic indicators specific to the context analyzed. The qualitative component aims to identify the attitudinal, behavioural, and value aspects specific to connections and consequences regarding the socio-demographic changes and environmental factors.

2. The interdisciplinary approach to socio-demographic changes

The scientific literature regarding the socio-demographic aspects in the context of economic growth is very rich, complex, and sometimes controversial. Such endeavours have passed many times from specific analyses and researches to governmental reports, strategies, and policies. The authors interested in the vast and comprehensive field of socio-demographic changes often have to face veritable challenges of reality. [3, p. 2] The dynamic and permanence of socio-demographic changes are perceived as normal phenomena in the evolution and history of humanity. For centuries, the population structure has changed continuously, both quantitatively and qualitatively, at a slower or at a very intense pace, which determined implicit modifications in multiple other fields: economy, education, health, environment, politics, etc. All of these changes have marked human society and economic development plans, at the level of all countries. Furthermore, the environment – perceived as the main provider of resources necessary for ensuring human living – is a cause of all these changes and, at the same time, it bears their consequences through various forms of manifestation: adaptive reactions, quantitative and qualitative changes, rigidity, resilience, etc.

The main causes of socio-demographic changes – thus the reasons for which the population has recorded numerical and structural changes - are related to ensuring stability and security, in order to assure at least a decent living standard. People permanently seek job opportunities, try to obtain satisfying incomes and to avoid conflicts or they migrate involuntarily, (due to political, social changes or to environment conditions). A generally acknowledged certitude is that the reasons for socio-demographic changes are not only numerous but also complex. Some authors approach

the socio-demographic changes from the perspective of both the demographic explosion and the demographic implosion. [5, p. 100] Hence, the causes and effects of these changes have as common denominator the circular character and the mutual dependence. This is why we believe it is worth mentioning that the population changes its socio-demographic structure, always because of economic, political aspects, technological progress, resource management, etc. In their turn, these changes determine certain effects upon the economy, upon politics, technological innovation stimulation, the existence of resources, etc. This is a complex circular system, with accentuated dynamics, unfolding continuously. All of these aspects represent determining grounds for the attention and reaction of the academia and of the decision factors, mostly in the past 20-30 years, when the forms and consequences of socio-demographic changes have become more diverse, comprehensive, and obvious. In fact, sometimes they exceed the sphere of perception as phenomena categorized within the range of normality. Researchers, academicians, scientists, politicians, managers, entrepreneurs, etc have focused increasingly upon socio-demographic changes from the perspective of their consequences. We note that the interest for theoretical and practical studies concerns an interdisciplinary area. Sociologists analyze the socio-demographic changes, economists approach the issue from the standpoint of efficiency and cost of changes, psychologists analyze the attitude and behavioural causes and consequences, environmentalists are concerned by the effects upon the environment, etc. None of these fields of interest can produce results without being included within a single unit.

Concerning the topic of the present research, we have chosen to debate the influences of socio-demographic changes upon human development, while the doctrine we support is strongly anchored in the concept of sustainability. The topic is interesting for researchers all over the world, who have reported that changes in the environment determine socio-demographic changes and the other way around. [1, p. 2] Moreover, considering that the population is the core of the research interest, we extract from the scientific literature an essential element: demographic modifications have a vital impact upon human development, through the implications that it determines in the ensuring of resources necessary for a satisfying living standard and in the respecting of sustainable development principles. [6]

3. The socio-demographic changes in Romania and the Human Development Index

For the present paper, we have chosen the particular case of Romania, a country where the socio-demographic changes within the last 25 years have been major and accentuated and, at the same time, they have produced considerable effects in numerous directions. We refer here to the evolution of society as a whole, to economic growth, to social climate, to national policy from the perspective of international cooperation, to the mentality of the population, to research management methods, etc. The main causes of changes specific to the last 25 years are related to the major political reorientation of 1989, marked by the passage from a centralized economy to a market economy, which had immediate and profound effects upon Romanian society. Furthermore, these changes

have also entailed certain atypical consequences that have sometimes taken by surprise even decision factors, (in charge of the socioeconomic state of the country).

The aspects that determined and marked the intensity of socio-demographic changes in Romania are related to: the effects of globalization, the investment in human capital (especially for education and health), the professional approach to early education, the consideration of population health as a strategic element in human capital management, the approach to sustainability in the context of the attitude towards the environment, and to research management methods. Specifically, we believe that education is the basic solution to the weighting of issues such as a cause or consequence of major socio-demographic changes. Whereas the national education system produces high values, high-quality graduates choose to have a job abroad [8] – definitely or temporarily – thus to value in another context what they have acquired in the national learning and education system. To this aspect, we add the gradual decrease in educational act quality, considering that the last 15-20 years have been marked by quantitative growth to the detriment of quality (concerning the number of pupils and university students). Most national reports are interested in the quantitative aspect, which allows deviations from qualitative assessments.

One of the major changes that Romania has had to face in the last 10-15 years is the significant decrease in the number of inhabitants, after a sustained increasing trend up to 1989. Actually, Romania reached a demographic peak in 1989: a record number of 23,151,564 inhabitants. This was in fact a consequence of the ambitious policy implemented by the socialist system. In the period 1992 – 2005, the population of the country decreased by around 1 million persons. This trend was enabled mainly by low fertility rates (1.3 children/woman) and by migration abroad. The socioeconomic trepidation was perceived even more acutely because – immediately after the fall of the totalitarian regime – certain political consequences emerged, overlapping the socioeconomic ones: industrial collapse, increased unemployment rates, accentuated stress and worries of the population, uncertainties concerning the future, social drift, etc. Subsequently, the opening of borders, the international political changes, and the European Union accession produced other major effects within a very short time:

- massive, temporary, or definite migration towards other countries, in order to find a job;
- accentuated manifestation of high product consumption due to the rapid adaptation to the fast consumption rhythm specific to highly developed societies;
- educational transfer, mainly towards humanities, to the detriment of technical fields.

Official statistical reports [8] show that the major changes in fertility and birth rate are components of the demographic change process that is part of *the second demographic transition*. Hence, lower fertility is accompanied by changes in the attitude and behaviour towards marriage, cohabitation, divorce, existence of children out of wedlock, etc. Overall, the transition to the market economy also produced major changes in the living standards of persons fit for work, a phenomenon associated with an

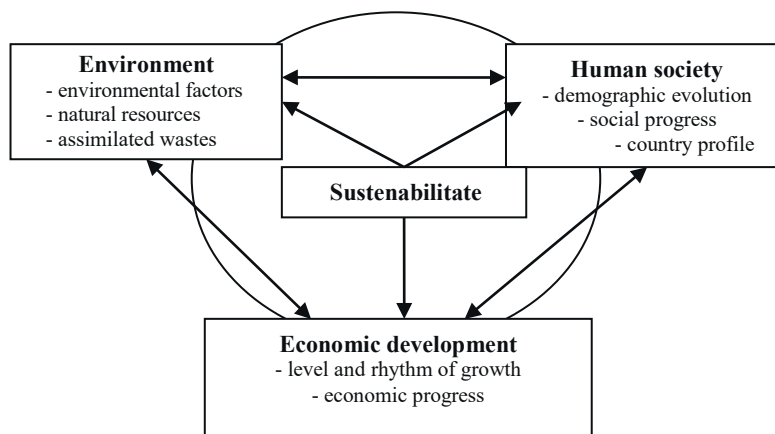
unpredictable evolution of labour market, to which public education reacted by providing services of a disputable quality sometimes. [4] Furthermore, the accentuated manifestation of the downsides of Romanian labour market has led to increased social consistency of the migration phenomenon. Currently, official records show that over 2 million Romanians work abroad, but the unofficial figures are not known (they are however estimated to around 5 million persons). Furthermore, there is no official record of the people who have left the country on a temporary basis or occasionally.

The socio-demographic transformations specific to the past 10-15 years have outlined a *socio-demographic profile* of Romania, reflected in the way the country population approached economic, social, and environmental issues.

In essence, changes have been noted in the occupational fields, in a trend towards hyper-consumerism, in a precarious eco-economic education, in a lack of interest for the environment, (due to ignorance regarding the importance of rational management of environmental factors or due to an inadequate approach to the principles of sustainability). It is also worth mentioning the focus on the management of the present, without taking into account the developmental need of the future generation. All of these aspects correlate directly with those referring to the rhythm of exploiting natural resources and to the management of environmental factors.

In this context, we also remind the role and manifestation of the complex circular system on the coordinates of which the socioeconomic and demographic evolution occur. Concretely, the environment with all embedded factors and resources represents the basic sources of economic development which, in its turn, determines the socio-demographic evolution, while the determined level of the socio-demographic evolution reflects upon the existence condition of the environment, from both a quantitative and a qualitative perspective. (Figure 1)

Figure 1. The complex circular system of the linkage environment - economy - society



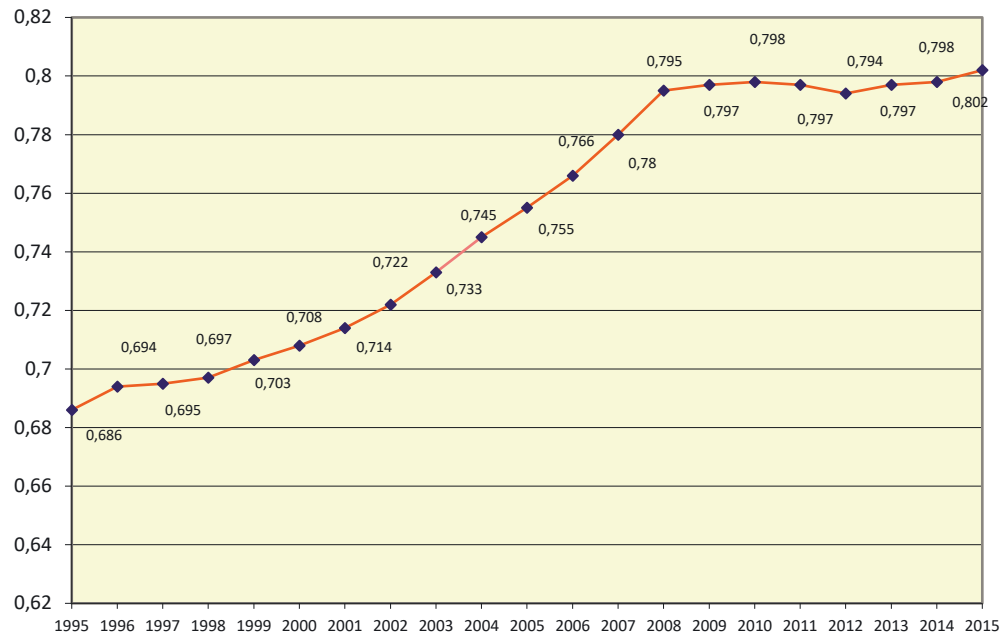
Source: Personal design and realization, according to the schematization of sustainable development concept.

The perspective approached is strengthened by the adherence to the doctrine of sustainable development, in agreement to which the circularity mechanism functions as a complex process. In other words, the interdependencies between the three basic subsystems of sustainability (economic, social, and environmental) have a direct impact on progress and human development.

The analysis of consequences determined by socio-demographic changes is a complex action, achievable through several approaching versions. For the present paper, we have chosen to use the analysis based on indicators, but considering there are so many of them, we have selected the most significant ones, in agreement with the scientific literature. Information sources are represented by statistical yearbooks, by the Eurostat database, and by specialized reports. The reference indicator is the Human Development Index (HDI). This is an essential aggregated indicator that measures progress, allowing us to assess the quality of life and the living standard, and it complies with the analysis of sustainability. [2, p.74] The United Nations Development Programme (PNUD) introduced HDI for the first time in the 1990s as an instrument for analyzing human progress and it indicates the progress of human capital of a country, along with economic implications. It comprises a set of relevant indicators for characterizing the economic and social evolution: gross domestic product per capita, life expectancy at birth, and the education index that includes enrolment rate and literacy rate.

The Human Development Index (HDI) enables the quantitative assessment of the strategic way in which a country can develop and mobilize the human capital. Furthermore, HDI reflects the achievements of a country through the human resources, on three basic dimensions: duration and quality of life from the standpoint of health, adequate education, and decent living standard. Concerning the last aspect, it is important to state that, for ensuring a decent living standard, several factors are involved, as follows: material welfare, population quality, and social system quality. HDI varies on a scale from 0 to 1; values close to 1 stand to indicate a very high level of human development.

Since 1995, Romania has also been included in reports for the hierarchy of human development. Hence, an evolution of general HDI for Romania is illustrated in Figure 2.

Figure 2. HDI evolution for Romania in 1995-2015 period

Source: United Nations Development Programme. Human Development Reports. Data: 1990-2015. *Human Development Index (HDI)*. <http://hdr.undp.org/en/data>

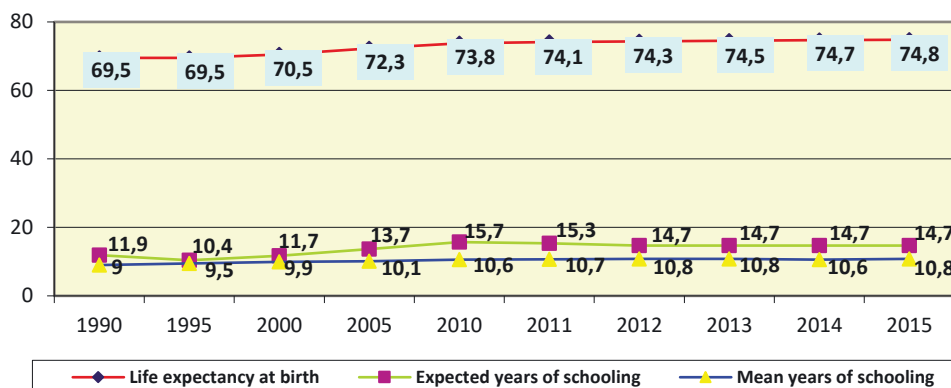
Figure 2 shows that, since 1999, HDI has increased at a fast pace until 2008, when the increasing rhythm became slower. A slight decrease was recorded in the period 2011-2013, most probably due to the effects of the economic crisis recorded in the previous years, and in 2015, HDI for Romania has exceeded the threshold of 0.8 (the interval 0.8-1 is specific to the very high level of development).

In the global hierarchy of HDI, Romania ranked the 50th in the year 2015, (the penultimate country in the category of countries with a very high level of development). The evolution is especially favourable, given that in 2006 it ranked the 64th out of 177 countries, meaning at an average development level.

In order to identify as accurately as possible the evolution of this aggregated indicator, we considered it useful to also analyze the indicators comprised within HDI, which may provide a clear image, from a demographic, social, educational, and economic progress perspective. Hence, we underpin that a favourable evolution in a unidirectional sense is not relevant in a broader context. This is also the case for the GDP (Gross domestic product) indicator; its singular analysis – that reflects only the value of economic growth – does not provide contextual information concerning the impact of economic growth on the development of society. Human progress is a conglomerate of effects from diverse but inter-relational and interdependent spheres of affiliation: background of existence, mentality, education, available resources, functional socioeconomic policies, external partnerships, etc.

Figures 3 and 4 illustrate the evolution of basic HDI indicators: socio-educational indicators (life expectancy at birth, expected years of schooling, and average of schooling years) in Figure 3 and the evolution of gross national income per capita in Figure 4.

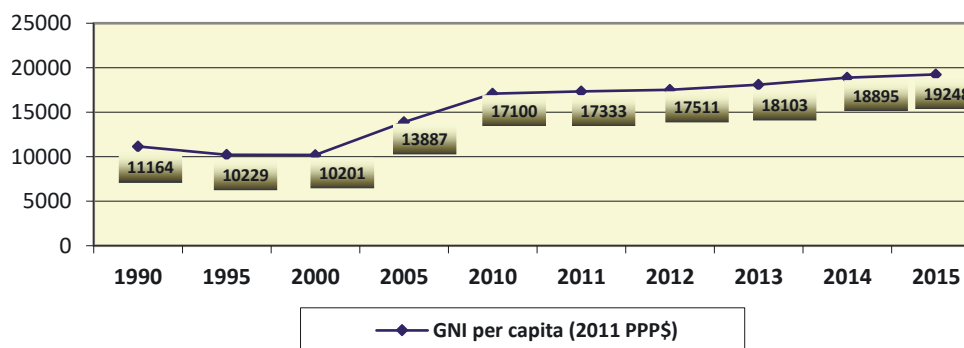
Figure 3. Dynamic of educational indicators of HDI - Romania (1990-2015)



Source: United Nations Development Programme. Human Development Reports.
Data: 1990-2015. Human Development Index (HDI). <http://hdr.undp.org/en/data>

Figure no. 3 shows that for all three indicators within the HDI favourable evolutions were indicated. Life expectancy at birth has increased continuously in the aforementioned interval (1990-2015), in the 10 years chosen for analysis, and it was eventually 5 years higher per capita. In addition, (from 9 to 10.8 years) the average of schooling years has increased permanently, while the years of schooling/person have increased significantly from 11.9 years in 1990 to 15.7 years in 2010; after dropping to 14.7 years throughout 2012, this value has maintained constant thus far. We mention that these assessments are only quantitative; hence, the increase in schooling years does not also reflect implicitly an improvement in the quality of the educational environment.

Figure 4. Dynamic of GNI per capita for Romania (1990-2015)



Source: United Nations Development Programme. Human Development Reports.
Data: 1990-2015. Human Development Index (HDI). <http://hdr.undp.org/en/data>

Figure 4 also shows that for the economic indicator Romania has had a favourable evolution. The values of gross national income per capita – calculated at the purchasing power parity (PPP) rate in \$ for the year 2011 - have recorded an increasing trend; since 2010, the increase has been permanent except for the year 2012, when a slight decrease was registered. In the year 2015, Romania exceeded the threshold of \$ 19,000 gross national income per capita.

Overall, according to the data observed and to the trend identified in the aforementioned figures, it is apparent that from the standpoint of economic growth, of progress in education, and of life expectancy at birth, the evolution is favourable for Romania. In other words, the living standard most likely has improved thanks to economic progress; investment in education has been possible in the same context, thus the general level of human development has registered a positive evolution in the last 15 years. The quantitative socio-demographic changes – mostly the reduction in the number of inhabitants - have not produced negative effects in the sphere of human progress and development.

4. Conclusions

The conclusive aspects show that, whereas the number of inhabitants has been decreasing (a phenomenon characterized by some authors as “dramatic”) the rhythm and level of consumption per capita have increased, which leads towards a generalized high-level consumption. Hyper-consumerism is maintained by certain socio-demographic factors: change in mentality due to the intercultural changes favoured by the migration phenomenon; reduced investments in the health and education of the population; precarious economic education; incapacity of assessing the complete lifespan of a product; strategic short-term orientation; lack of an overall view of over-consumerism; consumption encouragement maintained by specific sales mechanisms based on manipulating psychological techniques; and lack of interventions from State institutions and bodies. Romania is facing currently real challenges of sustainability and, according to the data analyzed, it has followed a favourable trend, considering that despite the sudden and major socio-demographic changes, it has managed to build a stronger economy and a more advanced society. Whereas some chapters - education quality, health investments, and promoting environmental values - still require consistent efforts, it is important to note that the impact of socio-demographic changes upon human development has not been negative thus far. We believe that the decreasing number of inhabitants is actually not unfavourable, from the perspective of preserving resources and ensuring a high life satisfaction level, while maintaining a favourable social balance of sustainable development. Nonetheless, taking into account that HDI and the associated indicators only illustrate the socioeconomic aspects and they ignore the environmental ones – included in the concept of sustainable development – it is important to identify the evolution pattern for environment-specific indicators, in the context of increased standard of living and quality of life, as well as of human development in general. We also note that in highly developed countries – ranking the first in the HDI hierarchy (Norway, Switzerland, Germany, Denmark, and the

Netherlands) – the very high value of HDI is associated with effective strategies and actions for preserving the environment and the natural resources. The outcomes are reflected in the reported environment indicators, including in studies concerning the attitude and behaviour of the population towards the environment. This represents the topic for a future research.

Among the limits identified for the research within the present paper, we enumerate as follows: lack of approaching environmental issues in the context of human development, (justified by the strict orientation of the research towards social, demographic, and economic aspects); use of a limited number of indicators in the analysis conducted; low focus on the downsides and advantages entailed by the socio-demographic changes, mostly on the ones related to economic and social welfare. We believe that the afore-stated limits actually represent a point of reference for future research.

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The Role of the European Union in the Consolidation of Market Economy in the Republic of Moldova

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Abstract

The European Union is by far the most important economic and development partner of the Republic of Moldova providing wide support for this young democracy to consolidate its fragile institutions. The main aim of this support is to improve the existing socio-economic relations in the country and, therefore, encourage the development of Moldovan market economy. Nowadays, euro- sceptics in the Republic of Moldova as well as in other countries put under the question the efficiency and effectiveness of policies EU has promoted in neighbouring countries. Supported by obscure interests and widely covered by biased mass media, they distort public opinion and denigrate EU backed achievements in Eastern Europe, including in the Republic of Moldova. The present paper comes to bring an impartial insight and a disinterested view upon the role of EU in consolidating market economy in neighbouring countries considering the experience of the Republic of Moldova in this sense. The research takes into account reliable data-sources on the base of which it is performed the quantitative and qualitative analyses and are drawn coherent conclusions. The research through the use of economic analysis provides consistent arguments assessing the impact of EU support upon Moldovan market economy and its institutional framework.

Key words: Transition; market economy; structural support; democratic institutions; Eastern Europe

JEL classification: F15; F34; F43; O11; O43

1. Introduction

The Republic of Moldova and the European Union have developed close cooperation relations in order to assure mutually convenient benefits in terms of economic development, social prosperity and political stability. Eventually, the deepened cooperation is supposed to lead to the integration of the Republic of Moldova into the European community as to assure the citizens with equal economic opportunities and standards of living as compared to other EU member states. However, the EU integration of Moldova depends on several important pillars and namely the rule of law,

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functional democracy and strong democratic institutions which make up the foundation of efficient market driven economy.

As a strategic economic and political partner of the Republic of Moldova, the European Union has provided extensive support to consolidate the weak democracy of Moldova and help this Eastern European nation in overpassing the political, economic and social consequences of transition. The assistance offered by the EU community, including technical, structural and financial support, aimed at increasing Moldovan economic competitiveness. Thus, the main goal of the present research is to analyse the evolution of EU-Moldova economic cooperation relations and to identify the main achievements and challenges the Republic of Moldova faces in this regard. In such a way, it is possible to evaluate the role of the European Union in the consolidation of Moldovan market economy through assessing the effects of assistance upon its fundamentals.

In the present political context, the research comes to impartially evaluate the effectiveness of European Union's backed support upon the development of the Republic of Moldova's socio-economic potential. The assessment comes to provide justified reasoning through the use of both qualitative and quantitative analyses. In this way, it is intended to demonstrate without the use of polemics real economic impact of EU guidance regarding the consolidation of market economy in the Republic of Moldova.

2. Literature review

The researched matter has broad literature coverage reasoning various views and spurring intense discussions on specific aspects. Nevertheless, the vast majority of authors which have been consulted come to underline the important role of the European Union in fostering economic development in the Republic of Moldova. They emphasize the community's role in helping Moldova to overpass the transition and improve the existing market driven relations in the country. So, according to Rodríguez-Pose (2013, p1034-1047) strong democratic institutions are at the corner-stone of efficient economy. The European Union assists in strengthening institutions in partner states including the Republic of Moldova. Šukytė (2015, p25-26) underlines the role of the EU in supporting Eastern European nations to overcome socio-economic challenges. Main focus of EU policies relies on empowering market relations in these countries through stimulating independent justice, free and unbiased institutions. The European Union tends to improve the economic and political framework of neighbouring Eastern European nations to assure the community with stable and predictable partners (Gromadzki, 2015, p12-18). Namely predictability and stability are essential conditions to develop active cooperation. Through developing the Eastern Partnership (EP) the EU created an important platform to guide the EP member countries in re-forming their institutions and socio economic relations based on EU experience (Forgo, 2015, p24-26). Some national researchers on this matter have expressed the necessity in deepening the cooperation with the European Union in order to re-ignite economic activity in the country. Essential conditions to foster economic activity are strong judicial and institutional framework, rule of law, transparent bureaucracy and facilitated business environment (Gațcan, 2015,

p45-46 and Crudu, Ignatov, 2016, p85-101). Boțan (2014, p83-95) underlines the role of Association Agreement with the European Union in re-enforcing Moldovan capacities in attracting both national and foreign investments and, therefore, stimulate economic growth.

3. Methodology

Research methodology is based on both qualitative and quantitative analyses taking into consideration the fundamentals of the synergistic approach. In such a way it is possible to research various aspects of the study matter and, therefore, reach more comprehensive result and conclusion. Within this framework it is considered various socio-economic indicators and relevant relations are analysed. Consequently, by cumulating all findings of the research a general assessment of the role of the European Union in the consolidation of Moldovan market economy is provided.

4. EU development assistance provided to the Republic of Moldova

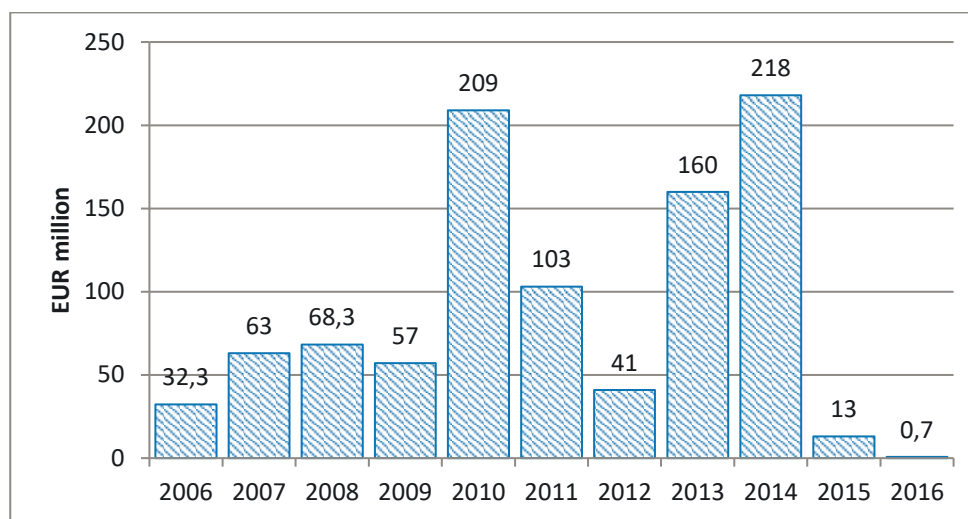
The external assistance provided by the European Union towards the Rep. of Moldova is an important component of external EU policy to stimulate socio-economic development and reformation of the Republic of Moldova according to the EU standards. The external assistance was provided through a variety of instruments intended to realise specific goals agreed both by the European and Moldovan policy makers. The external assistance received by the Republic of Moldova includes financial allocations, structural funding, technical assistance, humanitarian aid, grants and low-interest rate credits as well as budgetary support for different objectives including stabilising the external balance of payments.

In the period of 1991-2007, the Republic of Moldova has benefited extensively from external assistance of the European Union. Thus, during this period around EUR 137.6 million were directed towards TACIS National Programme, EUR 87 million as macro-financial assistance, EUR 35.6 million to improve food security, EUR 26.15 million to TACIS Regional programme and EUR 22.7 million to TACIS trans-border cooperation. Foreign assistance to other directions amount to slightly less than EUR 12 million. It is necessary to remark that during this period only for the y. 2006 it was allocated funding of EUR 32.3 million to different goals while for the y. 2007 allocations reached EUR 63 million. In the y. 2008, the Republic of Moldova has benefited from EUR 68.3 million only through the framework of ENP (EU Delegation to Moldova) (Infokit, 2008, p4-15).

Since the y. 2009, the EU commitments regarding the assistance to be provided for the Republic of Moldova have increased as the state assumed European values and reforms to reach the EU integration requirements. The main instrument through which the European Union provided funding in the period of y. 2009-2016 was the mechanisms regulated by the ENP framework. The economic dialogue with the Republic of Moldova has deepened, and therefore, the areas of European funding enlarged. In order to reduce the impact of world crisis upon the Moldovan economy, EU provided direct macro-

financial assistance intended to balance the payments' accounts of the Republic of Moldova. There were also undertaken large commitments in reforming the country, including the reforms in key sectors such as justice, public administration, police and border management. Besides these, through ENP framework, it was provided considerable support to education, agriculture, industry and related sectors as to modernise the country as a whole. So, EUR 700 million were allocated by the EU within the period of y. 2009-2014 (Bani.md), and other funding ranging between 335 million and 410 million was intended to be allocated in the period of y. 2014-2017, financing conditioned by the implementation of structural reforms assumed by the Republic of Moldova (ENP).

Figure 1. Foreign assistance provided by the European Union to the Rep. of Moldova, (EUR million), y. 2006-2016



Source: Designed by the author based on Government data.
Available online at: gov.md/Europa

As it can be remarked, the European Union has provided foreign development assistance to the Republic of Moldova in the period of y. 2006-2016 amounting to almost EUR 1 billion. This is a considerable input towards the development of internal country's capacities taking into consideration the socio-economic dimension. In such a way, the European Union proved to be the biggest donor of funding reaching almost 30 % weight. There have been implemented various projects aimed at strengthening the Republic of Moldova's internal institutional framework, functionality of the market economy in special, which are essential conditions for the socio-economic prosperity of the country. It is necessary to note the fact that foreign development assistance is granted by the developed countries to developing one and not always is an indicator proving the melioration of the socio-economic environment. In such a way, if not properly managed, development assistance could have an adverse effect upon country's balance of

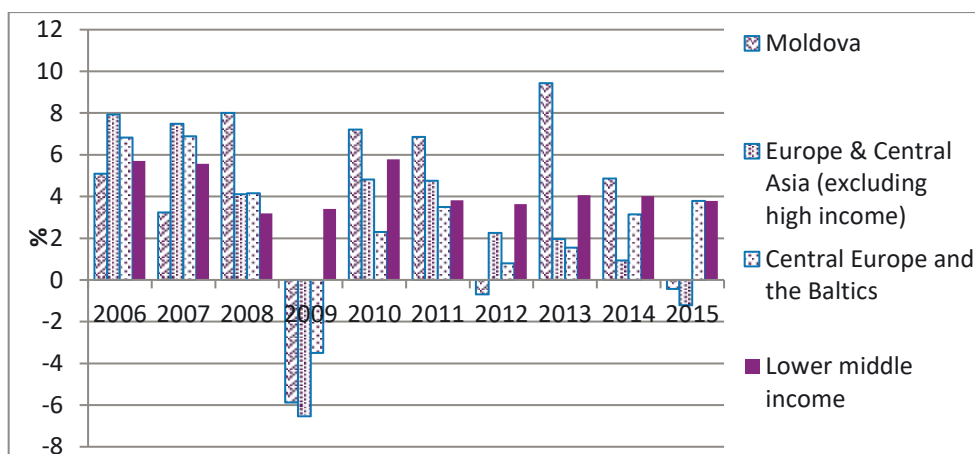
payments raising the level of debt without a visible economic impact which is caused by bureaucracy and wide-spread corruption.

5. Correlation between EU development assistance and selected indicators of economic development of the Republic of Moldova

It has been calculated the correlation index between the levels of foreign development assistance received by the Republic of Moldova from the European Union in the period of y. 2006-2016 and the evolution of several indicators of economic and social efficiency during the same time.

Firstly, it is necessary to examine the influence of European assistance upon the evolution of country's GDP per capita growth, as it is one of the most important indicators of the socio-economic wellbeing dynamics of the population (figure 2). The evolution of Moldovan GDP per capita growth is assessed in comparison to the same indicator of the following groups of countries including Europe & Central Asia (excluding high income), Central Europe and the Baltics and Lower middle income countries, classification provided by the World Bank. Thus, it can be highlighted that Moldova's GDP per capita began to grow faster than the indicators of the countries mentioned in the figure 2 as the degree of economic cooperation with the European Union went up. In such a way, it can be remarked that there is a moderate positive correlation of 0.53 between EU provided assistance and the evolution of GDP per capita reported by Moldova. This fact reflects favourable impact of EU assistance upon the general societal wellbeing in the country. Taking into consideration the data presented in the figure 2 and the calculated correlation, it can be generally inferred that the increase in the level of economic cooperation with the European Union has favourably influenced the economic development of the Republic of Moldova.

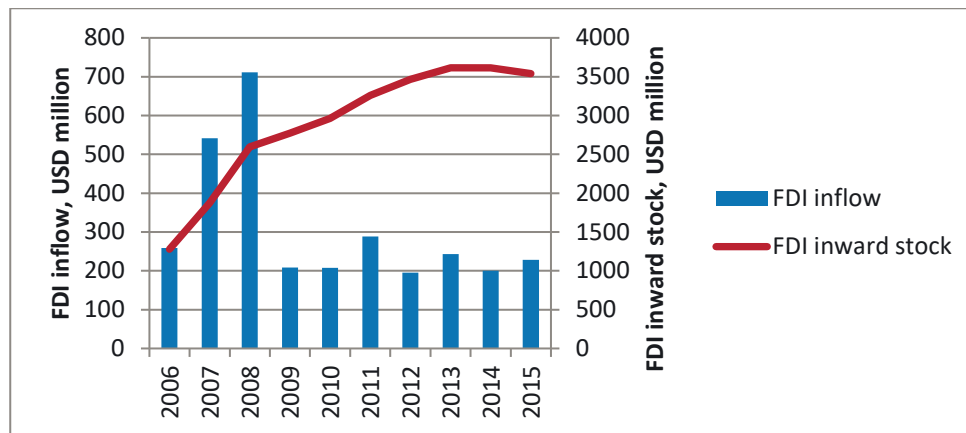
Figure 2. GDP per capita growth (annual %)



Source: Designed by the author based on data provided by the World Bank.
Available at: www.worldbank.org

On the other hand, it has been registered negative correlation of 0.27 between EU provided assistance and the FDI inflows in the Republic of Moldova. This fact means that development assistance has negative impact upon the FDI competitiveness in the country. So, it can be inferred that the allocation of development assistance creates artificial competition to foreign direct investments. In this way it can be explained the weak performance of Moldova in terms of FDI in the post crisis years (figure 3).

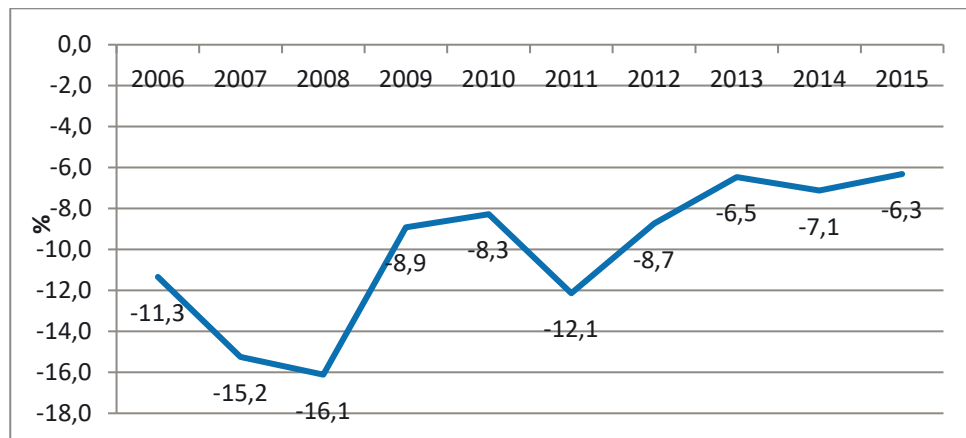
Figure 3. FDI inflow in the Rep. of Moldova, (USD million)



Source: Designed by the author based on data provided by UNCTAD.
Available at: www.unctad.org

There was also found insignificant positive correlation of 0.32 between the EU development assistance and the current account to GDP ratio (figure 4). This fact indicates weak influence of European development assistance upon the export competitiveness of the Republic of Moldova.

Figure 4. Current Account to GDP ratio of the Republic of Moldova, (%)



Source: Designed by the author based on the information provided by IMF.
Available at: www.imf.org

So, from the economic point of view it can be generally stated that the EU development assistance provided to the Republic of Moldova has a positive impact upon the overall country's economic performance, the fact explained by moderate correlation of 0.53 with the GDP per capita evolution. On contrary, the effects of development assistance upon external competitiveness are rather weak because of the tendency of assistance to compete out the investments. It was also demonstrated that assistance received by the Republic of Moldova did not significantly correlated with the current account to GDP ratio which highlights the idea that the development assistance is rather directed on supporting current budgetary expenses and not capital investments.

6. EU's role in consolidation Moldovan business and administrative environments

The European Union has offered much technical and financing support to the Republic of Moldova in order to consolidate its business environment as the main driver of economic growth. One of the most relevant indicators reflecting the situation in the business field is the Ease of Doing Business index provided by the World Bank. This index allows understanding the country's efficiency and performance regarding the main connected to business issues including the procedures of starting a business, dealing with construction permits, getting electricity, registering of property, getting credit, protecting minority investors, paying tax, trading across borders, enforcing contracts and resolving insolvency. So, by examining this index it is analysed the evolution of overall business performance through the use of various dimensions reflecting generally the ease of doing business and its confidence. In such a way based on the data provided in the table 1, it can be remarked that the Republic of Moldova has considerably improved its positions regarding the Ease of Doing Business ranking from 83rd position in y. 2006 to 52nd in y. 2016. This fact means that the economic cooperation with the EU has positively influenced the business environment. The European Union's role in the consolidation of Moldovan business environment is determinative.

Table 1. The rank of Rep. of Moldova according to the Ease of Doing Business Index

Year	2006	2007	2008	2009	2010
Rank of Moldova	83 (out of 155)	103 (out of 175)	92(out of 178)	103 (out of 181)	94 (out of 183)
2011	2012	2013	2014	2015	2016
90 (out of 183)	81(out of 182)	83 (out of 185)	78 (out of 189)	63 (out of 189)	52 (out of 189)

Source: Designed by the author based on data provided by the World Bank.

Available at: www.worldbank.org

Despite the achievements reported by the Republic of Moldova in terms of business environment improvement, it is necessary to remark the lack of efficiency in the area of combating corruption in Moldovan bureaucratic and judicial systems. The European Union concentrated much financial resources to assist in reforming these Moldovan sectors. Yet the efforts proved to fail due to rigidity and reluctance of Moldovan government and connected factors to implement reforms they were committed to. So, in order to remark the fact that the Republic of Moldova poorly managed reforms intended to assure stable and transparent institutional framework to provide the economy with a more lucrative environment intended to accelerate country's socio economic development, it will be analysed the index of corruption perception provided by the Transparency International (table 2).

Table 2. Corruption Perception Index of the Rep. of Moldova in the period of y. 2006-2015

Year	2006	2007	2008	2009	2010
Score 100 max	32	28	29	33	29
Rank	79 (out of 163)	111 (out of 179)	109 (out of 180)	89 (out of 180)	105 (out of 178)
Year	2011	2012	2013	2014	2015
Score 100 max	29	36	35	35	33
Rank	112 (out of 182)	94 (out of 174)	102 (out of 177)	103 (out of 175)	103 (out of 168)

Source: Designed by the author based on data provided by Transparency International. Available at: www.transparency.org

Taking into consideration the information provided in the table 2, it can be remarked that the Corruption Perception Index of Moldova registered alternating results. The highest position held by the country was 79th in 2006 while the lowest was 112th in 2011. The corruption is the most important problem of the Republic of Moldova which damages the investment and entrepreneurial activities causing institutional weaknesses and population poverty. Unless the problem of corruption is not solved the degree of economic cooperation with the European Union will have a superficial tent as the economic effectiveness of state will be under its potential. The problem of corruption destroys the European integration prospect of the Republic of Moldova, as the leading elite pursue other goals than those of population majority. In the y. 2015-2016 the problem of corruption caused mass uprisings of population which was outraged against high government hypocrisy and corruption (The New York Times, 2016). The main mistakes the European Union made in relation with the Republic of Moldova which could affect future economic cooperation were the legitimising attitude and passiveness regarding frauds and kleptocracy. Moreover, the European Union let the Moldovan governing elite to cover their underground activities with EU integration slogans. In such

a way, the EU image capital became used by individuals having high degree of distrust among the population (Kostanyan, 2015, p1-4).

7. Conclusion

Concluding it can be mentioned that the European Union is playing an important role in consolidating the market economy in the Republic of Moldova by providing support and development assistance to areas of most interest. Through the participation of the European Union it has been considerably improved the ease of doing business as well as it has been fostered the general socio-economic level of welfare of the population. In terms of investment and trade competitiveness the development assistance provided by the European Union had not a significant impact on the overall country's performance. This fact could be explained by the dominant priority of the EU which regards strengthening the institutional capacities of Moldova and only the secondary target being the improvement of economic, trade and investment performance of Moldova. Besides, it is necessary to underline that the role of EU in the consolidation of Moldovan market economy is diminished by a wide range of impediments in place which are indirectly set up to protect the current monopoly business interests in the state. So, some of the main impediments towards deepening the economic cooperation with the European Union are corruption, inefficient public administration and institutional ineffectiveness, lack of transparency in the sector of justice and authorities' reluctance towards the implementation of reforms in sectors of strategic importance for economic development of the Republic of Moldova.

So, in the period of y. 2006-2016 the European Union provided extensive assistance to the Rep. of Moldova in terms of technical advice and funding. Nevertheless, it should be mentioned that the EU has made several policy oversights in relation with Moldova affecting the efficiency of economic cooperation. Therefore, it can be mentioned the EU is inefficient when using the top-down approach in relation with the country. The fact which has created a discrepancy of understanding between the population and the European Union representatives caused by government distortions, the situation which worsens moving farther from Chisinau.

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In-Depth Teaching on European Union Matters for Future Professionals Related to Industry 3.0 and Industry 4.0

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Oleksandr KUBATKO³

Abstract

Future professionals in fields, which are in increasing demand on the labour market, need “Learning in Depth”. Such approach ensures that every student becomes familiar with specific EU issues they may choose to specialize on. It can be achieved via employing different teaching methodologies and technics. Developing in-depths learning materials, including hand-outs, power point presentations, tutorials materials, video-lectures, open on-line courses are part of this approach. Instead of traditional face-to-face lecturing, it implements lectures with open discussions and game simulations, targeting in particular cross-cultural peculiarities for sustainable development fostering based on achievements of Industry 3.0 and Industry 4.0. Much of the attention would be paid for the debates as a part of learning by doing methodology. The basic here is the Karl Popper format of debates. Its extended format with Government and Opposition as two confronting parties is preferable, modelled by debates with NGOs participation, local government, business, developers, and active citizens. The other type of team-work projects are round tables discussions, during which global scale issues will be simulated, where each student would need to become an expert for solving critical issues. There would be specific tasks of modelling production/consumption nets, including those achieved by social and solidarity economies.

Key words: in-depth teaching, in-depths learning, Karl Popper debates, social and solidarity economies, Industry 3.0, Industry 4.0

JEL: A23, O31, Q56

Future professionals in fields, which are in increasing demand on the labour market, need “Learning in Depth”. Such approach ensures that every student becomes familiar with specific EU issues they may choose to specialize on. It can be achieved via employing different teaching methodologies and technics.

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What are these specific EU issues? Mostly they refer to sustainable development formation in conditions of Industry 3.0 and Industry 4.0. Developing in-depths learning materials, including handouts, power point presentations, tutorials materials, video-lectures, open on-line courses are part of this approach. It would allow future professionals to become real experts in modeling production/consumption nets, including those achieved by social and solidarity economies.

Originally ‘Learning in Depth (LiD) is a simple though radical innovation in curriculum and instruction, designed to ensure that all students become experts in something during their school years’ (WISE, 2017). If we attribute this method to university students we would develop in-depths learning materials, including handouts, power point presentations, tutorials materials, video-lectures, open on-line courses are part of this approach. Instead of traditional face-to-face lecturing, it implements lectures with open discussions and game simulations, targeting in particular cross-cultural peculiarities for sustainable development fostering based on achievements of Industry 3.0 and Industry 4.0 as a result of the Third and Fourth Industrial Revolutions.

Our ‘Learning in Depth’ approaches would ensure that every student becomes familiar with a particular EU related issue they may choose to specialize on. We would achieve this via employing different teaching methodologies and technics. The courses related to sustainable development, solidarity economy, etc. may start from developing in-depths learning materials, including handouts, power point presentations, tutorials materials (including game simulations), video-lectures, open on-line courses. Specifically, instead of traditional face-to-face lecturing, we would implement lectures connected with open discussions and game simulations, targeting in particular cross-cultural peculiarities for sustainable development fostering based on achievements of Third and Fourth Industrial Revolutions. We already have collected a large bank of data and materials gathered within EU on high levels of international standards and managing cross-cultural peculiarities of relevant social, economic, and ecological issues. Therefore, EU being one of the leading centres for promotion of Sustainable Development would serve as a good example for seeding and promoting ideas of sustainable development in Ukraine.

The Karl Popper Debate is one more approach to teaching students. International debate education association explains The Karl Popper Debate format in the following way: focuses on relevant and often deeply divisive propositions, emphasizing the development of critical thinking skills, and tolerance for differing viewpoints. To facilitate these goals, debaters work together in teams of three, and must research both sides of each issue. Each team is given the opportunity to offer arguments and direct questions to the opposing team. Judges then offer constructive feedback, commenting on logical flaws, insufficient evidence, or arguments that debaters may have overlooked.

Karl Popper debate should:

- focus on the core elements of controversial issues;
- emphasize tolerance for multiple points of view;
- emphasize the development of analytical thinking skills;

- provide students with the opportunity to debate many kinds of resolutions (International, 2004).

Its extended format with Government and Opposition as two confronting parties is preferable, modeled by debates with NGOs participation, local government, business, developers, and active citizens.

Each student is given a particular topic to learn about through a particular university course. The scope of topics will refer to basic concepts and principles of Industry 3.0 and Industry 4.0 as the main results of The Third and Fourth Industrial Revolutions, which bring the necessity of socio-cultural, socio-economic and technological transformations for sustainable development on local level.

For future professionals up to date learning materials are important. These refer to qualitative transformations of the economic system, the components of the triad of system-forming groups of factors (material, energy, information and synergetic) should correspond with the goals and objectives of such transformations.

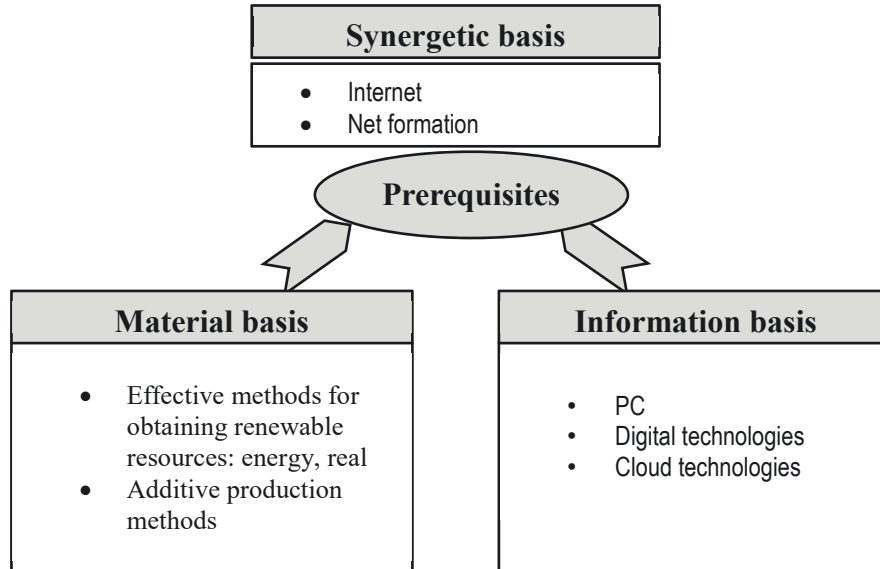
Any system is formed in the interaction of three basic groups of factors: material, information and synergetic. Their functions can be expressed in the following way: *material* – drive; *information* – direct (form the information algorithm of development); *synergetic* – unite (ensure consistent behavior of individual subsystems).

Currently, synergetic factors play the leading role in this process. Their main task is to integrate separate components of local economic systems into a single systemic whole – the global economy of the Earth ‘space ship’. This is exactly what happens in nature, where individual local ecosystems unite form a single biosphere of the planet.

One of the most important tasks of transforming the material and energy basis of the economy during the Third Industrial Revolution is its harmonization with the natural environment. This implies, first of all, the dematerialization of the production and consumption systems, in other words, their considerable ‘relief’, i.e. a decrease in the material consumption and energy intensity per unit of output (work performed) and for one person living on the earth, whose vital activity must be provided with everything necessary. In addition, the task of ecological harmonization of the material and energy basis necessitates the transition to organically compatible with ecosystem metabolism substances and closed cycles of resource use.

Figure 1 shows the necessary basic prerequisites for the implementation of the Third Industrial Revolution. Firstly, they assume the availability of effective (i.e., cheap enough for a unit of performed work) technical means (in particular, installations of alternative energy and 3D printers); secondly, the provision of a single (‘digital’) basis for fixing and transmitting information (for communication between people, a man with a machine and a machine with a machine), as well as the formation of a global memory system and a kind of an all-planet ‘think tank’ based on cloud technologies; thirdly, the formation of a unified communication basis on the basis of the Internet and network systems.

Figure 1. Basic prerequisites for implementation of the Third Industrial Revolution and start of the Fourth Industrial Revolution



Source: own contribution.

The formation of these prerequisites created a real basis for the solution of a number of practical tasks of the sustainable transformation of the economy in conditions of the Third Industrial Revolution.

The Fourth Industrial Revolution is a logical continuation of the Third Industrial Revolution, in which a synergetic basis is the driving force of socio-economic systems development. The term "Industry 4.0" is a buzzword used widely in German speaking countries for the Fourth Industrial Revolution currently taking place. Other terms frequently used in this context are cyber-physical systems, internet of things (IoT), smart factory, smart product, big data, cloud, machine to machine (M2M) (Lang, 2016).

The Fourth Industrial Revolution concept has received great significant after the speech at the International Environment Forum in Davos (January 2016) of one of the main theorists of "Industry 4.0" phenomenon Swiss economist Klaus Schwab. He described this phenomenon as the blurring between physical, digital and biologic areas (Schwab, 2016).

For the first time the concept of the Fourth Industrial Revolution has been formulated at the Hanover Fair in 2011. The phenomenon was defined as the introduction of cyber-physical systems in production processes. Currently it is Germany that is taking the leadership in the Fourth Industrial Revolution. A public-private program 'Industry 4.0' has developed. Large German corporations having research grant support from the Federal Government are to create a fully automated production lines (smart factories), in which products interact with each other and consumers within the concept Internet of things (Khel, 2016).

New methods of teaching-learning process will allow students going deeper into the current EU issues among which social and solidarity economy and social enterprises. Social economy and social enterprises have become really very important nowadays, it is because 'they have proven to be able to engage in many and varied general interest fields of activity and tackle a variety of needs that arise in society. GECES considers it essential to highlight five positive contributions, each showing a dimension of the potential of the social economy and social enterprises to contribute to the development of the European Union' (Social, 2016).

Table 1. A comparison between the Neoliberal Economy and the Solidarity Economy (IDEX, 2017)

Indicators	Neoliberal Economy	Solidarity Economy
1. The role of labor	a) Produce goods for sale b) Provide services	a) Satisfy needs b) Realize your potential
2. Organization of labor	Hierarchical owners are bosses	a) Democratic b) Support for the group c) Group decision-making d) As culture
3. Technology	Substitution of human labor	An instrument for labor
4. Land	a) Merchandise b) Individual property c) Business	a) Sustenance b) Collective property or individual property under collective use.
5. Production	For the market	a) For yourself/your family b) To exchange c) For the market
6. Product pricing	Depends on supply and demand	Depends on the work and its relationship to other products
7. The market.	Controlled by global big business and banks	Controlled by producers and consumers, according to their real needs
8. Money	Commodity, power	A means of exchange
9. Relationships	Transactional interactions	Ongoing cooperation and building power
10. Space	Competition	Free

Source: IDEX, 2017

As the example for student round table debates we may choose “The 2017 Commission Work Programme”. It confirms the full commitment to ensure the timely implementation of the Circular Economy Action Plan. The discussion may be around the European Commission Plastic Strategy 2017 to improve the economics, quality and uptake of plastic recycling and reuse, to reduce plastic leakage in the environment and to decouple plastics production from fossil fuels. These and many other actions will make it possible to transform socio-economic systems to sustainable development through green economy application. Greening the economy has to provide reduction of human footprint. Providing elements for forming green economy are:

- sustainable style of life with the priority of information goods consumption;
- diversification of green energy sources (solar, wind, geothermal, biogas, hydro);
- deconcentration of energy sources (hundreds millions power units instead of hundreds ones) integrated in one EnerNet;
- forming unified solidary economy on the European space.

Analyzing the above prerequisites for the achievement of sustainable development, it is possible to formulate the necessary qualities of the sessional economy, which simultaneously point to the directions on which the siding of the economy should move forward. The main ones are: resource renewability (renewable resources must become the fundamental basis of sustainable economy); dematerialization (drastic reduction in material intensity, energy intensity and environmental intensity); transformation (constant progress towards improvement through progressive transformations); innovation (perceptibility of rapid introduction of progressive innovations); naturalization (approximation of materials used, types of energy and technological processes to those that exist in nature); social orientation (the dominant goal is the transition from the priority of economic goals to the priority of social development goals); information orientation (informatization of production and consumption); ethics and humanization of economy (implementation of ethical principles of sustainable justice); synergy (the integration of individual economic entities into holistic systems (‘systems of systems’), many of which acquire the scope of regional, continental or global networks); decentralization (the increased freedoms of certain economic entities in making decisions and implementing activities according to the principle: ‘the center is everywhere, periphery is nowhere’); self-organization (increase the degree of systems self-organization according to the principle: ‘think globally – act locally’).

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Cross-Border Tourism and its Significance for Tourism Destinations

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Abstract

This article is concerned with cross-border tourism. It enhances the importance of cross-border cooperation in tourism. Cross-border cooperation is a form of international cooperation, along with interregional, transitional and trans-frontier cooperation. Cross-border regions often share the same historical and cultural traditions and attractive natural landscapes, such is the case of the Republic of Moldova and Romania. In both cases, cross-border regions can benefit from cooperation – cooperation can help create greater diversity and differentiation of the range of tourism and environmental products; create economies of scale and make promotion more effective, and can help better address specific problems or issues for tourism development.

Key words: cross-border tourism, cross-border cooperation, tourism destination.

1. Introduction

Tourism is regarded as an important component of regional economic development actions and a significant source of employment in the European Union. This was recognized in the Treaty of Maastricht which acknowledged for the first time that EU policies should include measures in the field of tourism. In most of cross-border regions, tourism is now an important component of development strategies or concepts, and is one of the priorities in their INTERREG Operational Programmes.

In April 1995, the European Commission published a Green Paper on the role of the European Union in tourism development, which aimed to stimulate debate on how to maximize the effectiveness of the EU's role in assisting tourism.

The principal EU *instruments to support tourism* include the following:

- the EU Structural Funds through the main Community Support Frameworks and Single Programming Documents and several Community Initiatives (especially Leader in rural areas and INTERREG) offer a major contribution to the development of tourism in regions of the EU and seek to achieve the objectives of economic and social cohesion as defined under article 130a of the Treaty;
- the internal market policies which are promoting a favorable environment for the growth of trade likely to promote intra-Community tourism and the

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idea of the EU being a single tourist destination for tourists from outside the EU.

The development of tourism can help address many of the typical development needs and weaknesses of border regions. These include the promotion of a diverse range of economic activities in border regions; the creation of new employment opportunities, an increase the number of jobs, and the development of new skills; offering a means for the conservation of the natural and cultural heritage of a region and opportunities to increase the range and quality of local amenities and services, and local infrastructure.

2. Literature review

While there has been much research on the competitiveness of tourist destinations in general, the cross-border areas have, for the most part, been neglected in these discussions.² The specifics of the border or frontier destinations make it possible to place them into an individual category of tourist destinations that deserve attention. Traditionally, frontier tourist destinations have been treated by researchers and practitioners as destinations that are deemed to have more problems and shortages, than opportunities to succeed in tourism development. Frontier regions are often blessed with few natural resources and may suffer the problems of relative or absolute inaccessibility, a small or even nomadic population. Many frontier regions are characterized by limited infrastructure such as transportation, accommodation and other services (Butler, 2002). On the other hand, sharing the border with a neighbor, a different visitor's place, can offer such destinations access to a richer variety of natural conditions, cultural or historical heritage possessed by a nearby destination. This unique opportunity is one of the main factors that lie beneath the idea of using cross-border cooperation between the border tourist destinations as an instrument for merging them into the sustainable tourism cluster with international aspirations. Subsequently, with such a perspective, a significant shift in tourism theory has occurred as well as in public minds wherein geographical borders of frontier destinations are perceived not only as barriers, but also as gates to more diversified and richer tourism offerings and improved destination performances.

In discussing and defining the cross-border cooperation, very different perspectives and *methodologies* can be chosen to study it. For example, this description illustrates the phenomenon in a positive manner: Cross-border cooperation is a form of international cooperation, along with interregional, transitional and trans-frontier cooperation, involving non-central governments and encompassing the extension of state-centric governance to subnational and supranational bodies (Perkmann, 2003; Prokkola, 2008; Koskinen, 2012).

One of the most popular methodologies among tourism researchers for measuring this phenomenon can be to study the attitudes of tourism actors (main stakeholders) regarding a frontier destination as well as the role of cross-border cooperation for tourism development in a region. This method has been successfully tested in many studies of

² <http://destination.unwto.org/content/conceptual-framework-0>

tourism in frontier destinations, focused on the attitudes of the tourism supply providers in the frontier regions with regards to cooperation and their interest in increasing competitiveness by creating joint cross-border tourism products. The study of Vodeb, 2010 was mainly aimed at small and medium tourism companies in the borderlands and tested two hypotheses: (1) competitiveness of the frontier regions can be enhanced through cross-border cooperation between the destinations, and (2) tourism actors in the frontier regions are interested in cross-border cooperation in tourism. The competitiveness of the frontier destinations was assessed based on five factors from Ritchie and Crouch's competitiveness model: appeal, management, organization, information and efficiency (Crouch et al., 2003). A factor analysis of responses in this survey identified the variables affecting cross-border cooperation. One of the main conclusions in this research was that tourism and cross-border cooperation with regard to tourists was perceived by destination stakeholders as a powerful tool to develop border regions. In another study, performed by Cankar and Seljak, the central objective was to determine what factors influence cross-border cooperation between tourism businesses in the Alps-Adriatic region (Cankar, S. et al., 2014). One of the main conclusions of this study was that personal relations, language skills and mutual interests enhanced cooperation, while administrative and legislative systems were barriers to it.

These are only two of the numerous studies that have become the platform for what can be defined today as cross-border cooperation theory. This theoretical field operates with different descriptions of how relationships between this phenomenon and tourism can be analyzed. One of the main points in this theory is that "cross-border cooperation is an interregional phenomenon that requires public facilitators, i.e. international, national, local and regional level authorities, for the practical implementation of the cooperation" (Koskinen 2012). Another important definition that came out of this field is *coopetition*; it was first introduced in 1995 as the need for cooperation among tourism destinations to better market the tourism product effectively and meet the competition at the regional or global level (Edgell et al., 2008; Vodeb, 2012).

3. Results

Cross-border cooperation is of obvious importance for the mutual strengthening of the tourism industries of neighboring countries (Grundy-Warr, Perry, 2001). The specifics of cross-border tourism cooperation need to be considered with great care and with an understanding of fundamental notions. For example, it should be clear that collaboration agreements in tourism planning entail very close contacts and communication (face-to-face) with all participants, from both the public and the private sector, and with an array of industries that take part in tourism planning. This type of collaboration can lead to effective dialogue and negotiations in building mutually acceptable interests and forwarding proposals for developing tourism in a given region.

The interdependency of the elements which together make up tourist destinations, and the balance of the effects of tourism (good or harmful) on various interest groups can best be understood from the perspective of a soft, open, system model. Every

destination has a unique mix of characteristics which are determined by its geographical location, culture and history. These together with the area's degree of dependency on tourism, and the industry's seasonal and structural characteristics, influence the experiences of both visitors and residents (Laws, 1995).

Determining a destination's competitiveness entails determining general conditions such as marketplaces, locations and companies. It is becoming clear, however, that destination competitiveness depends on the perspective of potential guests, and not on result-oriented indicators that provide only a view of the situation and offer very poor support of a destination's development. Finally, if destination appeal depends on the perspective of potential guests it becomes necessary for a destination to exhaust all opportunities possible for effectively entering the marketplace and to affect service quality by directly approaching service providers. The system theory claims that a destination's operational efficiency will be affected by change to any one of its component parts. For destination management to perform successfully, the three most important facts to consider are (Pechlaner, 1999):

- The effects on output resulting from change to inputs,
- The way in which all subsystems and processes of a destination are linked,
- The way in which subsystems and processes are controlled.

Swarbrook and Horner (2001) point out the importance of destination management, the responsibilities of which are divided among different organisations. Each of these, depending on their competencies and level of operations, contribute to achieving guest satisfaction in a destination. They include central government agencies, regional government agencies, associated public-private partnership organisations, private companies, and universities and faculties. The authors (Swarbrook et al., 2001) also stress the importance of coordinated action and management across all destination management levels, including partnerships between the public and private sectors to enhance competitive ability on the market.

Tourism development should not be left to a few politicians, civil service offices or entrepreneurs in tourism, but rather should be an issue addressed by the entire range of industries that are either directly or indirectly associated with tourism.

Destination stakeholders naturally have differing views on destination development. Although the competitive environment is subject to numerous forces and motives, customers and their needs remain the ultimate driving force behind competition and competitiveness: competitive actions derive from customer demand. The role of the public in a destination's competitive environment is a critical one. With the right communication, and interaction between the industry and these publics, a mutually supportive relationship can exist which ensures that, over the long term, a destination can develop its tourism industry in a way that benefits all stakeholders (Crouch et al., 2003).

Tourism development of a given region calls for the well-coordinated participation of all administrative levels (state, regional, local) according to their liability and competence within the tourism system. Partnerships between same-level administrative agencies are equally important, especially when natural or cultural

resources located in the cross-border regions of two or more countries are involved. These partnerships can help to prevent the exploitation or poor development of resources, as well as the economic, social and environmental imbalances that often arise on opposite sides of state borders.

Selection of concrete forms of cross-border cooperation between tourist destinations is affected and dictated by what are the needs, priorities and capabilities in frontier regions; and the knowledge about these influencing factors can be received by performing surveys and studies on stakeholder's attitudes. One of the most important prerequisites for choosing a relevant form is knowledge about what parameters are expected by the regional stakeholders to be given the highest priority among the others. According to the Practical guide to cross-border cooperation by Association of European Border Regions (AEBR, 2000) it can be quality of the environment; the type of tourism that can be developed (mass or niche); quality of the tourism products and types of visitors which can be attracted. Various forms of the cross-border cooperation also mean different degrees of involvement of state and official organizations; extent of formalization of this process; and of size of investments. Depending on what the subject for the cross-border cooperation is in each case, it can concentrate on different possible aspects, for example, competition on existing tourist segments; on new potential tourist segments; on improving existing products, or creating new tourist products.

Cross-border cooperation in tourism between frontier destinations is sometimes described as a process with several stages. It can be illustrated in the following three-step action (Seric, 2011):

- Preliminary actions aimed at developing a framework of conditions that enable effective participation in cross-border cooperation;
- Shift in destination's policy from traditional marketing towards the development-oriented goals;
- Establishing of common forms of cross-border cooperation that puts the existing destination's stakeholders together into the local level working groups or councils.

An alternate categorization of possible types of actions aimed at promoting cross-border cooperation between the tourist destinations is given in the Practical guide to cross-border cooperation by Association of European Border Regions (AEBR, 2000):

- Cross-border cooperation *on the upper strategic level* that involves higher officials and local governments to develop a joint plan and policy for how the regional tourism products can be integrated into the cross-border tourism brand. This joint work on the tourism strategy for the frontier destinations starts with preliminary actions, such as destination resources' audits; analysis of the competitive profiles of the destinations (identification of strengths, weaknesses, opportunities and threats), and finding out the main common meeting points for cooperation (priorities, opportunities and potential).
- Cross-border cooperation through *implementation of the specific projects* between frontier destinations. This form of cross-border cooperation can

cover a wide range of organizations and actors in the tourism industry, as well as different segments for cooperation such as external promotion of the cross-border destination; creating joint tourism information systems on amenities and accommodation, transport, connections; joint marketing and creation of cross-border networks of tourism suppliers; joint training in skills required by the tourism industry.

One of the possible grounds for cross-border cooperation that can be performed at the upper strategic level and through implementing specific projects is the *joint branding* of tourist products in frontier destinations. In this case, the tourism products in border regions are being marketed under the same umbrella brand and using a joint communication platform. Putting this into perspective, the main competitive advantage gained through cross-border cooperation by frontier destinations is building of a stronger interregional joint tourist brand that gains from the variety of historical, cultural and other resources in these frontier regions.

Another aspect of cross-border cooperation that is widely studied in tourism literature concerns the *factors that stimulate cross-border cooperation*. These factors have been identified and measured through several studies in surveys of the attitudes of stakeholders in border destinations (Cankar et al., 2014):

- Positive experience among the regional stakeholders with previously successful cross-border cooperation with neighbor destinations;
- Low transaction costs for the shift from traditional to joint marketing;
- Availability of funding for starting cross-border cooperation;
- Need to foster economic development in the region;
- Size of cooperation area;
- Good personal relations (contacts) between the potential partners, and their cooperation experiences;
- Common interests or problems potential partners are faced with;
- Linguistic skills that can facilitate communication across borders;
- Existence of transitional organizations;
- Availability of external experts for cross-border cooperation;
- Similar local and regional administrative structures in border destinations;
- Similar business structures;
- Linguistic and cultural similarities.

The notion of a tourism cluster is frequently used to describe the possible future forms for how destinations in different regions, including Republic of Moldova and Romania, can cooperate on tourism across borders. This notion according to Porter (1998) and other researchers refers to the geographical concentration of the companies, organizations and institutions that are linked together by working contracts.

Most tourism researchers agree that establishing an interregional (or multinational) tourism cluster that embraces a group of smaller destinations across the borders would normally result in many benefits for its members, and one of its main objectives will be building a strong interregional brand and product portfolio. The

existing strong competition between the border areas needs to be replaced with the idea that a cross-border region can jointly offer a unique product or range of products.

The *benefits* of competition between the border areas include (AEBR, 2000):

- Synergy effects of economy of scale that is, for example, cost optimization by sharing costs and risks;
- Access to larger markets and better distribution channels;
- Stronger tourism brand and marketing platform by accumulating international funds, human resources, technologies and efforts;
- Transfer of knowledge and expertise between regions;
- Creating more competitive and high-quality regional tourism products;
- Sustainable regional development in the long term.

All these potential gains explain why the elements of cross-border cooperation and clustering are internationally pursued in contemporary tourism planning policies. In particular, these instruments are useful for frontier and distant regions that are less promoted in a global world tourism context and do not favor attractive geographical and historical position, infrastructure and other objective factors.

Taking all these issues into account, cross-border tourism cooperation can result in increasing competitive advantages and overall competitiveness for the destinations involved in collaboration. But the process of clustering with respect to joint branding of existing or new tourist products is a complicated and demanding task. The cultural, geographical, economical and other differences between the parts of this cooperation process are both the resources to create a new competitive unit (and improve the destination's own performance) as well as a series of serious challenges. A practical example of such a challenge in collaborating across the borders is that it would set the requirement for each of destinations involved in this process to have the same or at least comparable standard quality for its tourist products or tourist facilities.

One of many possible overviews of these challenges or barriers to cross-border cooperation is provided by Cankar et al. (2014), which identified the following *barriers* to clustering across borders:

- Complex administrative and funding systems;
- Legislation, that is not harmonized or too different in border areas;
- Frequent changing of the rules of business;
- Unstable political situations;
- Unfavorable historical events;
- Corruption, and security problems;
- Poor infrastructure;
- Quality of the banking systems;
- Differences in culture that hinder intercultural communication;
- Language barriers;
- Barriers that are rooted in historical or political differences;
- Lack of local, regional, national government assistance;
- Lack of assistance from business associations;

- Poor purchasing power of nearby markets on the other side of the border;
- Poor quality and productivity of local firms;
- Product differentiation of local economy;
- Unfavorable geographical conditions in border regions.

Another classification of the typical barriers to improving competitiveness of a frontier destination through cross-border cooperation can be found in Practical guide to cross-border cooperation by Association of European Border Regions (AEBR, 2000):

- Gaps in knowledge and information about how a tourist destination can become the cross-border platform for creating and offering tourism products;
- Misunderstanding, lack of communication and conflicts between the stakeholders across borders as well as the conflict of tourism as an industry with other activities;
- Shortage in cross-border expertise, existing networks and experience in collaborating on tourism between stakeholders across the borders;
- Gaps in accessibility, transport and economic infrastructure that is required by tourism;
- Not enough expertise and knowledge that are required to supply quality products and services in tourism across borders;
- Insufficient knowledge of markets, tourism products and knowledge of how to market and communicate destination to target markets;
- The fear that there exists a serious threat of competition from the neighboring destination, which means that cooperation, will result in worsening current conditions.

Cross-border regions often share the same historical and cultural traditions and attractive natural landscapes, such is the case of the Republic of Moldova and Romania. In both cases, cross-border regions can benefit from cooperation – cooperation can help create greater diversity and differentiation of the range of tourism and environmental products; create economies of scale and make promotion more effective, and can help better address specific problems or issues for tourism development – such as finding solutions to the problem of seasonality, improving sustainability of employment in tourism in the cross- border region, and increasing tourism opportunities outside the traditional periods as the range of products increase.

Main types of *action* in border regions to promote tourism development relate to the following:

- Cooperation at the strategic level to jointly plan the development of the tourism products and services offered by the region, markets and marketing and the integration of cross-border tourism development into other aspects of policy – particularly, transport infrastructure and services, environment, and human resources development. Joint work on strategies' development begins from co- operation on a range of preparatory actions including audits of tourism resources (natural attractions, infrastructure, services), identification of strengths, weaknesses, opportunities and threats (SWOT), scoping, sectoral studies, and market studies etc. and identification of common priorities and

objectives (e.g. addressing seasonality aspects) and opportunities for cooperation in action;

- Cooperation in specific project and action areas involving the wide range of institutions and operators in the tourism sector – including regional tourism promotion agencies, local authorities, tourism operators, transport companies, businesses and local communities. The range of actions undertaken at this level include: cooperation in external promotion of the cross-border destination (e.g. by the regional tourism organizations), developing networks of cycleways, walkways, routes, sign-posting, mapping of tourism routes and places of interests; creating joint tourism information systems on amenities, accommodation, transport connections etc.; joint development, designation and management of common resources such as national parks, beaches, coastlines, lakes etc.; joint marketing and creation of cross-border networks of tourism providers (accommodation, services); joint training in skills required by the tourism industry including foreign language skills; and business support services for tourism businesses.

4. Conclusion

Tourism can act as a catalyst for structural adjustment and development of cross-border regions and can contribute to development across a variety of fields including labor market (new skills and alternative employment), infrastructure and facilities (roads, transport, accommodation and leisure facilities) and investment and new business location.

Cross-border tourism development strategies must be based on the concept of sustainable development and awareness of potential weaknesses associated with the negative effects of tourism (on the environment, agriculture, local communities, etc.). Environmental aspects must be integrated into the decision-making and management of tourism projects.

Successful tourism development in the cross-border regions requires cooperation at strategic level (planning products, markets, etc.) and at the level of practical action/projects involving a wide range of interests (public, private, community).

The existing strong competition between the border areas needs to be replaced with the idea that a cross-border region can jointly offer a unique product or range of products.

Successful cross-border tourism development strategies relate to creating a diversity of products and services to attract and retain tourists in the first instance and for longer periods.

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The Impact of Foreign Direct Investment on the Economy of Republic of Moldova

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Abstract

This study examines the implications of the FDI on economy of the Republic of Moldova. Using a data approach, the results show that global financial and economic crisis of 2008-2009 has strongly influenced the dynamics of FDI. Our results also demonstrate that Moldova needs to take cardinal measures to overcome the crisis phenomenon and to direct its economy on ascending development trajectory.

Keywords: Republic of Moldova, capital flow, foreign direct investment, strategy of investment attraction, balance of payments.

1. Introduction

A significant role in the globalization and internationalization of international economic relations is due to the increasing international capital flow. The intensification of capital movements between countries and regions of the world is caused by the increase of FDI, which leads to the acceleration of social and economic development of all countries. In most cases, high-rating countries targeting foreign direct investment have high economic growth indicators. FDI is presented not only as additional financial source, but also as an acceleration factor for speeding technical and economic progress, gaining access to cutting-edge technologies and techniques and advanced industrial management methods which predetermines the competitive positions of countries in global and regional markets.

Under the conditions of modern economy, the process of capital movement is subject to positive and negative changes. The financial and economic crisis from 2008-2009 significantly changed the FDI dynamics and flow. According to UNCTAD data, the inflow of FDI in the CIS countries, including the Republic of Moldova, between 2013 and 2015 fell from 62 billion USD to 30 billion USD in conditions of low prices for raw materials, the diminishing domestic market, the direct and indirect influence of the limitation measures, geopolitical tension, changes in the legislation [1].

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2. Literature Review

The theme of FDI is the subject of fundamental research of Moldovan scientists and businessmen. One of the monographs of the author N.Ciornîi, an active representative of the business, doctor in Economics, carried out profound research on FDI in the conditions of the Moldovan transition economy to the market economy and presented the investment processes between 1995-2000 [2]. The similar period was investigated by Gorobievski Sv., Gribincea A., emphasizing the reinvestment of revenues in the national economy for the refurbishment and modernization of enterprises [3, p.138].

Author Roşca P. notes in his analysis the practical aspects of international capital flows, that efficient use of FDI is the key for a successful function of national economies [4,p.94].

Further research by Doltu C. confirmed the dynamic increase in FDI from 142.9 million USD in 2000 to 512.0 million USD in 2007, including equity investments from 83.6 million USD to 266.0 million USD, and reinvested revenues from 11.7 million USD in 2000 to 190 million USD in 2007 [5, p. 119].

The dynamic increase of the FDI, the qualitative changes in the investment process have increased the efficiency of the Republic of Moldova's opportunities in improving the investment climate, bringing it in line with the market requirements, by studying the local conditions of the investment particularities, by the theoretical and practical trends and strategies for connecting to the European requirements and worldwide.

As a result of the scientific researches is published the manual "The Basics of Investment Activity", by Hâncu R., Suhovici A., Luchian I., which serves as methodological basis for new theoretical elaborations regarding the investment activity [6, p.6].

Subsequent FDI research during 2006-2010 was investigated by Gribincea A., noting the decrease in investments in 2009 from 711.46 million USD in 2008 to 145.33 million USD in 2009, or about 5 times [7, p.255].

In the subsequent research, Gribincea A. and Carbune N. carried out an analysis of the investment activity in Moldova during 2004-2011 [8, p.302].

3. The legislative and economic aspects of the organization and development process of FDI in Moldova

Legislative and economic aspects of the organization and development process of FDI in Moldova resulted in the emergence of the Law no. 81 from 18.03.2004 regarding investments in entrepreneurial activity, published: 23.04.2004 in the Official Gazette of the Republic of Moldova, no. 64-66, no. 344 [9]. In this law, art. 3, a series of notions are formulated, where *investment* is defined as the totality of the assets deposited in the entrepreneurial activity on the territory of the Republic of Moldova, including on the basis of the financial leasing contract, as well as within the public-private partnership, in order to obtain income; Capital expenditure - expenses incurred by the investor in

connection with the purchase and / or improvement of long-term assets that are not attributable to the results of the current period but are to be capitalized (attributable to the increase in the value of long-term assets); Foreign investment - an investment made by a foreign investor in the entrepreneurial activity carried out in the Republic of Moldova, including the income from its investment and what is reinvested in the Republic of Moldova; Investment activity - an investment activity and an entrepreneurial activity in connection with same investment in order to obtain income.

In subsequent articles of the law are formulated main forms of investment, principles of protection measures, the order of adjustment of disputes, status of foreign investors, bonds of state power in investment activity.

In order to create favorable conditions for the attraction of FDI to the Moldovan economy, the Government has strengthened the Decision no. 1288 of 09.11.2006 regarding the approval of the Strategy for attracting investments and exports promotion for 2006-2015, published: 24.11.2006 in the Official Gazette nr. 181-183, art. no. 1391 [10].

The main tasks of the Strategy are to increase the investment flow in the national economy (mainly FDI), to modernize and restructure them, to create new competitive, efficient export-oriented production sectors, to reduce the regional structure gaps and to ensure the positive balance of payments. Expanding exports and producing commodities based on investments must be a priority of attracting and applying FDI. The Strategy was planned in two stages. The first stage - the elaboration of the strategic directions for 2006-2010 was determined by the measures of the modern policy of attracting investments, proving them in infrastructure, promoting the management of public property, developing the financial market and stimulating investments; Development of free economic zones and industrial parks. The second phase - the strategic direction for 2010-2015 determines measures to enhance the role of the capital market as an accumulation mechanism and the distribution of accumulations. The results of the Strategy were targeted to the following indicators:

- improve country rating (Moody's, Fitch, S & P);
- investment rules in the economy (share of investments in fixed capital, GDP) 25-30%;
- increase of the volume of investments in fixed capital annually - 8-15%;
- increase in the volume of FDI - no less than 10% year;
- increase of industrial production year - 10-12%;
- accelerate the growth rate of the volume of goods and services exports by 10-15% year.

In the implementation of the Strategy, a special role is reserved for the civil police, which has to operate under the control / supervision of the society and to participate actively in the monitoring process, including the preparation and dissemination of independent information, to include in the political dialogue with the Government and to impose Responding to the effectiveness of the Strategy, fighting for effective policies, sharing responsibility for making specific proposals from society. The main instrument of dynamic and structural FDI analysis is the Balance of Payments and the International

Investment Position of Moldova [11]. The main FDI data are presented in this analysis by 2015 (inclusive). Referring to data for 2016, the NBM only published preliminary data of the Balance of Payments [12]. The main FDI indicators for Moldova are shown in tab. 1.

Table 1. Main FDI indicators in the national economy 2010-2015 (millions USD)

No.	Indicators	Year					
		2010	2011	2012	2013	2014	2015
	A	1	2	3	4	5	6
1.	FDI	2964.45	3261.06	3466.67	3620.97	3613.78	3466.07
2.	Social capital	182.42	1991.79	2140.03	2202.48	2191.08	1957.38
2.1.	Banks	238.28	261.83	247.17	253.08	153.65	202.27
2.2.	Other sectors	1587.14	1729.96	1892.86	1949.40	1937.43	1755.11
3	Reinvested Revenue and Unpaid Profit (+) Losses	349.15	428.88	417.85	437.05	470.12	593.17
3.1.	Banks	46.03	49.93	55.19	64.00	59.54	82.66
3.2.	Other sectors	303.12	378.93	362.66	378.05	410.58	510.51
4.	Other capital (other sectors)	789.88	840.41	908.79	981.44	952.58	915.52
4.1.	Claims against foreign investors	-9.84	-23.05	-32.85	-45.59	-38.66	-27.54
4.2.	Commitments to foreign investors	799.72	863.46	941.64	10627.03	991.24	943.06

Source: Balanța de Plăți și Poziția Investițională a Republicii Moldova, 2016.
www.statistica.md

Data from Table 1 confirms that FDI volume accumulated in the national economy in 2010-2015 increased from 2964.45 million USD to 3466.07 million USD, including:

- the capital share - from 1825.42 million USD to 1997.38 million USD;
- new reinvested earnings and unpaid profit from 349.15 million USD to 593.17 million USD;
- other types of capital - from 789.88 million USD to 915.52 million USD.

Similar changes occurred during this period including in the structure of FDI.

The data are presented in Table 2.

Table 2. Structure of FDI in the national economy 2010-2015, (%)

No.	Indicators	Year					
		2010	2011	2012	2013	2014	2015
	A	1	2	3	4	5	6
1.	FDI	100	100	100	100	100	100
2.	Social capital	61.58	61.08	61.73	60.83	60.63	56.47
3.	Reinvested Income and Unrealized Profit (Loss)	11.78	13.15	12.05	12.07	13.00	17.11
4.	Other capital,%	26.64	25.77	26.22	27.10	26.37	26.42

Source: elaborated by authors, adapted after data from table 1

Within the FDI structure, the share of equity capital fell to 61.58% in 2010 to 56.47% in 2015, the share of reinvested earnings and non-distributed profit (losses) increased from 11.78% to 17.11%, the share of other types of capital during the same period remained intact at 26.40%.

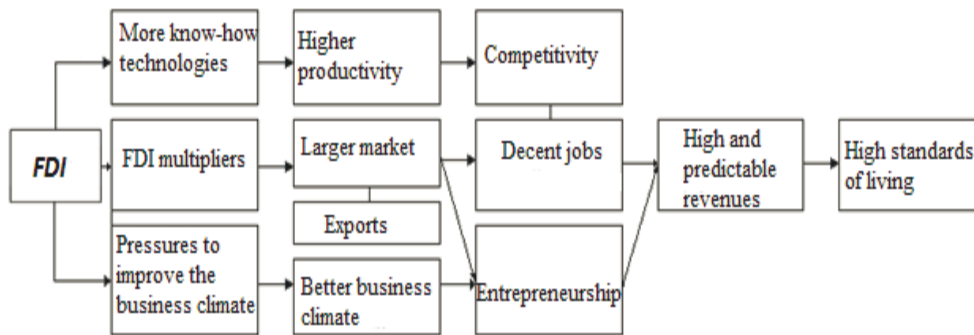
Table 3. FDI dynamics in the national economy, 2010-2015 (mil. USD, %)

No.	Indicators (annual variations)	Year					
		2010	2011	2012	2013	2014	2015
	A	1	2	3	4	5	6
1.	FDI, mil. USD	191.52	296.61	205.61	154.30	-7.19	-147.71
1.1	In % compared to the previous year	6.90	10.00	6.30	4.45	-0.20	-4.09
2.	Social capital	159.33	166.37	148.24	62.45	-11.40	-233.70
2.1.	In % compared to the previous year	9.56	9.11	7.44	2.92	-0.52	-10.67
3	Reinvested Revenue and Unpaid Profit (+) Losses	11.53	79.71	-11.01	19.20	33.07	123.05
3.1.	In % compared to the previous year	4.35	22.83	-2.57	4.59	7.57	26.17
4.	Other capital (other sectors)	17.64	50.53	68.38	72.65	-28.86	-37.06
4.1.	In % compared to the previous year	-2.28	6.40	8.14	7.99	-2.34	-3.89

Source: elaborated by authors, adapted after data from table 1

The example of the countries of Central and Eastern Europe that have more successfully passed the transition phase, even if they have more domestic financial resources and more developed engineering traditions than Moldova, nevertheless rely on foreign investments to achieve a growth and rapid economic modernization. Success in attracting FDI to the initial stages may even generate further FDI, expand access to foreign markets and support growth in exports (Figure 1). FDI also provides access to more technologies and know-how, resulting in a general increase in productivity in the economy. Equally, after overcoming a critical mass, the mere presence of FDI in more developed countries could (not always) contribute to improving the business climate by promoting more advanced business culture elements and more open private-public dialogue. This will lead to more decent jobs and more developed entrepreneurship, especially when SMEs become part of the FDI technology chains. Combining these effects leads to a greater and more stable income, including in terms of raising the standard of living of citizens.

Figure 1. Impact of FDI on the export's volume and living standards of the population



Source: Strategia Națională de Atragere a Investițiilor pentru Dezvoltarea Exporturilor www.particip.gov.md/public/documente/130/ro_2552_Strategia-de-atragere-a-investitiilor-pentru-dezvoltarea-exporturilor-2.0pentru-consultare-16-sept-2015.pdf

The dynamic analysis revealed the following: in total, FDI has diminished significantly with capital inflow of 11.40 million USD in 2014 and 233.70 million USD in 2015. At the same time, there is a substantial increase in reinvested earnings (123.05 million USD in 2015). It is necessary to make an analysis of the banking and real sector. The cumulative data on the banking sector are shown in the Table 4.

Table 4. Dynamics of FDI in the banking sector of the Republic of Moldova in 2010-2015 (million USD, %)

No.	Indicators	2010	2011	2012	2013	2014	2015
	A	1	2	3	4	5	6
1	FDI in the banking sector	284.31	311.76	296.27	317.08	313.19	284.99
1.1.	Annual variations, million USD	11.72	27.45	-15.49	20.81	-3.89	-28.26
1.2.	In % compared to the previous year	9.30	9.65	-4.97	7.02	-1.23	-9.02
2.	Social capital	238.28	261.83	241.17	253.08	253.65	202.27
2.1.	Annual variations, million USD	36.38	23.55	-20.66	11.91	0.57	-51.38
2.2.	In % compared to the previous year	18.02	9.88	-7.89	4.94	0.22	-20.25
3.	Reinvested revenue and unpaid profit (+) losses	46.03	49.93	55.10	64.09	59.59	82.66
3.1.	Annual variations, million USD	-24.66	3.90	5.17	8.90	-4.46	23.12
3.2.	In % compared to the previous year	-34.88	8.47	10.35	16.15	-6.97	38.83

Source: elaborated by authors, adapted after data from table 1

Data analysis in Table 4 reflects relatively stable FDI flows in the banking sector of the Republic of Moldova. The annual report may vary within $\pm 10\%$ that is acceptable for the FDI flow. An important role in stabilizing the activity of the banking sector in Moldova is played by the European Bank for Reconstruction and Development (EBRD). It is the largest institutional investor in the Republic of Moldova that aims to improve transparency and corporate governance in order to facilitate access to credit and investment resources for small and medium enterprises and to improve product quality and service standards [13]. The European Investment Fund concluded a series of partnership agreements with private banks as part of the Moldova InnovFin program for small and medium enterprises, implemented with the financial support of the European Union and aimed at promoting the innovation potential of the country [14]. International cooperation in the near future will stabilize investment flows in the banking sector of the Republic of Moldova. Within the structure of the real sector, FDI of the national economy represent 90-92%. Basic sector data are presented in Table 5.

Table 5. Dynamics of FDI in the real sector (SR) of Moldova's national economy for 2010-2015 (million USD)

No.	Indicators	2010	2011	2012	2013	2014	2015
	A	1	2	3	4	5	6
1	FDI in the SR sector	2680,4	2949,30	3164,31	3303,88	3300,59	3181,14
1.1.	Annual variations, million USD	179,80	269,16	2151	13958	-3,30	-119,45
1.2.	In % compared to the previous year	7,19	10,04	7,29	4,41	-0,10	-3,62
2.	Social capital	1587,14	1729,96	1892,86	1919,40	1973,49	1755,11
2.1.	Annual variations, million USD	122,95	142,82	162,90	56,54	-11,97	-182,32
2.2.	In % compared to the previous year	8,40	9,00	9,42	2,99	-0,61	-9,41
3.	Reinvested Revenue and Unpaid Profit (+) Losses	303,12	378,93	362,66	373,05	410,58	510,51
3.1.	Annual variations, mil USD	39,21	75,81	-16,22	10,39	37,53	99,93
3.2.	In % compared to the previous year	14,86	25,00	-4,29	2,86	10,06	24,34
4.	Another capital	789,88	840,41	908,79	981,44	952,58	985,52
4.1.	Annual variations, mil USD	17,64	50,53	68,38	72,65	-28,86	-37,06
	In % compared to the previous year	2,28	6,40	8,14	8,00	-2,54	-3,89

Source: elaborated by authors, adapted after data from table 1

The analysis of data from Table 5 confirms that in the real sector of the economy the most dramatic changes were noted in the years 2014-2015. During this period, the capital share was reduced by 200 million USD and by 66 million USD the other capital. Due to reinvested earnings, which grew in the period 2014-2015 by 137 million USD, the total decrease in the real sector recorded about 123 million USD.

To improve the situation may serve the program of cooperation between the Moldovan Government and the World Bank within the Strategic partnership for 2014-2017 which provides structural reforms in the investment climate and facilitating access to investment funds [15].

3. Conclusions

The author's view concerning the national governing bodies, that they should establish the priority sectors for attracting FDI, to organize the elaboration of the individual projects, the so-called *investment products*, the formation on their basis of the national market of these products for the investors' offer and their promotion on foreign investment markets.

For the efficient activity in this direction it is proposed the formation of groups by national expert branches for the systemic and objective estimation of each investment project and its social and economic necessity.

Only in such treatment and in the full extend will be reflected the benefits of FDI in the creation of new jobs, mainly in *Greenfield investments*, the development of new industries and branches, the acquisition of new technologies and stimulation of human capital and skills for the new economy.

Besides creating a favorable investment climate in the country, it is necessary to fight corruption, bureaucracy and fraud, which along with other harmful factors alter the image of Moldova, hindering access to foreign investments, demoralizing total society and creating a greater social danger.

One of the major elements on the agenda in the realization of the investment policy of the Republic of Moldova, according to the authors, is the simplification of the investment procedures, which include for investors the transparency of the operative information, the increase of the efficiency and effectiveness of the administrative decisions of the public bodies, the political environment through consultations, exchange of views and negotiations.

Resulting efforts to simplify investment procedures should become indispensable to Moldova's overall investment policy, including regulation, liberalization, protection, incentives and the drive to maximize investment benefits and minimize negative impacts or external factors.

The primary goal of investment policy is to achieve a maximum impact, the investments to serve the interests of sustainable development, using their benefits and minimizing adverse consequences. National decision-makers must find the optimal combination of applied instruments and policies, the balance between liberalization and regulation of investment processes for the sustainable development of the national economy.

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Professional Balance and it's Psychological Valences

Mariana ZUBENSCHI¹

Abstract

The harmony in the workplace of psycho-emotional stability, presents a revolutionary assurance of balance theory, launched in 1958, by the notorious scholar in cognitive psychology Fritz Heider, who studied at the Institute of Psychology in Berlin, with Kohler, Wertheimer and Lewin. Heider researched the environmental factors and their perception by different objects. The balance theory demonstrates a broad applicability in socio-psychology as it addresses either classical research, or attribution, or exploration of new attributive ideas and extensions: such as implicit causality of the verb in communication. Also, the balance theory provides apprehensions about the mechanism of causal reasoning that underlies at the retrospective base of prejudice, also about the justification of personal actions by attributing relational models, and the attribution of errors and successes in the contexts of organizational psychology. The balance theory in professional field, assumes the phrase of an adequate mental state in carrying out the professional activity. Therefore, an increasing number of employed people, became concerned about the ability to achieve the balance between the professional and the personal sphere, which was called "the Graal of the job" by Buckner and Sandholz in 2003. This article, comes with the novelty, in discussing the relations of psychosocial components on professional balance.

Key words: the balance theory, the socio-cognitive model, the professional imbalance.

1. Introduction

The explanatory dictionary of the Romanian language defines balance as a situation of a body that do not change its state of movement or rest when forces prompt on it „or state of tranquility, harmony and stability of the soul (<http://www.dex.ro/echilibru>).

In the organizational psychology, the theory of equilibrium was found in explaining the perceptions phenomenon of person matching in the organizational environment, its role, by justifying the organizational change phases, resilience and adaptation of human resources to the phenomenon of change, the emotional particularities preconception in professional environments, assessing dynamics and development in working environments, explaining the tensions, cohesion and internal and external effects of working groups, clarifying the positive effects of maintaining the organizational climate and effective communication, legitimating the ways of managing and addressing to the organizational problems, exploring the human resources from the perspective of the pretentious finalities, evaluation of the typological model of

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psychological contracts (Lazarus, Folkman, 1984; Kersten, Mamassian, Yuille, 2004; K rding, Beierholm, Quartz, Tenenbaum, Shams, 2007).

For example, the long-term psychological contracts: are balanced and relationate, in the Herzberg research, which is explaining the motivational phenomenon at work, in the explanatory-interpretive organizational environments model of Schein's, in Super's aspects which are clarifying the essential transparency of human development in the careers as life time and life space, in elaboration by Bandura theory of social learning, in promoting the procedural aspects of career theory by Dawis and Lofquist, 2007; Brown, Brewer, 2002; Weary, Harvey and Ickes, 1992; Zelen, 1998; in elucidating the phenomenon of mobbing at the workplace Zlate and Cretu, 2002 etc.

2. The Balance Theory

Fritz Heider, a scholar of cognitive psychology, defines psycho-emotional balance by "the stability of a psycho-emotional situation, a state of mind, etc." or "a set of essential developmental processes balanced between developing subject and environment", the triggering factors of professional psycho-emotional balance distortion were elucidated by the authors and researchers of occupational stress and emotional burnout as Freudenberg 1974, Maslach 1976, Lazarus and Folkman 1984, Weiner 1986, Zlate 2002, Vasiliev 1976 and Boiko 1999.

The balance theory describes the structure of people's views about other people and objects, as well as the perceived relationship between these elements. The central notions being certain structures between individuals and objects that are balanced, while other structures are unbalanced, and that balanced structures are more preferred than unbalanced structures. In particular, the balance theory asserts those unbalanced structures, which are associated with a feeling of discomfort that negatively affects, and this negative feeling leads people to make maximum efforts to balance their structures and to avoid those unbalanced structures. Heider in 1946, offers as an example for a balanced structure, the peculiarity of both friends which prefer the same rock band, and as an example of an unbalanced structure viceversa. According to balance theory, in the first case friends feel themselves comfortable about their music tastes, while in other case they create a tension of discomfort (Insko, Worchel, Folger and Kutkus, 1975).

The elements of balance theory, are the relationship between those who perceive (P), others (O) and towards attitude (X) sometimes called the triad of equilibrium. These elements are the constituents of triad model: *balance* that represents the cognitions (thoughts) that are in accordance with persons and factors (objects) in the environment; *imbalance*: inconsistent knowledge (thoughts) of personal and environmental factors; and *person who perceives* a balance or an imbalance, namely the person who is confronted with balanced or unbalanced cognitions (Heider, 1978).

3. The Triads and Dyads of Professional Balance

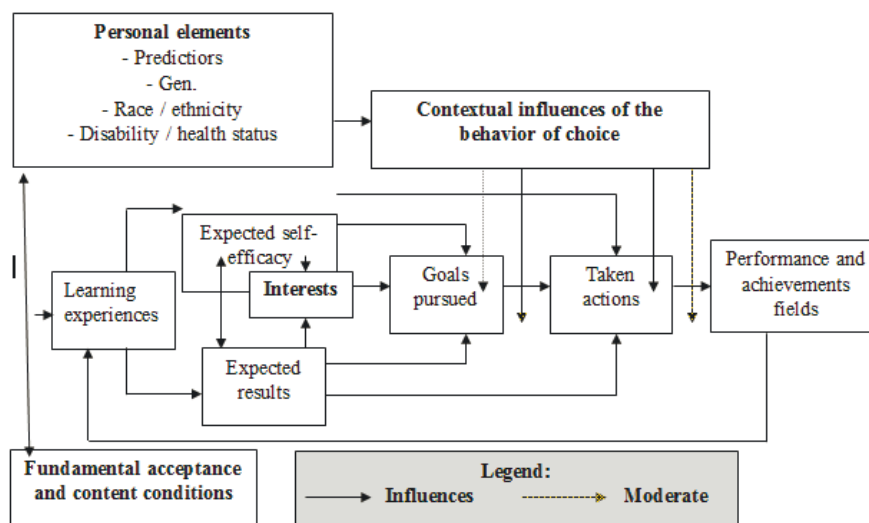
The distinction between balanced and unbalanced triads has demonstrated important implications in a variety of areas. Firstly, research has shown that the feeling of discomfort associated with unbalanced patterns influences the formation of new

attitudes. More specifically, it has been shown that the newly formed attitudes usually complement the triadic relationships in a manner such that the resulting triad is more balanced than unbalanced.

For example, if the person is informed that the colleague's work experience is productive, a positive attitude towards this professional event will be formed. However, if the work experience presents negative elements (corruption, bribery, nepotism, etc.), a negative attitude towards this phenomenon will be created as a feed-back. In balance model exchange, two trends have been demonstrated: a constant one, as the attitude towards objects, phenomena or events changes more often than the source of the message; and secondary the correction tendency, by message rejection as an evidence of unbelieving events distrust (Jaffe, Scott, 1994).

Achieving the balance in the professional sphere "is often a difficult but essential task" (Toma and Grady, 2002). Balance is a challenge of working people in the fields of human services, such as education, medicine or social work (Tack, 1991). An indispensable component of professional spheres which are offering services dedicated to humanity (social, educational, medical, etc.) are the customer or citizen, as a user and reviewer of given services. Thereby, the social professions have a particular responsibility in the "practice of what they promote", where the tendency to balance professional tasks through adequate remuneration will lead to a professional balance (Secretan, 2000). But these two components would only represent a glacier surface, because, when we discuss the phenomenon of professional balance, we can not ignore the profession as an integrated work experience in a lifetime or work schedule (figure 1).

Figure 1. The socio-cognitive model of person in the content of choice affecting factors and professional behavior



Source: Jackson Margo A, Verdino Joseph R. Vocational Psychology. In: Robert W. Rieber, Encyclopedia of the History of Psychological Theories. Springer Science and Business Media, 2012, p.1157-1176.

Indeed, professional life refers to the time spent in or outside society, in the the pursuit of professional activities context, where the professional time is regulated by the rules established by the employer, where the employee's margin of autonomy is relatively low and depends mainly by the organizational system, by the employee's business and autonomy in relation to his / her duties. This term refers to the part of human existence where the realised work at the workplace is remunerated, and overtime hours and travel to and from work may be unpaid (<http://www.blogdumoderateur.com/debat-du-mois-equilibre-vie-pro-vie-perso/>). The balance of professional component is also focused on providing information on how a person can improve their professional skills by using available resources and professional development services. In order to achieve the professional balance, the person explores the possibility of alternative work programs to see if he would allow himself to achieve professional goals while still fulfilling his responsibilities and roles. Darley and Hagenah, 1955 suggest that interests directly reflect the personality structure through the processes that intervene at the individual level of value systems, needs and motivations. Later, in a broader analysis Scahffer, Berdie, Brender, Fryer, Asch and Roe suggest that the interests represent personality needs, by the motivational and learning mechanisms.

Thus, we cannot discuss the professions without not mentioning the self-concept with reference to the professional area, as this is the internal aspect of professional integrity (figure 1), which demonstrates profound effects on the lives of individuals, due to the influence on cognition and behavior (Raskin, 1989; Gushue, Scanlan, Pantzer, Clarke, 2006). Van den Berg and David Feige in 1993 found that the levels of emotional stability marked by extroversionr, assessed in occupational employment predict how satisfaction and desire will correlate with the intention of leaving the work in folowing 1.5-2 years.

Carrying out the same activity, people have different personal feelings concerning their work requirements, satisfaction degree, perceived professional experience, or they manifest dissatisfaction about various work factors. At the same time, people with different personality traits show stable trends in their professional role. The inclusion of these individual peculiarities in a particular research will allow us to better elucidate the attainment of professional balance in motivating professional entities, and thus to reduce the number of intentions to leave the professional field, and to better manage their professional opportunities (Robitschek, Cook, 1999).

People have many professional roles, so they have many commitments. Each person has several areas of life that comprise several constituencies. The two major constructions, the role and the professional commitment, they form a commitment and a professional path, although, if there is a mutual association between them, through influences of identities. Once a person comes to identify themselves with an organization, he / she begins to become an employee of the organization, consolidating identity in a cyclical manner. In the professional life, both organizational identity and professional identity are strongly influenced by organizational and professional commitment.

Thus, Skorikov and Vondracek, in 1998, noticed that the whole work area is a prelude to the formation of self-identity. The general pattern of association between multiple engagements, multiple identities, their antecedents and their work results, we notice that the expression of professional identity depends on the decisional formula regarding professional and group commitment, all influenced by social learning, time, interaction and values, as professional components. Social interactions, such as social learning, can be ambiguously transformed, providing momentum in balancing the professional path (Buckner, Sandholtz, 2003).

Savage and Stewart, 1972, identify a negative correlation between the extroversion level and professional performance on a sample of 100 women employed as an operator at card punching machines. It is clear that those with a low degree of neurosis and high internalization are better adapted in performing monotonous professional tasks.

One of the person professional qualities which influences the forms of professional effectiveness, if not all professional peculiarities is the ability to take professional measures or actions. Undertaking, it presents an "action initiated by the personal initiative". The action to undertake, to run a project, to create a business is an individual peculiarity, which is also found in the elucidation of of career anchors types. It should be noted that scientists through action to do something, most often understand a certain type of behavior, a certain social interaction and very rarely a personal quality (Mebane and Ridley, 1988). Obviously this is due to the fact that this phenomenon is mainly described and studied by sociologists, economists and not psychologists. But afterwards began to regard the entrepreneur as a personal property.

Environmental or contextual factors define the structural opportunities in which individuals formulate and implement their professional choices. These include: distal or fundamental influences that allow learning from their experiences (such as educating environments and models of children) and proximity determinants (institutional barriers) that moderate professional behaviors. Individual perceptions of contextual factors as barriers or incentives can influence their behavior in achieving professional balance at certain points and by certain paths, factors that underpin the person's socio-cognitive theory in the context of factors affecting choice and behavior (Lent, Brown, and Hackett, 1988). Importantly it will be to mention the alternatives to look beyond professional platform or support and counseling, when nowadays are more than enough. The researchers should be focused more on investigating issues related to the profession, difficulties in assigning professional tasks, indecision, in adopting decision-making strategies, identifying the best way to make a decision, overcoming learning difficulties, and integrating a healthy lifestyle.

3. In conclusion

In depth, the balancing phenomenon given to the outer career peculiarities will alienate the promising alternatives to the most appropriate ones, and will examine the possibility of verifying them through "internalized zooms" as one of the most promising alternative for collecting additional information. The most appropriate alternative will

be to investigate the choice, based on the evaluation and comparison of the other alternatives. In terms of material structure, the content related to the profession can be seen as forming a universe that includes diverse vocational interests, needs, professional values, features and roles, skills, and professional styles. The personalized exploration phase should focus on capacities and motivational factors (Leolong and Barak, 2001).

In Joan Kofodimos book "Balancing Act", defines the balance as "a satisfactory, healthy and productive life that includes work, joy and love that integrates a number of living activities into self-concept, personal and professional development ". Indicating the fact that the balance expresses the desires, interests and values of the person.

However, due to its abstract function, the profession is inseparable from the tense of working relationship. In fact, the profession inherits the emerging contradictions that make it up, and not only create a value. According to Dewey and Eurydice, on the one hand, the profession offers individuals the possibility of self-realization, which is a major professional potential, and on the other hand inherent in the dormant contradictions of the capitalist world, which creates certain ambivalences, and produces professional burnout (Dewey, 1963; Eurydice, 2012).

The problem of professional balance is often studied in social psychology, whose research is based on socio-demographic variables (socio-economic status, family, education, gender, ethnicity, etc.). These theories imply the consequences of choices and decisions on social inequalities and professional mobility because the professional environment determines the social and personal status, income, wealth and lifestyle. The analysis of the relationships between these theories (sociological revival, epistemological constructs) and balance will determine the educational recourses.

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Innovations as a Factor for Ensuring Economic Safety

Maxim SANDU¹, Lilia ŞARGU²,
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Abstract

In modern conditions of development of the competitive environment, one of the main ways to solve economic, social and environmental problems is to use the latest achievements of science and technology. Each enterprise seeks to ensure that economic growth is intense, i.e. to be a consequence of the application of more sophisticated factors of production and technology. The prerequisite for intensive growth is the use of innovative strategy in the practical activities of enterprises. The end result of innovations is the materialization and industrial development of innovation, the idea of which can be the scientific and technical activity, and marketing research to identify unmet needs. The innovations are an effective defensive reaction of the firm to the emerging threats of losing market place, constant pressure from competitors, the challenge of new technologies, shortening the life of products, legislative restrictions and changing the market situation. In the offensive version, the innovation is a mean of exploiting new opportunities to preserve or gain a competitive advantage. In the long term aspect, the company has no choice but to pursue an innovation policy, which is the only source of lasting success. The main objective of researching the innovation activity of any organization is to ensure competitiveness in market conditions in order to identify risk factors and ways to overcome them.

Key words: Innovation policy, innovation advantage, competitiveness, economic security, innovative component, model of economy.

1. Introduction

The economic security presupposes the maintenance of the national economy at that stage of development, which ensures further economic growth and is able to counter the influence of external and internal threats. One of the criteria of economic security is the assessment of the resource potential and the opportunities for its development and the level of efficiency of the use of resources. In modern conditions, one of the main priorities that determines the strategy of economic security of the state, the achievement of the threshold values of the resource potential and the possibilities for its development,

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as well as the level of efficiency of the use of resources, is the innovative development [1]. Innovation, state policy, structural transformation, investment and innovation potential, innovation policy, lawmaking, innovative categories, economic security, the revival of the industrial and scientific and technical sphere.

The aim of the research is to analyze the safety of innovation activity as the basics, the foundation of national security, the implementation of an effective innovation strategy to achieve a state of sustainability in the economy, accelerate economic growth, move away from economic dependence in the raw materials and energy component, rather than to increase the competitiveness of goods and services offered on the world market

Degree of elaboration of the research topic. For the study of the problems of economic security has devoted their works G.G. Azgaldov, A.B. Kostin, V.Ganea, N., Percinscaia, Jan Fagerberg, Todorova L., and others.

Methods of research. To solve the set goal, the authors resorted to analytical methods, comparison, induction and deduction, forecasting, etc.

2. Results and analysis

The need for the transition of the Moldovan economy to an innovative development path is a recognized point of view among intellectual and power elite. The prospect of becoming a raw material appendage of the world economy is not very impressive for the Republic of Moldova, which is limited in minerals and other natural resources. Oil and gas remain the key items of Moldovan imports, providing the main outflow of currency from the country. This fact does not allow talking about the formed system of economic security and the possibility of gaining more significant positions in the world space. The Republic of Moldova occupies an unobtrusive position in the world markets of high-tech products. The threshold value of the country's economic security index - a share in the export of high-tech products - in the world practice is 10-15%, for technologically underdeveloped countries, the value of this indicator is within 1%. The share of the country in the total volume of world exports of high-tech goods is less than 0.2%, which is less than in countries such as the Czech Republic and Portugal [6].

The level of economic security of the state and its stable maintenance is largely determined by the effective functioning of the real sector of the national economy, the degree of its enterprises' susceptibility to innovation, and the ability to generate them. In our country, the innovative development of the economy during the period of market reform and especially in the 90s has been sharply stalled, and to date there are quite a lot of unresolved problems, which negatively affects the competitiveness of domestic products, as well as the national and economic security of the country [16].

In such conditions, ensuring national economic security is a priority task of the state, which strives to integrate fully into the world economic space. And for full integration into the world economy it is necessary that the country's economy is in a progressive phase of development, based on advanced achievements of science and technology [19]. It is for this reason that innovative activity has become today the main resource of the state, the effectiveness of its use determines the dynamics and progressiveness of the development of the national economy. The activation of the

innovative activity of the national economy, its branches and key economic entities becomes a necessary condition for the realization of the national interests of the Republic of Moldova in the system of economic security.

Table 1. Countries with the highest global innovation rating, 2016

Rating	Country	Rating	Country
1	Switzerland	21	Israel
2	Sweden	25	China
3	United Kingdom	42	Turkey
4	United States of America	43	Russian Federation
5	Finland	46	Republic of Moldova
6	Singapore	47	Croatia
7	Ireland	48	Romania
8	Denmark	
9	Netherlands	126	Togo
10	Germany	127	Guinea
11	The Republic of Korea	128	Yemen

Source: The Global Innovation Index 2016 Winning with Global Innovation.
http://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2016.pdf

According to other studies by Bloomberg-2017 (Bloomberg Innovation Index) In the battle of ideas, Sweden climbed to No.2 and Finland cracked into the top five of the 2017 Bloomberg Innovation Index, which scores economies using factors including research and development spending and the concentration of high-tech public companies.

Table 2. Bloomberg Innovation Index, 2017

Rank/ Economy	R&D intensity	Manufacturing value - added	Productivity	High-tech density	Researcher concentration	Patent activity
1.South Korea	2	1	39	2	6	2
2.Germany	8	3	32	5	14	3
3.Sweden	5	16	16	9	5	8
4.Japan	3	3	29	5	9	1
5.Switzerland	7	8	3	10	13	5
6.Singapore	17	5	5	13	7	24
7.Finland	4	18	26	23	3	7
8.United States	10	26	8	1	21	4
9.Denmark	6	22	13	21	2	10
10.France	15	39	15	4	18	11
11.Israel	1	35	35	7	1	20
12.Russia	31	27	18	8	27	15
21.China	16	15	40	3	46	6
36.Turkey	34	20	41	30	44	33

Source: The Global Innovation Index 2016 Winning with Global Innovation.
http://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2016.pdf

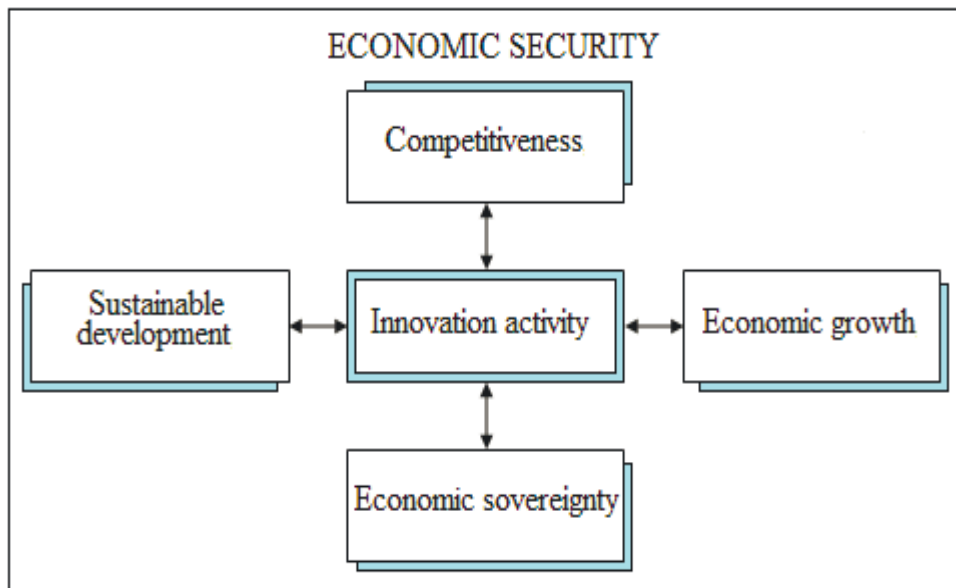
South Korea remained the big winner, topping the international charts in R&D intensity, value-added manufacturing and patent activity and with top-five rankings in high-tech density, higher education and researcher concentration. Scant progress in improving its productivity score — now No. 32 in the world — helps explain why South Korea's lead narrowed in the past year.

Innovations create conditions for accelerating the economic growth of countries at all stages of development. However, these conditions do not automatically appear, each country should define a combination of policy measures that will mobilize the innovative and creative potential existing in their economy [11].

The world leaders in the sphere of innovations are still Switzerland, Sweden, Great Britain, the USA, Finland and Singapore. In the list of 25 countries with the highest rating for the first time entered China. It became the first middle-income country to join a group of highly developed countries that invariably top the Global Innovation Index. Russia in this list is on the 43rd place, Ukraine - on the 56th, Armenia - on the 60th, Georgia - on the 64th, Belarus - on the 79th and Azerbaijan - on the 85th. Investments in innovation are an important condition for increasing the rate of economic growth in the long term perspective. The US remains one of the most innovative countries in the world [20; 21]. However, compared to other advanced countries in this area, the United States has lower educational expenditure, which affects the quality of higher and secondary special education. There are few university graduates in science and technology. For the last 20 years the Republic of Moldova has been moving towards radical economic transformations connected with the transition from a planned system of economy to a market economy, which requires the maximum openness of the national economic system - and this, in turn, means vulnerability to various internal and external threats [9]. A significant influence on the course of the economic development of the Republic of Moldova is also provided by globalization, which requires the country to reform its economy, to abandon its raw materials orientation, to fully and more effectively use intellectual potential, new technologies, and to increase innovation activity. The raw orientation of Moldovan imports fixes the status of the Republic of Moldova as commodity dependence, strengthens the country's dependence on fluctuations in energy prices on the world market, and makes it weak and vulnerable during periods of economic crises. The main task of the Republic of Moldova at the present stage is to create conditions for priority development of innovative high-tech industries, stimulating the export of goods with a high share of added value [12]. It is the innovative component of most economic processes that will allow the Republic of Moldova to integrate into the world economic space in the future. Innovation and innovation activity can be considered as one of the most important factors that can have a significant impact on ensuring national economic security in the context of globalization. A full use of innovations for national development is possible only if a purposeful innovation policy is implemented at the state level. This task is especially relevant for the Republic of Moldova, which has a significant innovative potential, which is clearly not used [13]. The main core of the innovation policy of the state should be a competent and effective innovation strategy, which in the Republic of Moldova is only

in the process of development. The key goal of any innovation strategy is to achieve a state in which the country's economy will have technical and technological independence and technical and technological invulnerability. Therefore, one of the main directions for ensuring the security of the economy of Moldova is the achievement and maintenance of the effective functioning of the innovative sphere of the economy, on the basis of which the implementation of the entire set of national economic interests of the country largely depends. The safety of innovation is the basics, the foundation of national security, since the implementation of an effective innovation strategy allows us to achieve a state of stability in the economy, accelerate economic growth, move away from the resource component of the economy, rather than increase the competitiveness of goods and services offered on the world market (Figure 1).

Figure 1. The role of the innovation factor in the system of economic security



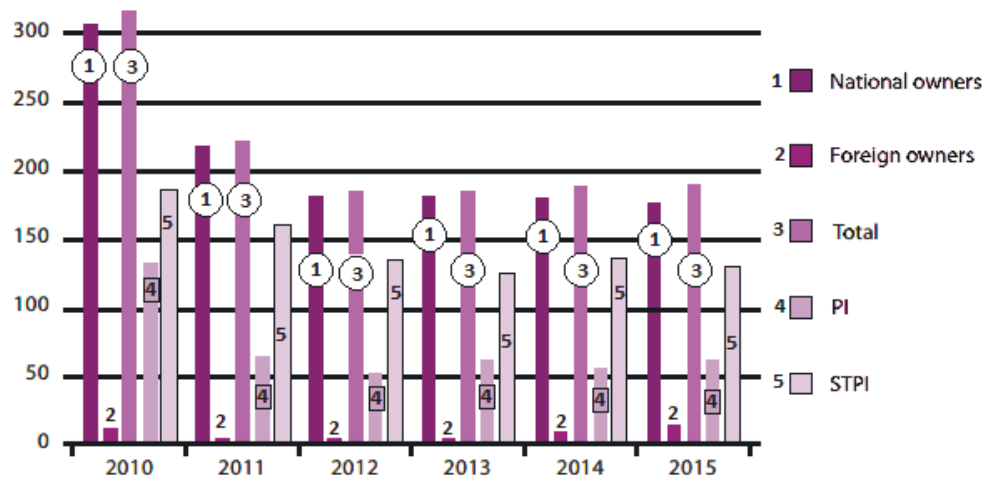
Source: Descoperiri și inovații ale savanților moldoveni.
<http://asm.md/?go=descoperiri>

To integrate the national economy into the world economic system, it is necessary to increase its innovation, which, in turn, will strengthen the competitive positions of domestic goods and services in the world market, and, as a result, the country's economic security system will strengthen [4]. For this, the main thing is the transition of the Moldovan economy from the raw material orientation to the innovative economy through the implementation of the following measures:

- overcoming the phenomena of criminalization and corruption in the national economy;
- formation of a favorable business environment and business climate;
- investment support from the state of innovative development;
- formation and development of a favorable innovation environment;
- stimulating innovation activities of enterprises;

- formation of conditions for a successful transfer of technology both from foreign countries to the Republic of Moldova, and vice versa;
- improvement of infrastructure [15], legislation, promotion of innovative projects (by the type of the Laboratory for Innovation in Moldova (MiLab)).

Figure. 2. Issued patents for invention, R. Moldova, AGEPI, 2015



Source: Laboratorul de Inovații Soc din Moldova (MiLab).

http://www.md.undp.org/content/moldova/ro/home/operations/projects/effective_governance/moldova-social-innovation-hub.html

During the reference period, AIP (Moldova) yielded 189 titles of protection for the invention (61 patents and 128 short duration patents). The absolute majority of them were released to national owners - 176 (94%), of which 64 (37%) were issued to individuals and 112 (63%) - legal persons. The dynamic release of patents in the past 6 years is reflected in Figure 2.

According to the authors, the impact of negative processes in the national economy of the Republic of Moldova on economic security is manifested in the emergence of a whole range of threats in the innovation sphere [5; 7]:

- the severance of economic ties between enterprises, shops and industries that make up single technological chains;
- the isolation of the sphere of scientific research and development from the real sector of the economy, and as a result, the crisis state of branch science;
- the imbalance of the national innovation system, the lack of mechanisms for the interconnection between its individual elements;
- a sharp reduction in the sphere of interaction of financial capital with industrial capital, the outflow of capital from the real sector to less risky industries with shorter payback periods at home and abroad;
- structural deformation of industry, different degree of readiness of industries and industries to operate in a market economy, taking into

- account the available scientific, technical and human resources and competitiveness of products, works and services;
- curtailing of high-tech industries and stopping the production of progressive products;
 - low competitiveness of domestic goods both in the world and national markets, which leads to: a) the dependence of the Moldovan economy on imports and the conjuncture of the world market; B) the need to improve the technical and technological level of production;
 - A raw material model of the export specialization of the Republic of Moldova, which offers raw materials in exchange for finished products - and this leads to financing of the economic growth of foreign countries, the exchange of resource rents for the intellectual, depending on the market conditions for energy resources;
 - a significant increase in the profitability gap between export-oriented industries and industries operating on the domestic market.

The above list of threats in the innovation sphere can be supplemented by the fact that the educational and scientific spheres in the Republic of Moldova practically lost their former positions, and this led to the brain drain, the curtailment of applied and fundamental developments, and the closure of a number of scientific institutions in the country. In addition, the Republic of Moldova has a high degree of development of the shadow economy associated with phenomena of corruption and criminalization, which undoubtedly constitutes an obstacle to the development of innovative industries and industries in the country. All this is because of the nihilism of state authorities and the lack of faith in the future of the Republic of Moldova makes it virtually impossible for the population to make rapid economic breakthrough of the country, its inclusion in the world system of economic relations [8]. Proposals for the transfer of the economy of the Republic of Moldova to an innovative development path are a subject of wide discussion in the scientific literature. Some experts are generally pessimistic about the new concept of socio-economic development of the Republic of Moldova. The authors believe that many points and provisions of innovation policy are not clear and allow us to state the following facts [11; 12]: First, in terms of spending on the social sphere, the budget of the Republic of Moldova will significantly approach world standards. Nevertheless, the level of state funding for the reproduction of human potential and socio-economic development planned for 2020 remains below the level of developed countries. Secondly, long overdue measures to create internal mechanisms for lending to economic growth have been postponed beyond the current decade. Thirdly, the Government continues its policy of further outstripping the growth of tariffs for gas and electricity. Fourth, the strategy does not intend to remove tax barriers that prevent the transition to an innovative development path. Fifth, the measures in the sphere of production and consumption of new equipment are not combined. The trajectory of the development of promising high-tech industries is formed under the influence of lobbyists of foreign competitors, as a result of which the scientific and technical potential created earlier in

the sectors is depreciating, and its most qualitative components are absorbed by foreign competitors [13].

All of the above allows us to talk about the imperfection of the socio-economic development of the Republic of Moldova for the near future in terms of the innovative component of economic growth and development. So, the strategic goal of development of innovative activity and formation of innovative economy in our country for the next few years can be called integrated development of domestic industries and territories to the level of their competitiveness in the world. And this requires carrying out structural modernization of the country's economy, technical and technological re-equipment of industries, combating shadow economy, criminalization and corruption, developing new legislation in the sphere of economic and innovation activity.

The main resource for all technological and modernization transformations in the innovative and economic spheres of the Republic of Moldova should be not the fuel and energy sector of the country, but the scientific and educational sphere. It is the integration of government, administration, education and science in the very near future that can accelerate the restoration of innovative production practically throughout the country. At the same time, attention should be paid to the deconcentration of scientific and educational activities, rather than its concentration, as the state authorities are doing now.

3. Conclusion

Today, the main source of economic growth is the innovation introduced into production. In this regard, the ability to generate them, as well as to translate new knowledge into technologies and products, determines the course of the accelerated development of the national economy.

The complexity of the problem is the need to understand the state, first of all governing bodies, that only new technologies have a dominant role for a stable, sustainable and progressive development of the country and the world at large. In this regard, it is important not only the formation, but also the implementation of an appropriate innovation policy in the country, aimed at improving the level of economic security. Based on the research conducted in the thesis, the conceptual foundations of the innovative component of Russia's economic security were developed and the following main results were obtained:

An innovative component of economic security has been singled out, a definition of this category has been developed, internal and external threats have been revealed, a system of interrelated criteria and indicators has been put forward and justified, which should be guided in terms of strengthening the innovative component of economic security.

The place of innovative security in the system of economic security of the country is revealed, the statistical material shows the influence of innovations on the state of national and economic security of the country in the internal and external economic sphere.

The state of the innovative component of the economic security of the Republic of Moldova and its regions has been revealed from the standpoint of the realization of national interests and a list of key problems that do not allow to effectively neutralize threats, both real and potential, is maintained, thereby maintaining the corresponding level of economic security of the country.

Priorities of innovation policy have been determined from the point of view of options for economic modernization, in terms of the directions of development of science and technology, from the standpoint of the branch structure of the national economy; as well as in terms of targeted programs.

Prospective directions of the state regulation aimed at activization of innovative processes in the domestic economy, connected with educational and cluster development, are grounded. In this regard, the following provisions can serve as proposals aimed at improving the level of economic security in Russia.

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Sub-Regional Cooperation of the Republic of Moldova on the South-East European Dimension

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Abstract

Formation of the country image on the world arena can be analyzed from the perspective of sub-regional cooperation. In this respect, we emphasize that Moldova has joined a number of initiatives, programs and organizations which, by their status and the range of the promoted objectives, became "antechamber" to the European Union. Fixing the borders of the sub-regional cooperation area, we note that in the Central Europe Moldova attends the Central European Initiative, while in the South-East Europe are carried out activities in the South-East European Cooperation Process and the Organization for the Black Sea Economic Cooperation and assists in the Organization for Democracy and Economic Development GUAM.

Key words: Republic of Moldova, regional cooperation, European process, European integration, advantages,

1. Introduction

To highlight the benefits of the collaboration of the Republic of Moldova with the European programs and structures, we consider sub-regional cooperation as a part of multilateral diplomacy manifested through increased political, security, economic and commercial relationships. In the process of sub regional cooperation it is maintained an on-going dialogue with Member States, inclusively through secretariats, ensuring attendance at meetings of experts and working groups [1]. We should note that sub-regional cooperation is a complementary dimension to the European Integration agenda and represents the synergy of the relations and interactions of sub-regional organizations and initiatives. To complement these ideas, V. Gheorghiu stated that regional cooperation at European level has the EU integration as an ultimate objective. Being driven by this purpose, Moldova is working hard to be present in all centers of European cooperation at regional level [2]. In the same context I. Jinga and A. Popescu analyze the importance of sub-regional integration organizations, mentioning that they have been formed and developed mainly after 1990, and their objective is represented by the creation and strengthen of the political and economic cooperation by unifying the continent and the sustainable development of European states [3, p.133].

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2. Main part

Particularly, when referring to the entities surrounding the Black Sea, S. Cinca stresses that the collapse of communism and of the Soviet Union opened a new period of cooperation. As a consequence, the emergence of new states and the strengthening of democratic societies determined the region to become one of the most dynamic, and the cooperation with NATO like partners but not as adversaries had granted this territory the decisive role in security promotion and strengthen [4, p.5]. By counter-balance, N. Popescu explains the increased interest in this area by "South-East Europe remains the main source of instability in the European area, being the only region where classical security problems with military aspects are very actual, which is no longer valid in the other parts of the continent "[5, p.5]. Analyzing the relationship with external partners, we find out that the first sub-regional contacts after the Declaration of Independence were established with the countries of the Black Sea basin. V. Gheorghiu emphasizes that Moldova is one of those states which founded the BSEC still in 1992 [6, p.8]. The interest of international public opinion for the BSEC is in an overwhelmingly positive dynamics, being explained by population intensity in the sub-region, which is seen like a genuine consumer and promoter of the ideas and values of sub-regional development from the international point of view. Due to the geopolitical dimensions of the content, we identify BSEC as one of the most extensive area of sub regional cooperation in the world. The above reasons are the basis of the interest shown by the Republic of Moldova in promoting the Black Sea economic cooperation, emphasis being placed on the participation in multilateral projects, insurance in exporting economic agents' products onto the markets of member countries, support in importing raw materials and energy sources and, not ultimately, encouragement of foreign capital investment into the national economy. We should note that all reflected actions are part of the governmental programs and indicate the particular attitude of political parties towards this organization. In this context, we emphasize that in the statutory documents of BSEC such as "Declaration on Black Sea Economic Cooperation" and "Bosphorus Statement" adopted on 25 June, 1992, the acceleration of socio-economic development of Member States for integration perspective into the European Union by intensifying multilateral cooperation is indicated among the main objectives. The benefits arising from the geographical proximity ensure the strategic partnership for both regional and continental cooperation and are a priority of Moldova's foreign policy. [7] We emphasize that a great importance is also assigned to the efforts of the BSEC in harmonizing national legislation with the European standards by applying the legal framework to ensure the removal of barriers to sub-regional cooperation, thus contributing to the implementation of projects in energy, transport, communications and environment and, as a result, allowing the creation of the Black Sea free trade zone as part of the European space and accelerating the reforms in the political, economic and social fields.

Opportuneness of the economic exploitation of the Black Sea economic cooperation can also be explained by the fact that Moldova has established bilateral relations with riparian states - Romania, Bulgaria, Turkey, Georgia, the Russian Federation and Ukraine, as well as with the countries of nearest terrestrial area -

Azerbaijan, Armenia and Greece. The last ones form the Wider Black Sea Region. The relationship of these countries with the EU structures through the programs of the European Neighborhood Policy is the tangential cooperation point. I.C. Lucinescu by quoting B. Jackson claims that "intense promotion of democracy in the Black Sea region counteracts the "revenge" ambitions of the Russian Federation, here the western and eastern values and aims being incompatible, the region presents a major interest for the European and Euro-Atlantic Community"[8, p.68]. The interest is confirmed by the fueled conflict in Ukraine, we should add.

In the order outlined by arguments, we should note that internal programmatic foreign policy provisions are formulated depending on the content of national interest, but from the external point of view the place and the role of the state are determined by the geopolitical interests of the great powers. We believe that the institutional, financial and technical European Union involvement in the sub-region is achieved by the provisions of the Eastern Partnership and the Black Sea Synergy programs to which Moldova is an active part. Conceived as an initiative of the sub-regional cooperation proposed by the European Commission in 2007, the Black Sea Synergy schedules the cooperation with the riparian states in the fields of democracy, human rights, migration control and prevention, solving the frozen conflicts in the sub-region and supporting the regional development in education, transport, tourism and ecosystem. A. Popescu and I. Diaconu mention that these objectives estimate the content of the foreign policy of the Member States fostering the regional cooperation as a strategy to get closer to the European Union [9, p.337].

In a thematic study V. Gheorghiu points out that, from foreign policy priorities, Moldova participates in the implementation of joint projects within the BSEC. The Black Sea Bank for Trade and Development that owns 2% of the statutory capital serves as a good example. [6, p. 9]. We should mention that so far, Moldova has participated as a member in several projects financed by the Project Development Fund, and the presidencies that were exercised by Moldova in BSEC has favoured substantially the expanding relations between partners and has consolidated its position in the area. We find the evidence in the electoral platforms of some political parties emphasizing that Moldova's activity in BSEC was an essential chapter in the foreign policy. Realizing a blueprint for programmatic vision on the sub-regional relationship of the Republic of Moldova, it should be mentioned that for the parliamentary elections in 2001 the Democratic Christian Popular Party promoted the more effective regional cooperation with neighboring countries and the countries of the Black Sea basin [10], while the Electoral Block "Braghiș Alliance" placed the Black Sea Economic Cooperation Organization on the same segment of cooperation with the Independent States Community [11] that are being distinguished by different approaches to geopolitical cooperation and integration.

In the documents of the Moldovan Democratic Party for the elections on 29 July, 2009, it is outlined that international favorable political climate and changing balance of forces inside are conducive to deepening cooperation with BSEC by diversifying the market for the products and local services. [12] In the same context, the Liberal Party is

programmatically opting for the harness of the framework of regional cooperation and active participation in the Black Sea Synergy promoted by Romania at the Polish-Swedish initiative regarding the Eastern Partnership [13]. The Alliance Moldova Noastră (Our Moldova) noting the strategic importance of the Organization programmatically promoted the harness of the opportunities for the inclusion of Moldova in the group of potential candidate countries for the European integration by participating in the Black Sea Synergy [14]. The Democratic Liberal Party of Moldova committed to act through traditional cooperation channels with the European Union ensuring to involve in the implementation of the objectives of the Common Foreign and Security Policy with direct reference to the issues of common interest which are related to international and regional security, fight against terrorism and illegal migration [15]. Namely this programmatic provision defines Moldovan political role in the sub-region, taking over and applying the experience of riparian states that have a positive impact in achieving foreign policy goals, i.e. a mechanism of rapprochement of the European integration.

In conclusion we reiterate that Moldova's participation in the works of the BSEC is a logical finality of programmatic provisions of foreign policy in the field of security, transport and infrastructure, energy, information technology, agriculture and efficient governance. By this forum, Moldova is a direct beneficiary of integration programs and initiatives launched by the European Union, although, we should recall, there have not been harnessed all existing reserves because there is not a full awareness of this process.

Moldova's cooperation in the extended area of the Black Sea is also performed in the GUAM, an institution which, by Common Communiqué of the Presidents of the four founding countries adopted on 10 October 1997 in Strasbourg, stated that it promotes the necessity for quadrilateral cooperation to strengthen stability and security in Europe. This goal is valid by respecting the democratic values, non-interference in state sovereignty, inviolability of borders, ensuring rule of law and human rights. In the outlined order of ideas, to correspond to the economic, social, political and institutional challenges, the Moldovan Parliament ratified the Statute of the Organization for Democracy and Economic Development - (GUAM) and the Agreement on Privileges and Immunities of the Organization on March 29, 2012. To exercise effective external cooperation the Convention of the GUAM member states on mutual aid in consular matters was ratified. [16]

Besides the adoption and implementation of the overall objectives of the Organization in the national area, the authorities have proposed as a finality the rapprochement to a strategic partnership for a long-drawn term on the transit of hydrocarbons from the Caspian Sea to the Europe, which favours the diversifying access to the necessary resources and ensures sustainable energy security by reducing the economic dependence on the Russian Federation. Pointing out the impact of external cooperation, S. Cebotari states that "GUAM is the only sub-regional structure from ISC space of which Russia does not belong and the intention of Moldova, Georgia, Ukraine and Azerbaijan to cooperate for ensuring stability in the Black Sea basin and in the region from the Black Sea to the Baltic Sea, a territory in which NATO and the European Union have expanded, only feeds the suspicions of the Russian Federation that the new

members could become advocates of the interests of GUAM member states in the relationship with Washington and Brussels "[17, p. 154]. To ground the strategic importance of Moldova's cooperation with GUAM member states, we specify that the organization arose from the necessity of political, economic and social dialogue to find solutions to common problems. Although ISC approached the same areas of cooperation being guided directly by Russia, it failed to identify optimal strategies for each individual state, thus national interest being avoided. By participation in GUAM, Moldova has sought to redefine its position in the sub-regional cooperation processes advocating for strengthening and expanding trade and economic relations. An important area of cooperation is the diversification in the sources for energy supply in the area of Member States, an objective that can be achieved by solving the frozen conflicts in the GUAM area. [18]

S.Cebotari and V. Grosu claim that Moldova's relations with GUAM experienced some fluctuations due to a different political vision of the communist government that led to the decision to leave the organization because "it would turn from a cooperation mechanism in a counterbalance to the Russian Federation"[19, p.141]. Russia's hostile attitude towards the problem of solving the conflict in the Eastern districts, ceaseless economic embargoes and continual changes in the strategic priorities of Moldova's governments following the parliamentary elections on July 29, 2009, has conditioned the resetting of the GUAM perspective.

Moldova's level of cooperation with GUAM states is reflected in the DLPM's electoral platform for the elections on 20 July, 2009, while the documents of other competitors, CPRM, DPM and LP, do not show provisions regarding the relations within this structure. DLPM by evaluating the importance of the Organization to strengthen the position of the Republic of Moldova in the sub-region specifies that stagnation in the cooperation within this entity has occurred not only due to excessive concentration of foreign policy priorities for the Western Balkans, but also due to the fact that it has become hostage to Moscow's objections. According to the electoral platform, GUAM is not an organization directed against anyone, its ultimate goals indicating the promotion of the European integration for its Member States, economic and democratic reforms and settlement of energy problems in the region. [15] In the context of these ideas and to overcome the established situation DLPM has proposed to revitalize Moldova's participation in GUAM in order to promote the European values and energetic security.

Therefore, the evaluation of Moldova's participation in the process of cooperation within GUAM denotes the identification of the solutions for the multiplication and diversification of the energy sources required by the national economy and consumers, but the basic problem is a decreasing degree of efficiency, authority and usefulness of the structure as three of the four member states - Moldova, Ukraine and Georgia have focused their efforts on Eastern Partnership cooperation, while Azerbaijan tends to exercise a multi-vector policy. It seems GUAM becomes history as in 2014 the Moldovan Presidency of the executive structure of the Organization for Democracy and Economic Development was little mediated without encouraging results.

An important step in consolidating the position of the Republic of Moldova on the European arena lies in the work involvement of the Central European Initiative (CEI) that is an inter-governmental forum which promotes political, economic, cultural and scientific cooperation between Member States. Its core mission is the sub-regional development for European integration [20]. V. Umanet noted that the Initiative aims at supporting the members in their efforts to advance the political dialogue with the European institutions and the intensification of economic integration into the European Union [21]. The political cooperation is determined by the non-political sub-regional cooperation focusing attention on the strengthening of institutional capacities to apply the experience of the Central European states and to call on projects funded by the Initiative. Starting from the ICE importance in the economic and political cooperation, the Ministry of Foreign Affairs sent a request to join this structure in 1996. As a result Moldova was admitted as a full member. Later, in the working sessions of the Initiative it was expressed the support for admission to the Stability Pact for South Eastern Europe [22, p. 54]. In 2008, Moldova held the rotating presidency of this program for social development and the activities were focused on strengthening cooperation between Member and Non-Member States of the European Union. The harness of the opportunities is transposed into projects promoting the European standards as a firm development mechanism for this region [2. 3].

Although it is an organization for intergovernmental cooperation, predominantly with political aspect, by ICE Moldova has managed to forge social, economic and cultural relations with partner states for economic development and cross-border projects harnessed into tangible results. By ICE coordinates it was possible to obtain funds for the regional research project Moldova - Ukraine - Romania entitled "New Frontiers in Southeast Europe and their impact on stability in the area ICE". The collaboration was made possible through CEI Cooperation Fund, established by the Ministers of Foreign Affairs in 2001, the budget being fueled by contributions from Member States based on an annual scale. Moldova's financial contribution is 3960 euro. The fund facilitates the implementation of multilateral cooperation activities with local impact, usually in the form of seminars, workshops, events and training courses in accordance with the priorities of the Initiative Action Plan [24]. The importance of Moldova's involvement in sub-regional cooperation activities comes from the opportunity to multiply European integration aspirations by taking the experience of the countries with an advanced degree in the process, such as sub-regional cooperation in relation to travel to the Schengen border.

Analyzing the offer of foreign policy from electoral programs and platforms, we find that any political party which has exceeded the threshold and has become part of the ruling coalition since 2009 does not refer directly to ICE and does not highlight Moldova's role and place in regional cooperation related to the program facilitating the integration into the European Union. However, national authorities formed by acceding to government of the pro-European parties, had associated sub-regional cooperation with the detachment modality from the former Soviet space. To validate this assertion, we refer to V. Chirilă who mentions that special attention is given to Moldova's participation

in the actions of the South-East Europe Cooperation Initiative (SECI) formed by the EU and the USA participation which is the first regional initiative designed to facilitate the integration of the Western Balkans into the European structures by encouraging cooperation between its members [25, p.121]. In the same context there should be mentioned that the LP was programming in the documents for the elections on 28 November, 2010, Moldova's accession to the European Union through its inclusion in the Western Balkan countries or in another separate project [26].

Declaration of constituting SECI on 6 December, 1996, offered to Moldova the opportunity to connect to drafts of sub-regional cooperation in South-East Europe related to facilitating border crossing, visa regime, and infrastructure modernization predominantly in transportation, energy security insurance, private sector development and cross-border crime prevention. Moldova's presence in this Initiative was the major reason for the inclusion into another institution, Stability Pact for South Eastern Europe (SP). The act for accession was signed in Brussels on 28 June, 2001, but the accession was conditioned by two aspects: not being addressed the solving of the conflict in the eastern districts or the option for the prospect of European integration. By accepting the conditions, Moldova became a member of the Pact being the only country in the CIS. The unique inherent advantage of this cooperation is the opportunity of detaching from the political and legal framework formulated by the Partnership and Cooperation Agreement and the creation of new forms of external dialogue. Wanting to accumulate as many reasons in favour of its capabilities for sub-regional cooperation, Moldova has sought to participate into the most important projects, programs and initiatives launched under the Pact "Democratization and Human Rights" relate to the human rights and ethnic minorities; "Economic Reconstruction, Development and Cooperation" related to the infrastructure development and sub-regional electricity markets, trade facilitation and liberalization, information technology and investment promotion; "Security Issues" related to preventing organized crime, corruption and human traffic, promoting cooperation between police services. According to V. Gheorghiu, through participating in these projects and initiatives, Moldova has shown the ability and desire to integrate into the structures from the South-East Europe offering availability to ensure stability and identify common regional issues and developing programs for their eradication [22, p.39]. On the contrary to some electoral provisions expressed by several parties for the elections in 2010 where they advocated for an active policy oriented towards using the geopolitical situation considered to be favorable in the implementation of international projects related to the construction of pipelines for oil and gas transit from the countries in the Central Asia to South-East Europe through Moldova, we find that national authorities' involvement in such projects has proven to be quite poor, transposition and implementation of EU energy package require consolidated efforts to fulfill the tasks on time. However, it should be stated that Moldova acceded to the Treaty of the European Union states and those from South-East Europe to create a common market for electricity and gas between the European Union and other countries, an action that occurred in 2010.

Although the subject of integration into the European structures has not been accepted for review and debate by SPSEE, Moldova obtained certain benefits exposed by standardizing areas of cooperation across human rights, economic development and border security and a substantial share in the list of funded projects are those dedicated to infrastructure.

A new stage of cooperation in the area of South-East Europe consists in the development of partnership relations with the Regional Cooperation Council, formally established on 27 February, 2008, recognized as the successor of the Stability Pact for South-East Europe. This structure is the result of a comprehensive restructuring process of regional cooperation formats, being intended to cooperation in the South-East Europe by focusing actions on facilitating the integration of NATO and EU member states. The main role of the Council is to generate and coordinate development projects through the creation of permissive political climate for the benefit of each partner country [27]. In accordance with the objectives the national authorities have great opportunities to build integrated member experience adjusting it to local realities and processes.

In the context of increasing the share of sub-regional cooperation, Moldova was accepted in South-East European Cooperation Process on 4 May, 2006, in the Summit held in Thessaloniki, Greece. Later, on 10 October, 2006, Moldova signed the Charter of Good Neighbourhood, Stability, Security and Cooperation in South-East Europe, becoming de jure full member not only geographically, but also geopolitically of the South-East Europe. Thessaloniki Declaration is a significant factor in the active and full participation of the country in sub-regional processes and initiatives from South-East Europe [28]. We note that there is a direct relationship between the activities of the Cooperation Process in the South-East Europe and the Regional Cooperation Council: The Process has the political role; while the Council has the mandate of an executive forum which due to its operational dimension focuses on identifying opportunities for cooperation among states and promoting sub-regional development projects.

In the same vein, N. Enciu and V. Enciu analyze the evolution process of rapprochement of the countries of the Central and South-East Europe to the European Union and state that for these countries, including Moldova, disappearance of political and ideological barriers has allowed the access to a new political and socio-economic culture and a distinct vision on the development of overall relations between the European or global institutions and states [29, p.205]. I. Jinga and A. Popescu consider that through the integration of Central European and Eastern European countries in these structures, "we are witnessing t a displacement of the East to the West, because European and Euro-Atlantic integration is not an end, but the most proper modality to ensure the stability and security" [3, p.4].

By the analyzing of the chronological development of external relations of Moldova, we determine that most acts of cooperation at the sub regional level were initiated and signed during the communist government, CPRM platform aimed at the transformation of the Republic of Moldova in the manner of the European standards, investments in economy, opening the Western markets for domestic products and liberalization of the people movement. These options have proven to be strategic, but

from tactical point of view, the foreign policy is oriented towards the Customs Union, considered a short-term development mechanism, to prepare for European integration.

3. Conclusions

Making the sum of the analyzed assertions, we consider sub-regional cooperation as a preliminary step, preparatory for Moldova's accession to the European Union, the short-term strategic objective of foreign policy. To this end it is necessary to respect the adhesion criteria, established for candidate countries under the Copenhagen European Council on 21-22 June, 1993, which comprise democratic institutions, rule of law, protection of human rights and protection of minorities at political level, as well as the insurance of functioning market economy and capacity to cope with competitive pressure within the European Union at the economic level [30]. In conclusion we note that participation in different formats of cooperation has served as support for enhancing internationally Moldova's presence. The external environment often occurred to be more conducive to building cooperative relationships than the internal one fragmented by political crises and lack of national consensus or the duplicity of the external policy. Political parties show some programmatic interest in the problems of external cooperation due to the significance of this component for transforming internal problems in tangible results in short and medium terms. Foreign policy in political party's activity is limited largely to geopolitical options associated with Moldova's development.

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Conceptual Approach to Innovation - a Modern Tool to Enhance Entrepreneurial Competitiveness

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Abstract

The paper studies the evolution of the innovation process generations, analyzes the meaning of the innovation concept and its influence on the performance of the economic agents. The issue addressed: the lack of a harmonized and unanimously accepted terminology of the term „innovation” leads to permanent discussions on this subject and to the impossibility of developing the harmonized methodology of its evaluation. Research methods: observation, analysis of documents, scientific papers and works. Conclusion: A significant number of studies have examined the impact of different forms of innovation and its effects on business performance, the findings indicating expressly that innovation, in its various forms and aspects, was the strongest predictor of business performance.

Key words: innovation, innovation management, knowledge, entrepreneurs' performance.

1. Introduction

Since the sixteenth century, the scientists from all over the world have written a series of papers and have conducted extensive research studies on innovation that can explain its essence. [1] One of the first and most comprehensive descriptions of innovation or the process of innovation in the field of economic sciences was introduced by the American economist and politician Joseph Schumpeter in his work „Theory of Economic Development” in 1930. At that time, the theory of economic development proposed by J. Schumpeter competed with Keynesian theory of economic development. The main idea of Schumpeter's theory consists in the fact that the major forces that influence the economic equilibrium are the entrepreneurs who can innovate and implement practical innovations, and as a result these activities lead to the economic growth and formation of the new equilibrium. Also in the 1930s, Schumpeter identified five characteristics of the innovation process:

- the use of new technology, new technological processes or new market

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- insurance of production (sale-purchase);
- the introduction of a new or well-known product, but with new properties;
- the use of new raw materials or semi-finished products;
- the change in the production process organization and technical-material supply;
- the emergence of new sales markets [2].

Therefore, J. Schumpeter's work can be considered as a benchmark of the classical theory of innovation. However, the economic situation after the Second World War (SWW) served as a catalyst for the development of innovation activities. At the end of this terror that took place on the territory of three continents and in the waters of four seas, the innovation was considered as being indispensable for the economic and technological survival of nations and companies, which led to its widespread use, to the intensification of scientific research activities and to the implementation of the innovation management [3].

2. Main part

Analyzing the specialized literature, it is possible to affirm that different generations of the innovation process appear in completely different moments and contexts, therefore they require a historical approach [4, 5, 6, 7, 8, 9]:

The first generation of the innovation process, after the SWW and in the mid-1960s, is characterized by economic growth due to *rapid industrial expansion and new technological opportunities*. The first generation or „the concept of push technology” supposes: the „more investments in research and development” the more „new successful products you get” [7].

In the Cold War era, special state funds had been created for research projects in the field of defense, fact that lead to the emergence of atomic energy, satellite communications, high technology surveillance, global positioning systems (GPS), super computers, etc. [10].

The second generation occurred between the mid-1960s and early 1970s. The level of employment in the manufacturing sector is considered as a static one, while the productivity of this sector is growing. Thus, during this period of time, *industrial concentration is increasing*, new products appear, but the manufacturing processes are mainly based on the existing technologies. The demand and supply are in balance. The large companies are struggling to gain a market share as large as possible.

The third generation, approximately, takes place between the early 1970s and the mid-1980s. During this period the inflation rate is considerably increasing and the level of demand reaches the saturation point (stagflation). Structural unemployment is steadily rising. The companies are forced to adopt consolidation and rationalization strategies, *while increasing emphasis is being placed on the process of large-scale innovation* and experience in this field. Successful process innovations are based on extensive and systematic studies covering many sectors and countries.

From the early 1980s to the early 1990s, the fourth generation took place. There is a steady increase of the awareness degree regarding the strategic importance of generic

technologies. More emphasis is put on technologies. There is a new development perspective. *There is a rapid increase in the number of strategic alliances between companies activating in different spheres.* The life cycle of the product becomes shorter, therefore special attention is paid to time management, integration and parallel development (integrated model) [6].

The fifth generation begins in the mid-1990s. The companies keep their commitment to technology accumulation. The creation of strategic networks continues. The speed of reaction, the speed of product development, the flexibility and adaptability remain very important for the market. „Fast Innovation” becomes an important factor for a company’s competitiveness. The companies are increasingly focused on the direction of integrated products and production strategies [7]. In this context, we note that nowadays the importance of knowledge has become indispensable for economic growth, which implies that staff knowledge within the commercial units and the competitiveness of these companies go hand in hand and they directly depend on each other. Therefore, the innovation based on extensive and in-depth knowledge becomes a determinant factor of national and regional competitiveness in the world knowledge-based economy [8].

It is certainly possible to note that there are other variations in the timing of different generations, and in some cases, the difference constitutes more than a decade. Miller (2001) [11, 12], for example, places the second generation between 1950 and 1985, while Niosi (1999) places the same generation between the early 1960s and the early 1970s. Although it is not always clear how the authors reached their conclusions on the splitting of periods, the main idea is to indicate when a certain approach to innovation activities was considered as a dominant one [4]. It should be noted that, in any case, new generations appear because the innovation adapts to a context that is constantly changing and the purpose of each new generation is to remedy the disadvantages of previous generations.

In the modern economic literature, there is no a harmonized and unanimously accepted terminology on „innovation”, therefore its definition represents a constant subject of discussions.

One of the most recognized notions is written by the American economist Peter Drucker „innovation is a process of endowing with something new, improving conditions or increasing utility levels” [13] and „innovation is the specific tool of entrepreneurship, the means by which they exploit change as an opportunity for different businesses or a different service” [14].

It should be mentioned that the Belgian physical chemist, Nobel Prize winner, A.I. Prigogine argues that innovation is a novelty, a significant change, a reorganization that can take place in any field of human activity, it contributes to meeting the existing needs of society, and its implementation brings about tangible economic benefits to the entrepreneurs. In other words, innovation is a final result of the innovation activity [15].

According to the opinion of the co-authors of the local paper „The fundamentals of innovation and technological transfer management”, „the innovation process begins concomitantly with the production (products) - economic (commercialization, marketing) activity and continues in the activities of work and business organization and

management, activities which imply the provision of services or even government” [16].

According to the Code of Science and Innovation of the Republic of Moldova (art. 20), innovation represents the implementation of the new or improved final result of the scientific research and technological transfer activity obtained in the form of competitive, new or improved knowledge, product, service or process used in practical activity and/or marketed [17].

The concept of innovation is characterized by the Moldavian scientist Hriscev as „a change emerged in the production process of goods and services, socio-economic relations, science, culture, education and other spheres of human activity, conditioned by the use of intellectual resources and oriented towards the modernization of the production process, improvement of its results and (or) reducing costs”[18].

Watts Humphrey, the pioneer in the field of computer software systems development of the American corporation producing advanced technologies IBM, defines innovation as the „process of turning ideas into manufacturable and marketable form” [19].

Another American author, James Harrington, states that innovation is successful everywhere it is implanted, the innovation itself represents growth and survival [20].

The official definition of innovation taken from the Green Paper on Innovation drafted by the European Commission and published in 1995 stipulates that: „Innovation has a variety of roles to play. As a driving force, it directs businesses to ambitious long-term goals. It also leads to the renewal of industrial structures and is behind the emergence of new sectors of economic activity. Briefly, innovation is:

- Renewal and expansion of a range of products and services and related markets;
- Creating new methods of production, supply and distribution;
- Introducing some changes in the management, organization of work, as well as of working conditions and qualified labour force” [21].

Currently, innovation is seen as an essential component of competitiveness, integrated into the organizational structures, processes, products and services within a company [14].

In this context, the definition presented in Oslo Manual, developed by the Organization for Economic Co-operation and Development (OECD), which is considered as the primary international basis for defining and evaluating innovation activities, as well as for the development and use of related data, considered as a fundamental reference source for describing, identifying, evaluating and classifying innovations at the company level, states that [22] „innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations”.

Therefore, there is a breakdown of the notion of innovation into four parts: product innovation, process innovation, marketing innovation and organizational innovation.

Product innovation means the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes

significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. Innovative products may be new to the market or new only to the innovating enterprise. [22, 23] Product innovations can utilize new knowledge or technologies, or can be based on new uses or combinations of existing knowledge or technologies. *Product innovation refers to both goods and services*, it is a difficult process driven by advanced technologies, constantly changing customer demands, shrinkage of the product life cycle as well as increasing global competition [14].

Process innovation represents the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software in order to reduce production and distribution costs, to improve quality, production or distribution of new or improved products and to reduce environmental risks [22, 23]. Fagerberg highlighted that it is recognized that the introduction of new products usually has a positive and clear effect on the revenue growth, employment, but the things are different in the case of process innovation, due to its cost reduction nature, process innovation has a more unclear effect [24].

Marketing innovation is the implementation of an absolutely new concept or marketing strategy that differs significantly from the previous marketing methods usually used within the enterprise. The most common marketing innovations are: significant changes in product design or packaging, product placement, product promotion or pricing.

The main objectives of marketing innovations are:

- Increasing or maintaining the market share;
- Introducing products for new customer groups;
- Introducing new products into geographic markets. [22,23]

Therefore, marketing innovations take into account the latest needs and requirements of customers and are oriented towards opening new sales markets or positioning the new product on the market as best as possible, intending to increase company's sales. Marketing innovations are closely related to pricing strategies, product package design, packaging method, product placement and promotional activities along the 4P-s marketing lines (product, price, promotion, placement or Distribution) [25].

Organizational innovation is the implementation of a new organizational method in the firm's business practices, workplace organization or external relations that have not been used before in the firm.

The main objectives of organizational innovation are:

- Reducing the time needed to meet buyer's or supplier's needs;
- Improving the ability of the new product or process development;
- Improving the quality of goods and services.

The following examples can serve as eloquent practices: the implementation of practices for codifying knowledge, e.g. establishing databases of best practices, lessons and other knowledge, so that they are more easily accessible to other employees; introducing education and training systems for employee development and improving worker retention, etc. Thus, organizational innovations are closely related to all

administrative efforts to renew organizational routines, procedures, mechanisms, systems, etc. in order to promote teamwork, exchange of information, learning, coordination and collaboration. [14]

Therefore, it can be noticed that the innovation process can be subdivided into: commercial and non-commercial. As for the definition of „commercial innovation process”, everything is simple. As a result of this innovative process, there is a marketable innovation, for e.g. a new technological product. The problem arises with the perception and understanding of the term „non-commercial innovation process”, as this type does not imply its use by the broad public and as a result of this process, the organizational changes occur most often. Namely this type is generally used by a small group of consumers, for example, by the company that invented it and keeps it secret for competitors, so that they can't get the same results without using this new process. The separate examination of these two categories of innovation should be done for several reasons:

- „marketable innovations” or „technical innovations” and „organizational innovations” lead to quite different results. While new technologies are being developed in scientific laboratories during research and as a result they can lead to copyright registration on intellectual property, „organizational innovations” are the result of less systematic efforts and rarely can be protected by intellectual property rights.
- „technical innovations” lead to significant economic results due to „organizational innovations”. Technical novelties will not have considerable economic consequences until internal conditions are changed in such a way as to create a necessary environment in which new managerial decisions will be fully implemented.

3. Conclusions

The positive relationship between innovation and business performance has long been discussed, but the evaluation methods and therefore the obtained results differ from case to case. A study carried out by Deshpande et al. in 1993, among the *Japanese companies*, indicated that positive innovation has influence on the organizational performance in terms of profitability, size, market share and growth rate [26]. Dwyer and Mellor, in their study accomplished among the *Australian companies*, found that those companies that adopted strategies of „offensive technique” had the highest percentage of successful new products and achieved the highest level of performance in achieving their established performance goals, profitability of the new product launch and overall success level [27]. Another study among the *Canadian companies* accomplished by Baldwin and Johnson also showed the significant impact produced by innovation by measuring performance, fact which affects the wide range of activities within organizations, including the increase of their market share and return on investment [28]. A study done by Salavou (2002) among the SMEs activating in the food industry sector of *Greece* showed that product innovation was a key factor in enhancing business performance to a large extent through the return on assets. A series of studies

mentioned above and also many other studies have examined the impact of different forms and sizes of innovation on business performance and the findings expressly indicate that innovation in its different forms and aspects was the strongest predictor of business performance. However, taking into account that the internationalization and globalization of the world economy, which has an increasingly strong and pronounced emphasis moving from material values to intangible values, the competitive advantage of companies turns into the management based on knowledge, creative ideas and methodology of innovative business management.

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Regional E-Infrastructure and Services for Research and Education in EAP Countries

Petru BOGATENCOV¹, Grigore SECRIERU²

Abstract

In the paper considering approaches and solutions for development of modern regional e-Infrastructure resources for providing specific services to the research and educational communities in countries supported by European Eastern Partnership Programme. Over the past several years the dependence of research and education on access to high-speed networking infrastructures, to large-scale computing and other e-Infrastructures' services is rapidly increasing. e-Infrastructure designates a new generation of integrated ICT based resources, services and is widely considered as a key enabler for scientific and social development. Such infrastructures represent a distributed medium based on high-bandwidth networks, distributed Grid computing, High Performance Computing (HPC), scientific Cloud resources and respective data repositories. The focus is made on describing the various services that are deploying in the Eastern Partnership countries to support educational and research activities in universities and research centers. Argued importance of developing of Research and Educational networks as a key e-Infrastructures' enables. Described expected outcomes of regional projects supported by European Commission in the area on regional infrastructures and modern services deployment for research and education.

Keywords – regional networking infrastructure, e- infrastructures and services for research and education

JEL: C89

1. Introduction

In the Eastern Partnership (EaP) countries (Moldova, Belarus, Ukraine, Armenia, Azerbaijan and Georgia) are developing national e-Infrastructure components like Grid, HPC and Cloud computing facilities, electronic libraries, scientific data repositories, etc. Taking into account European models, in EaP countries organizational structures for the support of modern collaborative research – National Research and Education Networks (NREN), National Grid Initiatives (NGI) and HPC users' associations were established. They are actively participating in the regional and pan-European projects, including initiatives focused on integration in the leading European e-Infrastructures. In the region there are many qualified research teams intensively using computational and

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informational resources provided at national and European levels (Bogatencov P., et. al., 2014).

It should be mentioned that during last few years important development of e-Infrastructure in EaP countries has been made, however there is still a significant gap between the developed European countries and the EaP region. Hence support from National Governments and EU for the further development of e-Infrastructure in the region is essential for the integration of scientific potential of these countries in the European Research Area. That is why since 2016 EaP countries are participating in the regional initiative named EaPConnect that is supported by European Commission in a form of co-funded project and is intending to fill the existing gap.

According to the information provided by NRENs of EaP countries the number of users of various networking services, computing resources and data repositories is constantly growing. Key research applications and services that are developing in the region covering a wide range of scientific disciplines, such as particle physics, life sciences and computational chemistry, earth and climate sciences, economical behavior, computational engineering, etc. Accumulated experience of new networking and computing technologies application shows that for more active and effective use of available e-Infrastructure resources and services is necessary to reorganize users' support activities, activate new approaches of interested users' communities engagement, enhance training activities for new and existing users, provide operative consultations for professionals to raise their skills in deployment of new demanded services.

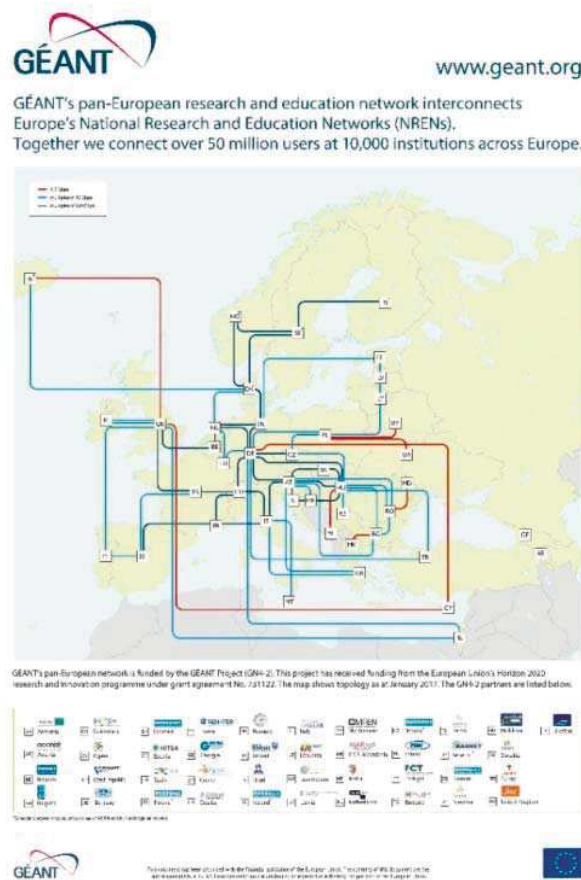
2. Regional Network Facilities

European Commission started deployment of common research and education Pan-European networking infrastructure with the aim to unite all research and educational institutions in Europe since 1993. A modern network infrastructure is one of the basic components of e-Infrastructure supporting the requirements of e-Science and e-Education. For the network level it is crucial to possess high performance and scalable advanced infrastructure operated by NRENs for the sustainable development and implementation of new services. As a preferable solution we consider optical fiber based networks that have a wide variety of network design approaches and technology choices. Such networks ensure the fixed cost of the use of the infrastructure and at the same time provide scalability up to Tbps, as the network grows.

Pan-European research and education networking infrastructure based on GÉANT network that is interconnecting European national research and education networks (GÉANT pan-European research and education network, 2014). GÉANT network operation and development is supporting by a serious of EU funded projects that include a collaboration between 40 partners represented by 37 European NRENs and NORDUnet (comprising NRENs from Norway, Sweden, Finland, Denmark and Iceland). In total, the project represents 42 NRENs including from EaP countries - Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. GÉANT provides a high-bandwidth, first-class network infrastructure and services connecting over 50 million

users at 10,000 institutions across Europe. The current GÉANT backbone topology is presented in Fig. 1.

Figure 1. GÉANT backbone topology.



Source: GÉANT pan-European research and education network, 2014

Several initiatives supported by the European Commission (EC) were launched to investigate the status of NRENs from organizational and technical points of view in Eastern Europe and propose the appropriate approaches for their further development. In 2006 - 2007 NRENs from EaP region were involved in the EC project “Distributed Optical Gateway from Eastern Europe to GÉANT (Porta Optica Study - POS)” (EU FP6 Porta Optica Study project, 2008), which aimed at the investigation of the most suitable approaches for realization of regional optical infrastructure that could be further integrated to GÉANT. During the project realization a detailed study of possible solutions to build fiber optic infrastructure for connecting R&E networks of the Eastern European countries to GÉANT network was performed. In the project several recommendations were made to build a number of cross border connections that will

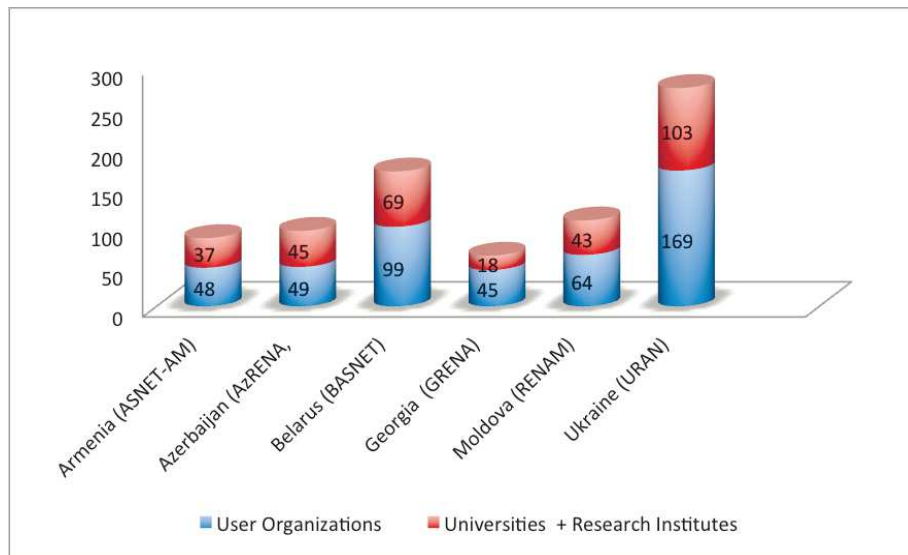
unite neighbor NRENs, determined principal ways to organize connection of elaborated regional infrastructure to GÉANT via Points of Presence in several countries.

In 2011-2013 a new feasible study of research e-Infrastructures development in the Eastern Europe countries was performed in the framework of CEENGINE project (EU FP7 CEENGINE project, 2012).

In the both projects utilization of “Dark Fibre” (DF) paradigm was suggested as the most appropriate solution for NRENs optical infrastructures implementation. This concept should be well understood in order to properly evaluate the economic aspects of such infrastructure development. Fibre acquisition and operations involve new cost categories that have to be recognized and added to the economic model of operations of fibre based NRENs. In addition, the economical assessment should be done for long term – DF is usually a long-term acquisition and should be evaluated as such. NRENs DF interconnections, so called Cross Border dark Fibre – CBF concept, is now widely used by European NRENs for optimization of Pan-European optical backbone construction.

As a result of these investigations and due to EC support the direct optical links were established between NRENs from Romania and Moldova, Poland and Ukraine, Poland and Belarus. Thus, Moldova, Ukraine and Belarus have cross-border connectivity to satisfy the current needs; however there is a need for development and creation of resilience backup connections to GÉANT network. At the same time, the problem of the "digital divide" is still relevant for the South Caucasus countries. The most important issue is the provision of high bandwidth communications, which would provide redundancy for all the countries involved. The Fig. 2 shows detail information about the organizations using such networking facilities in EaP countries based on data provided by NRENs and some additional information obtained also from GEANT Compendium (TERENA/GEANT Compendium, 2002 – 2016).

Figure 2. EaP NRENs – users’ community outreach.



Source: NRENs & TERENA/GEANT Compendium, 2002 – 2016

After the analysis of the provided and available information the following conclusions can be drawn:

- Over half of students, lecturers and researchers are served by EaP NRENs;
- Connectivity conditions for Belarus, Moldova and Ukraine are much better compare to Armenia, Azerbaijan and Georgia due to the support from Polish and Romanian NRENs;
- Fraction of scientific traffic is still low compared to the demand on the commodity Internet for EaP countries;
- Costs for clear channel needed to establish GÉANT connectivity are several times more expensive compare to the commodity Internet, especially in South Caucasus countries;
- Internal backbone capacity upgrade to 10 Gbps is required for Armenia, Azerbaijan, Georgia and Moldova; the current backbone capacity for Belarus and Ukraine is sufficient;
- Eduroam mobility service has been deployed in all EaP countries, however the percentage of institutional participation still very low;
- Additional analysis and more close cooperation is necessary for the implementation of the necessary and demanded services in the regional network.

Dialogue between EaP NRENs and EU experts initiated in 2012 and continued later within GN3plus project had the aim to investigate possible solutions for integrating EaP region to GÉANT and support of potential project elaboration focused on regional research and education network creation. An examination performed by a GEANT project experts' team focused on determining the resilient and cost effective technical solutions for deploying regional optical network infrastructure that would unite all EaP countries. Special attention devoted to finding solutions of effective integration of EaP networking infrastructure to GÉANT. The various approaches of the EaP regional network infrastructure development and its integration to GÉANT were discussed. The whole regional network architecture was proposed in the EaPConnect project Concept Note developed by experts from GEANT Association, CEENet and Eastern Partnership NRENs. The proposed regional network structure has clear advantages:

- Fulfills the connectivity and capacity requirements of all EaP NRENs;
- Provides a large capacity increase including to South Caucasus countries;
- Provides backup connection to NRENs;
- Traffic between NRENs in Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine goes mainly via CBF connections over the dedicated network.

As a long term vision that would ensure wider collaboration with EaP countries, in the EaPConnect Concept Note proposed to establish two optical connection arcs:

- North to South connection arc - possibly from Baltic States through Poland, Belarus, Ukraine, Moldova, Romania and further to Sofia and Athens.
- Black Sea – connection from Romania through Moldova, Ukraine, South Caucasus to Turkey and further to Sofia and Athens.

As the kernel of the North to South optical arc in the Concept Note considering creation in the western part of EaP region several CBF connections between EaP NRENs and optical links to neighborhood NRENs from Central Europe that already effectively integrated to GEANT optical backbone (see Fig. 3).

The realization of the first stage of the EaPConnect project networking infrastructure allowed to implement four new direct connections to integrate NRENs infrastructures of Armenia, Azerbaijan and Georgia in GEANT network, create CBF connection between Armenia and Georgia, upgrade (duplicate) existing connectivity of Belarus to GEANT Point of presence (PoP) in Poland and create the second optical link to the new GEANT PoP for Ukraine.

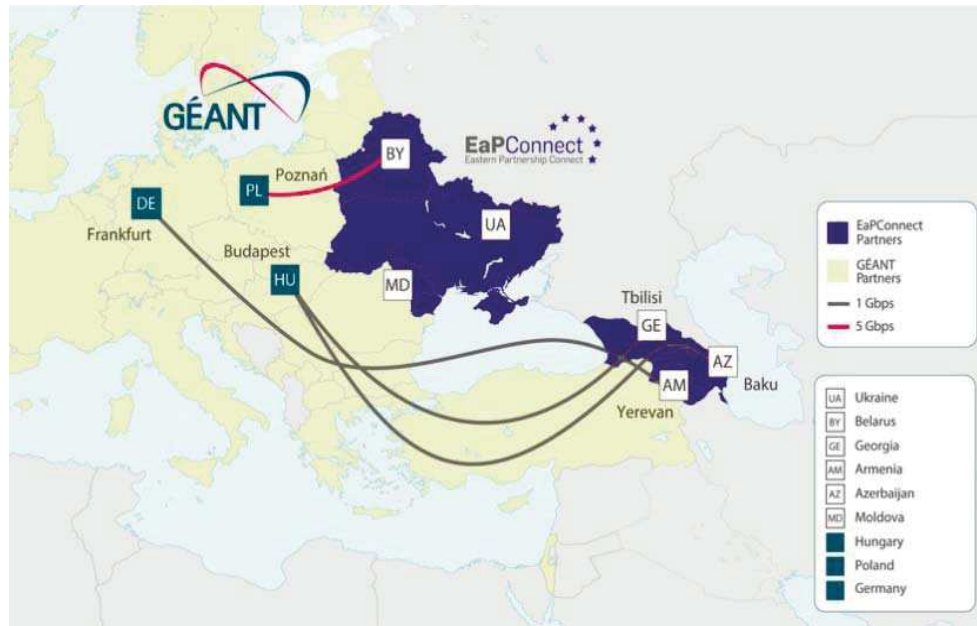
Figure 3. Geographical scheme of EaP North to South optical arc implementation



Source: BOGATENCOV P., et. al., 2014

During the first stage of EaPConnect project realization was elaborated the technical solution for upgrading connectivity of NREN of Moldova to Romanian NREN RoEduNet infrastructure and creation of the second CBF connection for NREN of Moldova to GEANT PoP in Bucharest. The realization of the elaborated technical project plans until the end of 2017. Newly created connections for implementation of the regional networking infrastructure are shown in the Fig. 4.

Figure 4. The first stage of EaPConnect project networking infrastructure development



Source: <https://www.eapconnect.eu/wp-content/uploads/2017/07/EAPtopology-Jun2017-1000w.jpg>

3. Computing and Data Infrastructures In EAP Countries

The current state of computer and networking technology makes the seamless sharing of computing resources on a global scale. Scientific computing Grids (I. FOSTER, C. KESSELMAN, et al., 2001) make it possible to integrate large, geographically distributed computer clusters and data storage facilities. Recent two decades within different projects (EU FP6 Enabling Grids for e-Science, 2003; EU FP6 Eu DataGrid project, 2006), EU is building the next generation pan-European computing infrastructures providing intensive computation and analysis of shared large-scale databases. SEE-GRID (South East European Grid) (ANTUN BALAZ, et. al., 2011) and BalticGrid (EU FP7 BalticGrid project, 2009) regional initiatives pushed to deploy sustainable national Grid infrastructures in the EaP countries and to integrate into the pan-European and worldwide e-Infrastructures through the interconnection of the regional infrastructures. Armenian, Georgian and Moldavian infrastructures were part of the SEE-GRID, and Ukrainian and Belarusian infrastructures were part of the Baltic Grid. In parallel NGIs have been established in EaP countries, which manage the computing resources provided to the national users' communities and integrated into the European and regional computing infrastructures. In addition, NGIs are focusing on forming of national users' communities, organization end user support, analyzing the needs of users', deploying demanded services for user communities.

In 2010 the new European Grid Initiative was launched. The goal of EGI-InSPIRE project (EU FP7 EGI-InSPIRE project, 2014) is to establish a sustainable European Grid

infrastructure and provide European scientists and their international partners with a sustainable, reliable distributed computing infrastructure that can support their needs for large-scale data analysis and simulations. 51 national and international institutions from Europe and Asia Pacific region are partners of the project, among them organizations from Armenia, Belarus, Georgia, Moldova and Ukraine. Information about Grid and cloud computing facilities in EaP countries (GRID STATISTICS, 2010-2015) is presented in table 1.

Table 1. Computational resources in eap countries

	Total Number of Sites	Number of Sites in EGI	Physical CPU	Logical CPU	Storage Capacity	Supported VOs
Armenia	8	2	148	592	27	6
Azerbaijan	3	0	84	336	72	4
Belarus	6	1	64	228	28	2
Georgia	2	1	74	300	28	5
Moldova	3	2	48	192	11	5
Ukraine	41	10	938	2372	455	45

Source: GRID STATISTICS, 2010-2015, BOGATENCOV P., et. al., 2014

The following conclusions can be made:

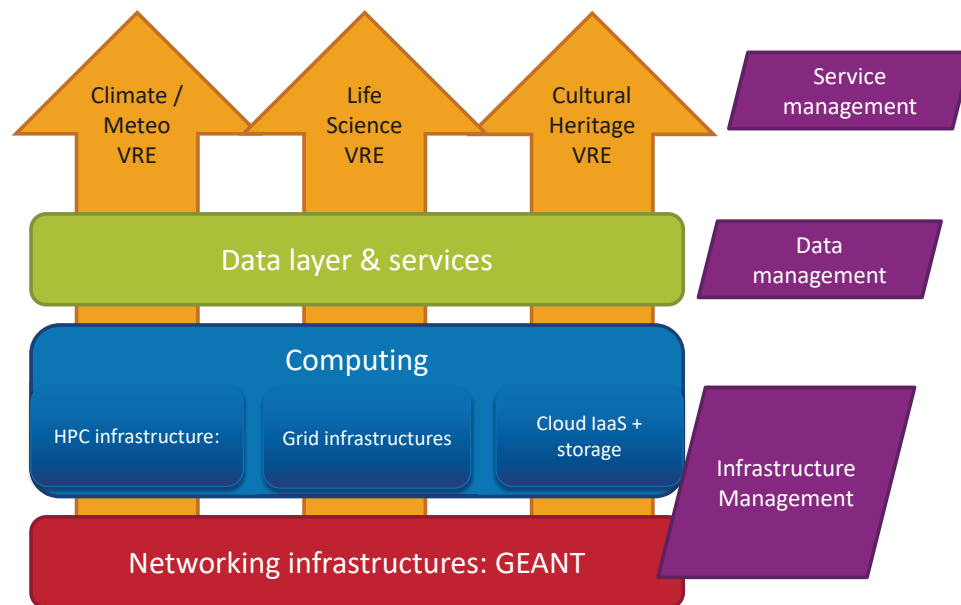
- All EaP countries are involved in distributed computing activities by providing computational resources to users;
- Only Azerbaijan resources are not included in EGI;
- Significant part of research computations is performed on HPC resources not included in EGI;
- Computational and storage resources provided to EGI are not large except Ukraine;
- Different EGI VOs are supported at 16 sites that included in EGI;
- Armenia, Belarus, Moldova and Ukraine support CERN related VOs (ALICE, ATLAS, CMS, LHCb).

Three EaP countries Armenia, Georgia and Moldova are engaged also in realization of the regional e-infrastructure development project “VRE for regional

Interdisciplinary communities in Southeast Europe and the Eastern Mediterranean (VI-SEEM)” (H2020 VI-SEEM project, 2015).

The project objectives addressed to the unique expertise focused on development of various e-Infrastructure components launched during the various e-Infrastructure initiatives realization in the region. The specific e-Infrastructure developments will provide an integrated distributed data handling platform upon which specific Virtual Research Environments (VRE) will be built. The integrated platform encompasses all layers including the networking and computing resources, and adding the specific data (and related data management services), software and tools relevant for the regional multi-disciplinary scientific communities. The Fig. 5 below depicts this integration over layers across the 3 selected communities.

Figure 5. Integration of the 3 selected regional communities over the layers of the integrated data processing platform



Source: H2020 VI-SEEM project, 2015

The overall VI-SEEM project aim is to provide user-friendly integrated e-Infrastructure platform for VREs in Climatology/Meteorology, Life Sciences, and Cultural Heritage for the region of South East Europe by linking compute, data and visualisation resources, as well as services, software and tools. The detailed objectives of the project include the following:

- Provide for the scientists from the region access to state of the art connectivity, computing and storage resources available in the region and help further to develop new resources across the region.
- Integrate the underlying e-Infrastructure layers with generic/standardised as well as domain-specific services for the region. The latter are leveraging on existing

tools with additional features being co-developed and co-operated by the scientific communities and the technology and e-Infrastructure providers, thus proving integrated VRE environments. The approach is service-driven in terms of service components and definitions, and their invocations.

- Promote capacity building in the region and foster interdisciplinary approaches.
- Provide functions allowing data management for the selected VREs, engage the full data management lifecycle and provide data interoperability across disciplines.
- Provide adequate user support and training programmes for the user communities in the region.
- Bring high level expertise in e-Infrastructure use to enable research activities of international standing in the selected fields of Climate, Life Sciences and Cultural Heritage

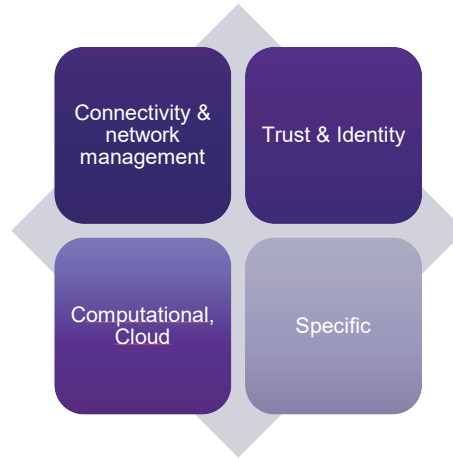
4. E-Infrastructure Services for Regional Research and Educational Communities

On the base of comprehensive analysis produced during EaPConnect and VI-SEEM projects proposal elaboration the following areas of development determined as particularly important for the EaP region research and educational communities:

- *ICT for education, research and digital information services.* Universities, research institutes, libraries and cultural centres need to enhance their activities and be involved in information digitization as well as new technologies for digital information access development. Providing access to digital libraries, e-services for access to cultural heritage and e-learning resources are amongst the highest priorities.
- *Electronic governance (e-governance) in education and research, including intelligent information management.* EaP countries are planning to create new services for research and educational communities with the help of new ICT solutions and reformed regulatory framework. The joint development of agreed solutions is an important task.
- *Health.* ICT for Health is one of the most significant societal challenges in EaP countries, as well as in the EU. It is important to develop interoperable solutions and standards within this field as well as to foster technical solutions implementation in EaP countries that are in line with the best European practices.
- *Connect to state of the art scientific research infrastructures in Europe.* Although there are several EU research centres with strong collaboration with EaP countries, this is technically limited by inefficient connectivity and lack of the necessary local e-infrastructure resources. Examples of domains of interest are Grids and Cloud Computing, nanotechnologies and microelectronics.

During the initial stage of the EaPConnect project realization the analysis of the most demanded services was produced. The services developing in EaP region enables to support the needs of researchers, students, stakeholders and other user communities both in a National and a Regional Levels. All services proposed for implementation are grouped as presented in Fig. 6.

Figure 6. Types of e-infrastructure service accessible for EaP research and educational communities



Source: EU FP7 CEENGINE project, 2012

Elaborated plan of e-Infrastructure services implementation includes the following grouped services recommended for priority deploying by EaP NRENs:

Connectivity & network management:

- *eduroam* - the pan-European service providing secure access to wireless networks on campuses from mobile devices effectively enabling mobility of researchers and students;
- *perfSONAR (PERformance Service Oriented Network monitoring ARchitecture)* - is a network measurement toolkit for running performance tests across multiple domains which helps to identify and isolate network problems.
- *Software Defined Network (SDN)* - is new paradigm and innovation in networking giving new possibilities in network utilization: reduce operational cost for network management; centralized network provisioning; hardware savings and reduced capital expenditures; guaranteed content delivery. The service allows to users themselves to manage the channel parameters of the owned channels.

Trust & Identity:

- *Web Single Sign-On* - the federated service available to connect campuses via identity federations.
- *eduGAIN* - emerging service in the GÉANT context around identity federations. Create inter-federation environments allowing the collaboration that is facilitated by national identity federations to reach beyond borders and support pan-European collaboration.

Specific:

- *Open Access initiative* - a new value added service for NRENs that is dedicated to support and promote open access to electronic publications according to the EC Directive 2001/29/EC, the Budapest declaration and other documents in that field. Open Access directories provided as a service by NRENs could offer a very

convenient way for EaP countries researchers to publish their work and to make it known at international level.

- *Real-time musical collaboration LOLA* (LOW LATency audio visual streaming system) - aims to enable real time musical performances where musicians are physically located in remote sites, connected by advanced network services, like the ones provided by the NRENs and GEANT and other high-speed international backbones.
- *Digitization of Cultural Heritage* - to support digitisation technologies and development of digital libraries by providing advanced data digitization, networking, computational and data storage facilities. Strength on balance collaboration and promotion of individual institutions to build virtual repositories on the top of regional digital libraries.

Computational and data storage serviced described in detail in the section III. Computing and Data Infrastructures In EAP Countries.

5. Conclusions

During the last few years important development of e-Infrastructure in EaP countries has been made, however there is still a significant gap between the developed European countries and the EaP Countries. Support from Governments and EC for the further development of e-Infrastructure and associated services in the region is essential for the integration of scientific potential of these countries in the European Research Area, such as European Research Infrastructures with global impact.

The realization of regional projects like EaPConnect and VI-SEEM will significantly contribute to the high quality networking infrastructure and well developed informational services deployment in EaP region.

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